

The Laird Rams: Warships in Transition 1862-1885

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ABSTRACT

The Laird rams, built from 1862-1865, reflected concepts of naval power in transition from the broadside of multiple guns, to the rotating turret with only a few very heavy pieces of ordnance. These two ironclads were experiments built around the two new offensive concepts for armoured warships at that time: the ram and the turret. These sister armourclads were a collection of innovative designs and compromises packed into smaller spaces. A result of the design leap forward was they suffered from too much, too soon, in too limited a hull area. The turret ships were designed and built rapidly for a Confederate Navy desperate for effective warships. As a result of this urgency, the pair of twin turreted armoured rams began as experimental warships and continued in that mode for the next thirty five years. They were armoured ships built in secrecy, then floated on the Mersey under the gaze of international scrutiny and suddenly purchased by Britain to avoid a war with the United States. Once purchased, they were largely forgotten. Historians rarely mention these two sister ironclads and if mentioned at all, they are given short shrift. Built with funds obtained in part through the Confederate Erlanger loan, these ironclads were constructed at Lairds shipyard in Birkenhead and represented an advanced concept of ironclad construction through new proposals involving turrets, the ram, heavy guns and tripod masts on an armoured ship, as advocated by Captain Cowper Coles, R.N. They proved too much of a leap in one design but when their roles caught up to the revised designs, the ships were modified to meet new requirements. After several mission and design changes they then performed to standard. This belated success occurred when the concept of the ideal armoured warship was in flux throughout the middle Victorian years.

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INTRODUCTION

The Laird Rams and the evolution of the ironclad warship

The two ironclad sister ships built by Lairds shipbuilders of Birkenhead during the American Civil War, have been largely overshadowed by another ship built by Lairds, the famous raider *C.S.S. Alabama*. Constructed after the equally famous *H.M.S. Warrior* and predating the ill-fated *H.M.S. Captain* (also a Lairds ship), the Confederate-intended Birkenhead ironclads were built in response to the combat proven monitors of the Union fleet, yet were more capable of an ocean going role (at least for coastal warfare) than the low-hulled Union turret warships. As they were nearing completion, the rams became the focus of intelligence gathering and diplomatic manoeuvre which ended when the two Birkenhead-built turret ships were acquired by a reluctant government in Whitehall. The move proved fortunate. They were built in time to provide Britain with an extra edge against potential rivals as larger British broadside ironclads were nearing completion.

Yet, advances in naval gun manufacture led one observer to note: 'The ship may be cased with armor [sic] which today is shot-proof; but tomorrow it may be pierced with ease by shot or shell thrown by some new iron monster'.¹ More than just the new guns, the British press warned that a new projectile would make ironclads like the celebrated *Warrior* and her sister the *Black Prince* obsolete 'and then our ironsides will take their place with Brown Bess among a class of antiquities which will be pronounced rusty'.² With proper forging techniques, bigger guns could be crafted in the iron makers' workshops (both smoothbore and rifle) capable of firing a larger powder charge which could propel a larger projectile at increased

¹ James Phinney Baxter III, *The Introduction of the Ironclad Warship*. (Originally published Cambridge, MA, 1933, Annapolis, 2001), 204.

velocity and range.³ Jules Verne would write (in 1863) of the ‘absurd duel between armour and cannonballs, as to which would resist and which would penetrate’. Verne predicted that the cannonballs (and shells) would triumph in this contest he called ‘a noble rivalry’.⁴

Displayed at Woolwich Arsenal is an armoured target from that era before steel, when iron was supreme. Here was a testament to the transition from the primacy of iron plates to the heavy gun as the ultimate factor in naval warfare. The shield was some 12 inches thick, originally cast in two separate plates, and fitted one below and one above to create a single gunport at the centre. The gunport was the obvious aim point for a range test circa 1868. The thick armour was not penetrated, but it was noticeably cracked and scalloped in appearance. The impact from shells and balls distorted the shield, giving the target an appearance more granular, not unlike wet clay. The armour was not dented much, but in some places it looked as though it had been scooped out, as if by hand. The iron was able to keep the shells out...but, barely. This target, in a way, represents the dilemma faced by naval architects and navies of that era. The experts did not know when the continuous experimentation and exasperating drive to outdo the latest advance in armoured construction and competing gunnery progress would end. Iron armour was made ever thicker and, consequently; guns became larger, massive beasts and were, appropriately, dubbed ‘monsters’. As a result of this industrial race between enough iron to protect, and sufficient power to overcome an armoured belt, naval

² ‘Note on Naval Estimates’, *Wrexham Advertiser*, 23 March 1861, 3

³ Howard J. Fuller, *Clad in Iron, The American Civil War and the Challenge of British Naval Power*. (Annapolis, 2008), 143, 240.

⁴ Jules Verne, *Paris in the Twentieth Century*. (New York, 1996), 133.

architects struggled to create the ultimate ironclad which was usually superseded by another industrial advance before the ship had been completed by the builders.

The mid-nineteenth century return of the ram as a weapon was, at best, secondary to the heavy gun. The ram added shock power to compensate for the lack of accuracy and muzzle velocity typical of the heavy gun of the early 1860s. The heavy rifled gun could achieve greater impact when ranges were decreased, and the ram offered a potential battle winning advantage when contact was made. This combination was dramatically unveiled on 8 March 1862, when the Confederate ironclad *Virginia* drove her bows into the hapless wooden sloop *U.S.S. Cumberland* at Hampton Roads. The salvaged Confederate frigate, remade into an ironclad equipped with heavy guns and an underwater iron prow, threatened to upset the naval balance of power. In the press, the proto-typical modern warship briefly became the mast-less, steam-driven, iron-shielded, broadside frigate more associated with men-of-war built in the Confederacy. In Britain, *Punch* first depicted an American armourclad arriving in the Channel as a casemate ironclad ram, not the low-hulled turret equipped *Monitor*.⁵

The naval lessons of the Civil War were ambiguous. The ram, in Confederate service, usually proved to be a successful weapon when contact was made with the hull of a smaller and stationary Union warship. Those events were rare and Confederate armoured vessels lacked the speed and manoeuvrability essential in a fight against superior numbers and in the shallow waters of the rivers and estuaries of the Southern States. The Confederacy did not have the industrial capacity to make adequate armoured warships, either of the quality or the numbers required to defend against a United States Navy which grew in size and capability as the war progressed. Under wartime conditions, the Confederates could only produce a few

dozen armoured vessels of varying worth. These casemate ironclads, although innovative in design, suffered universal flaws in construction, especially the underpowered engines. One Confederate naval officer, referred to these homemade ironclads as 'miserable make-shift vessels'.⁶ Fitted with rams, these Confederate armoured casemate warships were too heavy and too slow to drive off (and keep away) Federal steam-propelled frigates, sloops, light auxiliaries, and ironclads contesting their waters. Unlike the ever-changing armour and heavy guns, the ram was limited by the length and weight restrictions of its host. Although some Confederate ironclads were fitted with spar torpedoes, draught prevented their use against their more nimble Union adversaries. The Confederate home-built ironclads were both too heavy for effective use against a determined enemy in shallow waters and too unseaworthy for a deep water role.

The ram was considered a potent weapon by commentators of that era including American naval Chief Engineer J. W. King, who remarked that two Russian monitors, hampered by slow speed and the lack of 'iron spurs for ramming...must therefore be considered weak vessels, fit only for operations in shallow water'.⁷ *Punch* had taken notice of the new naval weapons and in a sketch, depicted John Bull fitted with a suit of armour. The breastplate was cast as the bow of an ironclad complete with a pointed iron cone, a clear threat to any potential opponent unwise

⁵ 'A Trifling Chronological Error', *Punch*, 26 April 1862, 163.

⁶ James Dunwoody Bulloch, *The Secret Service of the Confederate States in Europe; or, How the Confederate Cruisers were Equipped*. II. (London, 1883, reprinted 2009), 202, 203. The Confederate casemate ironclads suffered from weight and armament overload and all were too large for their underpowered engines. Referring to the ironclad *C.S.S. Tennessee*, which defended the Alabama port of Mobile, Bulloch noted 'she had neither the speed nor the ability to reverse quickly which are so essential in an armoured vessel with a fixed battery and designed to be used also as a ram'.

⁷ Chief Engineer J. W. King, USN. *European Ships of War and Their Armament, Naval Administration and Economy, Marine Constructions and Appliances, Dock-Yards, Etc.* (Washington, 1877), 168.

enough to venture too near the determined looking seafarer.⁸ The iron spur was a weapon which reappeared from the annals of ancient warfare only to fade back into irrelevancy when heavy guns became more accurate, steam engines became more reliable, and higher speeds were achieved for these men-of-war. The ram was a slow moving weapon, ideal for attacking a slow moving enemy vessel. The locomotive torpedo was yet another weapon that doomed the ram. Only when the combination of speed, gunnery and the subsurface threat matured, did the dead-end design feature of the ram fade away completely.

Until that time, the Laird-built armourclads were cutting edge weapons platforms built in a hurry, for a country desperate for anything better than what they had available in home waters. The South needed purpose-built iron vessels of superior workmanship and engineering if it was going to overcome the lag in industrial output. Only the workshops of Britain could offer the capacity to make armoured warships which could switch from defensive coastal roles, to a more offensive capability.

Construction on the Laird rams began in secret, as the Confederate States urgently needed armoured warships to lift the blockade. Early defeats on the battlefield and the incessant manpower demands of the army meant the South was unable to provide vital components for her navy from domestic resources. Stopgaps were attempted but, even with imported British components, the South could not achieve a suitable armoured force to effectively defend all key harbours and coastal areas from an expanding Union Navy. The Confederacy needed British expertise and industrial capacity. By 1863, the South no longer had resources or time enough to build up the infrastructure needed to finish an adequate number of

⁸ 'Vulcan Arming Neptune', *Punch*, 19 April 1862, 157.

ironclads to hold back the Federal juggernaut and lift the blockade. Britain held the logical answer to the dilemma. Based on their reputation for quality workmanship with iron steamers, and the expanding industrial capabilities along the Mersey, Lairds was the obvious choice. This firm was so known for its quality of work during this era, that Jules Verne wrote that it was this yard (although he referred to them as 'Leard') that built the steel hull plates for his mysterious submarine *Nautilus* featured in his now classic work of science fiction, *20,000 Leagues Under the Sea*.⁹ The French writer mentioned that the fictional submarine was built in secret, of components sent to a disguised address.¹⁰ Subterfuge, especially when associated with an advanced weapons system, worked better in the realm of fiction than had been the case with Lairds and the two ironclads built for the South, but the fiction was derived from factual events during the construction efforts of 1862-1863.

The ships are ordered

In 1862, Commander James D. Bulloch, C.S.N. arranged with shipbuilders Lairds, to construct two ocean-going ironclads in Birkenhead. The two sisters were identical at 224 feet, 6 inches in length, 42 feet 4 inches in beam and protected with a main armour belt of 4½ inches of iron over teak planks. Each had an armament of four 9-inch muzzleloading rifles which were housed in two turrets (two guns per turret) behind ten inches of iron plating on the turret faces. Fitted with three masts, sails would (theoretically) assist the steam engines on long voyages. The second ship of the class would be fitted with two experimental tripod masts in an effort to reduce braces and ropes required for the

⁹ Jules Verne, *20,000 Leagues Under the Sea*, (New York, 1966), 94.

¹⁰ *Ibid*, 94.

sailing rig and thus, allowing for greater arch of fire for the turrets. With a displacement of 2,751 tons, the two engines on each ship were estimated to drive the ironclads at what was then a respectable speed of 11 knots.¹¹

Commander Bulloch went to great lengths to arrange the details of a sale to a French firm who were intending to resale the ironclads to Egypt. This was a paperwork blind, but the Union spies, sponsored by American diplomats and supported by wealthy ship owners from Boston and New York, tirelessly followed-up every lead and rumour to ferret out the truth. Bulloch's subterfuge was not working. A severe winter had forced Lairds to put up temporary sheds on the site and gas lamps were installed to speed additional work during hours of darkness. Reportedly, the ironclads were intended for Egypt however this ruse failed to explain the urgent need for the vessels. Clearly the armoured men-of-war were intended for the Southern States. Bulloch worried over the delays as the 'whole character of the work was new, and builders cannot make close calculations; great labour and unexpected time required to bend armour-plates; and the most important part of the work, the riveting, is far more tedious than anticipated'.¹²

The hulls were built with a submerged bulbous iron ram bow to assist the smashing power of the four heavy guns. The first of the class was to have been commissioned as the *C.S.S. North Carolina* yet she floated upon the Mersey with the false Egyptian name *El Tousson*. Her sister, the *Mississippi*, was built as hull

¹¹ 'The Rebel Pirates. Ironclads on the Mersey. Description of the Vessels', *New York Times (NYT)*, 16 September, 1863, 1, 2, TNA, ADM 1/5842, *Admiralty Correspondence*, 'Specification of Cowper Phipps Coles Masts', 10 April, 1862, Patent No. 1027, was for Coles tripod masts design referred to as, 'Improvements in Masts for Ships'.

¹² James Dunwoody Bulloch, *The Secret Service of the Confederate States in Europe; or, How the Confederate Cruisers were Equipped*. I. (London, 1883, reprinted, 2012). 391, 395.

number 295 and launched on 29 August, 1863. She was christened as the Egyptian man-of-war, *El Monassir*.¹³

Confederate Navy Secretary, Stephen Mallory, put much hope in these ships and stated that ‘they could restore to us New Orleans’.¹⁴ Bulloch wrote the secretary to caution that New Orleans was too difficult to reach without supporting vessels to aid operations around the tricky mud flats which dotted the Mississippi River. Instead, Bulloch imagined that the armoured rams would surprise the inhabitants of Portsmouth, New Hampshire by bombarding the navy yard there.¹⁵ Frank J. Merli writes in *The Alabama, British Neutrality, and the American Civil War*, that among historians, the consensus holds that the Laird rams did not represent as great a crisis in U.S. affairs with Britain as had the *Trent* Crisis. This view is too dismissive of the slower-building crisis over the Laird rams. Merli’s statement is based on a weaker U.S. Navy in 1861, and it also fails to take into account the well-developed Northern Intelligence network in operation in Britain by 1863. Although the crisis over the Birkenhead rams was not as immediate as had been the *Trent* affair, it was a dangerous time, when a diplomatic miscalculation or overreaction could have produced damaging consequences.

In Richmond Virginia, one newspaper wrote of ‘Bright visions...conjured up of the blockade broken and the enemy’s cities bombarded’, when the rams appeared off the North American coast.¹⁶ These hopes were dashed through the candid letters sent by the United States Minister to the Court of St. James,

¹³ *The Official Records of the Union and Confederate Navies in the War of the Rebellion*, (ORN). II, 2, (Washington, 1921), 584-586.

¹⁴ *Ibid*, 407.

¹⁵ *Ibid*, 455, 456.

¹⁶ ‘An Important Confession’, *Daily National Republican*, 3 November 1863, 1.

Charles Francis Adams, to the Foreign Secretary, Earl John Russell. The loopholes in British neutrality laws, chiefly the Foreign Enlistment Act of 1819, did not prevent the sale of men-of-war and armaments to a non-combatant nation. Regarding the seeming inability of the British Government to prevent the impending departure of these two armoured rams from the Mersey, Adams issued his famous demarche to Lord Russell: 'It would be superfluous in me to point out to your Lordship that this is war'.¹⁷ Adams overstepped his position by continuing to preach to Lord Russell, when he wrote 'If Her Majesty's Government have not the power to prevent the harbours and towns of a friendly nation from being destroyed by vessels built by British subjects, and equipped, manned, and dispatched from her harbours...then all international obligations, whether implied or expressed, are not worth the paper on which they are written'.¹⁸

Russell would reply to Adams: 'there are passages in your letter...that plainly and repeatedly imply an intimidation of hostile proceeding towards Great Britain on the part of the Government of the United States unless steps are taken'. Russell's response was firm when he stated that Her Majesty's government would not 'overstep the limits of the law' and warned 'will not shrink from any consequences of such an action'. Adams quickly apologized and allowed the issue of the Laird rams to run their course through Whitehall without additional drumbeats of war.¹⁹ London ordered Treasury officials to seize the two rams on 9 October 1863, after it was feared that foreign agents would stage a 'forcible

¹⁷ David Hepburn Milton, *Lincoln's Spymaster: Thomas Haines Dudley and the Liverpool Network*. (Mechanicsburg, 2003), 91.

¹⁸ Amanda Foreman, *A World on Fire. Britain's Crucial Role in the American Civil War*. (New York, 2010), 522.

¹⁹ *Ibid.* 522.

abduction' of the *El Tousson* while she was underway from Birkenhead on her anticipated trial run.²⁰

As Howard J. Fuller demonstrates in his work, *Clad in Iron*, Lairds and other privately owned shipyards provided both industrial capacity and a pool of skilled labour that the Royal Dockyards could not surpass.²¹ The British Government needed Lairds and could not afford to alienate them. The acquisition of the two rams would strengthen the Royal Navy by denying them to the other power which had wanted to purchase them - the United States. Prime Minister, Lord Palmerston had warned the First Lord of the Admiralty, stating: 'If the Federals get them they will strengthen the Yankees against us if they should be disposed and able next year to execute their threatened vengeance for all the Forbearance we have shewn [sic] them; if we get these Ships they will give us Moral as well as maritime strength'.²² The confiscation of the armoured sister ships was resolved with a purchase by the Treasury to prevent their entering service for the Confederate Navy. The seizure also prevented additional damage to the already strained relations with the United States. After months of legal arguments, the Admiralty acquired the two incomplete vessels on 8 August 1864.²³ Although designed for another navy, when acquired, these two ironclads served in a coastal defence capacity as well as in the role as training ships and testing platforms for the Royal Navy. Of equal importance for Britain, a vital shipyard was not fiscally damaged, and skilled hands were employed instead of suffering

²⁰ LOC, 'Correspondence Between Her Majesty's Government and Messr. Laird Brothers Relative to the Iron-Clad Rams'. *United States Serial Set*, Number 1397, Senate Executive Department No. 11, Volume 4, 41st Congress Appendix No. XIII, (Washington, 1869), 264, 267, 276.

²¹ Fuller, *Clad in Iron*, 15-17, 22.

²² *Ibid*, 232.

a long work stoppage due to government intervention. This move was also one whereby Britain strengthened her navy in terms of ironclads in the advanced stages of construction, without appearing to give in to Union threats.

Fuller also contends the Laird rams were purchased for the Royal Navy, not merely in response to Union diplomatic pressure, but to augment the number of British ironclads available to counter other potential threats, especially from France. The additional need to strengthen the fleet against a French build up was well expressed in James P. Baxter's classic *The Introduction of the Ironclad Warship*. Regarding the mid-1860s state of European armourclad design, Baxter points out that the advantage regarding 'compactness, and homogeneousness would be on the side of France-individual power on the side of England:-a superiority-nowhere'.²⁴

The Laird-built armoured rams have been given less attention by historians, indeed they are almost always mentioned with the *Alabama* and in terms of the U.S. diplomatic efforts to halt their acquisition by the Confederacy. When the two sister ironclads are mentioned, the information is confused and the assessments are usually brief and almost universally indifferent. In his 1984 overview, *The Fighting Ships in the Royal Navy AD 897-1984*, E. H. H. Archibald summarized their service in a few lines: 'They had been acquired for the wrong reasons, and there was no really useful role for them to play'.²⁵ Others were not so quick to condemn. Writing during the time when they were still in service, Captain S. Eardley-Wilmot, R. N., gave a more complimentary assessment, claiming that had they gone to sea under the command of an experienced Confederate officer,

²³ Arnold A. Putnam, 'The Building of Numbers 294 & 295: The Laird Rams'. *Warship 1999-2000*. Edited by Antony Preston, (London, 1999), 14.

²⁴ Baxter, *The Introduction of the Ironclad Warship*, (2001), 319.

²⁵ E. H. H. Archibald, *The Fighting Ships in the Royal Navy AD 897-1984*. (Poole, 1984), 111.

‘skillfully handled, they should have made short work of the Northern monitors, to which in all points of construction they were greatly superior’.²⁶

In Service

Both Laird-built ironclads were purchased for the Royal Navy with the *H.M.S. Scorpion* commissioned first and the second ram hoisted her pennant later that month (October 1865) as *H.M.S. Wivern*.²⁷ They were valuable additions to the armoured squadrons of the Royal Navy but were poorly adapted to a blue water role. The *Wivern* was the first of the sisters to have any activity of note when in October 1867, she sent a boat crew to Holyhead to search for members of a Fenian plot.²⁸

Several years later, the Laird rams were already outclassed and ill-suited for work in home waters. The noted naval architect Edward J. Reed remarked (in 1869) that the *Scorpion* and *Wivern* were considered ‘the weakest of our armourclad fleet...have never exceeded 10 knots at their very best.’ Despite this claim, the *Scorpion* was able to slightly outpace her sister as she reached 10½ knots on at least one occasion. Their flat bottoms, which were more suited for operations off the American coasts or on the Mississippi River, made them ‘bad

²⁶ Captain S. Eardley-Wilmot, R. N. *Our Fleet To-Day and its Development during the Last Half-Century*. (London, 1900), 125. Howard J. Fuller, ‘John Ericsson, the Monitors and Union Naval Strategy’, *IJNH*, 2 (December 2004), 18. The Monitors were, according to Fuller, part of the ‘conflicting aspects of Union naval strategy which a single ship design could not possibly hope to resolve’. Fuller makes a distinction in naval missions for these ironclads; between Coastal defence against enemy warships, and coastal assault against enemy fortifications.

²⁷ Baxter, *The Introduction of the Ironclad Warship*, (2001), 320-321.

²⁸ ‘Kelly and Deasey-Searching a Greek Vessel’, *Dublin Evening Mail*, 2 October 1867, 4.

sailors'... as they 'rolled up to 27 degrees each way in a heavy sea'.²⁹ The ships were refitted to compensate in some ways for their low silhouette and poor seakeeping when not head on to the wind. As with other ironclads of that era, steering and performance underway had to be worked out through drill and while on fleet exercises. The turret ship was less compatible with sails and rigging than the broadside ironclad and this merger slowly fell away as the two Laird rams were reshaped with almost every trip they made to the dockyard, especially in their early years.

As other ships entered service, the Laird rams were assigned duties as coastal defence vessels. The *Scorpion* was first to leave British waters, steaming (sometimes under tow of an escort) to her new home at Bermuda in 1869.³⁰ The *Wivern* was ordered to Hong Kong due to problems with Russia over Russian border tensions with China. *Wivern* left Devonport, steamed up the channel and anchored at Spithead to correct 'defects in her machinery' and to be fitted to carry two 2nd Class Torpedo boats. She would not receive the boats or extra equipment needed by them as the boats added too much load to the low-hulled ironclad.³¹ Edward Reed was quick to warn 'the *Wivern* is utterly unfit to carry extra top-weight of any kind' and the Admiralty sensibly put the torpedo boats aside of her outbound voyage. The naval architect continued to force his opinions when he publically stated 'for general service in China waters she is, in my opinion, dangerously unfit'.³² Reed also gave his opinion that 'the low-decked ships hitherto built are not seagoing, in the proper sense of the term, although

²⁹ Edward James Reed, *Our Iron-clad Ships. Their Qualities, Performances, and Costs*. (London, 1869, reprinted Cambridge, 2011), 96, 'Naval and Military Intelligence', *Times*, 14 February 1880, 8.

³⁰ 'Naval and Military News', *Hampshire Telegraph*, 15 December 1869, 2.

³¹ 'Naval and Military Intelligence', *Times*, 14 February 1880, 8.

³² 'H.M.S. *Wivern*', *Times*, 20 February 1880, 12.

proposals have been made to use them for sea service'.³³ Reed was grouping all coastal defence ironclads under in the same characterization, but the Laird rams had been modified several times since their first commissioning in 1865. Bulloch stated that he had 'designed these ships for something more than harbour or even coast defence' and based in the colonies they would get more of a chance at occasional active service.³⁴ Despite Reed's misgivings, in early 1880, *Wivern* sailed for the South China Sea via Suez, as the Royal Navy needed the larger broadside ironclads for duty in home or Mediterranean waters.

The *Wivern* steamed to Hong Kong although that port had, according to one source, 'little to fear for years to come' as reportedly no enemy armoured vessels were stationed in the Far East, but Russia posed a growing threat.³⁵ With coastal defence ironclads positioned at key British ports in Asia and Australia, the Royal Navy was prepared to defend her stations in eastern waters *and* pursue hostile cruisers with similar warships or larger armoured frigates until the enemy vessels were sunk, driven into neutral ports, or bottled up in their own defended harbours.

At Bermuda, the threat of war with the United States had largely declined after the resolution of the Alabama Claims in 1872, although international emergencies did occasionally occur and required heightened vigilance for those warships of the Royal Navy assigned to the western Atlantic. The *Scorpion* would rarely get underway and she ended her days at the island fortress in 1901 as a target ship. Raised and repaired for her intended final voyage to a

³³ Reed, *Our Iron-clad Ships*, (2011), 139-140.

³⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. I, 394.

³⁵ 'H.M.S. Wivern', *Times*, 20 February 1880, 12, Clem Lack, *Russian Ambitions in the Pacific, Australian War Scares of the 19th Century*, (Queensland, 1968), 442, 451.

Canadian shipbreaker, she sank while under tow in 1903.³⁶ Her sister continued in service as a quayside auxiliary until she was no longer of any use to the Hong Kong Naval Base. After 57 years of intermittent service, the ironclad was sold for scrap to a Chinese firm in the summer of 1922 and broken up the following year.³⁷

Intended for another country's navy, the Laird rams never fired a shot in anger and served in a Royal Navy which never had a clear, active duty role for them. Despite this, they stood watch at the distant fortress bases, ready for service in a littoral combat role if needed. Their forward presence allowed for larger, more modern armoured ships of the Royal Navy to remain on home station, the Mediterranean, or assigned to cruising duties to protect Britain's interests in waters increasingly populated with ironclads from rival powers. When combined with such innovations as the submarine telegraph, modern dry docks, mines, torpedoes, and quick firing weapons, they provided an essential fit into the colonial base infrastructure. Unwanted at home, while overseas they were able to retain sufficient combat value until the close of the ironclad era.

The primary question I will address in this thesis: *were the Laird rams failures?* Historians regard them as unsatisfactory men-of-war but they were only partial failures and that, primarily for only the first years of their existence. Archibald's comments that they entered service with the Royal Navy for the 'wrong reasons' and they had 'no really useful role' is flawed on both counts.³⁸ The ships were acquired 'for prudent reasons', as their procurement by Britain

³⁶ Milton, *Lincoln's Spymaster*. (2003), 118-119, 'Sinking of the Scorpion' *Royal Gazette*, 30 June 1903, 1.

³⁷ 'Passing of the "Wivern"', *Hong Kong Telegraph*, 13 March 1923, 7.

³⁸ Archibald, *The Fighting Ships in the Royal Navy AD 897-1984*. (1984), 111.

prevented a serious breach with the United States at the height of the Civil War.³⁹ As Eardley-Wilmot noted, the Laird rams were 'superior' (in construction) to the Union monitors, and in this sense gave the Royal Navy a qualitative seagoing edge relative to the Federal turret ships, but also in regards to the French fleet.⁴⁰

Although France reportedly had made some advances in 'technological innovations' in the early 1860s, debate continues as to how effective those developments actually were.⁴¹ As these advantages are not considered to be an accepted fact, the 'relative truth' is likely a temporary advantage which was overcome by a catch up phase in British armoured shipbuilding. In 1871, Lairds would remark that preparing a force of complicated ironclads would take longer to make ready for active service than less complex wooden ships, but the skills to build those ironclads were acquired by the Birkenhead shipbuilders through rapid adaptations and innovations. The Laird rams were their first armoured ships launched at their Merseyside yard, and the experience gained by building those warships under a pressing timeline established a trend. The management and workforce acquired the expertise to produce more ironclads to follow; both for the Royal Navy and foreign powers.⁴²

Not originally intended to fly the White Ensign, the Laird rams were the first of over a dozen armoured ships constructed in British yards to foreign orders but acquired by the Royal navy during times of international tensions. Oscar Parkes

³⁹ 'The use of armour in the Royal Navy, *Hampshire Telegraph*, 30 January 1886, 2.

⁴⁰ Eardley-Wilmot, *Our Fleet To-Day and its Development during the Last Half-Century*. (1900), 125. Regrettably, Eardley-Wilmot does not give specifics to support this claim.

⁴¹ Howard J. Fuller, *Empire, Technology and Seapower: Royal Navy Crisis in the Age of Palmerston*. (New York, 2013), 173.

⁴² *Ibid.* 173, 48.

criticized the Laird rams as ‘among the worst of the bad bargains’.⁴³ Referring to a time when the rams were under construction (1863-1864) Stanley Sandler claimed the ironclads were of ‘very problematical worth’.⁴⁴ He also claimed these sister ships were ‘useless away from protected waters’ but affirmed, the roles the Confederacy intended for these vessels (breaking the blockade and coastal operations) were ‘admirable.’⁴⁵ These assessments need further qualification. When originally acquired, the Laird rams did not perform well in the fleet, but when utilized in a role more suited to their original design characteristics, they proved up to the tasks.

I will highlight the shortcomings, as discovered in their initial voyages, in the first chapters and will address modifications, and especially role changes, to illustrate their successful mission adaptation in the second half of their service lives. I will mainly focus on their twenty years in service from the time of their commissioning in 1865 until the conclusion of the 1885 Afghan crisis, when they had important, but mainly overlooked deterrent roles.

This thesis will set out to fill in the gaps between varying assessments and correct misperceptions regarding these warships. They were not ideal ironclads but they did provide useful service far longer than larger, more expensive armoured vessels from that time. I approach this thesis with the objective of describing the impact of the Laird rams on the Americans (during the Civil War), but later on the Royal Navy, Admiralty, and public in two stages: firstly, their early years while in British waters (including their construction) and, the second

⁴³ Oscar Parkes, *British Battleships “Warrior” 1860 to “Vanguard” 1960 A History of Design Construction and Armament*. (London, 1966), 78

⁴⁴ Stanley Sandler, *The Emergence of the Modern Capital Ship*. (Newark, 1979), n 42, 294., The First Lord of the Admiralty, The Duke of Somerset, opined that the rams ‘are not good for much’, but this view was written in a letter (18 February 1864) before the ships were completed.

stage, following their assignment to overseas naval bases. I will illustrate through government records, secondary works, and contemporary press accounts, a view overlooked by historians. The Laird rams played a significant, but largely forgotten role as coastal defenders at distant bases. This was the mission for which they were most suited. Created in haste and with a vague concept of use along the coasts of North America, they were not designed solely for a blue water role. They were sent out and left on distant stations, ready should Britain have need for them in colonial service.

Chapter one will outline the reasons Lairds was the shipyard chosen by the Confederates to build armoured warships to contest the Union fleet, as the South was hampered by a limited industrial base and a fragile transportation system. The Southern States did not have the ability to build an armoured force of suitable size or technical capability to counter the Federal ironclad threat, and the proximity to the Liverpool transportation systems, coupled with the abundance of skilled labour, gave Merseyside an unparalleled advantage for the hard-pressed Confederates.

Chapter Two will describe the difficulties both Confederate and Union agents faced while the rams were being built. Central to this area is the confusion, legal limitations, and varying interpretations of neutrality as both combatants sought the good will of the British government, financial support of British banking houses as well as armaments and manufacturing expertise from Britain's industrial firms. Espionage and subterfuge were employed by the combatants as both the Federals and Southerners were competing largely in Britain for similar products and in many cases, with the same provider, over hard to obtain

⁴⁵ Ibid, 85, 187.

resources. It was a race to acquire, as much as a race to prevent the acquisition of key weapons.

The Third Chapter will showcase the Laird ironclads in service with the Royal Navy. Their début as armoured cruisers in the Channel Fleet was a dismal failure due to both their design limitations, and lack of a clear mission. Britain possessed the two ironclads but did not know how to employ them. One British newspaper mentioned the two ironclads and described how 'A Naval Revolution' had taken place in the 1860s when shipyards in Britain and France 'set to work hammering and clinking at once'.⁴⁶ Numbers of armoured warships mattered during times of increased foreign tensions. Building the latest ironclad was one important component of calculations of national power. Using them with some effectiveness had to be determined after the Admiralty put them through their trials and exercised with a fleet of recently commissioned but usually dissimilar types of armourclads.

Chapter Four will examine the evolution of roles for the two turret ships during the 1870s and early 1880s. In the archives of the National Maritime Museum annex at Woolwich Arsenal, the plans of a modernized *Wivern* documented her mid-life transformation from a fully rigged warship into a more lethal variation, reliant on steam propulsion almost exclusively. Freed from a canopy of canvas and shrouds, this ironclad, and her sister, were remade into powerful coastal warships equal to most foreign seagoing rivals. Not suitable for home squadrons, they were sent out to defend key naval bases on the edge of empire. This concept is referred to in today's military parlance as 'Forward Presence' and the *Scorpion* and *Wivern* performed admirably in that role. This assignment of naval assets, especially in the case of the Lairds-built rams, was not made until

later in their service lives. When remade to take advantage of their design features and placed in a role more suited to colonial duties, they gave good service.

As coaling stations and dockyards became essential elements for power projection capabilities on a global scale, the Royal Navy required defences tailored for the needs of key installations far from home waters. The factors involved in preparing for an effective harbour and coastal defence, proved to have 'peculiar difficulties' throughout the British Empire.⁴⁷ It was in this colonial coastal defence role, where the two ironclad rams found the right fit for a variety of local missions on foreign stations. Commenting on the issues of an efficient harbour defence, the *Adelaide South Australian Register* of 3 June 1875 remarked that the scheme for defence had to 'be adjusted in varying proportions according to the character of the harbour to be defended'.⁴⁸

Another feature of this chapter will also highlight the role of the submarine telegraph as a tool for imperial defence planning in the 1870s-1880s and the rise of military intelligence as a permanent feature of the imperial administration in the age of near instantaneous communications. As telegraphic communications networks spread across the Empire, the Admiralty was able to dispatch squadrons to crisis areas at key moments (including during the 1878 Russian war scare), but was also compelled to retain powerful warships for coastal defence tasks to provide protection for colonial bases while the fleet was away.

⁴⁶ 'A Naval Revolution', *Reynolds's Newspaper*, 9 November 1873, 2.

⁴⁷ 'Harbour Defences', *South Australian Register*, 3 June 1875, 5.

⁴⁸ *Ibid*, 5. The article commented on a paper presented by Major Alexander Moncrieff at the Royal United Services Institute (RUSI) in London on 15 March 1875. See: Major Moncrieff, 'On Harbour Defence', *RUSI Journal*, 19, 1 May 1875.

Cable landings and coaling stations offered Britain both security and more points vulnerable to attack by potentially hostile foreign cruisers. To meet this challenge, Colonial defences were improved, with fixed and mobile assets provided for layered protection against potential adversaries. When recalled to periodic active duty from reserve, the Laird rams served as armoured defenders, and with the smaller gunboats and torpedo boats, were tasked with safeguarding colonial waters during times of crisis. Requiring smaller crews, these ironclads provided colonial military authorities with on-station firepower for short durations without tying down major warships needed for offensive missions away from the main British colonial bases. Alfred Mahan warned that unless the treasury of a nation was ready to take on the burden of 'practically unlimited expenditures, bigger ships mean fewer ships'.⁴⁹ The two Laird turret rams served a valuable deterrent role at key bases and they were able to fill that role with minimal expense to the exchequer.

Chapter Five, will discuss the role these coastal defence ironclads played in securing the key naval bases of Bermuda and Hong Kong as other navies also expanded to carry out their imperial missions. Britain had to use all available armoured vessels in order to safeguard her key ports and still retain sufficient forces for policing work. During the 1885 Russian war scare, the Laird rams were available for service as reserve training ships, and ready for colonial defence purposes. The role of small training ships as proposed by Reed, was termed a 'most valuable suggestion' by Major A. Moncrieff in his 1875 proposals for the composition of harbour defence forces.⁵⁰

⁴⁹ Robert L. O'Connell, *Sacred Vessels: The Cult of the Battleship and the Rise of the U.S. Navy*. (Oxford, 1991), 78.

⁵⁰ Moncrieff, 'On Harbour Defence', *RUSI Journal*, 19, 1 May 1875, 359. Moncrieff wrote of 'coast vessels of small draught' and Reed's small training ships used for training and defence roles were

As the Russian Pacific base at Vladivostok grew in strategic importance and more of the Czars warships were assigned there, the Admiralty in London assigned more British warships to the Far East to counter the Russian build up. British naval intelligence efforts during the 1880s were focused on attack planning against key harbours and coastal installations during times of war, and methods for attack and defence were examined in detail. This chapter will also discuss the threat of commerce raiders during the 1880s, and the utility of the coastal defence warships as a safeguard against the enemy cruiser. Another issue discussed is the development of the naval mine as a weapon for improved colonial defence. Envisioned as an area denial weapon, the mines also needed protection by boat crews, which in turn needed the protection of the smaller ironclad coastal defence ships in order to provide the layered security of key home and colonial bases.

The conclusion will detail several Admiralty intelligence plans for both coastal defence and coastal attack operations against would-be rivals. These plans from the 1880s, demonstrated how important the coastal attack role was for the Royal Navy during these years and how ships like the Laird rams could not be released for these missions as they were too valuable in their defence roles. This assessment is completely opposite of Ian Buxton's view that 'it was strategically unsound for a major power to build coast defence vessels'.⁵¹ They were

small gunboats with a single piece of heavy ordnance (like the 'flat-iron' or Rendel gunboats of the late 1860s and 1870s, see: Antony Preston and John Major, *Send A Gunboat! A Study of the Gunboat and its role in British policy, 1854-1904*. London, 1967, 215.), but Moncreiff also wrote the size of the defences, including the size of the coast vessels utilized, would be 'increased or reduced according to the character of the harbour, the nature of the approaches to it, and the kind of attack to which it would most likely be subjected'.

⁵¹ Ian Buxton, *Big Gun Monitors: The History of the Design, Construction and Operations of the Royal Navy's Monitors*. (Annapolis, 1980), 11. Despite the title, this account devotes less than

essential, but overlooked parts of what Lawrence Sondhaus referred to as 'the naval deterrents of yesterday'.⁵²

Though obsolete, they remained useful until their final days. Only when quick firing weapons, the improved Whitehead Torpedo, and the heavy steel guns came into service, were these warships rendered non-effective. Reclassed as Coastal Defence Ironclads by early 1892, these guardships were still on limited duty until the end of the century.⁵³ Deprived of permanent crews, the guardships were stopgap protectors until emergencies called them back into service or the occasional drill or squadron evolution was required. Both Laird-built sisters served in the less-than-preferred, but useful (perhaps even expendable) role as guardians of vital forward operating bases in the more distant corners of the British Empire until the end of the ironclad era.

one page to any reference of coastal defence ships constructed before 1914. Nevertheless, it is a superb chronicle of Royal Navy monitors and their operational impact during both world wars.

⁵² Lawrence Sondhaus, *Naval Warfare, 1815-1914*. (New York, 2001), 228.

⁵³ 'A Reclassification of Her Majesty's Ships', *Times*, 6 September 1892, 9.

CHAPTER ONE

Industry and Innovation: Building the Laird Rams 1862-1863

The two Lairds armourclads, built from 1862-1865, reflect concepts of naval power in transition, from the broadside of multiple guns to the rotating armoured gun platform with only a few pieces of ordnance. During these years, the ironclad was a new innovative weapons system, armed with guns of increasing size and ballistic power. The design of ironclad men-of-war was understood during these years to represent what had been termed a 'revolution' in naval affairs. The standard of what constituted sufficient armour and superior firepower was rapidly changing, and governments searched to create a suitable ironclad design which could 'stand such shot as improved science will bring to bear against them'.⁵⁴ The Lairds-built armoured vessels were bold attempts to answer that design dilemma.

The Lairds ironclads were built around offensive concepts for warships at that time: the ram and the turret. The sister ironclads were a manifestation of both innovative designs and compromises, packed into what was then considered to be a moderate sized hull.⁵⁵ They were hybrid men-of-war, designed and built for a Confederate Navy, desperate for effective armoured vessels. The builder, though highly experienced in the art of iron shipbuilding, improvised as construction on the two vessels progressed.

⁵⁴ Colin F. Baxter, 'Lord Palmerston: Panic Monger or Naval Pacemaker?' *Social Science*, 47, (autumn, 1972), 205. Baxter quotes from the October 1860 *London Quarterly Review*, 296-297, re: the 'Revolution' of ironclad shipbuilding. Also see: 'Iron-Plated Frigates', *Dublin Evening Packet and Correspondent*, 2 October 1860, 2, and the 'Revolution' in ironclad construction: 'The gorgeous Line-of-battle ship [sic] which inspired our youth...is doomed'.

⁵⁵ Warren F. Spencer, *The Confederate Navy in Europe*. (Tuscaloosa, 1983), 83.

Confederate and Union officials in Europe also adapted to circumstances by using legal precedent and subterfuge to accelerate or stop the building of these potentially decisive warships.⁵⁶

Rarely mentioned by historians, and usually then only in the context of the Civil War, these two sister ironclads have been dismissed, largely based upon limited accounts of their early years. Yet, they were game changers, not only in terms of a potential fight against armoured warships, but also for technological advancement and the precedent they offered for international relations. They were 'first' in several aspects of the development of the ironclad, during their building stage and later during subsequent refits.

These armoured vessels, built by Lairds of Birkenhead, were intended to buy time for the beleaguered Confederacy during the Civil War and would have complicated the Federal prosecution of the conflict. Because of this, completion and planned deployment of these warships was pursued by the Confederate Navy with skill and urgency; while the Union sought all diplomatic means to prevent their acquisition by the determined foe.

The Laird rams, were of vital importance for both the North and the South, and the Union efforts to block their sortie from the Mersey estuary strained relations between London and Washington to the breaking point. Union Navy Secretary Gideon Welles received reports that caused 'serious apprehensions' among some of his admirals on blockade duty over fears the Lairds-built armourclads should leave the Mersey under Confederate

⁵⁶ David Hepburn Milton, *Lincoln's Spymaster: Thomas Haines Dudley and the Liverpool Network*. (Mechanicsburg, (2003), xix, xxii.

colours.⁵⁷ The fears were justified as Confederate Navy Secretary Stephen Mallory intended to use the vessels to raise the blockade, and at the outbreak of the war, regarded the procession of 'an iron-armored [sic] ship as a matter of the first necessity'.⁵⁸

Completed in 1865, the two Lairds ironclad rams were seen as failures. Reed, described them as being perhaps the poorest examples of British armoured vessels.⁵⁹ The comparison was made largely against broadside ships, as the Laird armourclads, were considered when building, to have 'possessed a combination of qualities'.⁶⁰ The qualities and shortcomings of the two turret rams would come to light during their sea trials, subsequent voyages, and refits in the late 1860s, but they were among the first seagoing turret ships built, and represented a bold evolutionary step for warship design. The experience gained by Lairds during the construction of the rams also advanced Britain's technological edge over France during the ironclad race between the two powers in the early to mid-1860s.⁶¹

Indeed the Lairds armourclads were failures but only as they were originally (and incompletely) constructed. A more inclusive answer needs episodic qualification as the ships were adapted to new weapons and role changes throughout their service lives. This chapter will attempt to illustrate

⁵⁷ *The Diary of Gideon Welles*, I. 1861-30 March 1864, (Boston, New York, 1911). 407. Welles reported to his admirals that the Union was threatening war with Britain if the rams departed for the Southern States.

⁵⁸ *ORN* II, 2 (1921), 64, 69. In describing the armoured vessel he had in mind, Mallory referenced European broadside ironclads as the best example to confront the Federal Navy and lift the blockade.

⁵⁹ Reed, *Our Iron-clad Ships*. (2011), 96.

⁶⁰ William P. Roberts, 'James Dunwoody Bulloch and the Confederate Navy'. *The North Carolina Historical Review*, 24, 3 (July 1947), 332.

⁶¹ Baxter, 'Lord Palmerston: Panic Monger or Naval Pacemaker?' *Social Science*, 47, 4 (autumn, 1972), 203, 210.

efforts to build, under some secrecy, two of the most advanced warships of the 1860s.

These two warships were known in both the American and British press as the 'Laird rams' but that description is somewhat of a misnomer.⁶² The first portion of the identifier is correct and without contention, for they were built by the Lairds shipyard of Birkenhead and incorporated design features from those master shipbuilders. The pair of Lairds armoured vessels were blends of innovative design features, merged with more accepted forms of propulsion and weapons. The Confederates selected Lairds to build the two warships primarily for two factors: location and reputation.

In the mid-nineteenth century, Britain was the determining factor in terms of finance and industrial products necessary to fight a modern war. By 1860, Britain produced 53% of the world's iron, 50% of its coal, and took in almost half of the raw cotton produced globally for her cloth mills.⁶³ Britain was acknowledged as the leading industrial and mercantile power, with economists referring to her as the centre of global trade. Britain's markets and financial houses held the world's purse strings and her industries had the capacity to build and transport every deadly instrument for the arsenals and navies of both the North and the South. This was certainly true for warship construction, and the Southern States sent agents to Britain to acquire men-of-war in the shortest possible time.

Confederate flag officer Josiah Tattnell served as the commander of a hodgepodge of requisitioned tugs, packet steamers and the few underpowered ironclads outfitted and armed to defend the Confederacy's

⁶² Raimondo Luraghi, *A History of the Confederate Navy*. (Annapolis, 1996), 205.

⁶³ Paul Kennedy. *The Rise and Fall of the Great Powers*. (New York, 1989), 151

coasts and confided to a visiting British journalist during the war: 'Long before the South has a fleet to cope with the North, my bones will be whitening in the grave'.⁶⁴

British shipyards and factories had the means, both in terms of capacity and skilled hands, to make up for what the secessionists lacked. British neutrality laws were also less strict than were those of France, as French subjects were prohibited from assisting with the armament of a warship intended for either of the American belligerents in '*any manner whatever*'.⁶⁵ The ambiguity of British legal definitions of what constituted equipment and armament, left the door open for the Southerners to seek out shipbuilding contracts in the leading industrial nation on earth. The French were expanding their dockyard capabilities but, as one Confederate Naval officer noted: 'a practical man who wanted a first-class ship and engines, or a large quantity of well-made arms for quick delivery, or a batch of great guns in which he could feel confidence, or any heavy iron or steel work, would almost instinctively come to England to supply his want'.⁶⁶

The major British iron shipbuilders had a clear advantage of established reputations based upon long-nurtured mechanical skills. London was a major shipbuilding centre however, the real strength lay in the builders' yards near the coal and iron ore further north. Rail rates for transporting coal and iron were high; yet, labour costs were lower in other parts of Britain than

⁶⁴ *The Confederate Navy; The Ships, Men and Organization, 1861-65*. Edited by Dr. William N. Still, Jr. (London, 1997), 91.

⁶⁵ Roberts, 'James Dunwoody Bulloch and the Confederate Navy'. *The North Carolina Historical Review*, 24, 3 (July 1947), 319.

⁶⁶ Bulloch, *The Secret Service of the Confederate States in Europe*. II (2009), 2. That same officer (Commander James D. Bulloch) remarked that 'in the great mechanic arts, in building

in the south of England. The advantages in experience and reputation which had long proven beneficial to the yards and workshops on the Thames, changed in the mid-1850s with the advances in iron shipbuilding. London's specialized shipbuilding trade unions were slower to adapt to changes in iron manufacture.⁶⁷ The linkage between shipping, rail and manufacturing firms in closer proximity to the coal fields, cast Merseyside to the forefront. The region offered an enticing list of capabilities for the Americans (both Confederate and Union) interested in ships and equipment for their navies and weapons for their armies.⁶⁸ Shipyards on the Thames were not an option for the Confederate Navy's ironclad program, as the shipyards were too close to the U.S. Mission in London and Union spies could too readily gain access to any ship under construction on the river.⁶⁹ Unlike the commerce raiders, armoured warships could not be disguised as merchant vessels while under construction.

ships and manufacturing the heavy engines to propel them especially, Great Britain has outstripped all competitors'

⁶⁷ (No Author), 'Description of the Birkenhead Iron Works' *The Practical Magazine*, (London, 1874), 5-6, S. Pollard, 'The 'Decline of Shipbuilding on the Thames'. *The Economic History Review*. 3 (1950), 76.

⁶⁸ Brian Tunstall, *The Realities of Naval History*. (London, 1936), 200.

⁶⁹ Harriet Chappell Owsley, 'Henry Shelton Sanford and Federal Surveillance Abroad, 1861-1865'. *Mississippi Valley Historical Review*, 48, (Sep.1961), 212, Thomas R. Neblett, 'Major Edward C. Anderson and the C.S.S. Fingal', *The Georgia Historical Quarterly*, 52, 2 (June, 1968), 136. Neblett relates an account (autumn, 1861) from Major Edward Anderson, a Confederate artillery officer assigned to Britain in order to obtain war material. Anderson was soon followed by detectives hired by the United States Government, and on one occasion, a clean shaven 'shadow' in a dark suit and dark hat, was across the street when Anderson left his London lodgings and went by cab to a railway station to buy a ticket for Liverpool. After Anderson purchased his ticket, he noticed the same man standing nearby in a white hat, different collar, different shoes, and a mustache. Anderson spoke to the detective (a man reportedly named Brett) and stated that he had seen him in front of his residence a few minutes before wearing different clothing. This detective was thereafter removed from his surveillance mission and another assigned to watch Anderson.

The shipbuilders on the Thames created quality vessels for the higher prices charged but another factor prevented their selection by the Confederates. London had a higher proportion of shipwrights skilled in wooden shipbuilding and smaller numbers of boilermakers and ironworkers. The yards in other areas of the United Kingdom could build iron ships faster than the highly unionized shipbuilders of London.⁷⁰ Time was a crucial factor for the Confederates, and they were willing to sacrifice some issues of quality in favour of having an armoured warship ready for service at the earliest possible moment.

Selecting Lairds

The Lairds shipyard was an ideal choice to build ironclad warships as they were early pioneers of iron steamship construction, and remained innovators in the trade during the era. Beginning as a boilermaker in 1824, the grandfather of the clan William Laird, expanded into iron shipbuilding five years later.⁷¹ One of the first iron steamers in the United States, the *John Randolph*, was purchased in 1834 from Lairds for use around Savannah.⁷² The engine was built in Liverpool by Fawcett, Preston and Company and shipped to America with the hull sections of the *Randolph*.⁷³ The sections of the 'well arranged' hull were made from rolled boiler plate, fitted together by a five man work crew sent out by the shipbuilder to

⁷⁰ Pollard, 'The 'Decline of Shipbuilding on the Thames'. *The Economic History Review*. 3 (1950), 77, 81.

⁷¹ 'Mr. John Laird. The Birkenhead Ironworks and Docks', *Liverpool Daily Post*, 29 July 1861, 3

⁷² Alexander Crosby Brown, 'The John Randolph: America's First Commercially Successful Iron Steamboat'. *The Georgia Historical Quarterly*. 36, 1 (March 1952), 32. The steamboat *Codorus*, built by John Elgar of York, Pennsylvania, launched on 14 November 1825, was arguably the first iron-hulled steam vessel in America.

create the 100 foot long vessel.⁷⁴ This utilization of boiler plate, and similar construction techniques, revealed a natural progression of Lairds from the manufacturer of boilers into the field of iron shipbuilding. The success of the *Randolph* prompted her owner G. B. Lamar, to acquire two more iron steamboats from Lairds in 1836.⁷⁵ Lairds established its reputation in America as a premier builder of the most modern steamships to be had. This reputation would grow beyond Savannah as more clients recognized the durability of the iron-hulled steamship.

In 1839, the British government ordered its first iron-hulled steamship, the packet *Dover*, from Lairds shipyard, officially known as the Birkenhead Iron Works.⁷⁶ The iron-hulled steamer/auxiliary gunboat *Nemesis* was built by the shipyard, somewhat in secret, in 1840 for the Bengal Marine of the East India Company. Begun in a likely speculative venture before she was acquired for Indian service, the then largest iron vessel in the world, was sold in what one writer described as ‘a piece of inspired salesmanship’ and provided vital gunfire in the First Opium War.⁷⁷ Additionally, the *Nemesis* served as proof that Lairds could discreetly build warships which could influence decisive outcomes in distant waters against a numerically superior enemy.⁷⁸ After over two years of service in Chinese and Indian waters, the *Nemesis* docked in Bombay and her

⁷³ Ibid, 37.

⁷⁴ Ibid, 36.

⁷⁵ *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill (London, 1992), 62. The Lairds-built vessels of Lamar’s company were among a fleet of towboats which were ‘kept very busy’ on the Savannah River in the decades before the Civil War.

⁷⁶ Ibid, 26, Basil Greenhill and Ann Gifford, *Steam Politics and Patronage: The Transformation of the Royal Navy, 1815-1854*. (London, 1994). 129. David Lyon, Rif Winfield, *The Sail & Steam Navy List: All the Ships of the Royal Navy 1815-1889*. (London, 2004), 177.

⁷⁷ Greenhill and Gifford, *Steam Politics and Patronage*. (1994), 130.

⁷⁸ Edgar C. Smith, *A Short History of Naval and Marine Engineering*. (Cambridge, 1938 reprinted 2013), 112.

hull was examined. Although the iron plates of her flat bottom were dented and some were bent inward several inches as a result of her striking rocks and occasionally going aground, she remained remarkably seaworthy. Despite the mishaps, her six watertight compartments had contributed to her strength and durability on distant coasts. An official report stated the *Nemesis* remained 'as tight as a bottle'.⁷⁹

In the tense aftermath of the Texas Revolution, Lairds built the 778 ton iron warship *Guadalupe* for Mexico in 1842.⁸⁰ The ship sailed for Mexico with British officers and crew and in so doing, presented the British Government with a legal dilemma contrary to the neutrality law enacted by Parliament in 1819. Mexico and Texas had become rivals as a result of an ill-defined border between the two republics, and the Laird ship with another iron-hulled steamer built in London, (both vessels had British crews), gave Mexico a qualitative naval superiority. This issue was resolved due to the client failing to adhere to the financial terms of the contracts. The ships were transferred to British owners before they reached the waters of the Gulf of Mexico following repossession due to non-payment.⁸¹

The Royal Navy laid down its first iron-hulled frigate from Lairds, but she would not enter service in her intended role. This ship was commissioned in 1846 as a troopship after the Admiralty became uneasy over the use of an iron hull in a man-of-war.⁸² Beginning with gunnery experiments against the small iron steamer *Ruby* at Portsmouth that year, cannon fire had proven (for the moment) that iron did not have sufficient durability to withstand shot at close range. Wooden hulls received damage but timbers could be easily replaced.

⁷⁹ Ibid, 113-115.

⁸⁰ Baxter, *The Introduction of the Ironclad Warship*. (2001), 34.

⁸¹ Ibid, 34-35.

⁸² Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 174.

Early iron hull plates used in the target ship were 'open and very jagged' following shot from 32-pounder Smoothbore Muzzleloaders (SBML) and 8-inch guns which had raked the *Ruby* from end to end. The guns 'so tore the ribs and plates that it was evident that a similar vessel so situated would be in danger of being instantly sunk by one well directed shot'.⁸³

Lairds would build their frigate-turned-troopship to the best standards of modern iron construction then available. In spite of her iron construction, the ill-fated *H.M.S. Birkenhead* sank on 27 February 1852, after striking rocks at the aptly named Danger Point on the Cape of Good Hope, resulting in the loss of over 400 lives.⁸⁴ It was later determined that modifications to convert her for duties as a troopship had weakened her iron structure and contributed to her rapid break up on the rocky coast of South Africa. Openings were cut into the bulkheads 'to make more easy the passage from compartment to compartment in the hold'.⁸⁵

This tragedy did not severely damage the reputation of the shipbuilder on the Mersey and almost 300 vessels, many of iron hulls, had been built by the Laird family from 1829 to 1861.⁸⁶ Lairds had expanded briefly across the Mersey and took on another Liverpool yard at Dingle in order to build mortar vessels for the Royal Navy during the Crimean War (1854-56). This temporary move was in response to the Birkenhead facility being remade into a more complete

⁸³ Baxter, *The Introduction of the Ironclad Warship*. (2001), 37, 39, The iron shipbuilders criticized these results and claimed that the *Ruby* was a poor example of a properly built and maintained iron ship as her deck had been partially removed, her rivets were rusted and her iron plates were 'no thicker than half-a-crown'.

⁸⁴ Lyon, Winfield, *The Sail & Steam Navy List*. (London, 2004), 174.

⁸⁵ Smith, *A Short History of Naval and Marine Engineering*. (2013), 130.

⁸⁶ 'Mr. John Laird. The Birkenhead Ironworks and Docks', *Liverpool Daily Post*, 29 July 1861, 3

shipbuilding operation, purpose-built for the limited riverfront space available.⁸⁷ The designs of London architect, James Abernethy, recast the Birkenhead yard with four graving docks and a gridiron platform, which allowed repair of ships at low tide when space was not available in the docks.⁸⁸ New workshops, 600 feet by 60 feet, were erected during the Crimean War and lined the outer confines of the shipyard.⁸⁹ The workshops were 'requisite for carrying on the business of building and repairing ships of iron and wood, and of making boilers and repairing machinery'.⁹⁰ By 1861, the privately-held Lairds shipyard had arguably, become 'the most complete of the kind in the country' and had grown into an important shipbuilder employing 3000 men, complete with workshops which manufactured boilers and marine engines of 80 to 450 horsepower.⁹¹ The shipyard was a late entry into the field of marine engine manufacture, and did not produce its first steam engines for ships made at their adjoining slipways until 1857.⁹² One noted civil engineer remarked in 1866 of his colleagues, that men of John Laird's type, 'had to acquire our professional knowledge as best we could, often not till it was wanted for immediate use, generally in haste and precariously, and merely to fulfill the purpose of the hour'.⁹³

The men who built iron-hulled ships, boilers and steam engines to propel them, learned by doing. This knowledge was won through application of the shipbuilders' arts, business acumen, and the special ability to lead the thousands employed. Rising costs and constrained construction schedules brought on by

⁸⁷ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 146.

⁸⁸ 'Iron Shipbuilding at Liverpool', *Illustrated London News (ILN)*, 25 October 1856, 417.

⁸⁹ *Ibid*, 417, Birkenhead Map, Ordnance Survey Office, Southampton (1875)

⁹⁰ 'Iron Shipbuilding at Liverpool', *ILN*, 25 October 1856, 417.

⁹¹ *Ibid*, 417, 'Mr. John Laird. The Birkenhead Ironworks and Docks', *Liverpool Daily Post*, 29 July 1861, 3

⁹² J. R. Parkinson, *The Economics of Shipbuilding in the United Kingdom*. (Cambridge, 2011), 40.

iron shipbuilding moved Lairds to embrace new methods in labour saving machines while, simultaneously, maintaining the benefits of a hands-on management style. One account hailed the owners/operators of this shipyard as reaching a point of achievement which placed them second to none in the United Kingdom. When compared with other shipyards in Britain, this Merseyside industrial hive was renowned for its reputation for craftsmanship and was recognized by the British Government and foreign customers for the iron steamers it built.⁹⁴ By the middle of the nineteenth century, private shipbuilders in Britain achieved an advantage when securing Admiralty contracts. Although the work was divided between commercial shipbuilders and the Royal dockyards, 'at all times a part only of the naval tonnage of Britain was built in the Royal dockyards; the rest of the construction was let out by contract to private firms'.⁹⁵

The spirit of constant improvements in shipbuilding and management methods made Lairds a shipbuilder sought by both American combatants. By mid-1861, it was apparent that the Civil War would not be over after a short, single campaign. That year the Laird sons, William, John the younger, and Henry, had assumed day-to-day operations at the shipyard as their father took his seat as the Liberal MP for Birkenhead. John Laird had retired from shipbuilding to support local projects and had stood for Parliament, winning his seat in December 1861.⁹⁶ This was the city Laird and his family had been the driving force in recreating from a collection of villages into a manufacturing

⁹³ Smith, *A Short History of Naval and Marine Engineering*. (2013) , 171

⁹⁴ (No Author), 'Description of the Birkenhead Iron Works' *The Practical Magazine*, (London, 1874), 6-7.

⁹⁵ S. Pollard, 'Laissez-Faire and Shipbuilding' *The Economic History Review*. 5, 1 (1952), 105. Pollard reported that the commercial shipbuilders also had the advantage in Admiralty contracts of not being directly under government supervision as 'private yard had fewer changes to vessels building after the dockyard-built models' were created.

centre.⁹⁷ By mid-century, Birkenhead was 'the city of the future with expectations which the reality by no means disappointed'.⁹⁸ A planned municipality, complete with parks, sewers and gas lines put in before the streets, houses and shops were built, this booming, shipbuilding city was, second to much larger Liverpool, the other contributor to Merseyside. The expansion of shipbuilding, manufacturing and trade on both side of the river was termed 'the grandest monument which the nineteenth century has erected to the genius of Commerce and Peace'.⁹⁹

Commerce would take precedent over peace and Lairds had honed their skills in order to build warships for both the Admiralty and others. Lairds was chosen to build the Confederacy's pair of sister ironclads not only due to their reputation for expert craftsmanship and business skills but also for their willingness to work with the secessionists. They also had the ability, as demonstrated by the *Nemesis*, to work in secrecy.¹⁰⁰ The Lairds-owned Birkenhead Iron Works was the obvious choice. However, an experience gap existed which had been overlooked when construction began in 1862. Lairds had never completed an armoured warship before this contract.¹⁰¹

Securing the Contract

⁹⁶ 'The New M.P.'s'. *Morning Chronicle*, 25 December 1861, 6.

⁹⁷ *Ibid*, 6, *ORN*, II, 2 (1921), 380.

⁹⁸ (No Author), 'Visit to Birkenhead' *Living Age*, Volume 6, Issue 60, 5 July 1845, 25.

⁹⁹ *Ibid*, 25-26.

¹⁰⁰ Greenhill and Gifford, *Steam Politics and Patronage*. (1994), 130.

¹⁰¹ 'John Laird's Contract for the New Iron-Clad Frigate', *Cheshire Observer*, 14 September 1861, 5.

The Laird family business was too proficient to be ignored without consequences, and the contract was an avenue for influence with industrial leaders as well as with some government elites in Britain. Through financial arrangements with British industrial concerns, the warring Americans could link key leaders in Britain to their cause or deny access to their opponent. This bitter lesson was to be learned by the Union after Confederate purchasing agents in Britain secured contracts with key manufacturers early in the war.

The Union was first off the blocks but stumbled badly in the race to acquire British-built men-of-war. Assistant Secretary of the U.S. Navy, Gustavus Vasa Fox, favoured the idea of building two double-turreted ironclads in Britain with which the Federal Navy could attack the key South Carolina port of Charleston.¹⁰² This plan was relayed through John T. Howard of New York who had approached Lairds to seek their estimates. Fox proposed a pair of ironclads which would be equipped with two revolving turrets and protected by iron plates 4½ inches thick on each low-hulled vessel. The turrets, or ‘towers’ as he called them, would house a single 11-inch gun in each, fitted to a hull which had a proposed length of 205 feet, a beam of 47 feet, and a draught not to exceed 14 feet, later reduced to 12 feet. The ironclad as envisioned, was ‘not a sea boat’, but was intended as an ocean-going floating battery.¹⁰³

These armoured vessels were to have a deliberately low-hull height above water in order to present a harder target for the gunners of Confederate forts and shore batteries. The Fox-Howard ironclads were designed as mastless steamers and were equipped with one rudder at the bow and another at the stern to insure steering, if one section was damaged by shellfire. These were not defenceless

¹⁰² Baxter, *The Introduction of the Ironclad Warship*. (2001), 271-272.

¹⁰³ *Ibid*, 274.

iron steamers devoid of armament. Resembling a New York ferryboat, these armourclads were designed to get into a contested harbour and return without having to come about if mauled by enemy batteries. In Charleston, Confederate defences were positioned as close as 300 yards from the main channel, but with these ships, the twin rudder ironclads would have been able to go astern and quickly manoeuvre away from the guns if the action was too mauling.¹⁰⁴

The Assistant Secretary wanted them 'finished complete, with guns and everything appertaining'.¹⁰⁵ The letters from Fox to Howard and his subsequent discussions with Lairds clearly revealed that a British shipbuilder was asked to build two men-of-war for a belligerent, not to provide unarmed iron-hulled vessels which could be converted into warships once acquired by the United States Navy.¹⁰⁶ The eldest of the Laird brothers, William, travelled to New York and arrived on the Cunarder *Persia* on 21 May 1861, with the intention of securing a contract to build two ironclads for the government in Washington.¹⁰⁷ The attempt failed.

Had Fox engaged William Laird to build ships for the United States in those uncertain days in the summer of 1861, the Birkenhead Iron Works would have had a contractual obligation to the North. The Assistant Secretary had given in to pressure from Welles to have a fleet of armoured ships built only in the United States as the Navy Department was pressured by Congress to support Union shipbuilders. Washington lost its best opportunity to kill off the Confederate Navy's efforts in Britain before they matured into custom-built cruisers and the

¹⁰⁴ Ibid, 270-272.

¹⁰⁵ *Hansard*, 27 March 1863, 170, cc 70.

¹⁰⁶ Baxter, *The Introduction of the Ironclad Warship*. (2001), 271-272.

¹⁰⁷ Ibid, 272, 'Passengers Arrived', *New York Times (NYT)*, 22 May 1861, 8.

much more dangerous ironclad rams.¹⁰⁸ Had the Union utilized a few contracts to keep shipyards such as Lairds busy with orders for Union armoured warships, the Confederates would have been frozen out of the British ironclad market or, at the very least, greatly constricted, as Lairds was already engaged with an Admiralty contract and had building capacity for a few more ironclads during the early-mid 1860s.¹⁰⁹

In that era, business relationships were considered confidential undertakings and governments only reluctantly intervened. Lairds would later claim 'It is a rule well recognized in all Trading Establishments, that an Order whilst under Execution is the property of the person giving it, and that a builder has no right to make public the orders or instructions of his employers'.¹¹⁰ John Laird, the senior member of the shipbuilding firm (until 1861) was to state that contract negotiations were 'of a confidential character' and his decision to keep that confidence was also influenced by what he termed in 1863, 'the present state of law in America'.¹¹¹ Lairds were anxious to protect their American clients (both Confederate and Union) from American prosecution.

Despite the blockade, the relationships between the representatives of the Confederate Government in Britain, key ship owners/financiers like Liverpool-based George Trenholm (a native of South Carolina), and Merseyside merchants and shipbuilders, served the South well in the laissez-faire approach to business

¹⁰⁸ *The Diary of Gideon Welles*, I, 1861-30 March 1864, (Boston, New York, 1911), 291.

¹⁰⁹ *Ibid*, 291, 394, 395, Ari Hoogenboom, *Gustavus Vasa Fox of the Union Navy*. (Baltimore, 2008), 354, note 9, Douglas H. Maynard, 'The Forbes-Aspinwall Mission'. *The Mississippi Valley Historical Review*, 45 (June 1958), 68, 'Iron-Cased Shipbuilding', *London Evening Standard*, 10 February 1863, 3.

¹¹⁰ The National Archives, (TNA) , TS 25/1285, 'IRON CLAD SHIPS: Vessels under seizure: To Determine their Destination and Ownership', letter dated 29 October 1863

¹¹¹ *Hansard*, 27 March 1863, 170, cc 71.

then prevalent.¹¹² Where the North was restricted by too much bureaucratic oversight and interference, the Confederate agents in Liverpool had a free hand to make contracts and allow the merchants and shipbuilders to speculate in the arms trade with only minimal direction from the Confederate Government in Richmond, Virginia. By early 1862, Southern agents had successfully linked Lairds with the Confederacy for the duration of the War. The Union would pay a heavy price for delay and official Washington intransigence.

James D. Bulloch was the Confederate Navy's key officer assigned to Britain. His desk was located at the offices of the Southern shipping and financial magnate George Trenholm, at 10 Rumford Place near the Liverpool waterfront.¹¹³ This office was the epicentre of Confederate operations in both Britain and continental Europe. The selection of Bulloch as the Confederate Navy's purchasing agent was perhaps the best foreign posting made by the Southerners during the war. As a former Lieutenant in the peacetime U.S. Navy, Bulloch had gained experience in American men-of-war, merchantmen, and select mail steamers on scheduled runs from New York.¹¹⁴ After resigning his commission, he rose rapidly in the merchant marine to command steamers along the eastern and Gulf coasts of the United States.¹¹⁵ In December of 1861, Bulloch, having joined the new Confederate Navy, led the Greenock-built steamer *Fingal* through the blockade with stands of Enfield rifles, pistols, gunpowder, medicines, blankets, sabres and four cannon: enough arms to equip

¹¹² Wesley Loy, '10 Rumford Place: Doing Confederate Business in Liverpool'. *The South Carolina Historical Magazine*, 98 (October 1997), 358.

¹¹³ *Ibid*, 358.

¹¹⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. I, (London, 1883, reprinted, 2012). 31-32.

¹¹⁵ *Ibid*, 2.

a division.¹¹⁶ At no time during the remainder of the war, was a cargo of weapons and military supplies in such quantity ever again shipped through the blockade.¹¹⁷

While in Savannah, Bulloch saw the river steamers, in the service of the Confederate Army, conveying men and supplies to the fortifications down river. One such iron-hulled vessel was the vintage *Chatham*, another Lairds-built steamer still in operation after over twenty years of service.¹¹⁸ Bulloch needed only look over the side of the *Fingal* to see efficient and dependable examples of the iron shipbuilders' art. Lairds was a preferred choice for the Confederate Navy's chief purchasing agent in Britain even before his return. Bulloch's attention to duty, his discretion, and his drive for results made him irreplaceable for the Confederate war effort. He would never again go to sea in the service of the South, neither through fault nor failure, but as the cost of his success in the *Fingal* and subsequent efforts in Britain.

The Liverpool merchants, A. E. Byrne & Co., were the go-betweens who introduced Bulloch to shipbuilders and brokers.¹¹⁹ Andrew and Thomas Byrne assisted Bulloch in obtaining ships and contracts for his blockade runners, cruisers, and armourclads.¹²⁰ Andrew Bryne had purchased the *Fingal* for Bulloch, and they were paid a 1 per cent commission by Lairds for the contract to build the Rebel cruiser, *C.S.S. Alabama*.¹²¹ Although their role is not fully

¹¹⁶ Stephen R. Wise, *Lifeline of the Confederacy: Blockade Running During the Civil War*. (Columbia, 1988), 53-56, The weapons and supplies were immediately dispatched to Tennessee and Richmond to outfit new recruits.

¹¹⁷ *Ibid*, 56, J. Thomas Scharf, *The Confederate Navy*, (New York, 1996), 639, Bulloch, *The Secret Service of the Confederate States in Europe*. I, (2012). 112.

¹¹⁸ Wise, *Lifeline of the Confederacy*. (1988), 293.

¹¹⁹ Andrew Bowcock, *CSS Alabama: Anatomy of a Confederate Raider*. (London, 2002), 7.

¹²⁰ *Ibid*, 7, *ORN*. II, 2, (1921), 379.

¹²¹ *ORN*. I, 12 (Washington, 1901), 228, Bowcock, *CSS Alabama*. (2002), 7.

understood, A. E. Byrne & Company may have introduced Bulloch to the Lairds when he first came to Liverpool. Byrne & Co. were also paid a commission by Lairds (likely a higher rate than that for the more conventional *Alabama*) when the Birkenhead firm secured the contract to build the two rams for the Confederacy.¹²² The amount of commission paid by Lairds to Byrne & Co. for the two Bulloch armourclads is unknown, but in 1870 the Dutch Consul in Liverpool, Mr. J. W. S. May, brought legal action against Lairds for their failure to pay him a 2½ per cent commission for the Dutch turret ship *Prins Hendrik Der Nederlanden* and other smaller coastal ironclads the Birkenhead shipbuilder was engaged to build for the Royal Netherlands Navy.¹²³

During the Civil War, the closely attuned interdependent merchants on Merseyside proved to be a valuable source of expertise for the Confederacy. Access to both key industrial leaders and material needed for the war effort proved to be a pivotal diplomatic, and especially, mercantile victory for the South. Without these business agreements, which were nearly as ironclad as the armoured ships themselves, Lairds and their associates would not have become as dependent on the South for their profits as they eventually came to be. Washington lost leverage just as the Confederate gained their desperately needed entrée to British shipyards and factories. The Birkenhead Iron Works proved to be a vital link to the chain of access. In May 1861, Mallory, obtained permission from the Congress of the Southern States, then meeting in Montgomery, Alabama, to construct armoured vessels in Britain or France.¹²⁴ Mallory intended the armoured vessels to be equipped with Armstrong breechloaders, but he informed Bulloch the armament required careful

¹²² Bowcock, *CSS Alabama*. (2002), 7.

¹²³ 'Assize Intelligence', *Morning Post*, 23 August 1870, 7.

investigation and if the breechloaders were not suitable, then other guns of 'equal merit' could be substituted.¹²⁵

Following the Battle of Hampton Roads in March of 1862, Bulloch entered into a contract with the Laird Brothers for the construction of two armoured rams at a cost of £93,750, each.¹²⁶ The timing of the Lairds contract was ironic as it was influenced by Bulloch more than by the battle between the American ironclads. The contract was signed soon after Bulloch's return to Britain following his voyage on the *Fingal* which had been his priority, as previous instructions from Mallory ordered him to deliver the urgently needed supplies to Savannah.¹²⁷

The design of the ironclads had been modified from William Laird's proposed armoured men-of-war first offered to the Union in 1861. Each ship was now designed with a length of 224½ feet, a beam of 42½ feet and a draught of 15½ feet forward, increasing to 17 feet aft, with engines, coal, guns, equipment and supplies loaded. The hull and armour weighed 1870 tons, with armour alone comprising almost a sixth of that amount. Equipment comprised another 860 tons for a total displacement, when all combined, of 2750 tons.¹²⁸ Armour plate 4½ inches thick, protected the sides of the vessels with thinner 3 inch plates forward comprising the bow and 2 inch plates aft for the stern. The armour belt descended 3¼ feet under the waterline and provided extra protection against enemy shot or attack by a ram. Teak added to the already robust design with

¹²⁴ ORN, II, 2 (1921), 64, 68, 70-72.

¹²⁵ Ibid, 64. (Also see: William N. Still, Jr. *Iron Afloat: The Story of the Confederate Armorclads* [sic]. (Columbia, 1971), 9-11)

¹²⁶ Parkes, *British Battleships*. (1966), 78.

¹²⁷ ORN, II, 2 (1921), 65.

¹²⁸ Parkes, *British Battleships*. (1966), 78, 80.

thick 10 inch planks on the sides and 8 inch planks providing backing at the bow and stern.¹²⁹

Each ship was heavier than the original 1861 design and the concept for their employment had also changed. No longer intended to force their way into Charleston harbour around the forts guarding the entrance, these ironclads were modeled with a new objective. The Laird ironclads were refashioned to attack Federal warships near the American coasts and to raise the blockade of Southern ports. Attacking land defences was now but a secondary consideration and these armourclads were built to stand up to the Union monitors then coming down the ways.

The Laird sons had a flair for ship design. William headed the drawing department at his father's yard, but the other brothers would soon take over crucial positions in the firm as the business grew. During the Crimean War, John the younger visited friends in Marseilles, also observed French builders in Toulon, and would later copy some of their business practices.¹³⁰ Henry was the principal design talent, having apprenticed in the drawing department of the French yard of Messagerie Maritimes (also known as the Messagerie Imperiales) of La Ciotat near Marseilles.¹³¹ Although the shipyard was described as 'nothing warlike...a mere shipyard of an ordinary kind', after the Crimean War, it was visited by a Russian engineer who was on a mission to observe its operations in order to obtain ideas for the redevelopment of a shipyard in Russia.¹³²

¹²⁹ Ibid, 78.

¹³⁰ Kenneth Warren, *Steel, Ships and Men: Cammell Laird, 1824-1993*. (Liverpool 1998), 34, 'John Laird', *Engineer*. Volume 85, 28 January 1898, 88.

¹³¹ Warren, *Steel, Ships and Men*. (1998), 34, 'The Premier Gas' *Morning Chronicle*, 18 September 1858, 7, 'French and Sardinian Preparations' *Western Daily Press*, 25 February 1859, 3, 'Henry H. Laird', *Engineer*. 75, 2 June 1893, 467.

¹³² 'The Premier Gas' *Morning Chronicle*, 18 September 1858, 7.

The La Ciotat facility did not remain 'ordinary' and by early 1859, was developing an iron shield designed to protect the single cannon and men for each of the eleven light gunboats it was constructing for the French Government.¹³³ The shield of armoured plates moved with the gun as it rotated on a swivel platform, and the oval iron 'shed' was designed to deflect enemy shot. The mechanism that rotated the gun shield was itself armoured, and its separate iron cap was designed to turn when struck and thus not fully absorb the impact of a direct hit.¹³⁴

These French ideas for a rotating iron gun shield were undoubtedly observed by Henry Laird who incorporated this design knowledge into his work when he returned to Britain. He took over the drawing department of the Birkenhead Iron Works from William after his return from the Continent, and it was probably he who was instrumental in designing and modifying plans of the armoured ships which would later become Bulloch's rams.¹³⁵ The willingness to apprentice and collect data on French shipbuilding practices gave the Lairds a keen appreciation of the rapidly changing aspects of their art and an insight into the latest building techniques.¹³⁶

The British press remarked on the flurry of activity at the Birkenhead Iron Works, confusing a suspected Confederate cruiser (later named the *Alabama*) with an ironclad Lairds' had under construction. In 1862, the *Sheffield Independent* observed:

¹³³ 'French and Sardinian Preparations' *Western Daily Press*, 25 February 1859, 3. These gunboats were prefabricated in sections to facilitate overland transportation and were designed to be reassembled in 'an incredibly short space of time'.

¹³⁴ Ibid, 3, 'A New French Gunboat', *Falkirk Herald*, 7 March 1861, 2.

¹³⁵ Kenneth Warren, *Steel, Ships and Men: Cammell Laird, 1824-1993*. (Liverpool 1998), 34.

¹³⁶ 'Henry H. Laird', *Engineer*.75, 2 June 1893, 467, 'John Laird', *Engineer*. 85, 28 January 1898, 88.

'It had been known for some time that a large and powerful iron vessel was being constructed at the dockyard of Messrs. Laird, Birkenhead; but monsters of the deep are so much the order of the day at this establishment that no one troubled his head much about this new production, or cared to remark the extra thickness of the plates which were being used'.¹³⁷

Although the newspaper did not give particulars of the warship under construction, the headline clearly identified her intended customer as the Confederacy.¹³⁸

Bulloch was fortunate as he had contracted with a yard daily gaining experience in the art of armoured warship construction. The practice of differing paces of work was not usual in British shipyards during the nineteenth century in order to satisfy the more profitable foreign contracts.¹³⁹ The work on an armoured warship intended for the Royal Navy provided the Birkenhead Iron Works with a large work force which could flex to speed up work on the two armoured turret ships intended for Bulloch. The armoured ship ordered by the Admiralty was allegedly delayed to advance the work on the two smaller ironclads. The work on Admiralty contracts in private shipyards was reported in the British press as 'subordinate' to the work on foreign contracts and lesser iron projects such as bridge work.¹⁴⁰ Lairds were allegedly 'just jogging on' at a steady pace on the frigate *H.M.S. Agincourt* while the Confederate rams were pushed forward with 'spirit', but the claim was based on superficial evidence as the rams were then in the earlier stages of construction.¹⁴¹ The Admiralty had

¹³⁷ 'A New Confederate Iron-clad,' *Sheffield Independent*, 18 August 1862, 4.

¹³⁸ *Ibid*, 4.

¹³⁹ Pollard, 'Laissez-Faire and Shipbuilding', *The Economic History Review*. 5 (1952), 107.

¹⁴⁰ 'Iron-Cased Shipbuilding', *London Evening Standard*, 10 February 1863, 3.

¹⁴¹ *Ibid*, 3, Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 235-236

also contributed to the delay on the *Agincourt* and other iron steam frigates under construction for the Royal Navy, to await gunnery trials against the different varieties of armour plate then being produced in Britain.¹⁴²

Historians refer to the ships built for the Confederates with the shipyard numbers assigned in the builder's book, but rarely mention the ships assigned between the numerical gaps linking those ships built for Bulloch.¹⁴³ The contracts between the Confederate ships was an unintended benefit for Bulloch as the Union spies mistakenly attributed some of the work to his mission, whereas they were contracts for the Admiralty and private shipbuilders.¹⁴⁴

The Confederate commerce raider *Alabama* was the 290th vessel laid down by Lairds and was referred to by her number during most of her time at the yard. She put to sea as the unarmed steamer *Enrica* on 29 July 1862.¹⁴⁵ Hull 291 was ordered on 2 September 1861, and laid down on 30 October in the Lairds' already crowded yard.¹⁴⁶ This vessel was Lairds first armoured warship, the *Agincourt*, second of the *Minotaur* class, and was among the largest ironclads constructed to that time.¹⁴⁷ *Agincourt* had a length of slightly more than 400 feet and was to become one of the longest single screw armoured men-of-war ever constructed.¹⁴⁸ Hull 292 was the 140 ton steamer *Defiance*, intended for the river trade in China.¹⁴⁹ This small paddle steamer was soon in operation for her

¹⁴² Pollard, 'Laissez-Faire and Shipbuilding', *The Economic History Review*. 5 (1952), 105, 'The Navy', *Dublin Evening Mail*, 15 July 1862, 1, *Hansard*, 12 March 1863, 169, cc 1361.

¹⁴³ Merli, *The Alabama*. (2004), 200.

¹⁴⁴ Owsley, 'Henry Shelton Sanford and Federal Surveillance Abroad, 1861-1865'. *Mississippi Valley Historical Review*, 48 (Sep.1961), 214.

¹⁴⁵ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 274.

¹⁴⁶ Stephen Chapin Kinnaman, *The Most Perfect Cruiser*. (Indianapolis, 2009), 43

¹⁴⁷ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 235-236, 322.

¹⁴⁸ *Ibid*, 235-236, Kinnaman, *The Most Perfect Cruiser*. (2009), 43.

¹⁴⁹ 'The "292" *Dublin Evening Mail*, 20 November 1862, 3, 'Mr. John Laird, and the Birkenhead Ironworks and Docks', *.ILN*, 27 July 1861, 74.

owner Liverpool shipper James Breazley, whom John Laird would later lightheartedly refer to as 'a most suspicious character' after local newspapers speculated that the *Defiance* would soon sail not to the Far East, but towards the Confederacy.¹⁵⁰ In addition to shipbuilding, the Birkenhead Iron Works had also established a good reputation for repairing damaged steamships and overhauling local tugs and ferryboats, with work praised for thoroughness.¹⁵¹

Hull 293 was the paddle tug *Columbus*, built for Henry Cruse and his partner, a Mr. Downham of the 'Hercules Steam Tug Company of Liverpool' in late 1862.¹⁵² Proclaimed as the fastest tug on the Mersey, she was fitted with two steam engines which combined at 90 horsepower, to propel her at a top speed of 14 knots and contributed to her 'first-rate towing qualities'.¹⁵³

On 10 June 1862, Bulloch received instructions from Mallory directing him to negotiate contracts and begin construction of two ironclads in Britain. This dispatch was dated 30 April but had been delayed by the necessity of circumventing the Federal Blockade. Bulloch had already consulted with the 'eminent' shipbuilders (Lairds) and had sought plans for two ironclads to be made by the same firm, saving £1250 off the price of each vessel.¹⁵⁴ As they were built from the same set of plans, the result was a savings in both cost and time.¹⁵⁵ Here again, the Lairds' business acumen reduced costs for their client and prevented any slack in the construction schedules.

¹⁵⁰ 'Launch of a Government Troopship at Birkenhead', *Liverpool Mercury*, 24 November 1862, 3.

¹⁵¹ 'For Sale, The Fine Paddle Tug Steamer Lion', *Liverpool Daily Post*, 29 July 1863, 8.

¹⁵² Wirral Archives (WA) ZCL/5/195/4), 'The Fastest Tug-Vessel on the Mersey', *Liverpool Daily Post* 14 January 1863, 5.

¹⁵³ 'The Fastest Tug-Vessel on the Mersey', *Liverpool Daily Post* 14 January 1863, 5.

¹⁵⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 382, 385.

¹⁵⁵ 'H.M. Turret-Ships Wivern and Scorpion', *ILN*, 4 November 1865, 282.

The 10 June dispatch from Mallory was belated official approval for the verbal agreements Bulloch had made with Lairds to build two ironclads for the Confederate Navy. These two vessels would be referred to by their builders numbers '294' and '295', a practice that aided the accounting shorthand for the various parts and components that went into each ship and also assisted Bulloch's efforts to obscure the intended end user of the two armoured men-of-war. In addition, Bulloch had also entered into a verbal agreement with the shipbuilder to facilitate sub-contracting for the armour plate work.¹⁵⁶ Lairds allowed for the blending of business alliances to speed the work on the ironclads. Through the Birkenhead shipbuilder, Merseyside was closely linked to the Confederacy's naval building efforts.

Return of the Ram

The second identifier used by contemporary accounts to describe the sister armourclad warships under construction at Lairds in 1862 was the moniker of 'ram'. The latter part of the description is misleading for the ram was but an auxiliary weapon of the ships, whose key features were the armoured gun turrets. This throw-back weapon from the ancient Hellenic time of oar-powered vessels, had returned to the industrial world of the 1860s due to the advances in marine engine manufacture and improvements in the art of metal casting. The iron-hulled, steam-powered ship, fitted with a reinforced prow, could achieve a predetermined velocity and would (in theory) deliver a blow against an enemy vessel without incurring substantial injury to herself in the process. The ram did not overcome the heavy gun, but it permitted a means to deliver a critical strike

¹⁵⁶ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 385.

against a stationary or slow moving enemy in a sea fight. This was a close contact weapon from which there was no assured defence.

The ram reemerged as a conceptual naval weapon with the adoption of steam as more than an auxiliary form of propulsion. The return of the ram has several points of origin, with one deriving from an early nineteenth century maritime tragedy. In 1834, the officer commanding the U.S. Navy Yard at Philadelphia, Captain James Barron, proposed that the Navy Department consider his patent for the construction of a steamship fitted with a 'prow' or ram.¹⁵⁷ Barron claimed that the idea came not from ancient history but from the loss of the Nantucket whaling ship *Essex* in 1820.¹⁵⁸ That event resulted in the ship sinking after being rammed by a whale, and influenced not only Barron, but Herman Melville and served as the inspiration of *Moby Dick*.¹⁵⁹ In 1839, Nicolas-Hippolyte Labrousse, a Lieutenant in the French Navy, observed the *H.M.S. Archimedes* demonstrate the then new form of steam propulsion, the screw propeller, and realized a screw-driven ship could effectively carry a ram.¹⁶⁰ In February 1843, the French Navy conducted tests at Lorient with a ram attached to a chest weighing some fifty tons. The weighted ram would slide down an incline to crash against stationary targets simulating wooden and ironclad ships. The test results proved a ram would inflict damage against the side of another ship, but iron shipbuilding was not ready for the realities of a purposeful collision at the required speeds.¹⁶¹

¹⁵⁷ Lieutenant Commander Claude G. Berube (USNR), 'American Thunder Childs' *Naval History*, 24 (June 2010), 61.

¹⁵⁸ *Ibid*, 62.

¹⁵⁹ Nathaniel Philbrick, *In the Heart of the Sea: The Tragedy of the Whaleship Essex*. (New York 2000), xiii.

¹⁶⁰ Larrie D. Ferreiro, 'The Social History of the Bulbous Bow'. *Technology and Culture*, 52 (April, 2011), 340. Labrousse would predict, 'as in Rome, the ram will re-establish equilibrium in favor [sic] of courage, and diminish superiority founded on greater numbers'.

¹⁶¹ Baxter, *The Introduction of the Ironclad Warship*. (2001), 57, 63.

In Britain, Vice Admiral G. R. Sartorius, R.N., proposed the building of ram equipped armoured men-of-war to make Britain safe from a French invasion. The admiral proposed steam batteries, armed with heavy guns and a ram, to challenge an enemy fleet and render wooden warships particularly vulnerable. The steam battery as it existed in the mid-1850s did not have sufficient speed or manoeuvrability to be of service in a sea fight. His proposal was ridiculed in the British press and his steam rams were compared to 'a couple of infuriate buffaloes'. The ram equipped armoured men-of-war were dubbed 'experimental baubles', concepts for Emperor Napoleon III to waste his money upon as 'an absurd means of revolutionizing the whole system of modern warfare'.¹⁶² The proposal to build a screw-driven warship equipped with an armoured prow, would remain an idea until the seagoing ironclad came of age. For the Royal Navy, the steam ram came into its own in 1861 as a counter to the more expensive armoured steam frigates.¹⁶³

The ram equipped steamship became a reality during the first year of the Civil War in 1861, when the Confederacy and the Union converted or built ships fitted with rams (both ironclads and unarmoured vessels) to fight in close range encounters. The ram was best suited for work in the shallow coastal waters and rivers, especially along the Mississippi.¹⁶⁴ Although rams were fitted to a mixture of steam vessels fighting in American coastal waters in the 1860s, the screw propeller made the iron spur a viable weapon as both could be almost completely submerged and impervious to enemy fire.

¹⁶² 'The Steam Ram of Sartorius', *Hampshire Telegraph*, 18 September 1858, 4.

¹⁶³ Ferreiro, 'The Social History of the Bulbous Bow'. *Technology and Culture*, 52, 2 (April, 2011), 341.

¹⁶⁴ Berube, 'American Thunder Childs' *Naval History*, 24 (June 2010), 64.

John Laird's name would forever become linked with the ram. The firm he and his sons had grown into a leading builder of armoured warships, was acknowledged for their proficiency in providing international clients with this weapon of secondary importance, whereas his real impact was in the construction of the oceangoing turret ship. A feature incorporated into the two Laird rams were six main watertight bulkheads, with a special emphasis on the forward compartments, built to take the impact of ramming.¹⁶⁵ These athwartship bulkheads also gave the ironclads structural support and were designed to prevent the sides from crumpling when the ram 'struck a heavy blow'.¹⁶⁶ Other iron bulwarks were positioned longitudinally to provide each ship with about twelve watertight bulkheads, divided at key positions with sliding doors, which were also able to 'resist the pressure of the water'.¹⁶⁷

With the launching of the French ironclad, *La Gloire* in 1859, Britain and France embarked on their ironclad race, and the ram reappeared spontaneously from the annals of ancient history. After Britain responded to the iron threat across the Channel with the ironclad frigates *H.M.S. Warrior* and her sister, *Black Prince*, the shipyards building iron-hulled warships for the Royal Navy built ram bows almost instinctively.¹⁶⁸ Rapid evolution in the size of naval ordnance was

¹⁶⁵ Arnold A. Putnam, 'The Building of Numbers 294 & 295: The Laird Rams'. *Warship 1999-2000*. Edited by Antony Preston. (London, 1999), 10, Smaller bulkheads protected the bow and stern, with the forward collision bulkhead providing additional protection should the ram be employed.

¹⁶⁶ *ORN*, II, 2 (1921), 453.

¹⁶⁷ WA ZCL/005/0195/039/040, Description of Laird Rams, likely for Bravay of Paris, dated July 1863. (No Page).

¹⁶⁸ Baxter, *The Introduction of the Ironclad Warship*. (2001), 109. 159. Also see: Daniel A. Baugh, *The Journal of Interdisciplinary History*, 27, (Summer 1996), 123-124, review of C. I. Hamilton, *Anglo-French Naval Rivalry 1840-1870*, (New York, 1993): 'It was probably the first clearly defined modern technological arms race and was initiated by the challenging power, France.' Nevertheless. 'Britain had a much greater industrial capacity in respect to iron working and steam-propulsion manufacturing'.

not matched with improved accuracy, as guns grew to hurl larger shells against iron hull plates of increasing thickness. Battering mattered in terms of guns and the ram.¹⁶⁹ John Scott Russell, the builder of the S.S. *Great Eastern*, would later remark that the ram was the true decisive weapon for a warship: 'give her the stem is the order of battle...'¹⁷⁰

Britain's first iron-hulled ram warship, the frigate *H.M.S. Resistance*, was launched from the yard of Westwood & Baillie of Millwall, London, on 11 April 1861.¹⁷¹ Over 100 feet shorter than the *Warrior* but with a beam almost as wide, *Resistance* was according to one London newspaper, 'Ungainly...Indeed, to call her simply ugly is a flattery to which we are unwilling to stoop'.¹⁷² Other British newspapers showed less invective as they focused on her offensive capabilities and strength of construction. The 12 April 1861 edition of the London *Morning Post* remarked the ironclad ram would 'be comparatively invulnerable even to the modern improvement of rifled gunnery...her power would be tremendous even if opposed to a fleet of timber-built vessels'.¹⁷³ The following day, the *Newcastle Journal* remarked of her: 'a better built ship was never sent afloat'.¹⁷⁴

Royal Navy ocean-going ironclads of the 1860s were as varied an assortment of designs as were many armoured warships of other nations during that time of

¹⁶⁹ Stanley L. Sandler, 'The Day of the Ram', *Military Affairs*, 40, 4 (Dec. 1976), 177.

¹⁷⁰ *Ibid*, 176.

¹⁷¹ Baxter, *The Introduction of the Ironclad Warship*. (2001), 159, 'Launch of the Resistance', *London Evening Standard*, 12 April 1861, 3.

¹⁷² 'Launch of the Resistance', *London Evening Standard*, 12 April 1861, 3. The ironclad careered down her ways stern first into the Thames and narrowly missed a steamer and tug to the relief of the 10,000 in attendance, as the armoured warship would have, 'annihilated anything less impervious than a granite mountain'

¹⁷³ 'Launch of Her Majesty's Iron-Cased Screw Frigate Resistance', *Morning Post*, 12 April 1861, 5.

¹⁷⁴ 'Launch of the Ironcased [sic] Frigate "Resistance"', *Newcastle Journal*, 13 April 1861, 3. This account also stated her ram was admired for its shape, as the contour resembled 'the curved line of a swan's neck and breast'.

transition. They were not all graceful nor ungainly, just as they were not all handy nor good sailors. One British Admiral who served in many Royal Navy ironclads of this era precisely summoned up the deception of appearance over performance noting: 'Good looks do not always accompany good qualities in naval architecture any more than in other things'.¹⁷⁵ When placed in commission, the *Resistance* (referred to affectionately by her crew as 'Old Rammo') and her sister, *Defence*, had one distinction other ironclads lacked. Their long single gun decks were painted in the black and white chequered pattern of the old wooden frigates. This nod to the familiar Nelsonian paint scheme was short-lived and they were covered over in black around 1862.¹⁷⁶

The hulls of the 294 and 295 were built with a submerged iron ram bow to compliment the heavy guns. The shape of the ram was as an arch, curving upward from the keel, similar to that of the *Resistance*.¹⁷⁷ Union warships equipped as rams were of mixed hull design, with some extensions also curving upward from the keel, and other appendages or 'overhang' extending from the prow downwards to rejoin the forepeak midway down the submerged bow.¹⁷⁸ The ram, as first used in the Civil War in America, was a tacked-on afterthought. The first steam-driven armoured vessel to enter combat, was the converted icebreaker/towboat restyled as the *C.S.S. Manassas*. Taken to a New Orleans dockyard, cut down, and fitted with a rounded deck, the one inch thick iron plating was intended to protect her until she could close with an enemy vessel.¹⁷⁹ Equipped with a single 32-pounder SBML limited to fire ahead only, the little

¹⁷⁵ Admiral G. A. Ballard, *The Black Battlefleet*. (Greenwich, 1980), 230.

¹⁷⁶ *Ibid*, 166, 168.

¹⁷⁷ Parkes, *British Battleships*. (1966), 78.

¹⁷⁸ Alexander L. Holley, 'Iron-Clad Ships and Heavy Ordnance' *Atlantic Monthly*, 11, (January 1863), 93.

¹⁷⁹ Charles L. Dufour, *The Night the War Was Lost*. (Lincoln, 1994), 71.

ironclad was also fitted with a cast metal projection at her bow described as, 'a formidable mass of iron...in the form of a knob'.¹⁸⁰

In the early hours of 12 October 1861, the *Manassas*, with a small Confederate flotilla of converted wooden gunboats, attacked Union warships at anchor in the stretch of the Mississippi River just north of the Gulf of Mexico, known as the Head of the Passes.¹⁸¹ At 4:40 a.m., the *Manassas* came down through the fog to strike the steam frigate *U.S.S. Richmond*, as the larger warship was coaling.¹⁸² The *Richmond* had been struck a glancing blow on her port bow and suffered only a small hole, five inches in circumference when the ram collided.¹⁸³ Only three planks had been stove in two feet below the waterline, and the damage was not the catastrophic hull-tearing smash which the Confederates hoped for.¹⁸⁴ The *Manassas* got the worst from the encounter as the force of impact caused her to 'vibrate like an aspen'. The impact also caused one funnel to fall on her turtle-back upper deck, one of her two engines was rendered inoperable, and the ram was broken off.¹⁸⁵

When the ironclad *C.S.S. Virginia* buried her prow into the Federal sailing sloop *U.S.S. Cumberland*, on 8 March 1862, the action confirmed the steam ram had become a viable weapon in close quarters naval combat. The sloop sank in broad daylight in the anchorage of Hampton Roads, the wide estuary referred to as a 'natural naval amphitheatre' where several rivers empty into Chesapeake Bay.¹⁸⁶ The *Virginia* had delivered the dramatic blow in front of thousands of

¹⁸⁰ Ibid, 72.

¹⁸¹ Ibid, 77.

¹⁸² Still, *Iron Afloat*, (1971), 50.

¹⁸³ Ibid, 50, Baxter, *The Introduction of the Ironclad Warship*. (2001), 233.

¹⁸⁴ Baxter, *The Introduction of the Ironclad Warship*. (2001), 233.

¹⁸⁵ Dufour, *The Night the War Was Lost*. (1994), 79, Still, *Iron Afloat*. (1971), 50.

¹⁸⁶ Still, *Iron Afloat*. (1971) 25-27, 29.

opposing Confederate and Union troops lining the shore. As Labrousse had predicted, the ram had overcome a numerically superior enemy and had been proven to be a seemingly essential weapon for the armoured warship.

A lack of machine works compelled the Confederates to hammer rams out of scrap iron, with whatever blacksmiths were available. Mistakenly, the Confederates devoted valuable dockyard resources and skilled manpower to the task of making the ram a designed extension of the hull instead of a disposable spur used once as a shock weapon and then forgotten to focus on what really mattered in a sea fight: Gunnery. As the war progressed, the ram on Confederate ironclads was tapered into the prow with at least one Southern ironclad (*Atlanta*) carrying a saw tooth fixture on the bottom edge of the ram to cut down into a Federal warship.¹⁸⁷

The ram, as fitted to seagoing ironclads, was of different design but the feature also degraded the performance of many warships while at sea. The overhanging fixture on most Confederate and some Union river and coastal warships would have undoubtedly kept the head of many of them submerged into the waves had they ventured out from their harbours. By late 1862, the Federals were rethinking the design for their oceangoing armoured men-of-war, with the ram fashioned to reassemble the undershot curve of European ironclads. The steam frigate *Roanoke*, was reassigned from Hampton Roads to the Brooklyn Navy Yard and cut down to take iron plates and three Ericsson turrets.¹⁸⁸ The *Roanoke* also had a ram fitted to the forward plates which had extended several feet forward of the stem. A solid piece of iron was fitted to the tapered iron bow

¹⁸⁷ Ibid, 06, 107.

¹⁸⁸ Guernsey 'Iron-Clad Vessels', *Harpers New Monthly Magazine*, 148 (September 1862), 440.

frames and the spaces in between 'filled up with solid timber, all firmly bolted together'.¹⁸⁹

As the Laird rams were under construction at the Birkenhead Iron Works, the Union was struggling to complete a formidable ironclad frigate in New York. The ram *Dunderberg*, was originally intended as a combination ironclad with casemate and twin turrets for her 15-inch guns.¹⁹⁰ The twin turrets design of the Laird rams may have influenced this massive Federal armoured vessel as the Birkenhead-built ships and the *Dunderberg* were designed to house two guns in each turret, with 11-inch Dahlgren guns also carried below the turrets in the casemate of the New York ironclad.¹⁹¹ An additional indication of competing designs influencing the builders of the *Dunderberg* and the Laird armourclads, was similarities involving the ram and hull. The hull of the massive 378 foot iron ship taking shape in the yard of shipbuilder W. H. Webb, was 'dead flat the whole length' and similar to the Laird turret ships, but she also had armoured subsurface extensions from the casemate that protected her wooden hull. These armoured belts were capable of 'presenting a resistance to the enemy's rams or projectiles'. The forward weapon namesake of this Union 'ram-frigate' was described as:

'About as formidable a looking object as one can conceive; the entire forefoot of the vessel is prolonged thirty feet from the hull proper, and, rising easily up from the keel about half the distance from the waterline, is there rounded, presenting a blunt end in shape like the profile of an axe edge'.¹⁹²

¹⁸⁹ Ibid, 444, 445. The *Roanoke* was also given a curved iron extension or 'hood' aft to protect both her screw and rudder.

¹⁹⁰ Tony Gibbons, *Warships and Naval Battles of the Civil War*. (New York, 1989), 71.

¹⁹¹ Ibid, 71.

With this prow plated over with iron, and the hull compartmentalized, the great warship was seemingly impervious to catastrophic damage at the bow. The wooden body of the ram was noted to project 'inside of the hull almost as far as it does outboard' but this bulk was not considered as essential to the ship's structural integrity for 'even should the whole of it be knocked off in an affray the builders say that the hull will be water-tight'.¹⁹³

In Britain, the ram was intended for a unique purpose and was of different construction than the American-made counterparts. In the House of Commons, debate occurred between those who favoured forts as additional protection against a possible French invasion, and those who maintained that the Royal Navy was still Britain's best defence. On 10 July 1862, while debating the question of funding expanded fortifications, the question was broached over the need to raise troops for those positions. One MP, Sir Frederic Smith, sought to 'strike a blow' against the forts with their new heavier guns, and permanent, well-trained garrisons to man them, 'before it had taken too deep a root'.¹⁹⁴ France would not be able to amass an invasion fleet of warships and wooden-hulled transports without being detected. The guns of the Royal Navy were ready to meet the French warships in the Channel and the French transports would have been vulnerable to British ramming attacks as, 'three or four steam rams would be able to run into and destroy a great number of them'.¹⁹⁵ The concept called for the use of the ram as a shock weapon, with the heavy cannon on British ironclads keeping their French armoured opponents busy in a gun duel. The ram

¹⁹² 'The "Dunderberg"', *Scientific American (SA)*, 8, 14 March 1863, 162.

¹⁹³ *Ibid*, 162.

¹⁹⁴ *Hansard*, 10 July 1862, 168, cc 163.

¹⁹⁵ *Ibid*, cc 163.

was a cheap secondary weapon, a supplement to armour plate and the gun, and when properly utilized, able to defeat funding for land defences.

As stated, the British-built ram mounted on her first generation ironclads, was different in construction from those in America. The description of the fabrication of the ram on each of the two Lairds-built turret ships contracted by Bulloch is limited, but another ironclad built in Scotland during the Civil War offers a likely model. Confederate naval officer, Commander James North had contracted with the Glasgow shipbuilding firm of James and George Thomson to build an ironclad frigate mounting 20 guns in broadside and fitted with a ram.¹⁹⁶ The iron prow of this 'Scottish Sea Monster' as she was dubbed, (She was referred to by the Thomsons' as the 'No. 61', her hull number) extended from the keel and curved upward, midway from the bottom of her bow, along the stem to the waterline.¹⁹⁷

This ironclad was beyond the Confederates in every respect. With more than 4700 tons displacement, her draught of 20 feet would have kept her out of every harbour in the Southern States. Requiring an impossible to obtain complement of approximately 520 men, she would have been a veritable 'Flying Dutchman' never able to travel to her intended homeland.¹⁹⁸ The keel of 'North's Ship' was an iron plate 14 inches in height and 4 inches thick extending forward to receive the ram.¹⁹⁹ The ram on British-built armourclads was not a bulky iron wedge

¹⁹⁶ Luraghi, *A History of the Confederate Navy*, (1996), 202.

¹⁹⁷ Ibid, 202-203. The Confederates planned to name her the *Glasgow* or *Santa Maria*, likely as an initial moniker in an attempt to deceive Union spies, until she was safely at sea.¹⁹⁷ Once equipped with her guns, ammunition and stores she would have probably been named for a southern state after she hoisted the Confederate naval ensign.

¹⁹⁸ Gibbons, *Warships and Naval Battles of the Civil War*. (1989), 67, Luraghi, *A History of the Confederate Navy*, (1996), 203.

¹⁹⁹ *ORN*, II, 2, (1921), 193. The stem was 'of hammered scrap iron with part of keel forged on same' and served as the connection point between the separate ram forging and the keel plate.

fixed to the bows, but a knife-like projection blended into the bows to permit better performance at sea. Forward from the collision bulkhead on 'No. 61', bent iron plates referred to as 'breast hooks' less than an inch thick, were placed about three feet apart and then riveted to iron frames also positioned forward of the collision bulkhead. This iron webwork formed the structural fabric which would support the ram. The ram itself was 'to be made of the greatest possible strength on the most effective plan, so as to resist as much as possible the shock of collision'.²⁰⁰

Commander North's ironclad was built with a network of iron frames creating a shock absorber for the larger casting which was the contact point of the ram. The ram on the Lairds turret ships was likely constructed with a similar support structure to fit into the swan breast curve of the prow. The curved extension was 'to be forged solid of the best hammered scrap iron and formed as a projecting beak below the waterline to give the blow when the vessel is used as a ram'. The ram was cast as a single forging of varying measurements calculated from the height of the deck to 'the point of the beak'.²⁰¹

The Turret

In the spring of 1862, Lairds began construction of the *294*, the first purpose-built turret ship in Britain. However, the designation of the first British-built armoured ship with a *rotating* turret is properly assigned to the Glasgow

²⁰⁰ Ibid, 194.

²⁰¹ WA ZCL/005/0195/039/040, Description of Laird Rams, dated July 1863. (No Page).

shipbuilders, Napier and Sons and their ship built for the Royal Danish Navy, the *Rolf Krake*.²⁰²

The armament of the Laird rams, or more accurately the housing of the guns, proved problematic, at least initially. Bulloch had originally favoured building fixed turrets amidships for the few large Rifled Muzzleloaders (RMLs) to be carried aboard the two ironclads as the main armament. He had concerns that permission could not be obtained which would allow the utilization of Coles patented design for rotating turrets. As a result, the original plan called for the fitting of three non-moveable turrets, equipped with steam valves to raise and lower the gunports.²⁰³ This idea was discarded when Captain Coles reached an agreement with Lairds in December 1862, whereby each ironclad ram built for Bulloch were authorized to be fitted with two of his turrets, although in a slightly modified form.²⁰⁴ The belated approval granted to Lairds to use the Coles turret patent, placed Napier in the position as the 'first' shipbuilder in Britain to build an armoured ship with a rotating turret. On 28 August 1862, Napier signed a contract to build a warship fitted with two Coles' turrets.²⁰⁵ In July 1863, the *Rolf Krake* became the first turret ship to be commissioned in Europe.²⁰⁶

On 10 December 1862, the three Laird brothers and Coles agreed to the construction and fitting of two armoured copulas or 'Shield and patent apparatus &c' to the 294, then building at Birkenhead.²⁰⁷ Coles was paid a fee of £209, 17

²⁰² Hans Christian Bjerg, 'When the Monitors Came to Europe: The Danish Monitor Rolf Krake, 1863' *International Journal of Naval History (IJNH)*, 1 (October 2002), 3.

²⁰³ *ORN*, II, 2 (1921), 453, Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 10, Roberts, 'James Dunwoody Bulloch and the Confederate Navy'. *The North Carolina Historical Review*, 24, 3 (July 1947), 332.

²⁰⁴ WA, 5/195/39 & 40, 'Captain Coles License for ships 294 and 295', 10 December 1862.

²⁰⁵ Bjerg, 'The Danish Monitor Rolf Krake, 1863' *IJNH*, 1 (October 2002), 4.

²⁰⁶ *Ibid*, 1, 5.

²⁰⁷ WA, 5/195/39 & 40, Captain Coles License for ships 294 and 295, 10 December 1862.

Shillings per each ship (295 was covered under a separate contract signed the same day) with the contracts denying Lairds permission to place the Coles shields in any other ship, and did not imply a warranty on any rotating gun structure. These licensing agreements did allow for the installation of each turret 'with or without any subsequent modifications improvements additions or alterations' as approved by Coles.²⁰⁸

The contracts granted Lairds permission to use the Coles turret, but also gave the shipbuilders (and Coles) the legal ability to match their contractual obligations with advances in design to give the two rams the most up-to-date armoured copulas. This flexibility was recognition, by all parties, that advances in naval gunnery and metallurgy were an almost daily occurrence, and the ships would be the best Lairds had built to date. The then 'established axiom...that to stand still is retrograde', was fully understood by Lairds and Coles, as the Captain's 'shield' had evolved since his patents were taken out in March and September 1859.²⁰⁹

The original Coles' turret was an armoured cone, and closely resembled the modern single gun mount carried on today's frigates and destroyers. It was according to Coles, 'a large convex shield covered all over with thick iron and mounted upon a platform or frame which is capable of revolving after the manner of a turntable, and which also carries the gun upon any suitable carriage'.²¹⁰ The turntable or 'Rollerway', distributed the weight of the heavy iron shield and enclosed armament upon the iron rollers in order to avoid the reliance, 'upon spindles as in American Monitors'.²¹¹ John Ericsson's *Monitor* carried the turret

²⁰⁸ Ibid.

²⁰⁹ Bowcock, *CSS Alabama*. (2002), 184, WA, 5/195/39 & 40, Captain Coles License for ships 294 and 295, 10 December 1862.

²¹⁰ Baxter, *The Introduction of the Ironclad Warship*. (2001), 186-187.

²¹¹ H. W. Wilson, *Ironclads in Action; A Sketch of Naval Warfare from 1855-1895, With Some Account of the Development of the Battleship in England*. II. (London, 1896), 224.

upon her main deck and was turned by hoisting the iron cylinder (complete with guns, slides, crew and ammunition, etc.) upon her great central iron spindle, the lower edges of the turret making a slight contact with the deck when rotated. Once positioned at the required angle from the beam, the entire cased armament platform was lowered to the deck, ready to fire.²¹²

By 1862, the Coles turret was remade into a similar-sized iron cylinder capable of housing one or two guns. Unlike the Ericsson model, the Coles turret was fitted over a hole in the main deck and extended below to rest upon the rollers.²¹³ This turret also had a central iron spindle. The spindle was not a hoisting mechanism, but rather a device to secure the turret to the interior of the ship and provide an auxiliary means (via a capstan) to rotate the shield, if damaged in combat.²¹⁴ One American periodical scoffed at the Coles turret, calling its machinery as 'delicate, compared with the duty required of it, as watchwork'.²¹⁵ Intricate perhaps, but the Coles shield performed admirably. It was easily turned, not by steam but by manual rotation through hand winches which linked the gear teeth near the turntable to identical iron teeth under the turret base.²¹⁶

The Coles and Ericsson turrets were also different in their above deck construction. Both had evolved as round iron cylinders with gunports, and iron gratings on the turret roof for ventilation, but the construction of each type of armoured shield was different in notable ways. Coles' design had benefited from

²¹² 'The Ericsson Battery', *SA*, 6, 5, 1 February 1862, 73.

²¹³ *Ibid*, 73, Admiral G. A. Ballard, 'The First Mastless Capital Ship H.M.S. Devastation'. *The Mariner's Mirror*, XXII (1946), 6, 9.

²¹⁴ Baxter, *The Introduction of the Ironclad Warship*. (2001), 188-189, *ORN*, II, 2 (1921), 453

²¹⁵ 'The Foreign Ironclads' *SA*, 9, 24, 12 December 1863, 377.

the September 1861 tests aboard the floating ironclad battery, *H.M.S. Trusty*, at Shoeburyness.²¹⁷ Although the ironclad had been commissioned too late to see action in the Crimean War of 1854-56, the experiments with Coles iron gun shield cast the *Trusty* as the first ship in the world to carry an armoured turret.²¹⁸

When battered by solid shot from 68-pounders and rifled shell, the Coles shield held up well with only a single plate being destroyed, and that one not properly fitted in place.²¹⁹ The armoured shield had been fired at by one hundred rounds from a 100-pounder Armstrong gun (reportedly only 33 rounds struck the turret), at the close range of 400 yards, and 'shot after shot was seen to strike the shield, glance off rapidly and fall into the sea without affecting any apparent injury'.²²⁰ The 99th round made a deep indentation, and the 100th round hit the same spot, tearing away the plate.²²¹ The other plates were not impervious and, indeed, some damage had occurred to the other iron panels though they were merely riddled, not completely torn away. Clearly, more armour was required inside the turret wall and on the exterior face by the gunports if sufficient protection for the gun crews inside the copula was to be achieved. Despite the drawbacks, the Coles turret gave 'so much satisfaction' that it was worthy of

²¹⁶ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 11. Reportedly, a crew of 18 men could turn the armoured copula one complete revolution in only a minute. An additional account claimed a crew of eight men could carry out a rotation in 90 seconds.

²¹⁷ 'Naval and Military Intelligence', *Essex Standard*, 27 September 1861, 4.

²¹⁸ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 241.

²¹⁹ 'Naval and Military', *London Daily News*, 2 October 1861, 3. The copula cast off most of the rounds, and based on the superficial damage, 'a very large number of the shots glided off without injuring the plates'.

²²⁰ 'Naval and Military Intelligence', *Essex Standard*, 27 September 1861, 4, Baxter, *The Introduction of the Ironclad Warship*. (2001), 191.

²²¹ 'Naval and Military Intelligence', *Essex Standard*, 27 September 1861, 4.

more serious consideration as a method of housing guns aboard some of Britain's warships.²²²

The Admiralty was suitably impressed by the latest round of tests with Coles armoured copula aboard the *Trusty* and ordered another test with bigger guns. Days after the Shoeburyness experiments against the floating battery, another version of the Coles turret was built. The turret was expanded in diameter to carry two heavy guns instead of the single 40-pounder carried in the *Trusty* turret. A wooden mockup was built aboard the hulk *Hazard* for further tests.²²³ Both the Coles and Ericsson designed turrets initially progressed at a similar pace, but the press of the Union war requirements freed Washington bureaucrats from the need of more trials. On 4 October 1861, Ericsson and the U.S. Navy contractually agreed to begin construction of his turret ship, the *Monitor*.²²⁴

Britain was not far behind. Less than a month after the Confederate and Union ironclads *Virginia* and *Monitor* fought a draw at Hampton Roads on 9 March 1862, the Admiralty ordered (on 3 April, 1862) that work at the Portsmouth Dockyard, on the 121 gun ship-of-the-line *H.M.S. Royal Sovereign* be halted. The steam-driven three-decker was to be remade on the stocks, and work crews were reoriented to cut her down to her lower decks in order to follow a new set of plans.²²⁵ She was to be fitted with armour plate and four of Coles iron shields with five heavy guns. The forward copula was slightly larger as it carried two heavy guns and the others a single heavy gun each, all mounted on the centreline. Britain would convert this three-decker into the Royal Navy's first true turret warship. When commissioned in 1864, the *Royal Sovereign*, armed with

²²² 'Multum In Parvo' *Liverpool Mercury*, 7 October 1861, 7.

²²³ Baxter, *The Introduction of the Ironclad Warship*. (2001), 192-193.

²²⁴ *Ibid*, 260-261.

²²⁵ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 239.

five identical pieces of heavy ordnance, would predate the all big gun *Dreadnought* by more than forty years.²²⁶

The next step was to construct a purpose-built iron turret ship rather than convert pre-existing wooden hulls. The Admiralty quickly followed up the *Royal Sovereign* conversion with an order to build an iron-hulled armoured man-of-war equipped with Coles turrets. The London-based iron shipbuilders Samuda Brothers received the contract on 8 April 1862, and the *Prince Albert* was planned as the first turret warship built from the keel up intended for service in the Royal Navy.²²⁷ This ship however, was not completed until 1866 and she retains the distinction only with the caveat *first designed*. Another turret-equipped ironclad would be Britain's first. That 'other' was also designed from the keel up to carry her guns in iron shields. The only exception was the other ship was not originally intended for Queen Victoria's fleet.²²⁸

Upon initial glance, the Coles and Ericsson turrets were only similar in appearance: both usually housed two heavy guns, but the turret of the *Monitor* was smaller in internal dimensions, 20 feet in diameter and a height of 9 feet.²²⁹ The Coles turrets for the Laird rams were 23 feet in diameter and stood only 5 feet above the deck when placed aboard.²³⁰

The *Monitor's* turret had been assembled from curved plates, each a single inch thick and bolted onto each preceding plate to form a laminated armoured

²²⁶ Ibid, 239.

²²⁷ Conway's *All the World's Fighting Ships 1860-1945*. Editor Roger Chesneau, (London, 1979), 19-20, Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 240.

²²⁸ Ibid, 240, 253.

²²⁹ 'The Steam Battery "Monitor"', SA, 6, 22 March 1862, 177, SA, 'The Laird Rams', 11, 1 October 1864, 224.

²³⁰ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 11.

cylinder 8 inches thick.²³¹ Turrets used by the U.S. Navy would grow in diameter as heavier guns were fitted to successor monitor-type ironclads, but the construction methods remained the same during the 1860s. A turret for a Union warship would be built around a circular oak frame with each of the eleven curved iron plates fitted around the wooden pattern which resembled 'the skeleton of a giant cistern'.²³² Each inch-thick plate was an 'iron board' 9 feet in length, 3 feet wide, and bent to the required curve on a hydraulic press. After each succeeding plate was curved on the press, it was wheeled to the turret shell where a pine stick with white paint on the end was trust through the rivet holes on the previous plate to mark the exact spot where the next holes were to be punched through by machine. With each plate fitted in like manner, the layers of each 'course' were positioned to overlap with the plates on the layer below to prevent an alignment of the plate juncture, or to 'break joints' so as to prevent a joint becoming a single vulnerable place for an enemy shell to strike and weakened the structure of the entire turret.²³³

The great engineer Isambard Kingdom Brunel reportedly told Coles as early as 1855, 'You only need a breechloader to make your shield perfect'.²³⁴ This was a vision of the effective use of limited space in a turret interior, but a suitable gun was a generation in the future. During the *Trusty* tests, breechloaders failed as 'vent-pieces, if made of steel are broken and driven through the breech-screw; or if made of wrought iron, they are bent into an oval form...and jammed tight into

²³¹ 'The Steam Battery "Monitor", *SA*, 6, 22 March 1862, 177

²³² Guernsey, 'Iron-Clad Vessels', *Harpers New Monthly Magazine*, 48, September 1862, 440.

²³³ *Ibid*, 440.

²³⁴ Wilson, *Ironclads in Action*. II. (1896), 220.

the annular surface of the closing screw'.²³⁵ The mechanisms of early breechloaders were too delicate for the demands of black powder and the service conditions of the 1860s. Metallurgical arts had not yet advanced to enable the casting of breech mechanisms which could stand the high heat required of rapid firing and safely meet the effectiveness needed in combat conditions. Thus the muzzleloader in all its forms remained the weapons of choice throughout the 1860s.

The two guns carried in the forward cupola on the *Royal Sovereign*, changed the turret into a more suitable armoured platform with room for the crews to work the heavy guns and pass up shot and powder from below. Gone was the original capsule shape of Coles early designs. The sides of the dual gun turret (and three single gun turrets) on the *Royal Sovereign* were not inclined inward but perpendicular in order to provide more space for heavier guns than the 40-pounder tested in the armoured shield aboard the *Trusty*.²³⁶ Bulloch reported in a dispatch to Richmond that 'even Captain Coles has straightened up his turrets' to make room for the new guns, but he kept the same floor plan of his earlier shield.²³⁷ Unlike the Ericsson model on the *Monitor*, the rivets on the Coles turrets were likely recessed into the curved plates.²³⁸ The earlier Coles sloped capsule-like turret would return when steel breechloaders made the advanced design concept viable. Without the need for crew space to load the heavy muzzleloaders of the 1860s at the edge of the gunport, the sloped turret and the breechloader would reemerge in a complementary blend of form and function as

²³⁵ 'The Armstrong Gun', *Dublin Evening Mail*, 10 October 1861, 1. The ordnance maker Sir William Armstrong disdainfully referred to the breechloaders of that era as 'gimcrackery' with justification.

²³⁶ Baxter, *The Introduction of the Ironclad Warship*. (2001), 192.

²³⁷ *ORN*, II, 2 (1921), 310.

²³⁸ Photo NH 61923, '*U.S.S. Monitor (1862)*', U.S. Naval Historical Center, Washington

steel became the substance of both the shipbuilders and gunmakers at the end of the ironclad era.

The circular plates of the iron shields fitted on the *Royal Sovereign* would not serve as the identical pattern of turret built for the Laird ironclads as those were changed to meet the requirements of a Confederacy deficient in the means of rapidly constructing and repairing ironclads. The willingness to modify a patented design showed Coles as an inventor ready to make changes as required. He was likely eager to get the Laird ironclads at sea and into action to prove his concepts under fire.

The Coles turrets constructed for the Laird rams were built around an iron skeleton of T-shaped beams spaced apart at 20 inch intervals fitted over an inner ½ inch thick iron skin of boiler plate.²³⁹ Teak wood filled in the spaces between the inner skin and the support beams. Over this iron and teak blocked frame, was a metal basket of ¾ inch iron strips to hold the pieces together, and outside of this was another 8 inches of teak.²⁴⁰ East India teak had been selected due to its elastic qualities. Teak did not warp with changes in temperature; a necessary feature for ships operating in warmer climates.²⁴¹ In December 1863, *Scientific American* observed the Royal Navy's preference for 'the universal teakwood, like unto which there is none other in John's (Bull) opinion'.²⁴² Over the outer teak layer of the turret, were fitted the iron plates each 5½ inches thick to resist enemy shot and shell.²⁴³ These vertical plates were arranged in a 21-sided polygon to provide for time-saving fitting, and to prevent repair delays if damaged in combat.

²³⁹ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 11.

²⁴⁰ Ibid, 11.

²⁴¹ (No Author), Description of the Birkenhead Iron Works' *The Practical Magazine*, (London, 1874), 28.

²⁴² 'The Foreign Iron-Clads', *SA*, 9, 12 December 1863, 377.

²⁴³ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 11.

The mechanic deprived South did not have the industrial equipment required to reroll damaged armour plate (especially not plate of that thickness) nor the skilled manpower in sufficient numbers for overly complicated dockyard repair work.

Around the gunports of the modified turrets, another course of plates, each 4½ thick were fitted to provide 10 inches of iron armour around the turret faces.²⁴⁴ Bolts ran the entire distance from the turret exterior to the thin boiler plate within to bind the entire structure together. The armour on the *Trusty* had (except for the one plate torn away) suffered ‘only one or two screw nuts off, and a very few bolts started’ inside the vessel as a result of her pounding during the Shoeburyness tests.²⁴⁵ Loosened screws and bolts represented a danger of broken bits flying off upon impact during action, and ricocheting around the turret interior injuring the gun crew. The thin inner lining of iron sheeting inside the turrets on the Laird rams would have gone some way in mitigating this danger.

The turret interiors were also modified to meet the requirements of Bulloch and his (unofficial) sponsor, the Confederate Government. Coles suggested (perhaps to Lairds) that the turntable of the turret be staggered in such a way as to allow for proper balancing when the guns were run out.²⁴⁶ Another modification was an incline for the slides which would allow the heavy guns to become ‘Self-Acting’ after firing.²⁴⁷ Recoil would shove the guns back into the turret, but after reloading, the guns would, with the aid of gravity, slide back to a ready position with muzzles protruding from the gunports. A few quick adjustments by the crew as directed by the gun captain to align with the next target, and the RMLs would be ready to fire again.

²⁴⁴ Parkes, *British Battleships*. (1966), 78.

²⁴⁵ Baxter, *The Introduction of the Ironclad Warship*. (2001), 154.

²⁴⁶ *ORN*, II, 2 (1921), 310.

²⁴⁷ Wilson, *Ironclads in Action*. II. (London, 1896), 220.

The above deck hull bulwarks attached to the ships sides were armoured flaps, five feet tall and hinged at the lower edges to fall outboard, thus permitting an arc of fire for the turrets on each beam.²⁴⁸ The 'novel' bulwarks were topped by a wooden rail (likely teak) which was 'removable at pleasure' to clear another support which held the moveable iron sides upright until the guns were needed.²⁴⁹ The flaps would fall from each side to give 'the required sweep of the guns in training' for broadside fire, or slightly off beam forward and aft. The clear path of fire for the guns was limited, as the forward turret was restricted by the foremast and forecastle and the guns in the aft turret by the mizzen and poop.²⁵⁰

The guns would have been positioned abreast 4½ feet apart in each turret, with oval gunports capable of allowing the muzzle of each gun, 12 degrees of elevation and 5 degrees of depression.²⁵¹ Depression was restricted to those few degrees as the ports were only five inches above the deck and only of sufficient width to allow a crewman to see an object beyond the side of the barrel.²⁵²

Armour Plate

The iron plate produced for the Laird rams was primarily from local sources. On 3 September 1862, Thomas Haines Dudley, the U.S. Consul at Liverpool,

²⁴⁸ Parkes, *British Battleships*. (1966), 79. James Reed claimed the 'turn-down' iron bulwarks were four feet high and made in lengths of about eight feet. See: TNA, ADM 1/5842, *Admiralty Correspondence*, 'Steam Rams on the Mersey', Letter written by James Reed, 17 September 1863, 8-9.

²⁴⁹ 'The Laird Rams', SA, 11, 1 October 1864, 224.

²⁵⁰ Ibid, 224, ORN, II, 2 (1921), 225.

²⁵¹ ORN, II, 2 (1921), 265.

²⁵² TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*,

wrote to U.S. Secretary of State, William H. Seward, to report on the early progress made on the Lairds ironclads.²⁵³ Dudley, a Quaker lawyer from New Jersey, was perhaps the most able American diplomat of the war and provided the Union with a steady flow of usually accurate intelligence on Confederate activities in Britain.²⁵⁴ According to Dudley's sources, the Mersey Steel and Iron Company in Liverpool, was producing 1500 tons of armour plate most of which was intended for the Laird rams, with the remainder to be shipped to the Southern States.²⁵⁵ The size of the plates directly associated with the Laird rams were not mentioned, but others created for the Confederate Navy offer an indication of what was likely a standard size of plate to speed production. Some plates, viewed by Dudley, measured 18 feet in length, were a foot wide and 2¼ inches thick. This rapid output was respectable considering sections of the Mersey Steel and Ironworks had been torn down and rebuilt to make way for a railway then building south to the Liverpool docks.²⁵⁶

The Mersey Steel and Ironworks had originated in 1812 and had grown over five decades into a cannon and armour producer of international reputation. Ericsson, the Swedish inventor/designer of the *U.S.S. Monitor*, had previously designed two 12-inch iron prototype heavy guns for installation on the U.S. steam frigate *Princeton*, in the early 1840s.²⁵⁷ One gun, the 'Peacemaker', was cast in America, and the other known as the 'Oregon', was cast at the Mersey Steel and Ironworks. The Mersey-built gun was reportedly still in use during the Civil War,

ORN, II, 2, (1921), 265.

²⁵³ ORN, I, 13 (Washington, 1901), 331.

²⁵⁴ Milton, *Lincoln's Spymaster*. (2003), xix, xxii.

²⁵⁵ ORN, I, 13, (1901), 331. The plates were 'made in a new manner' of 'the best iron' in the rolling mill of the Mersey works.

²⁵⁶ 'Progress of the New Railway into Liverpool', *Liverpool Daily Post*, 20 September 1862, 5.

²⁵⁷ Baxter, *The Introduction of the Ironclad Warship*. (2001), 14.

but the 'Peacemaker' burst with tragic effect during a trial voyage down the Potomac River on 28 February 1844. That explosion killed the U.S. Secretary of State, the Secretary of the Navy, four others and wounded several more.²⁵⁸ Ericsson's reputation unjustly took a battering as a result.

The Mersey works were also tasked with crafting huge iron pieces such as the propeller shafts, for the ironclads *H.M.S. Achilles* and *Northumberland*.²⁵⁹ This manufactory cast and crafted the 40-ton stern post for the *Agincourt*, their expertise being possible by steam-driven hammers described as being of 'immense' size.²⁶⁰ The steam hammer, invented by James Nasmyth in 1842, was one of the wonders of the Industrial Revolution. So great was its transforming impact, one historian wrote 'For myself, I would be prouder to say that I was the inventor of that motion, than to say I had commanded a regiment at Waterloo'.²⁶¹ The Nasmyth steam hammer grew apace with the rush of industrialization, and the impressive appearance of one such engine was described in a New York periodical as looking 'like the gateway of a Gothic church'.²⁶² The skill required to work those great machines was prized by the factory owners, as a well-trained hammer man could crush down on a piece of iron or steel with a force which caused the entire structure to shake, or he could feather down gently for a light tap. With skilled hands so close by, Lairds would undoubtedly have contracted with the Mersey works to also craft the stern posts and critical propeller shafts for the two rams building in his Birkenhead yard.

²⁵⁸ Ibid, 14, 'Launch of the Valiant', *Lloyd's Weekly Newspaper*, 18 October 1863, 1.

²⁵⁹ 'Prince Alfred in Liverpool', *Blackburn Standard*, 25 September 1861, 4, 'International Exhibition', *Kentish Chronicle*, 31 May 1862, 2.

²⁶⁰ 'Launch of the Agincourt', *London Evening Standard*, 28 March 1865, 6, 'The Japanese Ambassadors in Liverpool', *Liverpool Daily Post*, 29 May 1862, 5.

²⁶¹ David Evans, *Building the Steam Navy. Dockyards, Technology and the Creation of the Victorian Battlefleet 1830-1906*. (London, 2004), 58.

The Mersey Steel and Ironworks was something of a misnomer in the early 1860s as the first metal was not the preferred metal. An advertisement from a September 1865 edition of the *Liverpool Daily Post*, listed the products of the 'Mersey Steel and Iron Company' with iron forgings and castings of 'the highest quality and largest size' and armour plate available for the Admiralty or for export 'with dispatch and care'.²⁶³ Steel was mentioned almost as an afterthought. Steel was utilized only in small batches and usually for very select purposes. Lairds built the first steel-hulled yacht in Britain in 1858 with plates cast by Mersey Steel and Iron; she was the 'very neat screw-steam' yacht *Deerhound* built for the Duke of Leeds.²⁶⁴ That same year, Lairds had built the paddle steamer *Ma Roberts* for Dr. David Livingstone's African explorations up the Zambesi River, with 'puddled' steel plates also supplied from the Mersey works.²⁶⁵ Ironically, the *Deerhound* was present when another Lairds-built ship, the raider *Alabama* was sunk in the engagement with the Union steam sloop *Kearsarge* in the Channel on 19 June 1864.²⁶⁶

A British newspaper from September of 1863, mentioned one of the Lairds-built turret ironclads as having a steel ram.²⁶⁷ This report was false as steel was a lightweight material in ship construction and was too brittle except the small batches used as armour piecing caps on some shells.²⁶⁸ In 1856, William Clay, the managing director of the Mersey works, experimented with Bessemer converters but the metal produced was not satisfactory and was referred to as

²⁶² Guernsey, 'Iron-Clad Vessels', *Harpers New Monthly Magazine*, 148, (September 1862), 436.

²⁶³ 'The Mersey Steel and Iron Company, Limited' *Liverpool Daily Post*, 26 September 1865, 7.

²⁶⁴ 'Launch of a Yacht at Birkenhead', *Liverpool Mercury*, 17 July 1858, 9.

²⁶⁵ Kenneth Warren, *Steel, Ships and Men: Cammell Laird, 1824-1993*. (Liverpool, 1998), 95.

²⁶⁶ 'The Week's News' *Cheshire Observer*, 25 June 1864, 4.

²⁶⁷ 'Another "Ram" for a "French" House', *Liverpool Daily Post*, 31 August 1863, 5.

²⁶⁸ 'Trial of Mr. MacKay's New Gun', *Cheshire Chronicle*, 16 April 1864, 3.

'rotten hot and rotten cold'.²⁶⁹ Nevertheless experiments with other processes continued, and hard steel (usually for machine tools) was manufactured at the Mersey factory during this time. The preferred method then in vogue was not Bessemer's but a more labour intensive system to create puddled steel known as the 'Rieppe patent'.²⁷⁰

Iron used for the Laird rams also came from other suppliers as the Mersey works were unable to provide the entire requirement within the strict timeframe.²⁷¹ John Brown of the Atlas Ironworks in Sheffield provided some armour plates for the *Agincourt* then building at Lairds. It is likely that arrangement was also carried out with the two ironclads built for Bulloch. The Lairds turret ships were constructed with iron from another outside source as a weight savings measure. Iron from the Yorkshire foundry known as the Low Moor Ironworks, provided the thin, light but tough plates, used to fabricate the watertight bulkheads.²⁷² The Low Moor works were well known in America for their high quality iron used in such items as railway carriage axles, 'semi-steel' locomotive tyres, and the 'best qualities of boiler plate'.²⁷³

Building begins

The keels of the 294 and 295 were laid down in April of 1862 and consisted of

²⁶⁹ 'Experiments with Bessemer's Process' SA, 12, 1 November 1856, 64.

²⁷⁰ 'To Make Steel from Pig Iron', SA, 3, 10 November 1860, 308.

²⁷¹ 'Liverpool News', *Glasgow Herald*, 2 July 1864, 7.

²⁷² 'Launch of Her Majesty's Ironclad Frigate Lord Warden', *Sheffield Daily Telegraph*, 30 May 1865, 3, *ORN*, II, 2, (1921), 224.

²⁷³ 'Patent Railway Axles-Interesting Chance in Extending a Patent' SA, 4, 14 April 1849, 235, 'Semi-Steel Locomotive Tires [sic]' SA, 4, 5 January 1861, 3, 'The Exhibition of Iron and Steel', SA, 16, 15 June 1867, 374.

an iron plate 2 feet, 3 inches in height, and a width of 11/16th of an inch.²⁷⁴ A Dublin newspaper described the, 'two iron-clad shell-proof rams, of peculiar shape and construction, rising into shape adjacent to the where the famous '290 was put together'.²⁷⁵ The Birkenhead shipbuilder was utilizing every spare space and hand to maximize output. With the *Alabama* gone from British waters that summer, the men of Lairds were fully engaged with the *Agincourt* and especially Bulloch's turret rams.

Patrick Barry's work, *Dockyard Economy and Naval Power*, provided descriptions of many shipbuilding firms and ironworks in operation in Britain in the mid-1860s. Although this account provides rare photographs of the shipyards, iron foundries, engine shops, and rolling mills, in operation at that time, a photo of Lairds is conspicuously missing from Barry's work. Originally published in 1863, the author saw the Laird rams under construction but, because any photograph could be used as evidence against the shipbuilders, he left what appears to be a deliberate hole in this account of British iron shipbuilding and armour manufacturing firms. Nevertheless, Barry provides a rare glimpse of the rams under construction, and he describes the first of the pair building in No. 3 slip and the hull of the second ram was then being assembled in No. 4 slip.²⁷⁶ The shipyard, crisscrossed with traveling cranes mounted on iron rails, conveyed the iron plates and frames to the workmen labouring in the adjacent slips. The steam cranes were likely built by the engineer James Taylor in his Britannia Ironworks, near Lairds shipyard in Birkenhead. His steam cranes

²⁷⁴ Putnam, 'The Building of Numbers 294 & 295: The Laird Rams'. *Warship 1999-2000*. Edited by Antony Preston. (1999), 10, Parkes, *British Battleships*. (1966), 78.

²⁷⁵ 'Lord Clarendon at Liverpool', *Dublin Evening Mail*, 16 October 1862, 4.

²⁷⁶ Patrick Barry, *Dockyard Economy and Naval Power*. (London, 1863, reprinted, 2005), 301. Likely in the interest of speeding the work along, and to best use available space at the shipyard, one of the rams was built stern on to the Mersey, the other bow on.

were of such utility that they were used not only in British ports but in harbours around the world.²⁷⁷

The 6,621 ton ironclad, *Agincourt*, was laid down in Graving Dock No. 3 of Lairds.²⁷⁸ The interior of the shipyard was taken up by the slips, graving docks and cranes. Along the exterior wall of the works, were sheds and shops for the engineers, fitters, boilermakers, and other artisans who made the vital components and frames for each ironclad.²⁷⁹ The works ran parallel along Church Street, the main entrance was bordered on the south by Mersey Street, and on the north by the railway station which linked Birkenhead with the industrial centres of Manchester and Birmingham.²⁸⁰ A tunnel connected the railway with the shipyard through a 'cartway' which provided direct access for heavy equipment and individual iron sections which had been forged in other workshops outside the confines of the shipyard. These cartway rails merged with the rails for the traveling cranes and provided a means by which heavy armour plates, engine parts, boilers etc. could be shunted around the shipyard in an almost continual flow.²⁸¹

The buildings which housed the machine shops and furnaces for bending plates and bending frames, were three stories in height and shielded the shipyard and workers from the growing city of Birkenhead, and prying eyes, eager for an up close look at the progress on the ironclads. The river was a different matter. A ferry traveled from the railway station at the north of the Lairds yard to Liverpool. Another ferry landed near Mersey Street on the south

²⁷⁷ 'Obituary', *Manchester Courier and Lancashire General Advertiser*, 15 September 1894, 13.

²⁷⁸ 'Iron-Case Shipbuilding', *London Evening Standard*, 10 February 1863, 3.

²⁷⁹ (WA), Birkenhead Map, Ordnance Survey Office, Southampton (1875)

²⁸⁰ (No Author), 'Description of the Birkenhead Iron Works' *The Practical Magazine*, (1874), 3.

²⁸¹ *Ibid*, 3.

side of the Birkenhead Iron Works, permitting a limited view of the two iron men-of-war under construction.²⁸² At a fare of only two pence, the Mersey would have been crossed by a ferry every 30 minutes.²⁸³ Anyone determined to survey the progress on the Laird rams would have regular and cheap access from the river.

Aside from the keels, the frames of the 294 and 295 were the starting point of construction for the two vessels. The 'large and spacious apartment' section of the yard, known as the moulding loft, was where frames were bent and fashioned to required specifications.²⁸⁴ There, angle iron 5 inches by 3 inches, was heated and hammered into shape on heavy blocks, each frame held in place by pegs previously positioned around a chalk outline indicated by either letters or numbers.²⁸⁵ Once completed, each frame was perforated at predetermined intervals by a punching press for an assigned number of rivet holes, then hoisted by heavy crane and positioned around the keel to form the skeleton of each ship.²⁸⁶ In late 1862, the Continental Iron Works in New York City were building three monitors for the Federal Navy. Details of their fabrication suggests some basic similarities of iron construction techniques likely utilized at the Birkenhead Iron Works. A September 1862 article from *Harpers New Monthly Magazine* described the fitting of plates to the ribs to form the iron hulls:

'These plates and ribs are riveted together in the most elaborate manner...bent each to its exact shape and the countless holes have been punched, every one being to a hair's-breadth in its appropriate place, before the pieces are brought to the stocks where they are built up. Upon each vessel are a hundred or two hundred workmen, seeming to cling like bees to its sides. Little portable furnaces at short intervals are heating the rivets,

²⁸² Ibid, 26.

²⁸³ (No Author), 'Visit to Birkenhead' *Living Age*, 6, 5 July 1845, 25-26.

²⁸⁴ (No Author), 'Description of the Birkenhead Iron Works', *The Practical Magazine*, (1874), 26.

²⁸⁵ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 10.

²⁸⁶ Ibid, 10, (No Author), 'Description of the Birkenhead Iron Works' *The Practical Magazine*, (1874), 26.

which boys are carrying around to the places where they are needed'.²⁸⁷

The hive-like semblance was a familiar sight at Birkenhead when the frames of the Laird rams were 'spaced 21ins apart' from the centre of the keel plate, during the formation of the skeletons of the sister ironclads.²⁸⁸

Other Design Features

Steering in battle was a concern, as the exposed wheel on any warship was likely to be shot away in a close fight. The 294 and 295 had a double wheel on the poop, but this station would have been abandoned in action. When in battle, the ship would have been steered from a safer position below decks via a double wheel, positioned aft of the forward turret and forward of the boiler room.²⁸⁹

Bulloch suggested an armoured oval 'Sentry Box' plated over with 5½ inches of iron, be placed on deck over the steering gear directly below.²⁹⁰ From this armoured box (iron over the ever-present teak), the commander of the ram could direct his ship from his slightly elevated position forward of the funnel.

Additionally, armoured casing around the funnel base provided some added protection as the rear of the conning tower was likely unarmoured, but also of sufficient height to provide a view over the top of the forward turret.²⁹¹

²⁸⁷ A. H. Guernsey, 'Iron-Clad Vessels', *Harpers New Monthly Magazine*, 148, (September 1862), 442.

²⁸⁸ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 10.

²⁸⁹ *Ibid*, 12.

²⁹⁰ *ORN*, II, 2 (1921), 364, R.F. Scheltema de Heere, 'The Prins Hendrik Der Nederlanden', *The Mariner's Mirror*. 17 (Cambridge, 1931), 44.

²⁹¹ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 12, Scheltema de Heere, 'The Prins Hendrik Der Nederlanden' *The Mariner's Mirror*. 17 (1931), 44, Parkes, *British Battleships*. (1966), 78.

The shape of the stern was built with defence as the primary consideration. The stern was not squared off to allow room for the Captain's cabin as on traditional warships, but rounded and bluff to give protection to the aft section of the ironclad. Bulloch acknowledged the, 'peculiar shape is not pleasing to the eye' but unlike the graceful ironclad frigate *Warrior*, and other first generation oceangoing British ironclads, the rudder and the screw were almost completely submerged.²⁹² This somewhat mitigated the danger of exposed propellers, 'inviting well-aimed shots' from enemy gunners.²⁹³ With the bluff stern extending aft in an oval curve, and a ram bow extending forward of the somewhat rounded prow, they were not slender but similar to other British-built ironclads of the mid and later 1860s: 'full-breasted and full-buttocked as a canal barge'.²⁹⁴

The 294 and 295 were built to 'a very uncommon form', yet this design was intended to blend offensive and defensive aspects into a seagoing armoured turret ship equipped with the best heavy guns available in Britain.²⁹⁵ This stern design had appeared in the Royal Navy with the ironclad *H.M.S. Achilles* (launched in 1863) and contributed to an improvement in handling. The large overhanging stern of the wooden navy (and converted ironclads) was done away with and substantial weight savings achieved as a benefit.²⁹⁶

The 294 and 295 had many unique features however the propulsion systems were not innovative, but typical of many British warships of the 1860s.²⁹⁷ A pair of Horizontal direct-acting engines were installed on each of the Lairds turret ships, and the engines were equipped with a single cylinder, 56 inches in

²⁹² *ORN*, II, 2 (1921), 453.

²⁹³ 'Defects of the British Ironclads', *SA*, 1010, 13 February 1864, 101.

²⁹⁴ Ballard, *The Black Battlefleet*. (1980), 63.

²⁹⁵ 'Shipbuilding on the Mersey', *Chester Chronicle*, 29 November 1862, 7.

²⁹⁶ Ballard, *The Black Battlefleet*. (1980), 42, 63-64.

²⁹⁷ Putnam, 'The Building of Numbers 294 & 295'. *Warship 1999-2000*. (1999), 10.

circumference, with a stroke of 33 inches.²⁹⁸ The Laird rams had four rectangular boilers per vessel, typical of those carried on warships of that era.²⁹⁹ The boilers, each with six furnaces, were built for a pressure of 20 pounds per square inch (another source reported that that the pressure was slightly higher at 22 psi), also considered typical for British warships of the mid-Victorian years.³⁰⁰ Although greater steam pressure was used in Royal Navy warships during this era, the higher pressure was not considered worthy of risk, in terms of the wear and tear on the machinery, especially in a climate warmer than Britain, as higher steam pressure would wear on the engines and 'require more care on the part of the engineers'.³⁰¹

The comparison of the Laird rams with their half-sister, the armoured turret ram *Prins Hendrik Der Nederlanden*, offers a key reference point to determine likely similarities, as the three ironclads were built by Lairds within months of each other. Constructed from 1864-1865 for the Royal Netherlands Navy, the *Prins Hendrik* was a slightly larger copy of the two ironclad ships ordered by Bulloch, and the Dutch ship would more closely resemble the 295 with her then-unique fore and main masts, when commissioned.³⁰² The *Prins Hendrik* was equipped with four box boilers for a total grate area of slightly more than 208 square feet. The two Confederate-intended rams had a larger grate area of 250

²⁹⁸ 'The Double-Turreted Ship Wyvern', *ILN*, 16 December 1865, 594.

²⁹⁹ Parkes, *British Battleships*. (1966), 78, *Steam, Steel & Shellfire. The Steam Warship 1815-1905*. Editor Robert Gardiner, Consultant Editor Dr. Andrew Lambert. (London, 1992), 175.

³⁰⁰ 'Miscellaneous, Return of a Blockade-Runner, Departure of the Scorpion', *NYT*, 8 April 1865, 2, Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 252, Parkes, *British Battleships*. (1966), 78.

³⁰¹ Antony Preston, 'Creating an Inshore Navy: Royal Navy Littoral Warfare Forces in the Russian War 1854-56'. *Warship 1999-2000*. Edited by Antony Preston. (London, 1999), 23, Robert V. Kubicek, 'The Design of Shallow-Draft [sic] Steamers for the British Empire, 1868-1906'. *Technology and Culture*, 31 (Jul. 1990), 433.

square feet in their boilers but the Dutch ship could produce an additional five pounds of steam pressure per square inch, and her engines were more powerful at 400 horse power.³⁰³ The Birkenhead Iron Works continued to modify their construction techniques, and constantly sought ways to improve upon their latest designs and shipbuilding practices. Before the Birkenhead ironclads of the mid-1860s were launched, innovation and change were daily practices, and the experience of building each hull (mostly side-by-side) gave the skilled workmen, designers, foremen, and owners, an invaluable knowledge pool which permitted them to build armoured warships of increasing complexity.

Lairds engines were not advanced, but were well-built and known for their reliability: 'From their simplicity, these engines are kept in repair at a very modest cost, and they are also very economical in fuel, and for these reasons they appear likely to be very generally adopted'.³⁰⁴ Available records reveal that the two engines constructed at Lairds for the 295 were engine numbers 80 and 81.³⁰⁵ This implies that engine numbers 78 and 79 were built for the 294. These engines were made from 'one set of patterns' arranged on the second floor of the Engineer's Fitting and Erecting Building, in an area reserved as the Pattern and Millwrights shop.³⁰⁶

The engines were likely of the familiar 'Penn Trunk Engines' design, so named for the well-known marine engine manufacturer, John Penn of

³⁰² Parkes, *British Battleships*. (1966), 80, Scheltema de Heere, 'The Prins Hendrik Der Nederlanden' *The Mariner's Mirror*. 17 (1931), 51.

³⁰³ 'The Double-Turreted Ship Wyvern', *ILN*, 16 December 1865, 594, Scheltema de Heere, 'The Prins Hendrik Der Nederlanden' *The Mariner's Mirror*. 17 (1931), 45.

³⁰⁴ 'The Fastest Tug-Vessel on the Mersey', *Liverpool Daily Post*, 14 January 1863, 5.

³⁰⁵ WA, Z/CL2/9/0000/005 'Records of Cammell Laird and Co. H.M.S. Wivern, Engines No. 81, copy of plans

³⁰⁶ 'H.M. Turret-Ships Wivern and Scorpion', *ILN*, 4 November 1865, 282, (No Author), 'Description of the Birkenhead Iron Works' *The Practical Magazine*, (1874), 2, 26.

Greenwich.³⁰⁷ Penn developed his engines to resolve the problem of linking the crank shaft to the propeller shaft, by placing the connecting components directly on the end of the piston.³⁰⁸ Installation of the horizontal direct-acting engines on a large British ironclad warship of the time (such as on *H.M.S. Minotaur*) frequently placed the cylinders of each engine on the port side of the shaft, and the condensers on the right side, to provide balance.³⁰⁹

The trunk engine also had the advantage of components of limited height, allowing the whole of the machinery to fit below the waterline and thus, protected from shot and shellfire. Penn-built engines were known for their high quality of iron castings and careful workmanship. In 1854, Penn had discovered that by fitting the hardwood, lignum vitae, in strips at key positions in the shaft tube at the stern, the addition would greatly reduce the wear not only of the shaft tube, but also the bearings.³¹⁰

The London-based engine builder, Maudslay, Sons and Field, was considered the senior of the marine steam engine manufacturers in the United Kingdom during this era, and was seen as the 'mecca' for early precision tool makers such as James Nasmyth.³¹¹ During the Crimean War, Maudslay, and Penn built one hundred and fifty sets of engines for an urgent Admiralty order for shallow

³⁰⁷ Ballard, *The Black Battlefleet*. (1980), 28. This type of engine was described as having 'occupied the minimum of floor space (within the hull of the vessel) without loss of stroke, and for a horizontal lie offered the further advantage of large surfaces for the sliding parts, which reduced wear'.

³⁰⁸ Richard Sennett, Henry J. Oram, *The Marine Steam Engine: A Treatise for Engineering Students, Young Engineers, and officers of the Royal Navy and Merchant Marine*. (Reprint of London, 1898 version Bremen, 2012),. 7

³⁰⁹ WA ZCL/005/0195/039/040, Description of Laird Rams, dated July 1863. (No Page) Ballard, *The Black Battlefleet*. (1980, 194.

³¹⁰ *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill (London, 1992), 100.

³¹¹ *The Dynamics of Victorian Business: The Problems and Perspectives to the 1870s*. Edited by Roy Church (New York, 2006), 90, 91.

draught gunboats. The use of interchangeable plans for this order was the ‘first example of mass production in marine engineering’.³¹² By the mid-1860s Maudslay, Sons and Field, and Penn each employed approximately 1500 skilled workers and were both considered ‘easily the foremost in world’ in the field of marine steam engine manufacture.³¹³ Lairds was new to engine building, having only added that capability when the new Birkenhead Iron Works was constructed in 1857.³¹⁴ Limited experience in engine building was likely why the Laird rams had engines of 350 horsepower (total per each ship), adequate for the size of the 294 and 295 but not sufficient for the larger ironclads then building for the Royal Navy.³¹⁵

The two Laird rams were each fitted with a single shaft to drive a single screw.³¹⁶ Some experimental ships such as the iron battery *H.M.S. Meteor* (1858), were fitted with three screws but results were not favourable, as the *Meteor* experiment was an attempt to merge the machinery drive techniques of the factory shop floor with the engines of a warship.³¹⁷ The ships were not suitable for sea service as they were criticized as being ‘unable to sail, steam or steer’ and were considered ‘not altogether satisfactory’.³¹⁸ For serviceability and

³¹² S. B. Saul, ‘The Market and Development of the Mechanical Engineering Industries in Britain 1860-1914’, *The Economic History Review*, 20, (April 1967), 117.

³¹³ *Ibid*, 88, 89 102.

³¹⁴ Warren, *Steel, Ships and Men*. (1998), 34.

³¹⁵ Putnam, ‘The Building of Numbers 294 & 295’. *Warship 1999-2000*. (1999), 10.

³¹⁶ Parkes, *British Battleships*. (1966), 78.

³¹⁷ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 240-241. This floating battery (and perhaps others of the five-ship *Aetna* class) built in Britain during the Crimean War, was adapted from a single screw armourclad to carry two wing propellers in addition to her original central screw; with those side screws likely driven by belts connected to the single engine.

³¹⁸ Wilson, *Ironclads in Action*. I, (London, 1896), xxxiii.

performance, most British ironclads of the 1860s relied on the dependable large diameter single screw propeller.³¹⁹

The engines on the *294* and *295* rotated the shaft at a maximum of 70 rotations per minute and turned the single, three bladed 14 foot, 6 inch screw at a maximum speed of slightly more than 10 knots.³²⁰ The screw was fixed at a 20 degree pitch and the three blades allowed for a measure of improved performance at speed, but the pitch and the drag produced by the third blade would later prove a detriment when the Laird rams attempted to operate under lower speeds or sail alone.³²¹ The screw was fixed and could not be disengaged and hoisted on deck as with other British warships of that era. Due to the propeller configuration, the Lairds ironclads were impaired under sail and slight steam as 'screw drag' scooped up water at slow speed.³²² The *294* and *295* were built as men-of-war with an eye toward labour savings while at sea. Although they operated efficiently while under adequate or full steam, they lacked the requisite qualities of endurance and were therefore not suitable as long range commerce destroyers. They were compromises of design and restricted to only a moderate speed for the whole of their lives.

The sails were problematic for ironclads, and especially for the low-hulled turret ships. Bulloch favoured a new system of self-reefing topsails as another way to keep down the required number of crewmen. In a dispatch to Mallory, Bulloch included a set of drawings for his armoured ships with specifications 'as

³¹⁹ Ballard, *The Black Battlefleet*. (1980), 194.

³²⁰ Parkes, *British Battleships*. (1966), 78, *Liverpool Daily Post*, 10 October 1865, 10.

³²¹ TNA, ADM 53/9512, *Ship's Log H.M.S. Scorpion*, 2 December 1868 to 31 December 1869

³²² Ballard, *The Black Battlefleet*. (1980), 194. *Liverpool Daily Post*, 10 October 1865, 10.

minute as they can well be made'.³²³ The Laird rams were equipped with sails to provide maximum canvas over an area which could be handled without too great a reliance on well-trained seamen (another vital resource sorely lacking in the Confederate States). Bulloch explained with an almost resigned air, his willingness to try a novel masting plan: 'The object in this peculiar rig was to get a good amount of canvas in such a shape as to require the smallest possible number of seamen, properly so called'.³²⁴

Bulloch was not the first to adopt this 'peculiar' yard and sail system. The first British patent for this method dated from 1806, and the designs were periodically modified. In 1850, Royal Navy officer H. D. P. Cunningham took out a patent for rolling topsails around their yards.³²⁵ Cunningham's, 'application of mechanical science' was preceded by others, but his had the added benefit of coming along at the right time.³²⁶ The discovery of gold in both California and Australia enticed many an able seaman to desert his ship for the mining camps.³²⁷ To make up for the loss in men, the ability to reef sails from the deck of a merchantman was adopted as a method to keep down crew numbers and prevent clippers from being abandoned in the harbours of San Francisco and Melbourne.

Double topsails served as a pattern for the Laird rams, and the iron steam frigates, *H.M.S. Resistance* and her sister the *Defence*, were the first in the Royal Navy to carry them.³²⁸ The two steam frigates employed these yards and sails

³²³ ORN, II, 2 (1921), 452, 453. He matter-of-factly explained the drawings of the sail plan with only a passing reference to a labour savings appliance aloft: 'I will merely say that the upper topsails roll up as the yards are lowered'.

³²⁴ Ibid, 453.

³²⁵ 'Reefing Topsails', *London Daily News*, 16 September 1861, 2. 'Cunningham's Self-Reefing Topsails', *Hampshire Telegraph*, 23 May 1857, 5.

³²⁶ 'Reefing Topsails', *London Daily News*, 16 September 1861, 2.

³²⁷ Ibid, 2.

³²⁸ 'Naval and Military Intelligence', *Morning Post*, 21 March 1862, 2.

(as did other British warships in the early 1860s) in what was known as the 'Cunningham System' where (theoretically) the upper part of the sail was rolled up as the yard was lowered 'similar in its effects to the spring blinds to a window of a railway carriage'.³²⁹ This proved to be better adapted to the less pressing demands of commercial sailing ships than the unforgiving stresses of a man-of-war. The concept proved a failure as wet sails wadded up when the yard was lowered, quickly fouling other rigging. The Royal Navy discarded Cunningham's invention after only a year in service.³³⁰

Despite years of modifications, and new methods for masting and improved arrangement of yards and ropes, the blend of sail and steam was never fully successful on men-of-war fitted with turrets. Rotating gun platforms offered the advantage of a readily moveable armament but stays and shrouds restricted the angle of fire. As armour grew thicker and guns grew heavier, masts became more of a concern regarding the centre of gravity on a turret ship. Masts and yards also took time to clear away for action. Yet despite the masts, yards, rigging and canvas being a cluttering inconvenience in regard to the room needed to work the guns, they remained an accepted form of auxiliary motive power to supplement the engines and single screw. Another decade would pass before navies began to permanently discard sails and the armoured warships would be altered to take on a form more suitable to their key attributes of protection and firepower.

Main Guns and Secondary Armament

³²⁹ 'Ship Launch', *Sussex Advertiser*, 18 January 1859, 6.

³³⁰ Ballard, *The Black Battlefleet*. (1980), 166.

The question of which type of guns would be carried on the Laird rams was not resolved immediately, as Bulloch was following the latest ordnance advances and gunnery tests. Acknowledging 'the whole matter of armored [sic] ships and their armament being still in a transition state', he wanted optimal firepower combined with the need for reliability, safety, and most importantly, ease of handling.³³¹ Lacking sufficient hands, many gun crews manning the Confederate ironclads in America had come from the artillerymen of the army.³³² Quickly pressed into service in the crowded, unfamiliar environment of an armoured warship, the artillerymen would have needed a familiar weapon to work in the closed-up spaces of a turret. Bulloch decided on a set of two 9-inch RMLs, (each gun weighing 11 tons) per turret built by the Confederacy's preferred British ordnance manufacturer, former Royal Artillery officer, Captain Alexander T. Blakely.³³³

The Blakely rifles were the model for heavy guns made in the Confederacy under the direction of ordnance expert and naval officer, Lieutenant John M. Brooke, C.S.N. The Blakely and Brooke guns (copied by other ordnance manufacturers) were recognized by iron banding around the breech, which provided extra strength for the larger powder charges needed to hurl the heavier shells against armoured warships, and by a method of rifling within the bore known as 'hook-slant'.³³⁴ Brooke guns provided the main armament of most ironclads built in the South, but the Blakely rifle was a weapon of choice for Confederate cruisers. The *Alabama* and *Florida* were among those commerce

³³¹ ORN, II, 2 (1921), 310.

³³² Luraghi, *A History of the Confederate Navy*. (Annapolis, 1996), 175, 192.

³³³ ORN, II, 2 (1921), 178, 310, George M. Brooke, Jr. *John M. Brooke, Naval Scientist and Educator*. (Charlottesville, 1980), 263.

³³⁴ Brooke, *John M. Brooke*, (1980), 264.

raiders that carried at least some Blakely guns on their world-ranging voyages.³³⁵ Blakely produced heavy guns that were so technologically advanced, Confederate General Beauregard, the commander of the garrison at Charleston, wrote of two 600-pounder Blakely RMLs as being 'magnificent specimens of heavy ordnance...different in construction from anything I had ever seen'.³³⁶

Bulloch was not an ordnance expert, but he sought to maintain a flow of heavy guns to the Confederate Navy from dependable sources. Those were the RMLs as manufactured by subcontracted firms in Britain under the direction of Captain Blakely. One business contracted to produce heavy RML Blakely guns, was the Liverpool engineering firm Fawcett & Preston, which had manufactured the engines for the *Florida*.³³⁷ This establishment, dating from 1758, was an early leader in marine engineering and cannon manufactory. Fawcett & Preston built the first iron steamship on the Mersey in 1829 and were acknowledged for their capacity to construct guns of various calibers and their ability to construct limbers of wrought-iron, as a substitute for the shortage of suitable wood.³³⁸

Bulloch compromised on another gun type for his ironclads. Two 70-pounder Whitworth RMLs were to have been carried aboard as secondary armament with one to be placed forward and another aft to provide end-on fire.³³⁹ The secondary armament was more complicated and expensive than the venerable 32-pounder smoothbore, and the system of rifling the barrel was debated between naval officers as to which (Blakely or Whitworth) was more effective

³³⁵ Wilson, *Ironclads in Action*. I. (1896), 147, 152.

³³⁶ C. R. Horres, Jr. 'Charleston's Civil War "Monster Guns", the Blakely Rifles', *The South Carolina Historical Magazine*, 97, (April 1996), 123, 130.

³³⁷ 'Ordnance in the London Exhibition', *SA*, 6, 21 June 1862, 391, Gibbons, *Warships and Naval Battles of the Civil War*. (1989), 24.

³³⁸ Bowcock, *CSS Alabama*. (2002), 7, 'The International Exhibition' *Hampshire Chronicle*, 17 May 1862, 3, 'Liverpool News'. *Glasgow Herald*, 30 September 1861, 5.

against armoured ships. Another Confederate naval officer in Britain remarked that the cost of the 70-pounder Whitworth RML was £700 per gun, £5 per shell and exclaimed the sum 'almost takes away one's breath'.³⁴⁰

These cannon were manufactured by Joseph Whitworth from his Sackville Street factory in Manchester.³⁴¹ Whitworth had trained at Maudslay's works in London and had opened his own machine tool factory in Manchester in 1835.³⁴² His machines and tools were created with precision and were of such robust design, that comparatively unskilled workmen could craft quality products from his mechanisms which were 'almost self-acting'.³⁴³ By 1851, Whitworth turned his expertise to ordnance manufacture, and his skill contributed to the body of knowledge that enabled the building of rifled guns with reduced 'windage' in the bore, while also building guns able to withstand the higher pressures from larger powder charges.³⁴⁴ On 25 September 1862, during tests at Shoeburyness, a Whitworth gun pierced a target designed to replicate the armour of the *Warrior*. Subsequent trials proved that the flathead Whitworth shells could puncture armour plate with a neat hole, but guns such as the larger Armstrong RMLs would fire a shell, while not piercing, could smash against a larger area thus buckling the plates upon impact.³⁴⁵

³³⁹ ORN, II, 2 (1921), 290, 310.

³⁴⁰ Ibid, 301, 310.

³⁴¹ Ibid, 360, 668.

³⁴² Marshall J. Bastable, 'From Breechloaders to Monster Guns: Sir William Armstrong and the Invention of Modern Artillery, 1854-1880'. *Technology and Culture*, 33, (Apr, 1992), 234.

³⁴³ W. T. O'Dea, 'A Century of British Engineering', *Journal of the Royal Society of Arts*, 99, (4 May 1951), 466.

³⁴⁴ Saul, 'The Market and Development of the Mechanical Engineering Industries in Britain 1860-1914'. *The Economic History Review*, 20, (April 1967), 121, Karl Lautenschlager, 'Technology and the Evolution of Naval Warfare', *International Security*, 8 (fall, 1983), 10.

³⁴⁵ Bastable, 'From Breechloaders to Monster Guns: Sir William Armstrong and the Invention of Modern Artillery, 1854-1880'. *Technology and Culture*, 33, (Apr, 1992), 234, 238.

Although costly, the Whitworth guns were prized for their strength, but they were also considered complicated cannon to work. The field artillery pieces were more problematic as they were not gunner proof and suffered damage in the stress of battle. In 1861, one Richmond newspaper relayed a report claiming with some justification, that the Whitworth field pieces were 'too excellently fashioned' for the average artilleryman.³⁴⁶ The English traveler-war tourist, Captain Edward FitzGerald Ross, had observed Confederate forces in Virginia and North Carolina in the summer of 1863, and remarked on the Whitworth artillery in service. Ross observed a Confederate artillery park and commented 'There are a few Whitworth guns, which are very accurate and of great range, but require much care. The breech has been blown off or disabled through carelessness in loading. This is especially the case with breech-loading guns. I understand that the Whitworth guns which are now sent out are muzzle-loading guns'.³⁴⁷

Despite the skills required to load both the breech and muzzleloaders from this manufacturer, in the hands of well-trained and patient artillerymen, the Whitworth cannon were exceptional. In North Carolina, a young artillery officer gained 'much reputation for accuracy and rapidity' with his select gun and crew.³⁴⁸ At the port of Wilmington, a Whitworth gun set a record 'for extraordinarily accurate practice' when a shell hit the blockader *U.S.S. Connecticut* at the then extraordinary range of five miles.³⁴⁹

Bulloch stated that the type of gun he wanted (as the main armament) for his Birkenhead ironclads was the one 'which will throw the largest shot with the

³⁴⁶ 'The Whitworth Gun', *Daily Dispatch*, 22 June 1861, 4

³⁴⁷ FitzGerald Ross, *Cities and Camps of the Confederate States*. (Urbana, 1997), 132.

³⁴⁸ 'The Siege of Washington N.C.', *Daily Dispatch*, 16 April 1863, 1.

³⁴⁹ Ross, *Cities and Camps of the Confederate States*. (1997), 151

greatest initial velocity'. The secondary armament was not chosen for shell size, but for its capability within the limited spaces available fore and aft. The Whitworth rifles were to have had a limited arch from either the forward or aft positions. This arch would have been restrictive as the guns would have been placed behind their own iron-plated shields or bulwarks, in the forecastle and poop as these crew spaces were not armoured.³⁵⁰ The forecastle and poop structures were added after the hull was half complete, and were not built directly into the main hull frames but fitted to provide accommodation room for the men forward and the officers aft. They were of 'light structure, sufficiently strong to resist any force of the sea' but built to be removed in a dockyard or shot away in battle to give the ships all around fire (from the turret guns) if needed.³⁵¹

Another addition, though not considered unusual on wooden and iron broadside warships, were racks to stow hammocks near the gun positions. On the Laird rams, these racks would permit the stowage of hammocks three deep around the upper edge of the turret roofs. The protection provided by the rolled hammocks were for marine riflemen to lie down on each turret roof and fire at the crew of any nearby enemy vessel, or down to clear their own decks of a hostile boarding force.³⁵² This was not an ideal position as the concussion from the main armament would have been disorienting to the riflemen, and the presence of the marines on the roof of the turret would have also interfered with the gunlaying if done from the roof top hatches.

³⁵⁰ ORN, II, 2 (1921), 290.

³⁵¹ Ibid. 453.

The Search for the Ideal Ironclad Warship

The building of the French *La Gloire* and the immediate British response in the form of the *Warrior*, set off an ironclad race between the two great rivals that redefined the measures of what constituted a first tier naval power. The venerated three decked ship-of-the-line, already forced to adapt to the screw propeller, had been outclassed by the large, rifled muzzleloading gun and early breechloader equipped steam frigates disliked by naval purists for their single deck 'streets of guns'.³⁵³ Britain embarked on a massive building/conversion program to construct ironclads in order to not only keep pace with the French but to take the lead in the number of armoured ships afloat. Between 1859 and 1861, ten new ironclads were laid down in British yards and another seven two-deckers still on the stocks, were converted into single deck armourclads.³⁵⁴

In the Commons the First Secretary to the Admiralty, Lord Clarence Paget, stated in July of 1861, 'It is no use denying that the whole world is commencing the construction of these (ironclads) ships. Every maritime nation has completely given up the thought of building wooden line-of-battle ships' and added he did not want 'to excite alarm throughout the country, but rather to engender a proper confidence, that we are determined to maintain our maritime position in its integrity'.³⁵⁵ The newly-built ironclad frigates and the cut down sisters (each originally intended for 91-guns) of the *H.M.S. Bulwark* class, would give Britain

³⁵² Ibid, 454.

³⁵³ J. H. Ward, Commander, U.S. N. *Steam for the Million: A Popular Treatise on Steam and its Application to the Useful Arts Especially to Navigation*. (New York, 1864), 96. See: Howard J. Fuller, 'The *Warrior's* Influence Abroad: The American Civil War', *IJNH*, 10 (October 2013), 6. The *Warrior* also influenced the building of the *Monitor* and 'Union naval policy towards counter-deterrence-or coastal defence first, and coastal assault-against the Confederacy-second.'

³⁵⁴ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 233, 236

an edge over the French, as the wooden walls were eclipsed by the unwieldy iron-plated sides of major warships on both sides of the Channel.³⁵⁶

The *Bulwarks* were still in the frame when the order to remake them into ironclads was given and when launched, their converted hulls had a less refined appearance than the rakish *Warrior*. These cut-downs had a rounded stern, a bow with only a slight angle to the waterline and no ram. The squat appearance of these converted ironclads led to their being referred to as 'double enders' by the seamen who shipped aboard them.³⁵⁷

One British periodical of the day reflected on the sudden shift to ironclad warships in a poem titled 'Iron-clad Jack' published in April 1862. This fabricated sea song blustered:

*'In armour case fo'ard, amidships, abaft
In our sides neither crevice nor crack,
All safely we steam in our blacksmith-built craft:
Naught to fear now has Ironclad Jack'
'Nor of splinter or shot feel a dread;
Pound away as he will, boys, we'll never say die!
For we're proof 'gainst steel, iron and lead.
We've no woodwork to riddle, a low or aloft,
No canvas to shift or to tack;
Not an inch in the ship that is shaky or soft,
Shot and Shell proof is Iron-clad Jack!'*³⁵⁸

The poem mentioned Jack safely steaming along in his ironclad, but the armoured vessels of this era were cumbersome ships. An 1863 edition of *Scientific American* denounced the 'lumbering old iron-clads of England and

³⁵⁵ *Hansard*, 26 July 1861, 164, cc 1633.

³⁵⁶ Lyon, Winfield, *The Sail & Steam Navy List*. (2004), 193.

³⁵⁷ Ballard, *The Black Battlefleet*. (1980), 116.

³⁵⁸ 'Iron-clad Jack: A Sea-Song of the Future', *Punch*, 12 April 1862, 146.

the...unwieldy carcasses of France' as 'good examples of old fogysm'.³⁵⁹ The editorial went on to criticize the deep draught British ironclads, with their 'uncouth bows and sterns' as being unable to approach the shoreline of North America unless with great care, as their weight of armour caused them to 'heave prodigiously upon the troubled sea'.³⁶⁰ The argument was partially refuted by another American periodical printed earlier that year. Although European ironclads were 'ponderous...with their lofty sides and many vulnerable points', Union ironclads were barely seaworthy and those few which could undertake a sea voyage without undue fear, were not impervious to enemy guns.³⁶¹

European ironclads were too deeply laden to reach all ports in North America, but several major ports in the Union could be entered and chief among them was New York. One editorial in January 1863 noted the limitations of coastal fortifications and remarked 'when the attack is made by iron-clad steamers, the peril to a city is fearfully increased. We think we are fully justified in the opinion that the *Passaic* or the (New) *Ironsides*, the *Warrior* or the *La Gloire* could enter the harbor [sic] of New York unharmed in spite of all the fortifications which defend it'.³⁶²

Stopping a force of enemy ironclads within gun range of a great metropolis, was a troubling prospect for any nation dependent on oceanic trade. The Confederacy and the Union followed the customary path of other established, or

³⁵⁹ 'The Foreign Iron-Clads', *SA*, 9, 12 December 1863, 377.

³⁶⁰ *Ibid*, 377.

³⁶¹ A. H. Guernsey, 'The Revolving Iron Tower and Its Inventor', *Harper's New Monthly Magazine*, 26, (January 1863), 247.

³⁶² *Ibid*, 245. It is noteworthy that the first ironclad mentioned in the editorial was the only monitor, and the other three ironclads were the traditional broadside equipped ocean-going armoured vessels. Despite the advances achieved by the Union Navy during the Civil War, their ironclads were not ideal examples of seaworthiness. Getting to the scene of combat was half the battle, and the monitors built in America were regarded as coastal warships.

aspiring naval powers, and sought British expertise in the ways of armoured naval warfare. British-built fast cargo ships transported weapons and material which kept the Confederate forces supplied with enough arms and equipment to stave off a war-winning Union victory on the battlefields of the South for most of the conflict, but only armoured men-of-war could lift the blockade of the seceding states.

The *New York Times* noted that the Laird rams had the ability to elevate their turret guns to bombard distant towns and forts 'while ships of the Warrior class would be perfectly useless for such service'.³⁶³ Bringing guns to bear was a concern, not only in terms of elevation but also for aligning the armament on to a target at the optimum time. A crewmember of the Federal monitor *Nahant* wrote that the turret did not stop when required, and on occasion, had to be reversed several feet or put through a complete rotation in order to bring the target into alignment with the guns. The Laird rams rotated their turrets manually; the mechanical defects on the steam rotated turrets of the Federal monitors would have impaired their efficiency in a fight with other turret armed ironclads.³⁶⁴ The Laird rams presented a threat in the form of ocean-going armoured vessels able to both, withstand fire from most Union warships, and deliver well-aimed shot and shell at range with a marginally higher rate of fire.³⁶⁵

³⁶³ 'Miscellaneous, Return of a Blockade-Runner, Departure of the Scorpion.' *NYT*, 8 April 1865, 2.

³⁶⁴ Alvah Folsom Hunter, *A Year on a Monitor and the Destruction of Fort Sumter*. edited by Craig L. Symonds, (Columbia, 1987), 89

³⁶⁵ *Ibid*, 35. 66, Here Hunter describes how the guns on the monitor *U.S.S. Nahant* had to be swabbed out and reloaded with long handled sponges and rammers through the open gunports after the turret was turned away from the enemy. Later when 'sectional' rammers and sponges were used, gunports were left closed and the turret did not need to be rotated, but the rate of fire did not improve as the 'sectionals' were complicated to use., Gibbons, *Warships and Naval Battles of the Civil War*. (1989), 30.

The Bulloch contract with Lairds to build the sister armourclads represented a technological forward leap in naval warfare as the industrial capacity and manufacturing skills of Britain were utilized to produce a pair of warships to offer an effective challenge to the evolving might of the Union Navy. These sister ships were an amalgam of design features incorporated into armoured hulls built at the very edge of marine engineering practices at that time. They were created not only as a response to the Federal monitors, the Laird rams were built as evolutionary models of the next phase in the development of the armoured man-of-war. The ironclads under construction on the Mersey were understood by all observers to be something unique and powerful, so powerful as to contest the Union command of the sea around the beleaguered Confederacy. These two ships with their armour plate, heavy ordnance, and moderate endurance on a light draught, were power projection weapons the South desperately hoped to have at sea under their flag. With each frame and plate fitted at Lairds shipyard, the Federals viewed progress on the ironclad rams with increasing alarm. These two new turret ships, under construction in Birkenhead, were viewed as direct threats to the Federal Navy and the coasts of the Union itself.

CHAPTER TWO

Reluctant Actions: Seizure and Acquisition of the Laird Ironclads 1863-1864

The two armoured warships building at the Birkenhead Iron Works during the early 1860s, had become something of a legend for the belligerents during the Civil War. For the Confederates, they were the best chance for raising the blockade of their coasts. Union officials saw them as a threat they could not assuredly counter despite their latest ordnance and larger monitor-type ironclads. The U.S. envoy in London, Charles Adams, complained to the British Foreign Secretary that the lead ship was 'a steam-vessel of war, of the most formidable kind now known'.³⁶⁶

Historians have approached the Laird rams during the vital stage of their construction (1863) with too much of a retrospective view. The crisis in Anglo-American relations is seen as 'largely resolved before it began. As a *casus belli*, the Laird rams crisis of later 1863 has been much overrated'.³⁶⁷ However, a more detailed review of events is needed in order to determine aspects of what was a slow brewing diplomatic dilemma that later came to a near crisis. This chapter will describe how this predicament was not as clear as is commonly supposed. A secondary objective of this chapter will be an examination of the potential impact that the Laird ironclads had on naval plans and operations for both the Confederacy and the Union.

³⁶⁶ TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', dated 11 July 1863

³⁶⁷ Merli, *The Alabama*, (2004), 23.

The Civil War was not as distinct to many as it is in retrospect. War news certainly had an impact on British investors and politicians, as it did on the American opponents, and the results of the dual Confederate disasters at Gettysburg and Vicksburg in early July 1863, 'did not always have symmetric effects on North and South' nor did those two events have an irreversible effect on British opinion as many historians previously stated.³⁶⁸ By the summer of 1863, the war was far from over and the Laird rams contributed to the apprehension felt in the North, as the conflict continued in the aftermath of Union victories, some smaller setbacks, and the ill effects of the New York draft riots.³⁶⁹

Attitudes in Britain were 'more complex than once supposed', and although many favoured the end of slavery, many also identified with the Confederacy's fight for independence.³⁷⁰ Palmerston had decided in October 1862 that the British government should 'continue merely to be lookers-on till the war shall have taken a more decided turn'.³⁷¹ In a speech given in the Commons on 23 July 1863, he identified the key issue surrounding the Laird rams as one of ownership. After debating the nature of ships converted for use as commerce raiders, the Prime Minister turned to warships under construction for foreign customers saying 'There is a further difficulty. I will suppose a ship built of such a character that we might safely say it was built for warlike purposes. Then you must prove whom she is intended for'.³⁷² The situation had not changed enough for London to intervene with the Laird rams then under different stages of

³⁶⁸ William O. Brown Jr. and Richard C.K. Burdekin 'Turning Points in the U.S. Civil War: A British Perspective', *Journal of Economic History* 60 (Mar. 2000), 217, 218, 230.

³⁶⁹ 'America', *Morning Post*, 27 July 1863, 5.

³⁷⁰ Joseph M. Herson, Jr. 'British Sympathies in the American Civil War: A Reconsideration' *Journal of Southern History* 33 (Aug. 1967), 357-360.

³⁷¹ *Ibid*, 359.

³⁷² *Hansard*, 23 July 1863, 172, cc 1271.

construction in Birkenhead during the summer of 1863. The crisis would have to run its course.

Adams did not overstate the threat these warships posed to the United States when he wrote 'all the appliances of British skill to the arts of destruction appear to have been resorted to' in their creation.³⁷³ They represented the cutting edge of design and construction of the ironclad warship, and it was believed they could have a major, even a critical impact on the outcome of the war. The construction of these two ships would redefine the rules of diplomatic protocol, clandestine intelligence collection, and ultimately influence a reinterpretation of international law and the definitions of neutrality.

Work on the two Laird rams progressed rapidly in the early stages, and Bulloch was able to report to Secretary Mallory by 11 August 1862, 'The armour-clad ships are getting on finely...' and on 24 September, Bulloch again wrote to Mallory: 'I have nothing to add except that the ships are progressing as rapidly as could be expected, and that I am more pleased with them every day'.³⁷⁴ Bulloch, like many ship owners, extended the construction timeline by requesting additions and modifications as the ships were building. In a report to Richmond he stated, 'the ships being of entirely new design, I see reasons to modify the plans from time to time but only in immaterial points not involving important alterations'.³⁷⁵

By the autumn, the weather effected the Birkenhead Works, and new measures were taken to regain lost time caused by rain and cold. In a November dispatch to Mallory, Bulloch reported on the slow progress on the two

³⁷³ TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', dated 11 July 1863

³⁷⁴ Bulloch, *The Secret Service of the Confederate States in Europe*, I (2012), 389,391.

³⁷⁵ *Ibid*, 391.

armourclads, 'An unusual amount of bad weather has somewhat interfered with a certain portion of the work upon the ships of this description; but the builders are as anxious as I am to have them ready in the stipulated time, and have covered them with comfortable sheds, and have even introduced gas, so as to insure additional hours for work during the short foggy days of this climate'.³⁷⁶

Beginning in the spring of 1863, the issue of how or whether to stop the Laird rams leaving British waters was discussed in Parliament on several occasions. The issue would grow in importance and in intensity as the ships progressed in their stages of construction. In response to the difficult questions of how to stop an ironclad ostensibly building by a neutral party for a belligerent power, the broader issue of the Foreign Enlistment Act of 1819 was also debated. Rising to defend his name and the involvement of the Birkenhead Iron Works in the building of the *Alabama*, John Laird systematically countered the claims of his critics in the Commons, that he had violated the law and outfitted a warship for the Confederate States and was in the process on building ironclads for them. The member from Birkenhead referred to the verbal wrangling over what constituted a violation of neutrality, as 'childish fuss'. Calling the opposition to task for providing arms to the Northern States, he questioned why Manchester arms manufacturers shipped thousands of rifled muskets, swords and percussion caps from Liverpool to ports in the United States with cargo deceptively labeled 'hardware'.³⁷⁷ Laird then dropped a bombshell when he read aloud to the Commons, the 1861 letters from Union representatives asking his sons to build ironclads for the North, 'On the 14th of August, I received another letter from the same gentleman, from which the following is an extract: — I have this morning a

³⁷⁶ *ORN*, Series II, 2 (1921), 292.

³⁷⁷ *Hansard*, 27 March 1863, 170, cc 33, 38, 70-72.

note from the Assistant Secretary of the navy, in which he says, 'I hope your friends will tender for the two iron plated steamers'.³⁷⁸ Laird continued by claiming 'to talk of freedom in a land like the Northern States of America is an absurdity'. Not content to rest there, Laird went on to declare that his friend (he was likely referring to Bulloch) was followed by detectives, and that spies were employed in his sons' shipyard in Birkenhead and in other factories in the United Kingdom. In his closing remarks, Laird addressed his response against his critic, (John Bright) by stating 'I would rather be handed down to posterity as the builder of a dozen Alabamas than as the man who applies himself deliberately to set class against class, and cry up the institutions of another country which, when they come to be tested, are of no value whatever, and which reduce the very name of liberty to an utter absurdity'.³⁷⁹

Laird's words stirred not only in Parliament but also resonated across the Atlantic. In the Confederacy, excerpts of the fiery speech were relayed via telegraph and courier as far away as northern Louisiana. The 4 May 1863, edition of the *Shreveport Weekly News* reported that the shipbuilder-turned M.P. had forcefully argued that the weapons shipped to the Federals were as dangerous as the unarmed ironclads building in Birkenhead.³⁸⁰

The U.S. Secretary of the Navy was upset by Laird's allegation, and denied that the Federal Navy had contacted the shipbuilder to request the building of ironclads for the North. Wells wrote in his diary on 2 May 1863: 'It is wholly untrue, a sheer fabrication. The truth is, our own shipbuilders, in consequence of the suspension of work in private yards early in the war, were clamorous for contracts, and the competition was such that we would have had terrible

³⁷⁸ Ibid, cc. 70.

³⁷⁹ Ibid, cc. 70-72.

indignation upon us had we gone abroad for vessels, which I never thought of doing'.³⁸¹ The Navy Secretary was intensely bitter over Laird's claim, and after penning a denial to U.S. Senator Charles Sumner, Welles wrote in his diary on 19 May, 'He (Laird) is in my opinion, a mercenary hypocrite without principle or honesty, as his words and work both show'.³⁸² The denial was released to the Northern press and on 10 August, the *New York Daily Tribune* opined that Laird's allegation was false and that he had 'been the dupe of some adventurer'.³⁸³

On 13 August, Welles became despondent when he received a telegram reporting that a letter from Fox may have entangled the Navy Department with Lairds. Washington intriguers crept out of the background, and the Navy Department's Chief Clerk W. H. Faxon, reported to Welles his opinion that the Assistant Secretary 'has been forward, and too ready with his letters substituted for those for the Secretary or chiefs of bureaus'.³⁸⁴ Faxon suggested that Fox had taken it upon himself to contact Mr. Howard, the Brooklyn, New York based interlocutor between the U.S. Navy Department and Lairds in 1861. Faxon also thought that Fox may have corresponded with one of the Lairds before Welles squashed the proposal early in the war.³⁸⁵ The Navy Secretary, feeling battered by the Northern press, gave credence to Faxon's allegations by writing in his diary on 13 August 1863: 'There may be something in these surmises'. Welles wrote that he did not feel that the Assistant Secretary was purposely going

³⁸⁰ 'Telegraphic', *Shreveport Weekly News*, 4 May 1863, 1.

³⁸¹ *The Diary of Gideon Wells*, I, 1861-30 March 1864, (1911), 291.

³⁸² *Ibid*, 307.

³⁸³ 'Secretary Welles and Mr. Laird', *New York Daily Tribune*, 10 August 1863, 4.

³⁸⁴ *The Diary of Gideon Wells*, I, (1911), 401, 'The Federal Government and Mr. Laird', *Dundee, Perth and Cupar Advertiser*, 25 August 1863, 8.

³⁸⁵ *The Diary of Gideon Wells*, I, (1911), 401

against his instructions, but that Fox was 'perhaps anxious to do something to give himself notoriety'.³⁸⁶

Welles had reason to be cautious around his assistant, as Fox was the son-in-law of the influential Postmaster General Montgomery Blair, who sometimes had the ear of Lincoln.³⁸⁷ Welles did not have this degree of access, and resented the standing of both Secretary of State William Seward, and the Secretary of War Edwin Stanton. Regarding Stanton, Welles noted: 'not unfrequently [sic] he has a private conference with the President in the corner of a room, or with Seward in the library'. Blair would later confide to Welles, 'Strange, strange, that the President who has sterling ability should give himself over so completely to Stanton and Steward'.³⁸⁸ Welles was of a different temperament than Seward and Stanton. According to biographer John Nevin, he was more introverted, more of a background worker: 'Welles was a wire-puller for thirty-five years, a politician's politician...'.³⁸⁹ In light of the Navy Secretary's isolation from Lincoln's inner circle, he both admired and distrusted those with a bold, direct air, including his Assistant Secretary. Welles came closer to the truth regarding the drive and political skill of his deputy when he wrote in his diary (also on 13 August), 'Fox is shrewd'.³⁹⁰

Fox was also a connected 'wire-puller' in his own right, but not a directly political one. A former officer in the U.S. Navy, his pre-war career mirrored that of Bulloch as Fox rose to the rank of Lieutenant while in the Navy, and

³⁸⁶ Ibid, 401. Welles was distrustful, perhaps even envious of Fox as he continued in his diary entry of 13 August, writing: 'There are little weaknesses which others as well as Faxon detected. Admirals Smith, Lenthall and Dahlgren were vexed by Fox's 'officious manner and order'.

³⁸⁷ Doris Kearns Goodwin, *Team of Rivals, The Political Genius of Abraham Lincoln*. (New York, 2005), xvi, 335, 629.

³⁸⁸ Ibid, 525. 526.

³⁸⁹ John Niven, *Gideon Welles: Lincoln's Secretary of the Navy*. (Baton Rouge, 1994), viii.

commanded a mail steamer in civilian life.³⁹¹ Fox would use his naval connections to cut through red tape and bureaucratic indifference. It was this willingness to act boldly that put him occasionally at cross purposes with the careful and cautious Welles. This difference in experiences, both in sea service and politics, contributed to the Navy Department's embarrassment in light of Laird's speech in Parliament which connected the Birkenhead Iron Works with a proposal for ironclad warships, however tenuous, from Washington in the summer of 1861.

Perhaps from caution, perhaps from embarrassment, the Assistant Secretary made no mention of the Laird revelation in his correspondence. One of only a few references to Laird and his ships in Fox's letters was ever made. On 13 August 1862, Rear Admiral S. F. DuPont, on blockade duty off South Carolina, wrote to Fox: 'To ease my mind and yours about the Charleston division-the *Powhatan* should be the base there; she can run down those within, if they venture out, as well as crush the "Laird" boat and other ironclads from England'.³⁹²

The Union Navy was confused about the size and dimensions of the Laird ironclads. These ships were not the low-hulled armoured turret ships originally envisioned in 1861. Perhaps the Union Naval authorities thought the Birkenhead-built ironclads were based on the earlier designs and more like the monitors with their shallow draught and low freeboard. This could explain the belief that a paddle frigate like the *U.S.S. Powhatan* could run down the Laird armourclads in a manner similar to what the *U.S.S. Mississippi* (another paddle frigate) had attempted against the damaged Confederate steam ram *Manassas*

³⁹⁰ *The Diary of Gideon Wells*, I, (1911), 401.

³⁹¹ Hoogenboom, *Gustavus Vasa Fox of the Union Navy*. (2008), 46-49.

during the Battle of New Orleans on the night of 24 April 1862.³⁹³ The *Powhatan*, despite her vulnerable paddle wheels, was one of the largest ships in the Union fleet. She had been recently overhauled and fitted with ten 8-inch and one 11-inch Dahlgren smoothbores.³⁹⁴ A well-armed, handy ship with dependable engines, she could maintain 10 knots in most weather but she still was no match for the improved Laird turret ships.³⁹⁵

One reason for this early confidence on the part of DuPont and Fox concerning the Laird rams likely originated from inaccurate information reported through the British press. The 10 February 1863, edition of the *London Evening Standard* claimed the Lairds 'cupola corvettes' would not be armoured.³⁹⁶ Rather, these two ships were reported as having 'a mere skin of iron' with no heavy armour or thick teak timbers for protection. The article opined if ships such as the Laird corvettes, 'costing no more than ordinary iron transports' were built instead of the more expensive *Warrior* and *Agincourt*, they could 'choose their own fighting distance, and by that means in the end overcome an iron-cased adversary'.³⁹⁷ This same article favoured a warship design which would emerge over forty years later as the powerful, but dangerously flawed battlecruiser. The reporter likely toured Lairds yard before the armour plates were put on and thus drew the wrong conclusions about the 'corvettes'.

On 3 February 1863, Bulloch reported to Richmond via a cipher dispatch, that the work on the ironclads at Birkenhead had been delayed due to

³⁹² *Confidential Correspondence of Gustavus Vasa Fox*, I, (New York, 1918), 145-146.

³⁹³ Dufour, *The Night the War Was Lost*. (1994), 265, 274, 275, 279, 280.

³⁹⁴ Gibbons, *Warships and Naval Battles of the Civil War*. (1989), 36, 138-140, 166.

³⁹⁵ *Ibid*, 139.

³⁹⁶ 'Iron-Cased Shipbuilding', *London Evening Standard*, 10 February 1863, 3.

³⁹⁷ *Ibid*, 3.

'insurmountable difficulties'.³⁹⁸ The weather contributed to the delay, but the work to bend the plates was slowed by the machinery limitations of the yard. Lairds had only 'two or three very light hammers for small forgings' and the fitting of the plates was undoubtedly slowed by these restrictions. Furthermore, the slow progress on the much larger *Agincourt*, was described in February 1863 as 'not in a very forward state'.³⁹⁹ The armour plates required an almost painstaking degree of exactness to fit on to the hulls of the rams. Bulloch wrote 'No armoured ships for the Admiralty have ever been completed in time and the most important part of the work, the riveting, is far more tedious than anticipated'.⁴⁰⁰ Lairds was an experienced iron ship builder, but it was new to the work on armoured men-of-war.

Lairds were also protective of their reputation. Bulloch was impatient with the delays encountered building the *Alabama*, but the shipbuilders would not be rushed.⁴⁰¹ The launching of the wooden-hulled cruiser was delayed in part by the exacting builders rejecting defective stern posts until the right one was found and properly fitted.⁴⁰² This same attention to detail and exactness of construction was another reason for delay on the iron corvettes. The armour plates were dove-tailed to interlock when attached to the hulls of the turret ships, and the work was done 'so accurately, that the joints are scarcely perceptible'.⁴⁰³ Another observer noted the plates were 'beautifully planed and fitted, that it is almost impossible to tell whether the vessels are plated or not'.⁴⁰⁴

³⁹⁸ Bulloch, *The Secret Service of the Confederate States in Europe*, I. (2012), 395.

³⁹⁹ 'Iron-Cased Shipbuilding', *London Evening Standard*, 10 February 1863, 3.

⁴⁰⁰ Bulloch, *The Secret Service of the Confederate States in Europe*, I. (2012), 395.

⁴⁰¹ Kinnaman, *The Most Perfect Cruiser*, (2009), 102.

⁴⁰² *Ibid*, 102.

⁴⁰³ 'The Steam Rams at Birkenhead', *Chester Chronicle*, 26 September 1863, 2.

⁴⁰⁴ 'Launch of Iron Steam Rams at Birkenhead', *Birmingham Daily Post*, 31 August 1863, 4.

Bulloch was a careful man and he knew his moves were being watched. He had written to Mallory on 7 November 1862 that his plan for evading British neutrality laws had to be revised after the departure of the raiders *Alabama* and *Florida*. He wrote of the need for careful preparations, as the departure of the first armoured ship had 'to be conducted with such caution and secrecy that I fear to mention the plan even in this way' (via a ciphered dispatch) to Richmond.⁴⁰⁵ Bulloch had to devise a unique plan of subterfuge for each ship and he kept those plans to himself until the pressure by Union agents required a different tactic that went beyond the direct dealings with Lairds.⁴⁰⁶ Rumours about the two ironclads had swirled around the docklands and out to the British press. One story held that the armourclads were destined for the Imperial Chinese Navy, but the claim was not believed due to the presence of Bulloch at Lairds 'who is daily in attendance superintending their progress'.⁴⁰⁷

The Eastern connection was a confusion of facts related to ships building for the Imperial Chinese Navy at the time. A flotilla of, approximately, eight smaller men-of-war were under construction in Britain for the emperor, then battling against the Taiping Rebellion.⁴⁰⁸ This squadron, usually referred to as the Lay-Osborn Flotilla, was named after the British Inspector-General of Customs in China, Horatio Nelson Lay, and the man selected to command the ships on their passage to the East, Captain Sherard Osborn.⁴⁰⁹ The unarmoured Chinese flotilla and the Laird rams were intertwined both in the British press and the

⁴⁰⁵ Bulloch, *The Secret Service of the Confederate States in Europe*, I. (2012), 391.

⁴⁰⁶ *Ibid*, 392.

⁴⁰⁷ 'Vessels Building for the Confederates', *Liverpool Mercury*, 13 February 1863, 6. This edition inquired as to Bulloch's role: 'Does this gentleman hold his commission from his Celestial Majesty or from Jefferson Davis'?

⁴⁰⁸ Merli, *The Alabama* (2004), 160, 162.

⁴⁰⁹ *Ibid*, 162, 165.

Federal spy network as two of the ships intended for China were built at Lairds.⁴¹⁰

Rumours over the Laird rams were also fueled, in part, by newspaper reports from the Confederacy which filtered back to Britain. Bulloch warned Mallory that 'indiscreet persons who should have known better have written to private persons at [sic] the South on such matters, and I am not surprised at the result'.⁴¹¹ The 22 November 1862, edition of the Richmond *Daily Dispatch* relayed from a New York newspaper, a report of 'three immense iron steam rams, the most powerful ever constructed' with one building on the Clyde and the latter two on the Mersey built by 'John Laird, M. P. who built the pirate Alabama, and is pushing them rapidly to completion'.⁴¹² Discretion was not exercised by the Richmond newspaper and on 24 November of that same year, the *Daily Dispatch* relayed the disingenuous claim that after the *Alabama* sailed from Birkenhead, 'no further contracts have been undertaken'.⁴¹³ This statement backfired and instead of confusing the Federals, added to further speculation about the mysterious iron ships building under the covered sheds (known as the 'annexe') at the Lairds yard.⁴¹⁴ Information continued to leak that 'two of the most formidable specimens of naval architecture that Liverpool ever has produced' were taking shape at Lairds.⁴¹⁵ Arguably, the knowledge that men were working on the two ships night and day contributed to information about the two armourclads having 'oozed out that they are intended for the

⁴¹⁰ Ibid, 167.

⁴¹¹ Bulloch, *The Secret Service of the Confederate States in Europe*, I. (2012), 394.

⁴¹² 'The Confederates iron-clad navy-Yankee information on the subject-What England is doing about it.' *Daily Dispatch*, 22 November 1862, 1.

⁴¹³ 'Later from the North', *Daily Dispatch*, 24 November 1862, 1.

⁴¹⁴ 'Lectures on the American Crisis', *Liverpool Mercury*, 7 February 1863, 6.

⁴¹⁵ 'Gunboat Building on the Mersey', *Westmorland Gazette*, 22 November 1862, 8.

Confederacy'.⁴¹⁶ The builders were pushing their men to complete the turret ships for a foreign power in urgent need of these ironclads and the Confederate States was the only client hard-pressed enough to require such an extended work schedule.

From his flagship, Rear Admiral S. P. Lee, U.S.N, wrote to Fox to convey his views on the increasing danger presented by the ironclads building in Britain. In his letter dated 29 March 1863, Lee wrote: 'the use the rebels have made of the extensive English workshops to provide a formidable seagoing ironclad ram navy, is the worst feature of the war'.⁴¹⁷ This fear was justified as the Laird armourclads had developed a reputation for quality workmanship even before they were completed. Almost a year later, *Scientific American* would claim 'no better specimens of war ships [sic] have ever been constructed than the two rams built by Messrs. Laird at Birkenhead'.⁴¹⁸

British Neutrality and the first stage of the Civil War

Britain declared her neutral stance when the Civil War had been underway only a month. On 13 May 1861, Queen Victoria signed a declaration whereby the British Empire would 'maintain a strict and impartial neutrality in the contest' between the 'Government of the United States of America and certain States styling themselves as the Confederate States of America'.⁴¹⁹ This declaration announced that a law enacted in 1819, forbade direct involvement in a conflict by British citizens, and the Queen prohibited her subjects from participating in the

⁴¹⁶ Ibid, 8.

⁴¹⁷ *Confidential Correspondence of Gustavus Vasa Fox*, II, (New York, 1918), 252.

⁴¹⁸ 'Defects of the British Ironclads', *SA*, Volume 1010, Issue 7, 13 February 1864, 101.

⁴¹⁹ 'The Neutrality Proclamation', *The Spectator*, 18 May 1861, 521.

American war 'as they will answer to the contrary at their peril'. The proclamation continued at some length and also warned against entering into military service for a foreign power and made specific reference to sea service prohibiting the enlistment of:

*'Any natural-born subject...shall, without such leave or license... serve in and on board any ship or vessel of war, or in and on board any ship or vessel used or fitted out, or equipped, or intended to be used for any war-like purpose, in the service of or for or under or in aid of any foreign power...'*⁴²⁰

The law as echoed by the proclamation forbade Britons from building warships for a foreign belligerent while the United Kingdom remained neutral as they were not to:

*'Equip, furnish, fit out, or arm, or attempt or endeavour to equip, furnish, fit out, or arm, or procure to be equipped, furnished, fitted out or armed, or shall knowingly aid, assist, or be concerned in the equipping, furnishing, fitting out, or arming of any ship or vessel, with intent...to cruise or commit hostilities.'*⁴²¹

Further, those who violated the law and were indicted, could face fines or imprisonment or both and warned that ships fitted out with:

*'The tackle, apparel, and furniture, together with all the materials, arms, ammunition, and stores, which may belong to or be on board of any such ship or vessel, shall be forfeited; and it shall be lawful for any officer of his Majesty's customs or excise, or any officer of his Majesty's navy...to make seizures under the laws of customs and excise, or under the laws of trade and navigation'*⁴²²

⁴²⁰ Ibid, 521.

⁴²¹ Ibid, 521.

⁴²² 'Royal Proclamation', *Reynold's Newspaper*, 19 May 1861, 10.

The Queen's declaration commanded her subjects to 'abstain from violating or contravening' the law regarding neutrality, and gave the strongest warning that those who deliberately violated the law 'will in no wise obtain any protection from us'.⁴²³ The mention of those who sought to *contravene* the law was a point of focus for Confederate agents, Union diplomats and their solicitors. If a direct violation could not be proven, the subsequent legal move was to show a violator as purposely taking steps to avoid the conditions of the law by staying outside its ill-defined legal edges. The strict adherence to the not-so-well-defined text of the law, allowed shipbuilders and arms manufacturers to carry on their trade with both the Confederacy and Union to such an extent that rendered the law, known as the Foreign Enlistment Act of 1819, almost unenforceable.

The differentiations between what was legal and what was not expressly excluded by the neutrality laws and the proclamation would prove to be a source of continual friction between Britain and the United States throughout the war. The building of the Laird rams strained the relations between London and Washington to near the breaking-point. Tensions had risen several times during the conflict but the events of 8 November 1861, almost resulted in war when the Federal steam sloop *U.S.S. San Jacinto* stopped the British mail steamer *Trent* in the Bahamas and took off two Confederate commissioners.⁴²⁴

During the winter of 1861, as the Royal Navy was preparing its ships for a war with the United States, Britain's ironclads were seen as an eventual factor should a conflict ensue. One British newspaper remarked 'We have not mentioned the Warrior nor the floating batteries, as we do not suppose there would be any intention during the winter months of sending across the Atlantic any iron-plated

⁴²³ Ibid, 10.

⁴²⁴ ORN, Series I, 1, (Washington, 1894), 138-143.

ships'. The British press had apparently forgotten that an ironclad was on station at Bermuda and in service.⁴²⁵ The ironclad floating battery *Terror*, one of the first generation steam armourclads intended for service during the Crimean War, was in commission at Bermuda under the command of Captain F. Hutton, R.N, the first Captain-in-Charge of the naval base at the island fortress.⁴²⁶ Armed with sixteen 68-pounders, this ship provided the heavy broadsides needed to defend the island base or attack an American fort at close range.⁴²⁷

The *Terror* was the third of the *Erebus* class of floating batteries, laid down a year after Britain's first ironclads of the *Aetna* class were begun as part of an Anglo-French plan to build armoured gun platforms with which the allies could bombard Russian coastal fortifications at close range. The *Terror* and her sisters were almost identical to the *Aetnas*, but they carried two extra 68-pounders, their hulls were built of iron instead of wood, and their greater horsepower permitted a slightly increased speed. These batteries were designed to steam up to an enemy fort under their own power but to get to the foreign shore, they had to be towed by larger vessels.⁴²⁸

The paddle sloop *H.M.S. Devastation* had charge of the *Terror* during her voyage, (mainly under tow) to Bermuda in the autumn of 1857.⁴²⁹ Useful for intended close combat but unwieldy in service, this ironclad was the mobile armoured defender of a crucial naval base near a hostile shore. *Terror* became Britain's first ironclad to be stationed overseas, and the first armoured ship to

⁴²⁵ 'The British Forces on the North American & West India Station', *Yorkshire Gazette*, 7 December 1861, 11.

⁴²⁶ 'Stations of the Royal Navy in Commission', *Morning Post*, 5, December 1861, 6, Lt. Cdr. (Ret.) Ian Stranack, *The Andrew and the Onions. The Story of the Royal Navy in Bermuda 1795-1975*, (Bermuda, 1990), 143.

⁴²⁷ Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 241.

⁴²⁸ *Ibid*, 241.

cross from the eastern to the western hemisphere. During the *Trent* crisis, the *Terror* was provided with a crew, and several ships were available at Bermuda to tow her if required.⁴³⁰

A difficulty arose regarding manning of British ships, suddenly called into commission in anticipation of combat with the United States. The 7 December 1861, edition of the *Huddersfield Chronicle* warned: 'our only anxiety is the want of 'trained seaman'.⁴³¹ The men of the Royal Navy reserve were eager for the call up and in a spontaneous display of patriotic zeal, men paraded through the streets of several cities with Union flags and marching bands. In one procession, some Jack Tars carried a flag with the motto 'Ready, aye ready'.⁴³²

In Bermuda, the crew of the *Terror* was assigned from other warships in the squadron. By November 1862, the *Terror* was manned by a crew detailed from the steam frigate *H.M.S. Ariadne*.⁴³³ The ironclad floating battery was considered to be 'so heavy and clumsy to be almost immovable', but she provided vital protection to the naval base and stood ready to meet a foreign challenger, especially as the United States Navy grew in strength from 1861.⁴³⁴ To man the warships in times of crisis, the admiral on station would decide to move men from various crews to man the reserve component. This was especially true for guardships like the *Terror*. Ready when needed, but most of her crew had to be detailed for temporary duty on the unwieldy armourclad.

⁴²⁹ Ibid, 160, 'The Navy', 'H.M. Gun-battery "Terror", *Royal Gazette*, 20 October 1857, 2.

⁴³⁰ 'The North America and West India Station', *Exeter and Plymouth Gazette*, 6 December 1861, 10.

⁴³¹ 'Our Naval Position in the Event of War', *Huddersfield Chronicle*, 7 December 1861, 6.

⁴³² 'The Royal Naval Reserve', *Carlisle Journal*, 6 December, 1861, 8.

⁴³³ TNA, ADM 53/8205, *Ship's Log H.M.S. Terror*, 16 Dec. 1861-31 Dec. 1862, entry 29 Nov. 1862.

⁴³⁴ 'The Yankee Blockade of Bermuda', *Newcastle Journal*, 30 October 1862, 3.

Here was a pattern that would reoccur throughout the mid-nineteenth century. The Royal Navy could husband ships and resources during times of peace and mobilize during times of international tensions, but manning was always a concern. With Britannia challenged on the seas, patriotism would send previously reluctant trained men marching in the streets and Britain's wealth of seamen would come to the colours. Yet this was a surge capacity of manpower, for the pull of commerce, and the needs of industry drew the reserve sailors and trained men back to merchant ships and factories as foreign crises abated.

The *Trent* affair was the lightning rod event in the autumn and early winter of 1861. By Boxing Day, Seward had convinced a recalcitrant cabinet and a hesitant Lincoln to acquiesce to London's demands and turned the Confederate commissioners over to 'British Protection' and thus, let the crisis subside.⁴³⁵ In Washington, Ambassador Lord Lyons, had upheld British honour through tact and determination in his discussions with Seward, and both men helped to avert war through their diplomatic manoeuvres.⁴³⁶ The *Trent* crisis ended when the United States freed the Confederate commissioners and their two secretaries in early January 1862.⁴³⁷

The senior Royal Navy officer in North American waters, Vice-Admiral Sir Alexander Milne, had taken steps to prevent inadvertent acts by his commanders from aggravating the already tense peace. From his flagship *H.M.S. Nile* at Halifax, he had ordered in September 1861, that warships of his squadron were 'positively enjoined' not to enter a Confederate port or salute the Confederate

⁴³⁵ Goodwin, *Team of Rivals*. (2005), 398

⁴³⁶ 'Return of Lord Lyons from Washington', *Caledonian Mercury*, 17 June 1862, 3.

⁴³⁷ 'Arrival of Mason and Slidell', *Berkshire Chronicle*, 1 February 1862, 6, After being released from their confinement at Fort Warren in Boston harbour, the steam frigate *H.M.S. Rinaldo* carried the party to Bermuda where they arrived on 9 January.

flag. If a Southern warship or fort fired a salute, the British captain could return it 'though you are to be most guarded not to encourage or invite in any manner such proceedings'.⁴³⁸ Vessels of either belligerent carrying war material were not to be interfered with in a British port nor were they allowed to be interfered with by a warship flying the opposing flag.⁴³⁹ Milne also advised his commanders that the previous practice of cruising with U.S. warships for the purpose of suppressing the slave trade was discontinued, 'as it might lead to an infringement of the strict neutrality'.⁴⁴⁰ The admiral usually did not range too far afield as he had to maintain contact with the Admiralty and especially Lord Lyons in Washington. Halifax was directly linked to the Union capital city via telegraph lines, and to keep his fleet war ready, the admiral was instructed to watch for a coded message. If relations with the United States were to be severed, a telegram sent from Lyons reading, 'Could you forward a letter for me to Antigua?' would be the order to commence hostilities.⁴⁴¹

Liverpool and the Laird Rams

The British Foreign Secretary, Lord John Russell, undoubtedly read reports with a mixture of resignation and bewilderment regarding the symbiotic relationship between the commercial interests of Liverpool merchants and the

⁴³⁸ NMM, MLN/114/9, 1st Bt., Sir Alexander Milne, Admiral of the Fleet. 'Additional Instructions for the guidance of Cruizers employed in the Protection of British Commerce on the East Coast of America'. 9 September 1861, 10.

⁴³⁹ Ibid, 12.

⁴⁴⁰ NMM, MLN/114/9, 1st Bt., Sir Alexander Milne, Admiral of the Fleet. 'Additional Instructions for the guidance of Cruizers employed in the Protection of British Commerce on the East Coast of America'. 12 November 1861, 6.

⁴⁴¹ Amanda Foreman, *A World on Fire: Britain's Crucial Role in the American Civil War*, (New York, 2010), 103, 413.

Southern States. Russell noted that the merchant class of Liverpool was of a 'port specially addicted to Southern proclivities, foreign slave trade, and domestic bribery'.⁴⁴² Liverpool had strong commercial links with the South for decades. Those links only strengthened when imports of cotton dwindled, but arms and war material made up for the dislocation in trade. One Merseyside sea captain noted blockade running had relit 'a spirit the like of which has not been known since the palmy days of the slave trade'.⁴⁴³ Liverpool had the advantage of location as it was near the cotton mills of Lancashire and linked via railway and canal to the iron works and armament manufactories of Britain. Connected by established business relationships to the belligerents, 'the great American trade is mostly within the grasp of Liverpool'.⁴⁴⁴

The deprivation inflicted by the cotton famine was largely recovered in other industries. Merchants in the wool trade 'reaped a [sic] unexpected harvest of gold', and the munitions makers 'waxed fat and greasy'.⁴⁴⁵ The war offered a tradeoff for British industry with one observer noting: 'In the kingdom as a whole the number of person on relief did not rise materially during the war, for as heavy as was the unemployment in textile areas, other industries enjoyed a compensating boom'.⁴⁴⁶ The war encouraged merchants to avoid the neutrality laws and develop clear ways to bypass trade restrictions.

⁴⁴² Spencer, *The Confederate Navy in Europe*, (1983), 101.

⁴⁴³ Wesley Loy, '10 Rumford Place: Doing Confederate Business in Liverpool'. *The South Carolina Historical Magazine* 98 (October 1997), 353. So tightly intertwined were the Merseyside merchants with the Southern States, that Liverpool reportedly flew more Confederate flags than were seen even in Richmond.

⁴⁴⁴ 'The Wonders of the Port of London', *SA* 9 (5 December 1863), 357. Trade in 'metals, hardware, earthenware, &c' were mostly disguised to obscure the real contents were weapons intended for the war in America.

⁴⁴⁵ Lance E. Davis & Stanley L. Engerman, *Naval Blockades in Peace and War*. (Cambridge, 2006), 129

⁴⁴⁶ *Ibid*, 130.

The U.S. Consul in Liverpool was the determined lawyer, Thomas H. Dudley. With his offices on the waterfront, he and his agents were well positioned to survey the Mersey for ships arriving and departing.⁴⁴⁷ The office of U.S. Consul at the great port city was a plum position, considered 'one of the most lucrative of the foreign appointments in the Presidential gift'.⁴⁴⁸ The post required an active occupant due to the pressing commercial requirements of oceanic trade between Liverpool and America. The outbreak of the Civil War increased those duties and obligations multifold, but Dudley was to prove equal to the task. However vigilant, he was frustrated by his failure to prevent ships from sailing for the Confederacy laden with arms and munitions. In May 1862, he sent a dispatch to Seward complaining of Liverpool's loyalties: 'The people of this place if not the entire kingdom seem to be becoming every day more and more enlisted' in service of the Confederate war effort.⁴⁴⁹

At Birkenhead, Bulloch took advantage of the cooperative relationship with Lairds and their suppliers, to propose changes to his ships in order to adjust to new concepts of naval warfare. In a letter to Mallory, Bulloch reported that the ironclads would have bowsprits 'fitted with a hinge so as to be turned inboard when the ship is to be used as a ram'.⁴⁵⁰ He did not mention how the bowsprit would be brought back, but the ship's plans indicated the bowsprit was hinged to

⁴⁴⁷ Bowcock, *CSS Alabama*. (2002), 7.

⁴⁴⁸ Horatio Bridge, "Personal Recollections of Nathaniel Hawthorne", *Harper's New Monthly Magazine* 502, (March 1892), 510. In 1853, the office was held by the poet Nathaniel Hawthorne, who wrote to a friend to lament that his 'official duties and obligations are irksome to me beyond expression'.

⁴⁴⁹ Herman Hattaway and Richard Beringer, *Jefferson Davis Confederate President*. (Lawrence, 2002), 138.

⁴⁵⁰ Spencer, *The Confederate Navy in Europe*, (1983), 82.

the forecastle.⁴⁵¹ When readied for close combat, the giant boom would be unshipped and hauled directly aft, lifting the bow sprit on end and clear of the forepeak, allowing the ram to crash into an enemy hull with minimal threat of fouling the rigging. This was not a new concept. A similar approach to a non-fixed bowsprit had been tried out in the *La Gloire*. The French warship had a bowsprit that was 'a short, straight, stumpy affair, and can evidently be removed at pleasure'.⁴⁵² In early 1862, the Admiralty considered fitting the steam frigate *Resistance* with a movable bowsprit 'to draw in and out like a telescope', but decided to fit a more traditional fixed bowsprit instead.⁴⁵³ Britain was not to lag behind for long, as the 'beautiful yacht-like frigate' *Northumberland* was equipped with a bowsprit capable of being folded backwards in order to clear the 'knife-like bow projecting at the water-line'.⁴⁵⁴

The funnel for each Laird ironclad was altered during the later stages of construction. The two known builder's models, one a profile of the first of the class, and the other a full model of the second, show a slightly raked funnel resting on a base roughly three feet in height.⁴⁵⁵ At some point during the building process, the funnel was fitted, not slightly raked as originally designed, but straight and capable of telescoping.⁴⁵⁶ The original funnel (still slightly raked)

⁴⁵¹ Putnam, 'The Building of Numbers 294 & 295: The Laird Rams'. *Warship 1999-2000*. Edited by Antony Preston. (999), 12-13.

⁴⁵² 'The Mechanics of Modern Naval Warfare' *The North American Review* 103 (July 1866), 201.

⁴⁵³ 'Naval and Military', *London Daily News*, 27 January 1862, 2.

⁴⁵⁴ 'The Great Exhibition', *Dundee Advertiser*, 10 May 1862, 3.

⁴⁵⁵ WA 2/527, NMM, 'HMS Wivern (1863) Service Vessel; Coast Defence Ship', Repro ID: F8955-001, 'One of the Steam-Rams in Course of Construction in Messrs. Laird's [sic] Ship-Building Yard, Birkenhead', *ILN*, 26 September 1863, 321.

⁴⁵⁶ 'Her Majesty's Ship Majestic Keeping Watch Over the Steam-Rams in the Mersey', *ILN*, 28 November 1863, 552, U.S. Naval Historical Center (USNHC) Photo #NH 48145, 'Engraving of Confederate ironclad built by John Laird during the Civil War', USNHC Photo #NH 52526, 'HMS Wivern in the Hamoaze River, Plymouth, England, in 1865', USNHC Photo #NH 71211, 'HMS Wivern off Plymouth, England'.

as fitted on the first of the Laird rams was capable of being 'lowered at pleasure by an exceedingly ingenious arrangement' likely involving an internal winch.⁴⁵⁷ The one clear change made after the first ship was launched, was the fitting of a circular armoured casemate, around the funnel and projecting well above the turrets tops. Early photographs of the second Laird ram show a straight funnel elevated approximately eight feet above an armoured sleeve which stood some ten feet above the deck. Illustrations of the first Laird ram reveal the funnel was altered and the armoured casemate was added after the ship was launched.⁴⁵⁸

Funnels aboard warships during the middle Victorian years were raised and lowered to accommodate sail or steam. An advantage of the armoured sleeve was to protect the funnel from enemy shot and shell, but one experiment gave a false conclusion regarding the draught a damaged funnel could produce. On 3 June 1846, the steam tug *H.M.S. Echo* was the subject of experiments conducted by the Royal Navy at Spithead.⁴⁵⁹ The funnel of the tug was cut with a series of holes to simulate damage from 24-pound shot, with one hole near the top of the funnel, one midway down, and the other at the 'jacket' or base of the funnel at the deck.⁴⁶⁰ An ingenious damage repair kit consisted of ready-made curved iron sheets, two feet square, fitted with a small handle which turned two iron clasps.⁴⁶¹ These 'stoppers' would be fitted over the shot hole and clamped in place to cover the damaged area like 'the clasp of a door or cupboard'. The results of the tests wrongly concluded that when the temporary repair plates were

⁴⁵⁷ 'Ship Launches on Saturday', *Liverpool Daily Post*, 6 July 1863, 5, Ballard, *The Black Battlefleet*. (1980), 161.

⁴⁵⁸ USNHC Photo #NH 71211, 'HMS Wivern off Plymouth, England', 'The Anglo-Rebel Pirates-One of Laird's Steam-Rams', *Harpers Weekly*, 17 October 1863, 661.

⁴⁵⁹ 'Portsmouth, June 6, 1846', *Hampshire Advertiser*, 6 June 1846, 5.

⁴⁶⁰ 'Portsmouth, May 30, 1846'. *Hampshire Advertiser*, 30 May 1846, 5, 'The Experimental Squadron', *Morning Chronicle*, 5 June 1846, 3.

removed, the smoke continued up the funnel and no effect was observed in the speed of the *Echo* or in the performance of her machinery, although it was noted that a strong wind would have probably had an effect.⁴⁶² The tests were ‘most satisfactory’ and led to the mistaken belief ‘that very little danger will occur from shot striking a steamer’s funnel’.⁴⁶³

This error derived from observations made of a series of holes carefully cut into the funnel instead of the impact of a ball or shell breaking and bending iron as it passed through the smokepipe. A decade before, ‘impact’ and ‘initial velocity’ were dubbed ‘scientific bosh’ by some senior officers of the Royal Navy more familiar with Nelson’s quarterdecks than the increased firepower of the guns produced during the early industrial age.⁴⁶⁴ Admiral Sir Percy Scott would later remark of this time: ‘Gunnery officers were laughed at as mere pendants and coiners of long words.’⁴⁶⁵ Gunnery emerged during these decades to become more a mixture of science and sight than muscle and frequency of broadsides. Written in the aftermath of the Crimean War, and the Indian Mutiny of 1857, the 4 June 1859, edition of *Scientific American* observed the change in warfare: ‘a sure aim will effect more than the shower of bullets hitherto thrown way’.⁴⁶⁶ Although that journal was referring to land combat, the inference was the same for war at sea. Accuracy mattered more than weight of fire alone. In

⁴⁶¹ ‘Portsmouth, May 30, 1846’, *Hampshire Advertiser*, 30 May 1846, 5.

⁴⁶² *Ibid*, 5.

⁴⁶³ *Ibid*, 5, ‘The Experimental Squadron’, *Morning Chronicle*, 5 June 1846, 3.

⁴⁶⁴ Commander Geoffrey Penn, R.N. “*Up Funnel, Down Screw!*” *The Story of the Naval Engineer*. (London, 1955), 48.

⁴⁶⁵ Admiral Sir Percy Scott, *Fifty Years in the Royal Navy*, (London, 1919), 27.

⁴⁶⁶ ‘Science and Modern Warfare’, *SA*, Volume 14, Issue 39, 4 June 1859, 325.

1857, the newly commissioned steam corvette *H.M.S. Pelorus* was one of the first ships in the Royal Navy to receive a gun sight.⁴⁶⁷

Almost immediately after the successful introduction of a steam-driven armoured warship in combat, was the funnel proven to be a vulnerable point. During the first day of the Battle of Hampton Roads, the *Virginia* had her funnel damaged by the nearly point blank fire from the 9 and 10-inch smoothbore guns (and single 70-pounder rifle) of the sinking *Cumberland*, causing the unwieldy ironclad to slow, and her casemate to fill with smoke.⁴⁶⁸ The *Virginia* suffered a loss of steam pressure and a subsequent loss in her already marginal manoeuvrability prior to the epic battle with the *Monitor* the following day. On the morning of 15 July 1862, the ironclad *C.S.S. Arkansas*, was barely able to reach the Mississippi River port of Vicksburg after an enemy shell tore the funnel seal at the top of her casemate. The impact dislocated the breechings to the boilers, and resulted in a drop of steam pressure.⁴⁶⁹ This damage caused the *Arkansas* to slow and prevented her from using her ram with any hope of success.⁴⁷⁰

A lower silhouette precluded some damage to a warship's funnel for enemy shot was not cast upwards, as would be found with a slope-sided casemate ironclad. During the second Schleswig War of 1864 between Denmark and Prussia, the Danish twin turret ironclad *Rolf Krake* was in action with Prussian shore batteries on three occasions and although she was struck one hundred and fifty times, sixteen rounds piercing the funnel with no appreciable loss in

⁴⁶⁷ Scott, *Fifty Years in the Royal Navy*, (1919), 26, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 209.

⁴⁶⁸ Luraghi, *A History of the Confederate Navy*, (1996), 141, Scharf, *The Confederate States Navy*, (1996), 159, Gibbons, *Warships and Naval Battles of the Civil War*, (1989), 161.

⁴⁶⁹ Chester Hearn, *Naval Battles of the Civil War*, (San Diego, 2000), 124, 127, Scharf, *The Confederate States Navy*, (1996), 316.

⁴⁷⁰ Scharf, *The Confederate States Navy*, (1996), 314.

combat performance. Had the Prussians used heavier guns (some were 12-pounder field guns), the results of the funnel damage would have had a detrimental effect on steam pressure. The superior quality armour plate held up to the shot and shell, and a low hull made her a hard target for the Prussian gunners, but she received her only casualties when enemy rounds penetrated the thin deck plates, a weak point of many ironclads built during the 1860s. On 19 July 1864, during a debate in the Commons on the characteristics of armoured warships, the *Rolf Krake* was praised: 'the manner in which her guns had been used, her speed, and the way in which she had manoeuvred, were admirable'.⁴⁷¹

Repairs and modifications were made to the ironclad after the actions, her funnel had been 'shot through and through', and the turret tops were altered to prevent harassing fire from small arms entering through the ventilation gratings as had occurred during one engagement. The turrets withstood the Prussian cannon fire with only slight indentations detectable, but the movable bulwarks were 'shot to pieces' and the deck armour ($\frac{3}{4}$ inch of iron covered with wood) proved to be inadequate protection from plunging fire, with one enemy shell piecing the deck and exploding near the engine room door.⁴⁷² Deck armour also deflected one Prussian shell into the side of the forward turret. Though this round did no damage to the turret, the steel shell penetrated the deck near the turret base, as this plating provided only limited protection against shot and shell fired on a flat trajectory.⁴⁷³ Battle experience in America and Denmark undoubtedly contributed to the appreciation for more protection for the funnel of a

⁴⁷¹ Michael Embree, *Bismarck's First War: The Campaign of Schleswig and Jutland 1864*, (Solihull, 2006), 119, 196, *Hansard*, 19 July 1864, 176, cc1766.

⁴⁷² 'The Rolf Krake', *Glasgow Herald*, 12 August 1864, 6.

⁴⁷³ 'The Rolf Krake at Alsen', *Glasgow Herald*, 16 July 1864, 3.

warship from hostile fire. The telescoping funnels for the Laird rams were not fitted to only facilitate voyages under sail, they were protective measures proven from combat at close range with enemy guns.

Union Reactions to the Laird Rams

In December 1862, the Federal Government received a plan that involved a scheme to buy the Laird rams, and similar potential men-of-war out from under the Confederates. The Boston merchant John Murray Forbes suggested in a letter to Fox, that men 'untrammelled by naval contractors, and such nuisances' would travel to Britain and posing as representatives of 'Siam, or China, buy the best of the war steamers now under construction for the rebels'.⁴⁷⁴ After months of delay, Forbes business associate, financier and shipowner William H. Aspinwall of New York, joined in the scheme now backed with U.S. Government bonds. The bonds were to be sold via the Federal Government's banker in London, Baring Brothers, in order to raise £1,000,000 for the purchase fund.

Forbes arrived in Britain (29 March 1863) before Aspinwall, and took immediate steps to aid Union efforts in the United Kingdom. After meeting with Consul Dudley in Liverpool, he made money available to aid intelligence collection efforts against the Confederates as the U.S. Consul was found to be 'in sad need of moral & effective aid'.⁴⁷⁵ Despite efforts to conceal their real objective, the undertaking to purchase the ships was found out and reported in the British press. Aspinwall was too high in profile to avoid attention as he was an, 'ancient commercial oak' able to 'give the Rothchilds a few ideas how to

⁴⁷⁴ Douglas H. Maynard, 'The Forbes-Aspinwall Mission'. *The Mississippi Valley Historical Review* 45 (June 1958), 68.

make money'.⁴⁷⁶ The attempt to purchase warships under construction for the Confederacy was unveiled before it could begin, as the British press reported that Aspinwall and Forbes were not representatives of neutral powers but working for the Government of the United States.⁴⁷⁷

Although the mission to obtain the ships failed, several ancillary gains were made by the two merchants. One was the sudden inflow of desperately needed cash into the coffers of U.S. Consul Freeman H. Morse in London, and especially Dudley in Liverpool. With these much needed funds, the Union intelligence network in Britain retained expert detectives and expanded its supply of paid informants. Another related benefit of this tranche of funds for intelligence collection, was to effect a division of labour between the two consuls. With their hands on the purse, Forbes and Aspinwall persuaded Morse and Dudley to avoid overlap.

Dudley was responsible for all intelligence collection in Britain north of the 53rd parallel, and Morse would manage collection in England and Wales south of the line. In addition to funding British newspapers which reported favourable articles about the United States not wanting a war with Britain, the duo were able to convince Washington to take key steps to remove impediments to better relations. They persuaded the Federal Government not to issue 'Letters of Marque' with which the struggling U.S. Merchant Marine could be remade into privateers, ready in the event the Union went to war with the British Empire.

⁴⁷⁵ Ibid, 71-72.

⁴⁷⁶ 'Letter from "Manhattan", *London Evening Standard*, 8 May 1863, 5.

⁴⁷⁷ 'Southern Views of American Affairs', *Liverpool Mercury* 18 April 1863, 5.

Forbes made 'careful use of the press' to highlight the efforts taken by the United States to avoid an increase in tensions with Britain.⁴⁷⁸

The most direct suggestion to change policy was an insistence that the Navy Department remove Rear Admiral Charles Wilkes (who had commanded the *San Jacinto* when she stopped the *Trent* in 1861) from front line service. Forbes noted that the Federals must make active efforts 'setting their teeth' to avoid aggravating British political leaders, and not just respond to events. Wilkes was a provocation and his squadron achieved a fresh incident each time it dropped anchor in the West Indies. Forbes regarded Wilkes abrasiveness as hitting 'twice as hard in irritating John Bull as the same thing done by anybody else.'⁴⁷⁹ His reputation for belligerency and Anglophobia was a growing concern for the North and this was reported in the Southern Newspapers. In Texas, an edition of the *Dallas Herald* commented that Admiral Wilkes was 'causing increased irritation in England'.⁴⁸⁰ As if Forbes' warnings over Wilkes were not enough, the financier Aspinwall wrote to Fox with his view that 'Every Englishman thinks that his appointment was a taunt to them intentionally made-& whatever he does, good or bad, is viewed with suspicion'.⁴⁸¹ Welles would note in his diary regarding the inability of this admiral to follow orders: 'Wilkes often recklessly disregards and breaks them'.⁴⁸² On 22 May 1863, within a month of receiving the letters from Forbes and Aspinwall, Wilkes was relieved of command of the U.S. West Indian squadron. The British press reported that his removal was the result of

⁴⁷⁸ Maynard, 'The Forbes-Aspinwall Mission'. *The Mississippi Valley Historical Review* 45 (June 1958), 69, 75, 77.

⁴⁷⁹ *Ibid*, 73.

⁴⁸⁰ 'News from Jackson', *Dallas Herald*, 10 June 1863, 1.

⁴⁸¹ Maynard, 'The Forbes-Aspinwall Mission'. *The Mississippi Valley Historical Review* 45 (June 1958), 81.

⁴⁸² *The Diary of Gideon Wells*, I, (1911), 322.

'representations' made by Lord Lyons, in Washington with the result that the 'Federal Government desires to maintain at this time the most amicable relations with that of Great Britain'.⁴⁸³

With Wilkes out of the way, more attention could be focused on the aspects of British neutrality and Confederate efforts to build ironclads and cruisers in British ports, instead of defending or explaining the legal interpretations of a rogue flag officer of the Federal Navy. The Forbes/Aspinwall mission almost succeeded due to the frailty of Confederate credit. Bulloch had pulled in funds from George Trenholm's financial and shipping interests in Liverpool, but since the start of the war the South lacked capital, and payments were late. Bulloch would write 'there was always much perplexity and embarrassment from lack of ready money'.⁴⁸⁴

The Confederate Government had been able to fund the war through bonds backed by cotton, but this method had only limited effects by mid-1863.⁴⁸⁵ Bulloch had asked Mallory to forward his suggestion that bonds or 'Cotton Script' could be sold in Britain, but the sell had to be through the established agents (Fraser, Trenholm & Co.) and not left to a private individual. Bulloch warned that negotiations had to be along established business practices as, 'The English like to do business in a formal matter-of-fact way, and are always suspicious of adventurers and undertakings that require to be puffed'.⁴⁸⁶

By March 1863, the Union was also vying for funds from European lenders. Former U.S Treasury Secretary Robert J. Walker was in London as the unofficial representative of the Union and was urged to avoid any actions which would

⁴⁸³ "Times" Telegram', *Liverpool Mercury*, 15 June 1863, 5.

⁴⁸⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. I, (2012), 101

⁴⁸⁵ Richard Roberts, *Schroders Merchants & Bankers*, (London, 1992), 64.

⁴⁸⁶ *ORN*, II, 2, (1921), 265.

cause embarrassment to the Federal Government.⁴⁸⁷ Walker did not heed the advice, but drove down Piccadilly in a carriage pulled by eight white horses from his fashionable residence there, and dropped pamphlets denouncing Jefferson Davis, from a balloon as it floated over the English countryside. These antics did not produce any appreciable effect against Confederate fund raising efforts, but Walker's subsequent dissemination of statistical reports detailing Federal monetary policy and trade volumes, had a positive impact on leading banking houses in London and on the Continent.⁴⁸⁸

Nevertheless, pro-Southern agents did employ a 'puffed' sell with mixed success in Europe. A more advanced speculative venture proposed by a retired French civil servant came along at the right moment to shore up funding for the South and also served as a mechanism to shield against Federal attempts to outbid them in the European arms markets. As Forbes and Aspinwall were being armed with bonds from the Federal Treasury, the French banking house of Emile Erlanger & Company of Paris floated a loan for the Confederate States.⁴⁸⁹

Foreign governments had been seen as uncertain investments after several newly independent South American countries defaulted on their loans in the 1820s. By 1862 this had changed, and 'a distinct turn' in favour of loans to foreign governments was again circulated in the exchanges of Europe. On 19 March 1863, the Confederate loan was floated in Amsterdam, Paris, Hamburg, London, and Liverpool.⁴⁹⁰ Erlanger used his business contacts to raise funds for the Confederacy instead of Richmond pushing its own bonds as the main source

⁴⁸⁷ Amos E. Taylor, 'The Role of Washington in the National Economy during the Civil War', *Records of the Columbia Historical Society*, 53/56, (Washington, 1953/1956), 147-149.

⁴⁸⁸ *Ibid*, 151-153.

⁴⁸⁹ Judith Fenner Gentry, 'A Confederate Success in Europe: The Erlanger Loan', *The Journal of Southern History* 36 (May 1970), 157, 160.

⁴⁹⁰ Roberts, *Schroders*, (1992), 62, 66.

of income. This signaled hope to the Confederate Government, as the loan and secret shipbuilding projects were interpreted as harbingers of more aid and perhaps, direct intervention by Britain and France. This view was unrealistic for both acts were isolated and not part of a general policy shift in either London or Paris in favour of the Confederacy. Erlanger had originally issued the loan at a higher share price to help Richmond make a good political impression in Europe.⁴⁹¹

The Liverpool agents for the loan were the trusted shippers/financiers Fraser, Trenholm & Company, who received a commission from the sale of each bond and allowed Bulloch to borrow from them at will.⁴⁹² The Erlanger loan was made more attractive due to a linkage with the price of cotton at only a quarter of its then value in Liverpool.⁴⁹³ The Confederate States were offering discounted cotton futures in exchange for this war loan of £3,000,000 at 7% interest; it appealed to 'the gambling element' in financial circles and gave access (via blockade running) to much needed cotton.⁴⁹⁴

Cotton was a problematic commodity. The Confederates had imposed a virtual embargo on its export early in the war in a misguided effort to attract more European support. Although a decline in shipments succeeded in drawing down reserve stockpiles, especially in the cotton mills of Manchester, the move injured

⁴⁹¹ Henry Blumenthal, 'Confederate Diplomacy: Popular Notions and International Realities', *The Journal of Southern History* 32 (May 1966), 158, Gentry, 'A Confederate Success in Europe: The Erlanger Loan', *The Journal of Southern History* 36 (May 1970), 177, 178. ,

⁴⁹² Edwin DeLeon, *Secret History of Confederate Diplomacy Abroad*. Edited by William C. Davis. (Lawrence, 2005), 173.

⁴⁹³ Roberts, *Schroders*, (1992), 65.

⁴⁹⁴ *Ibid*, 65, 68, Charles S. Davis, *Colin J. McRae: Confederate Financial Agent*. (College Station, 2008), 36, 37, 39.

efforts to create a convertible resource for credit in Europe.⁴⁹⁵ By late 1862, another product from the South was far more profitable. Turpentine had risen by one hundred percent on its pre-war value, vastly out-performing cotton, which had only risen by twenty per cent during the first year of the war. By 1863 the price of cotton was rising with limited supply available through the blockade, but the Confederate Government failed to generate more than a trifling revenue through either taxes or export duties.⁴⁹⁶ As a result of miscarried domestic revenue generation efforts, foreign bond sales became crucial for the maintenance of the Confederate war effort.

Most financial houses in Britain were aligned with the North, especially according to Forbes and Aspinwall, 'our steady-going friends the Barings', but Erlanger was able to persuade the London firm of J. Henry Schroder & Co. to take up the Confederate loan issue in Britain.⁴⁹⁷ This was more than a financial godsend for the Southern States. It was also a useful propaganda tool as Schrodgers was a firm of 'high standing and influence'.⁴⁹⁸ The Southern propagandist Edwin DeLeon, then operating from Paris, did not like the conditions of the loan but conceded it 'seemed a great success, financially and politically'.⁴⁹⁹ The success of the loan would, according to DeLeon, encounter

⁴⁹⁵ Blumenthal, 'Confederate Diplomacy: Popular Notions and International Realities', *The Journal of Southern History* 32 (May 1966), 158, 161.

⁴⁹⁶ Stanley Lebergott, 'Why the South Lost: Commercial Purpose in the Confederacy, 1861-1865', *The Journal of American History* 70 (June 1983), 61, 66, 67.

⁴⁹⁷ Roberts, *Schrodgers*, (1992), 66. Maynard, 'The Forbes-Aspinwall Mission'. *The Mississippi Valley Historical Review* 45 (June 1958), 76.

⁴⁹⁸ Roberts, *Schrodgers*, (1992), 66.

⁴⁹⁹ DeLeon, *Secret History of Confederate Diplomacy Abroad*. Edited by William C. Davis. (2005), xx, 171.

'occasional fluctuations as the Confederate cause brightened or darkened' with each battlefield victory or defeat.⁵⁰⁰

The Erlanger loan did not produce steady income throughout the war, yet it provided needed revenue at a crucial time for Bulloch. On 9 March 1863, he wrote to Mallory informing him that 'he (Bulloch) could not induce builders to commence more ironclads without cash'.⁵⁰¹ The funds were delayed in disbursement, but some money did reach Fraser, Trenholm & Company and from them, payment was made Bulloch's and other accounts on Confederate naval and military contracts.⁵⁰² Although not enough to meet the growing needs of the Southern States, the Erlanger loan provided receipts 'in specie, and far larger in proportion than it (the Confederate Government) realized on any but the earliest of its domestic loans'.⁵⁰³

Ownership of the Rams

Bulloch had taken essential steps to obscure the intended ownership of the ironclads and to achieve this objective, obtained legal counsel to guide him through the intricacies of British law, especially the Foreign Enlistment Act of 1819. Bulloch employed F.S. Hull, a leading Liverpool solicitor, to serve as his legal advisor throughout the duration of his mission in Britain.⁵⁰⁴ A key restriction in the Foreign Enlistment Act, a 'bewildering...precept' according to

⁵⁰⁰ Ibid, 173.

⁵⁰¹ *ORN*, II, 2, (1921), 372-373

⁵⁰² Ibid, 567-569.

⁵⁰³ William Garrott Brown, 'The Resources of the Confederacy', *The Atlantic Monthly* 88 (December 1901), 831.

⁵⁰⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 65. 66. Bulloch regarded Hull to be 'a conscientious adviser...a watchful and safe mentor'.

Bulloch, was the restriction against arming, equipping or furnishing a man-of-war for use by a belligerent against a neutral power.⁵⁰⁵ The expert advice of Hull, helped Bulloch avoid one sticking point in the 'precept', regarding what was meant by 'equipment'. More specifically, the armour on a ship's sides was not considered 'equipment', as the iron plates were not grouped as armaments and ordnance stores. Armour by itself did not pass the definition of Article 7 of the Foreign Enlistment Act as being, 'for war-like purposes'.⁵⁰⁶

By April of 1863, the hulls of both ironclads were completed and the 294 had 'a great number of iron armour-plates fixed'.⁵⁰⁷ At the end of June, Bulloch reported to Mallory that the engines of both ships had been ready 'for several months' and the 294 would have been launched six weeks earlier, but she was held back for political considerations.⁵⁰⁸ He also reported to his superior that spies working for the U.S. Consul in Liverpool were 'daily watching their progress'.⁵⁰⁹ The Russians were also watching, and indicated they were interested in buying the two vessels. Bulloch would not wait until the ships were launched and ready for sea. He transferred ownership to thwart both the Union and Russian interlopers.⁵¹⁰

Bulloch was occupied with 'a good deal of management' to transfer the ownership of the rams from his name to a French firm. Bulloch had arranged to build two ironclad rams and two 'clipper corvettes' with the French shipbuilder, Jean-Lucien Arman of Bordeaux, and acting on orders from Richmond dated 27

⁵⁰⁵ Ibid, 66, 'Royal Proclamation', *Reynold's Newspaper*, 19 May 1861, 10.

⁵⁰⁶ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 66.

⁵⁰⁷ Putnam, 'The Building of Numbers 294 & 295: The Laird Rams'. *Warship 1999-2000*. Edited by Antony Preston. (London, 1999), 11.

⁵⁰⁸ *ORN*, II, 2, (1921), 445-446.

⁵⁰⁹ Ibid, 445

⁵¹⁰ Ibid, 446.

March 1863, transferred the ownership of his Birkenhead ironclads to a French company in order to remove them from Britain, and fit them out in France.⁵¹¹

Arman was a well-connected choice to serve as facilitator. He was a politician of national standing, served in the *Corps Legislatif*, and had occasional access to Emperor Napoleon III.

In late March 1863, Bulloch travelled to Paris and met with the Confederate emissary John Slidell, to arrange the transfer of his turret ironclads then building at Lairds.⁵¹² Bulloch and Slidell met with Arman who then arranged a meeting in Paris between the two Confederate officials and a suitable firm.⁵¹³ A subsequent meeting with the Messrs. Bravay proved fruitful and a 'satisfactory arrangement' was made, whereby Bulloch would no longer serve as the owner of the two Laird rams.⁵¹⁴ The Messrs. Bravay had acquired the ironclads for a 'nominal sum', but their ownership was a blind.⁵¹⁵ They were holders of the contract but, once the ships were finished, the former owner would reacquire title (for another fee) and the ships would steam for America under the Confederate ensign. Bravay & Company of No. 6 Rue de Londres, Paris, was under the directorship of Adrien Bravay, with his older brother François, providing the funds to launch the firm.⁵¹⁶

François was the stuff of legend. The son of a French tradesman in 'narrow circumstances', the young Bravay was apprenticed to a shoemaker, a trade that

⁵¹¹ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 398, Baxter, *The Introduction of the Ironclad Warship*. (2001), 385.

⁵¹² ORN, II, 2, (1921), 445.

⁵¹³ Ibid, 445, Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 400.

⁵¹⁴ ORN, II, 2, (1921), 445.

⁵¹⁵ Ibid, 445.

⁵¹⁶ ORN, II, 2, (1921), 654,709, 'Ismail Pacha of Egypt', *Harper's New Monthly Magazine* 39 (October 1869), 740, TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', No. 70, dated 5 September 1863.

would produce his entrée to fate.⁵¹⁷ Taking up trade in Egypt, he was favoured by chance when he repaired the shoe of Viceroy, Sa'ad Pasha. After a subsequent meeting with the Viceroy, the 'Lucky Shoemaker' received a contract to supply shoes for a portion of the Egyptian Army. Bravay would continue in this service of the Pasha until the death of the ruler in 1862. Following this, the wealthy François (who allegedly added to his purse through trade with Algeria) returned to France with a fortune estimated at 15,000,000 Francs (£1,200,000) and stood for office.⁵¹⁸ After months of legal contests, he won his seat in the Chamber of Deputies.⁵¹⁹ The election trials and legal battles of François was a likely reason Adrien was the public face of Bravay & Company. It was through the elder brother's shoe contract, that the Messrs. Bravay got their proverbial foot in the door, both in Egypt and in France. Bravay was an accomplished hand at manoeuvring around the intriguers in the official circles of Cairo and even after the death of Sa'ad, he regained his influence to such a degree with the new Viceroy, Ismail Pasha, that he was regarded as 'potential as any foreigner in Egypt'.⁵²⁰ This linkage was the bedrock on which Bullock's plausible storyline was built.

The Laird rams ostensibly would be sold to Egypt to build their fleet, and the transfer of the ships from Bulloch to the Bravay brothers was 'a mere business transaction'.⁵²¹ Lairds facilitated the transfer of ownership 'in the ordinary course of business' and obtained a 2½ percent commission from Bulloch, who readily

⁵¹⁷ 'The Lucky Shoemaker', *Belfast News-Letter*, 5 December 1863, 4.

⁵¹⁸ Ibid, 4, 'More Electoral Defeats of the French Government', *Herts, Guardian, Agricultural Journal, and General Advertiser*, 23 January 1864, 2, Davis, *Colin J. McRae*. (2008), 36.

⁵¹⁹ 'France', *London Daily News*, 2 June 1864, 5, 'The Vote by Ballot', *Manchester Courier and Lancashire General Advertiser*, 22 January 1864, 3.

⁵²⁰ Edwin De Leon, 'Ismail Pacha of Egypt', *Harper's New Monthly Magazine* 39 (October 1869), 740, 742.

agreed to the fee, as he was 'Hoping that in better times we may be able to renew our business associations, which have been as satisfactory to me as our social intercourse has been agreeable'.⁵²² The plan was believable, as the Messrs. Bravay had received an order for two ironclads intended for the Pasha. On 28 December 1862, François had written to his brother Adrien from Alexandria reporting that he had sought to disengage from contractual obligations with the viceroy. Nevertheless, the Pasha ordered François to build 'two armoured frigates, after the best and most perfect designs'. The ships were to come from France and the contract was not to be made public. This was due to political considerations and was likely a subterfuge to hide the purchase from the Pasha's overlord, the Sultan in Constantinople.⁵²³

Mallory ordered on 29 October 1862, that the Laird rams be named for the states of North Carolina and Mississippi but he did not specify which would bear which name.⁵²⁴ That was left up to Bulloch. The first of the Laird rams, 294, was to have been commissioned as the *C.S.S. North Carolina*, yet she would receive the false Egyptian name, *El Tousson*. Her sister, the *Mississippi*, was built as 295 and received the cover name, *El Monassir*.⁵²⁵

Despite the sale to the French firm, Bulloch was still involved with the construction of the two ironclads, only now he was less visible. The contract to build the four corvettes, and another pair of rams through Arman and his associates (two corvettes were built in Nantes by J. Voruz), was initially a good idea to diversify Confederate shipbuilding contracts, yet this would later prove to

⁵²¹ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 404-405.

⁵²² *Ibid*, 404.

⁵²³ *Ibid*, 406.

⁵²⁴ *ORN*. II, 2, (1921), 286-287.

⁵²⁵ Putnam, 'The Building of Numbers 294 & 295: The Laird Rams'. *Warship 1999-2000*. Edited by Antony Preston. (London, 1999), 11.

be an ill-timed distraction.⁵²⁶ Bulloch had written to Mallory regarding the moves he might take to insure the Laird ships left British waters with only a vague concept 'As I can only shape plans to suit possible changes of circumstances, it is quite impossible to go further into detail on this subject'.⁵²⁷ Traveling to and from Bordeaux, Paris, and back to Liverpool consumed much of Bulloch's time when delicate hands-on management of the completion and departure of the Laird ships was required. When nuance and careful steps were most needed in Liverpool, he was away in France.

Prior to transferring ownership, additional equipment was likely arranged for installation on the Laird ironclads. On 20 May 1862, when the Confederates were scouting around for British shipyards to build their ocean going ironclads, Commander North wrote to Bulloch to report on the plan of his intended 61, the vessel later to be dubbed as the 'Scottish Sea Monster'.⁵²⁸ North mentioned that a spare screw propeller would be carried on his ironclad as replacement for the three bladed iron propeller, fixed to the single shaft.⁵²⁹

The workmanship required to construct propellers was considered a high art of the iron shipbuilders' craft, and those not up to the exacting demands were regarded as 'a poor tool'.⁵³⁰ These tasks were handled by specialized foreman, (propeller) molders, who produced the screws fabricated for ironclads built in New York and other shipbuilding centres.⁵³¹ The Confederacy lacked skilled

⁵²⁶ Scharf, *The Confederate States Navy*, (1996), 804.

⁵²⁷ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 413.

⁵²⁸ ORN. II, 2, (1921), 193, Luraghi, *A History of the Confederate Navy*, (1996), 202-203.

⁵²⁹ ORN. II, 2, (1921), 197. This was a two bladed propeller.

⁵³⁰ 'Who Cast the Screws for the Italian Frigate?', SA 11 (3 September 1864), 150.

⁵³¹ Ibid, 150.

machinists and was critically deficient in propeller molders.⁵³² Bulloch likely considered adding such a replacement screw to each of his rams on their voyages to the Confederacy. Transporting spare screws on deck was not unusual. When *H.M.S. Black Prince* steamed south from Glasgow to complete her fitting out in Portsmouth in 1861, she carried a propeller blade on deck as a replacement in the event the main screw had been damaged.⁵³³

The two bladed screw North referred to in his letter to Bulloch was probably a 'Griffiths' type, capable of adjustable pitch, and praised during a trial run in October 1862, for 'scarcely any perceptible vibration'.⁵³⁴ The Royal Navy had adopted Robert Griffiths' pattern for all screw warships in the early 1860s, and this design offered benefit of uniform production and greater strength. This strength was achieved by bolting the 'fans' or blades of each screw propeller to the hub with flanges, instead of the earlier method which involved attaching them with a 'key' and wooden wedges. This new method permitted an increased rate of screw revolution and greater speed.⁵³⁵ The adoption of the Griffiths pattern required the Royal Dockyard at Woolwich to take on extra 'wheelers and other artisans' to handle the increased workload of the understaffed propeller molders.⁵³⁶

The Laird rams were fitted with other modern pieces of equipment and likely included William Hornsey's patent engine room telegraph.⁵³⁷ This pedestal

⁵³² *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (ORA). Series 1, 6 (Washington, 1882), 626

⁵³³ 'Arrival of the Russian Frigate General Admiral, and trial of the Russian Battery Pervenetz', *London Evening Standard*, 7 August 1863, 3, Parkes, *British Battleships*, (1966), 16, 24.

⁵³⁴ 'Naval Intelligence', *Liverpool Daily Post*, 1 October 1862, 5.

⁵³⁵ 'The Navy', *Dublin Evening Mail*, 20 January 1863, 2, Anonymous, *The International Exhibition of 1862*, 2 (Cambridge, 2014), 37.

⁵³⁶ 'Naval and Military Intelligence', *Morning Post*, 19 January 1863, 3.

⁵³⁷ Anonymous, *The International Exhibition of 1862*, (Cambridge, 2014), 37.

mounted instrument, positioned near the wheel(s), resembled a garden sundial and carried the face turned upward. The orders for changes in speed were relayed to the engine room counterpart by a lever resembling a sideways 'L' which, when pivoted over the indicated position as displayed on the face, sounded a gong in the engine room and a brass pointer would swing to the desired position on the dial.⁵³⁸ An earlier version of the engine room telegraph had first been mentioned in service on the River Tay in 1821.⁵³⁹ Additionally, in July 1825, the *Edinburgh Philosophical Journal* mentioned an engine room telegraph, an invention of James and Charles Carmichael of Dundee, which had been fitted on the Dundee and Fife ferry, *George IV*, and 'for some time used'.⁵⁴⁰ The workings of the Carmichael-built telegraph was described by a Royal Navy officer:

*'By the simple motion of a small handle, or index placed on a table, upon deck, in view and in hearing of the man at the helm and the master of the vessel, every movement which the engine is capable of giving to the paddle-wheel may be at once commanded. The vessel may be moved forward, or backwards...or entirely stopped, at any given moment, by merely turning the handle to the places denoted by the graduations of a dial plate.'*⁵⁴¹

The engine room telegraph was too much of a leap toward in automation for many officers in the navies and merchant fleets of that era, and the man-in-the-loop remained a familiar function of relaying commands from the deck. A series of hand signals was one method employed but when that failed, orders were relayed through voice by 'bawling out the engineer below'.⁵⁴² Another method

⁵³⁸ Ibid, 37.

⁵³⁹ *The Advent of Steam*, Editor Robert Gardiner, Consultant (London, 1992), 17.

⁵⁴⁰ Penn, "Up Funnel, Down Screw!" (1955), 26.

⁵⁴¹ Ibid, 26.

⁵⁴² Ibid, 26.

used for relaying commands to the engineer was through a series of bell signals.⁵⁴³ These signals, used in the U.S. Navy in the early 1860s, were detailed as 'Ahead slow, 1 bell; fast, 4; slow again, 1; slower, 1; stop, 2; back, 3'. The U.S. Navy method differed from the bell sequence used in the American merchant marine although the Navy system was 'more complex but less ambiguous'.⁵⁴⁴ Methods of communicating from the deck to the engine room were simplified when the Hornsey telegraph was adapted for standard use in the Royal Navy in 1858.⁵⁴⁵

The Union Spy Network in Britain

Inspection of the work on the Laird rams was by mid-1863, done not by Bulloch but by others assigned by him. Lieutenant R. R. Carter of the Confederate Navy was sent through the blockade to serve in one of the ironclads (likely the 294) but was reassigned for the duty of 'inspection of work actually in progress'.⁵⁴⁶ Carter, praised for his 'cheerful and intelligent assistance' by Bulloch, was appointed liaison with Lairds and those firms contracted to build Blakely pattern ordnance. Carter's duties allowed for work to continue, and Bulloch to 'keep entirely out of sight in the matter' of securing the guns for the Laird armourclads.⁵⁴⁷

⁵⁴³ J. H. Ward, Commander, U.S. N. *Steam for the Million: A Popular Treatise on Steam and its Application to the Useful Arts Especially to Navigation*. (New York, 1864), 118.

⁵⁴⁴ *Ibid*, 118.

⁵⁴⁵ Anonymous, *The International Exhibition of 1862*, (Cambridge, 2014), 37.

⁵⁴⁶ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 412-413.

⁵⁴⁷ *Ibid*, 413.

Bulloch had visited Lairds frequently during the earlier stages of construction, including supervising and assisting with the laying of the keels of the two rams.⁵⁴⁸ Bulloch met with the yard foreman in charge of building his ironclads, and was seen in the company of one of the Laird brothers at the shipyard.⁵⁴⁹ Bulloch became more cautious as Union informants had ready access to the docks along the Mersey. He was to remark on his need to maintain a low profile as 'experience has taught me that it is far safer to keep our business as little extended as possible, as otherwise the chance of our transactions being ferreted out by the Federal spies, who abound even in this country, is greatly increased'.⁵⁵⁰

Dudley's intelligence network had evolved since the outbreak of the war, and money from the Forbes/Aspinwall mission aided efforts to collect information through outside sources. The Consul would be acknowledged for his intelligence gathering against Confederate plans to purchase weapons and especially, acquire warships. His tenacity paid dividends and he was later praised for his determined efforts 'in hunting for secret information appears to have been indefatigable'.⁵⁵¹

Dudley's attempts to obtain reports on the construction status of the rams were initially frustrated by watchmen at the Lairds yard. The Consul wrote to Seward 'They are using great precautions to keep us ignorant of their doings. No stranger is admitted into their yard'.⁵⁵² Dudley had to go beyond Merseyside to obtain a trusted agent to get to the men at the Birkenhead Iron Works. One

⁵⁴⁸ 'The Steam Rams Seized at Birkenhead', *Liverpool Mercury*, 10 March 1864, 6

⁵⁴⁹ *Ibid*, 6.

⁵⁵⁰ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 385-386.

⁵⁵¹ Milton, *Lincoln's Spymaster*. (2003), 119.

⁵⁵² *Ibid*, 80.

leading supplier of information was London detective Matthew Maguire.⁵⁵³ Maguire had obtained very detailed information about the *Alabama* while she was still building at Lairds in 1862, and his success marked him as a very effective agent for Dudley.⁵⁵⁴ In a sworn deposition dated 21 July and related to the Confederate cruiser, Maguire was by that time living in Liverpool and kept in employment around Britain by Dudley.⁵⁵⁵

Men like Maguire had to be handpicked, and efforts to obtain a sub-strata of paid informants able to provide reliable and legally verifiable information took time. Although initially thwarted at the entrance to Lairds, the Union diplomat did obtain information regarding the armour plate being rolled for the Laird rams at the Mersey Steel & Iron Company.⁵⁵⁶ Dudley warned Seward that the plates were much improved over what the Union fleet had to contend with from homespun Confederate ironclads. The Consul observed the plate making process, and noted: 'the metal is heated in pieces not more than a hundred pounds in weight and then rolled together...they say the new mode is much more tenacious and its power of resistance much greater than the old'.⁵⁵⁷ In 1863, one British newspaper described the art of armour plate production as an act that required 'more than mere heating, and has to be cooked and watched in its cooking with as much care as if it was an omelette'.⁵⁵⁸ British rolling mills were world leaders in the production of iron cladding, and few places could match the

⁵⁵³ Ibid, 80, 85.

⁵⁵⁴ ORN. Series II, 2, (1921), 384.

⁵⁵⁵ Ibid, 384.

⁵⁵⁶ ORN, Series I, 13, (Washington, 1901), 331.

⁵⁵⁷ Milton, *Lincoln's Spymaster*. (2003), 79, 80.

⁵⁵⁸ 'Manufacture of Armour Plates, *Exeter Flying Post*, 15 April 1863, 6.

skill and capacity of Yorkshire iron works, as iron plate took on the sobriquet, 'Sheffield carpet.'⁵⁵⁹

Particulars, such as the one detailing the plate produced at Mersey Steel & Iron, were lacking from subsequent reports sent by Dudley. The Consul's workload prevented detailed analysis on all information with the result that intelligence was sometimes confused by the sheer volume of reporting. Lines crossed with other Federal agents and Dudley served as a facilitator and relay for intelligence obtained. He did not have the resources for always accurate reporting. His apparatus lacked a filter.

The Consul passed on information and rumour concerning the Confederate efforts in Liverpool, to the commanders of Federal warships during their regular calls to British ports. On 20 July 1863, Rear-Admiral S. P. Lee, relayed a report to Welles regarding the disarmed steamer *Gibraltar*, formerly the Confederate cruiser *Sumter*, which had loaded at Liverpool and was waiting to clear customs on 3 July.⁵⁶⁰ Her cargo reportedly included a number of heavy guns in wooden cases including two Blakely RMLs intended for transfer to one of the Birkenhead rams when the ironclad left British waters.⁵⁶¹ The report claimed the guns weighted 22 tons each. In the holds of the *Gibraltar* were shot, shell, 'other munitions of war', and the machinery likely intended to work the guns in one of the turrets of a Laird ram.⁵⁶² The blockade runner did carry two 13-inch RMLs, but these were destined for Charleston, not the rams. These guns (each weighing 22 tons) were too large for normal stowage and had to be positioned

⁵⁵⁹ Ibid, 6.

⁵⁶⁰ *ORN*, Series I, 9, (Washington, 1899), 127, 128.

⁵⁶¹ Ibid, 128-129.

⁵⁶² Ibid, 129.

vertically, giving the *Gibraltar* the appearance of a ship with three funnels.⁵⁶³ Although Lee's report was inaccurate in all its details, Bulloch did obtain ordnance for his ironclads from a Liverpool source. Fawcett & Preston would build several 9-inch guns (including those numbered 221, 222, and 223) as part of a five gun order dated 8 September 1863, with four of those guns intended for the Laird rams.⁵⁶⁴

The presence of the Union informants in Britain was so evident by mid-1863 that 'The port of Liverpool has been delivered over to a systematic espionage such as probably would be looked for in vain in despotic Russia, and could scarcely find a parallel in free America'.⁵⁶⁵ In May 1863, the *London Evening Standard* printed a letter to the editor from a British subject recently returned to London from the continent.⁵⁶⁶ Mistaking him for a Confederate official, the man was followed. Describing the interests in his communications, the beset Briton reported: 'If the postman knocked at my door to deliver a letter an attempt was made to handle it and ascertain where it had been posted...If I dispatched a telegram a "private detective" was at my heels, and as soon as I left the telegraph office a bribe was offered to the young female who had received my message for the communication of its contents'.⁵⁶⁷

Liverpool was 'bristling with alarm' over the rumours of secret agents, and 'every strange looking person in the streets is at once taken for a hired spy or private detective'.⁵⁶⁸ The Liverpool police, on orders from the Treasury,

⁵⁶³ Steven Roberts, 'Captain Alexander Blakely, RA, "Original Inventor of Improvements in Cannon and the Greatest Artillerist of the Age" (London, 2012), 34.

⁵⁶⁴ *Ibid*, 16.

⁵⁶⁵ 'Liverpool News', *Glasgow Herald*, 13 April 1863, 4.

⁵⁶⁶ 'Yankee Espionage in England', *London Evening Standard*, 23 April 1863, 5.

⁵⁶⁷ *Ibid*, 5.

⁵⁶⁸ 'Outlines of the Week', *Kentish Chronicle*, 25 April 1863, 5.

investigated activities related to another vessel Bulloch hoped to acquire as a cruiser, the *Alexandra*. Maquire's men and the other for-hire private detectives were functioning in an unofficial capacity, and were subject to 'all kinds of censure and suspicion'.⁵⁶⁹ These and other demonstrations of how the usually murky business of espionage had suddenly emerged into the public conscience were reflected in a comedy called 'Finesse'; or "Spy and Counter Spy".⁵⁷⁰ The comedy starred a well-known favourite of the English stage, Alfred Wigan, with his wife and others in supporting roles. The farce was termed a great success with one reviewer commenting that the 'applause was hearty...the laughter incessant'.⁵⁷¹ Bulloch was dogged by the clandestine agents of the United States and complained that their actions were increasingly invasive. The Confederate officer was to remark:

*'The spies of the United States are numerous, active and unscrupulous. They invade the privacy of families, tamper with the confidential clerks of merchants, and have succeeded in converting a portion of the police of this country into secret agents of the United States, who have practiced a prying watchfulness over the movements and business of individuals intolerably vexatious, which has excited the disgust and openly expressed indignation of many prominent Englishmen, and the frequent criticism of that portion of the British press which is really neutral'.*⁵⁷²

The U.S. intelligence system in Britain began operations in the summer of 1861, having been established by The U.S. Consul to Belgium, Henry Shelton Sanford.⁵⁷³ The Consul was eager to serve the Union, and roamed between Brussels, Paris, and London in his personal quest to obtain any information

⁵⁶⁹ 'The Spy System in Liverpool', *Liverpool Daily Post*, 17 April 1863, 4.

⁵⁷⁰ 'Miscellaneous', *Leamington Spa Courier*, 23 May 1863, 5.

⁵⁷¹ 'Haymarket, Theatre Royal', *Era*, 7 June 1863, 8.

⁵⁷² Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 425.

regarding Confederate activities in Europe.⁵⁷⁴ During one of his visits to Britain, Sanford was given the name of a London detective by Consul Morse, when the diplomat was stopping over in the British capital. Morse informed Sanford that police detective Ignatius Pollaky was 'just the man', but required £100 to start work with his team of private investigators.⁵⁷⁵

Pollaky worked for C. F. Field, former 'Chief of the Detective Police of the Metropolis' who employed Pollaky in the role of superintendent of his Foreign Department.⁵⁷⁶ Detective Pollaky had gotten married on the 5th of June and was undoubtedly motivated to his new line of work in the interests of generating cash for his new household.⁵⁷⁷ Apparently Morse had read of Pollaky in the newspapers as he was a well-known witness for Crown prosecutors.⁵⁷⁸ By 12 July 1861, Morse had employed the investigator, and soon thereafter Pollaky and his agents were beginning their work of setting out 'Posts' to be manned, and persons of interest to be followed.⁵⁷⁹ Bulloch was a primary target on their lists and the Confederates in Liverpool were reported on as 'B. & Co.,'⁵⁸⁰ Pollaky was one detective mentioned in the British press, as associated with the 'Spy System considered so hateful to Englishmen'. He had been previously utilized by those who sought information for pending divorce cases, forgery claims, and now,

⁵⁷³ Owsley, "Henry Shelton Sanford and Federal Surveillance Abroad, 1861-1865". *Mississippi Valley Historical Review* 48 (Sep., 1961), 212.

⁵⁷⁴ *Ibid*, 212.

⁵⁷⁵ *Ibid*, 213.

⁵⁷⁶ 'Mysterious Murder in Rhenish-Prussia, District of Coblenz, On the Rhine', *Cork Examiner*, 10 June 1861, 4, 'Insolvent Debtors' Court', *Morning Chronicle*, 8 April 1861, 8.

⁵⁷⁷ 'Marriages' *London Evening Standard*, 5 June 1861, 7.

⁵⁷⁸ 'Central Criminal Court', *Morning Post*, 9 May 1861, 7.

⁵⁷⁹ Owsley, "Henry Shelton Sanford and Federal Surveillance Abroad, 1861-1865". *Mississippi Valley Historical Review*. 48 (Sep., 1961), 213.

⁵⁸⁰ *Ibid*, 218.

continuous surveillance work needed to track Confederate agents.⁵⁸¹ Morse soon found Pollaky and his men to be too heavy-handed as their techniques lacked finesse and created unwanted observation by the general public. Sanford also lacked the requisite careful touch and in November 1861, proposed planting an agent on board the steamer *Gladiator* then loading with supplies for the Confederacy, and running her onto a mud bank in the Thames.⁵⁸²

The system established and paid for in part by Sanford, ran afoul of Adams, who disliked Sanford's meddling where Consul Morse held the portfolio. Sanford's ad hoc network also suffered from bureaucratic redundancy as both consuls were paying for information from the same source, Pollaky. Adams disdainfully noted that the U.S. Consul to Belgium spent most of his time in Paris and travelled to London for the purposes of 'poaching'.⁵⁸³ The overlapping, dual reporting channels could not continue especially as the close surveillance methods of Pollaky's informants had generated unwanted press in Britain. Adams wrote to Seward, who then informed Sanford via letter, that his activities had unintentionally created 'some inconveniences' for the U.S. diplomats assigned to Britain, and he was to stay out of intelligence collection operations there.⁵⁸⁴

⁵⁸¹ 'London Sketches', *Northampton Mercury*, 15 February 1862, 4, 'Central Criminal Court' *Morning Post*, 9 May 1861, 7.

⁵⁸² Milton, *Lincoln's Spymaster*. (2003), 30.

⁵⁸³ Owsley, "Henry Shelton Sanford and Federal Surveillance Abroad, 1861-1865". *Mississippi Valley Historical Review*. 48 (Sep., 1961), 227. Adams' secretary, Benjamin Moran, derisively referred to the energetic Sanford as 'that Legation on Wheels'.

⁵⁸⁴ *Ibid*, 218-219. By the beginning of 1862, the intelligence system Sanford established was either disbanded or absorbed by the two networks run by Morse in London, and Dudley in Liverpool.

Dudley achieved a notable success in the spring of 1863, when he delayed a ship intended as a gift for the Confederate Navy from leaving Liverpool.⁵⁸⁵ The *Alexandra* was a wooden-hulled screw steamer, configured for rapid adaption into a commerce raider. She was launched by the shipbuilder William Miller & Sons and fitted out through Fawcett, Preston & Company, the same yard, and engineering firm which had built the *C.S.S. Florida*.⁵⁸⁶ Dudley saw this ship as the opportunity for a test case concerning the Foreign Enlistment Act, and sought the assistance of A. F. Squarely, a Liverpool solicitor who had helped him during the earlier attempt to stop the *Alabama*.⁵⁸⁷ The evidence gathered by Dudley and his solicitor was routed through Adams who relayed it to the Foreign Secretary.⁵⁸⁸

The Union efforts were rewarded when officers from H.M. Customs seized the *Alexandra* on 5 April 1863. The Crown prosecutors lost their case as the ship was not armed, but the government tried again. The result was another failure and the *Alexandra* was released in April 1864. She would eventually sail for the Confederacy later that year as a blockade runner, (she had been renamed *Mary*), not as a warship.⁵⁸⁹ Although not a decisive victory as Union diplomats had hoped, the *Alexandra* case set a precedent. Dudley had found a way to impede the efforts of the Confederate agents and their associated shipbuilders in Britain through legal (albeit temporary) intervention. The courts did not uphold the seizure, but delay became an effective tactic used by Dudley to aid the Federal war effort.

⁵⁸⁵ Stern, *The Confederate Navy*, (1962), 166.

⁵⁸⁶ Milton, *Lincoln's Spymaster*. (2003), 33-35, 79, 81.

⁵⁸⁷ *Ibid*, 44, 82. Merli, *The Alabama*. (2004), 67.

⁵⁸⁸ Stern, *The Confederate Navy*, (1962), 166.

⁵⁸⁹ *Ibid*, 166.

Union surveillance operations which had continued in Britain throughout most of the Civil War, now rose to new levels of activity. The efforts centred not only on stopping arms and supplies from reaching the Confederates, but also on obtaining clear evidence for Adams to present to Russell. Dudley's background as a lawyer provided a skilled discernment regarding which testimony would carry weight at an official inquiry. More than mere information, he now moved to obtain sworn depositions from eyewitnesses. Detectives had become tainted. The Union needed a fresh approach to block the Mersey ironclads from putting to sea. They obtained men on the inside, paid informants who were skilled shipfitters in Lairds shipyard.⁵⁹⁰

Especially valuable were those men who worked on or near the rams. Austin Joseph Hand was one paid informant working as a caulker in Lairds yard. He would swear that he saw Bulloch at the Birkenhead Iron Works when the keels for the two turret ships were laid down.⁵⁹¹ One informant relayed a discussion he had with 'Mr. Moore' one of the head workmen at Lairds', who stated with a sense of pride in the two ships: 'Wait for the 294 and 295, get out and alongside the "Alabama" and then you will soon see the Southern ports opened'.⁵⁹²

Paid informants are of doubtful reliability and soon after paying for information obtained from within the Birkenhead Iron Works, rumours swirled out that men were watching the construction of the rams and receiving coin for tale-bearing. Dudley had informed Seward that the workers he had to rely on for inside information were 'not as a general thing very esteemable men, but are the only persons we can get to engage in this business, which I am sure you will agree

⁵⁹⁰ 'The Steam Rams Seized at Birkenhead', *Liverpool Mercury*, 10 March 1864, 6.

⁵⁹¹ *Ibid*, 6.

⁵⁹² TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', February to October 1863, 20.

with me is not a very pleasant one'.⁵⁹³ Men from shipyards suspected of building warships intended for the Confederates, were reportedly offered £50, or passage to the United States and the offer of a position or 'excellent situation' if they provided information to Union agents.⁵⁹⁴

As mentioned previously, Laird had stated in the House of Commons as early as March of 1863, Union spies were interfering with work around the Kingdom: 'Almost every detective that can be got hold of in this country is employed, and they have spies everywhere. I believe there are spies in my son's [sic] works in Birkenhead, and in all the great establishments in the country'.⁵⁹⁵ By August 1863, spies reportedly delayed progress on the rams and security was tightened at Lairds yard as a result.⁵⁹⁶ Some informants were suspected, their positions were in jeopardy, and they were likely sacked if found out. One of Dudley's informants wrote of the social and economic costs of his involvement in the Union intelligence network: '[I would] never undertake a job like this as I have lost all my self-respect and done myself a great deal of damage. I hope you will write by return as I am getting bankrupt. Let me know to be or not to be'.⁵⁹⁷

Austin Hand was a curious case. He had traveled with his wife to Liverpool to visit his brother-in-law, then employed at Lairds. His relation helped him obtain a position at the shipyard where he returned to his trade as a ship-caulker.⁵⁹⁸ Hand, an American citizen, supplied information to Dudley 'from time to time' but when his deposition detailing Bulloch's visits to Lairds to inspect the rams was sent to Russell by Adams in London on 17 July 1863, both Hand and his brother-

⁵⁹³ Milton, *Lincoln's Spymaster*. (2003), 32-33.

⁵⁹⁴ 'Confederate Cruisers', *Liverpool Mercury*, 2 December 1863, 3.

⁵⁹⁵ *Hansard*, 27 March 1863, 170, cc 71.

⁵⁹⁶ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 418.

⁵⁹⁷ Milton, *Lincoln's Spymaster*. (2003), 107.

⁵⁹⁸ 'The Rebel Rams A Fit Case for Aid', *NYT*, 17 October 1864, 2.

in-law were subsequently sacked.⁵⁹⁹ Labeled as a spy, the unfortunate Hand had been unable to obtain work in and around Liverpool since his discharge from Lairds in August 1863, and he was compelled to return to the United States.⁶⁰⁰

Hand arrived in New York on 28 July 1864, in a destitute state, but hoped for work at the Brooklyn Navy Yard. Unable to procure a position, Hand had reached circumstances of 'great distress'.⁶⁰¹ The story of Hand and others who assisted the American consul in Liverpool undoubtedly sent a chill through Merseyside. No one who had jeopardized the reputation and wellbeing of the area shipyards and the means to procure work for over 3000 men working at Lairds, could continue undamaged. Swearing out depositions to give to Dudley would end any semblance of a steady working life in Birkenhead and Liverpool. Once labeled as an informer for the Union, these men had to go away, some as far as America, in order to rebuild their lives. Taking the £50 from the Federal spymaster had proven to be more costly than anticipated for certain informers.

Launching the Rams

Although the public had been largely barred from the major shipyards in Britain, some newspaper reporters were permitted access, and one wrote of his visit to Lairds in September 1863.⁶⁰² That unnamed correspondent, having traveled to Liverpool and then on to Birkenhead to ostensibly visit an agricultural show, wrote: 'to not have paid a visit to Messrs Laird's great industrial establishment, would have been something equivalent to being in Rome and yet

⁵⁹⁹ Ibid, 2, 'The Steam Rams Seized at Birkenhead', *Liverpool Mercury*, 10 March 1864, 6.

⁶⁰⁰ 'The Rebel Rams A Fit Case for Aid', *NYT*, 17 October 1864, 2.

⁶⁰¹ Ibid, 2.

⁶⁰² 'Visit to Messrs Laird's Shipbuilding Yard', *Dundee Courier*, 19 September 1863, 2.

visiting neither the Pope nor St. Peter's'. After walking among the building ways, the correspondent found the two copula ships which he described as 'unmistakable ships of war...evidently sea-going, very strong, yet fine in the lines, with workmen clustered upon them everywhere like bees'. The atmosphere at Lairds had undoubtedly changed with a new emphasis on security, as the writer observed that 'in the whole establishment there was not a single loiter...each man seemed occupied, and even more intent than his neighbor, in close attention to his special duty'.⁶⁰³

The pace of work on the two rams had suddenly picked up in the early summer of 1863. The *Alexandra* case had cast doubt over Confederate shipbuilding efforts, but the work was renewed with purpose after Lairds and Bulloch felt reasonably confident that the sale to Bravay & Company would prevent the U.S. diplomats from gaining ground with the Foreign Office. On 16 June, payment terms between Lairds and the new French owners were agreed whereby one fourth of the costs of the ships would be paid to the builders when the first ironclad was launched, and another quarter was to be paid when the first ship was completed.⁶⁰⁴ The remaining funds would be paid under identical conditions for the second ship.⁶⁰⁵

The drafts of money were facilitated by a French banker, a Monsieur Langier, who had also helped facilitate the Erlanger loan.⁶⁰⁶ Langier had reportedly signed as a guarantor for the rams, and served as the financial link between the Lairds and Bravay. On 28 June 1863, Bulloch had officially relinquished legal

⁶⁰³ Ibid, 2.

⁶⁰⁴ WA 5/195/39 &40 'Terms of Contract with Messrs A. Bravay & Co. 6 Rue de Londres Paris/for completing 2 Iron Screw Steamers', dated 16 June 1863.

⁶⁰⁵ Ibid.

⁶⁰⁶ 'The Steam Ram Mystery', *Dundee, Perth, and Cupar Advertiser*, 8 September 1863, 3.

claim to the Birkenhead rams (which had officially begun under contract on 1 July 1862), and did 'for ever [sic] quit claim' his interest in the ships.⁶⁰⁷ Work could go ahead with renewed emphasis despite the prying of Federal informants, as the Confederate agent was out of the picture, at least as far as Lairds were concerned. Bulloch had temporarily relocated to France to supervise the building of his armourclads at Arman's yard in Bordeaux, and only came to Liverpool for a day or two in the late summer to review letters and post his dispatches to Richmond via the Bermuda mail.⁶⁰⁸

The two ironclads building at Bordeaux were lesser men-of-war compared with their Laird predecessors. Shorter and of less displacement than the Birkenhead vessels, these French variants carried a 9-inch Armstrong RML in the forecastle and two 70-pounder RMLs in a fixed turret aft.⁶⁰⁹ Like the Laird ships, both Arman ironclads were designed to operate in shallow waters (although their draught was almost as much as that of the 294 and 295) and built with rams, but the iron beaks projected much further forward than on the Birkenhead ships.⁶¹⁰ One French armourclad was given the cover name *Cheops* and her sister the *Sphinx* in an attempt to give the ships another Egyptian air.⁶¹¹ Unlike Lairds turret rams, the Arman ironclads were wooden-hulled and coppered in preparation for use in the warmer waters of the American South.⁶¹²

The ram on these French-built ironclads was unusual. Shaped like an elongated duck bill, it was described as 'a huge round backed point, sharpened

⁶⁰⁷ TNA, FO 412/11, 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', No. 101, dated 18 June 1863.

⁶⁰⁸ *ORN*. Series II, 2 (1921), 509.

⁶⁰⁹ Gibbons, *Warships and Naval Battles of the Civil War*, (1989), 66.

⁶¹⁰ *Ibid*, 66, *The Confederate Navy; The Ships, Men and Organization, 1861-65*. Edited by Dr. William N. Still, Jr. (1997), 26, 204-205.

⁶¹¹ Luraghi, *A History of the Confederate Navy*, (1996), 287.

and curved as it descends under the waterline', and extended approximately 20 feet from the prow.⁶¹³ Four times as long as the five foot tapered ram on the Laird ironclads, this feature negated the manoeuvre advantage of the twin screws, and twin rudders on the *Cheops* and *Sphinx*.⁶¹⁴ The ram of the two Laird turret ships (when compared to other British-designed steam rams of the era) was likely submerged three feet below the surface, but on the Arman vessels, more of the ram was above the water at the prow unless the ships were loaded forward.⁶¹⁵

Unlike the Laird ships where the ram was a secondary weapon, the Bordeaux armourclads were built with an emphasis on the ram as a first strike option. The larger surface area of the ram on Arman ships undoubtedly cast up spray and confronted the rudders with more submerged mass to overcome when helm was needed. Steering was also hampered by the pronounced forward sweep of the 'tumblinghome deficiency of the ram bow' as observed by Patrick Barry during his visit to the Arman yard while the French rams were under construction.⁶¹⁶ When the *Sphinx* belatedly entered Confederate service in 1865 as the C.S. S. *Stonewall*, her commanding officer Captain Thomas J. Page, C.S.N, described her ram as an 'elephantine proboscis' and faulted the structure as contributing to her poor seakeeping abilities.⁶¹⁷ Page noted the ironclad plowed into the waves

⁶¹² Barry, *The Dockyards, Shipyards, and Marine of France*. (1864), 230.

⁶¹³ 'The Last Rebel Ram', SA XII (27 May 1865), 335.

⁶¹⁴ 'Trial Trip of One of the Mersey Steam Rams', *Liverpool Mercury*, 31 August 1864, 6, Philip Van Doren Stern, *The Confederate Navy*, (New York, 1962), 222- 223.

⁶¹⁵ Ibid, 247. 'Naval and Military Intelligence', *London Evening Standard*, 14 August 1862, 6.

⁶¹⁶ Barry, *The Dockyards, Shipyards, and Marine of France*. (1864), 230.

⁶¹⁷ Captain Thomas J. Page, C.S.N, 'The Career of the Confederate Cruiser "Stonewall"'. *Southern Historical Society Papers* 12, (Richmond, 1879), 263.

‘diving and coming up, after the fashion of the porpoise’.⁶¹⁸ The ram was simply too large for a ship of 194 feet in length overall.⁶¹⁹

In Richmond, Mallory was increasingly anxious to get the Laird rams away from Birkenhead. On 21 April 1863, he had written to Bulloch with his views on the two turret ships announcing ‘These vessels would be of incalculable value to us at this Time’. Undoubtedly anxious for the Confederate Navy to have the wherewithal of scoring a blow against the Union forces, Mallory ventured a bold but highly impractical concept of operations when he wrote in the same letter about the possibility of restoring New Orleans to Confederate control. The secretary was desperate for information to allay his fears that the Confederate ironclads might not get out in time, and he concluded the introduction of his letter with an inquiry: ‘What prospect have we of getting them out, and when? These are all questions that intrude themselves constantly upon me’.⁶²⁰

Earlier, Bulloch had written to Mallory requesting the command of one of the Laird armourclads. The Confederate Navy Secretary replied peevishly on 3 March 1863, ‘if you adhere to this desire, give the earliest notice practicable, that I may send an officer to take-not supply your place’.⁶²¹ Faced with the ungracious opposition from his superior, Bulloch withdrew his request for command. When his success getting the *Florida* and *Alabama* into commissioned service for the South should have been rewarded, his plan changed to one of waiting for official gratitude to come later. On 30 August 1863, Mallory wrote to the Confederate officer selected to command the Laird rams, Captain Samuel S. Barron, C.S.N, instructing him to travel to Britain and assume

⁶¹⁸ Ibid, 263.

⁶¹⁹ Gibbons, *Warships and Naval Battles of the Civil War*, (1989), 66.

⁶²⁰ ORN. Series II, 2, (1921), 509.

⁶²¹ Ibid, 369.

the command of the first Birkenhead ram after Bulloch brought her out to France. Barron was under orders not to interfere with Bulloch's 'special duties...the department desiring to leave his judgment and action the larger scope'.⁶²²

Mallory had tried to assuage Bulloch's disappointment at not receiving a command when he wrote in April 1863 'I know of no gentleman in our service whom I would, from my point of view, with more pleasure see in such command than yourself, while at the same time there is not one to whom I could look to supply your place for us in England'. This was a shortsighted move by Mallory, a move which dampened the ardour of a man deserving of a chance to command a warship on a combat mission. Mallory suspected he overstepped, and wrote to Bulloch to explain 'I may have too far lost sight of your professional esprit'.⁶²³

Mallory was too far removed from the action to appreciate what his man in Liverpool had accomplished. A short assignment at sea would have given the chance of glory to an accomplished officer instead of overburdening him with more desk work. Mallory unwittingly removed the inspirational spark that hope provided to his most effective officer. With command a fading prospect, Bulloch pursued his tasks with a determination driven by duty, rather than one also motivated by anticipation and the hope of adventure. Bulloch switched operations to France to avoid the increased attention from Federal agents in Britain, but the Laird rams were progressing again and he was needed most in Liverpool at this time.

Bulloch was probably hoping that one of those French-built ships would be finally awarded to him as his command. Mallory's oversight had thwarted his best officer, and in so doing probably injured the Confederacy's best chance of

⁶²² Ibid, 485-487.

⁶²³ Ibid, 407.

getting one of the Laird rams away from European waters at a crucial time in the war. Bulloch was undoubtedly disappointed at not receiving command of one of the Laird ironclads. He knew his position in Europe was crucial for the Confederate war effort but he could not completely contain his bitterness and later wrote:

*'Active service at the front wins the "Bauble reputation". The men who work in the rear are not despised or even undervalued, but they must have the nerve to stifle their ambition. They may expect fair and just commendation, but then they must not aspire to stand side by side with those who wear the "Myrtle Crown".'*⁶²⁴

On 4 July 1863, the *El Tousson*, the first of the Laird rams, was launched on the Mersey.⁶²⁵ She was launched without her masts or turrets, and her wide beam gave her an appearance of looking 'more circular than conical' when afloat.⁶²⁶ As she slid down the ways, she carried the British flag astern and a French Tricolor fluttered from a temporary mast amidships in an acknowledgment of her new owners.⁶²⁷ Towed to her fitting out dock at Lairds, men were detailed to work in 24-hour shifts in a renewed effort to get her ready for sea.⁶²⁸ One Liverpool newspaper remarked of *294* at her launching, 'She will give a good account of herself, and sustain the high reputation of her now celebrated builders'.⁶²⁹

The launching was a tribute to Bulloch's perseverance, however that same day; the Confederates had suffered two catastrophic blows that would place them on the defensive for the remainder of the war. The Confederate fortress of

⁶²⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. II. (2009). 233.

⁶²⁵ 'Ship Launches on Saturday', *Liverpool Daily Post*, 6 July 1863, 5.

⁶²⁶ *Ibid*, 5.

⁶²⁷ 'Launch of Iron Steam "Rams" at Birkenhead', *Sheffield Independent*, 31 August 1863, 3.

⁶²⁸ 'The New Iron-clads in England', *SA*, Volume 1009, Issue 14, 3 October 1863, 214.

Vicksburg, Mississippi, the last link to the trans-Mississippi river region of the South, surrendered to Union General U.S. Grant on 4 July.⁶³⁰ A day earlier, General Robert E. Lee's regiments, the crème of the Confederate Army, were defeated in the epochal encounter at Gettysburg, Pennsylvania and began a struggle to get back to the relative safety of Virginia.⁶³¹ In one 24-hour span, the Southern States lost the initiative and became frantic for the means to divert Union forces from their now compressed front lines.

Although the Laird ironclads were incomplete at this stage, they impacted naval plans and operations for both the Confederacy and the Union. The rams offered the Confederates the means to inflict telling damage on the Union far from the battle lines. Though he could not command his armoured ships, Bulloch still held influence regarding their utilization. Five days after the first Laird ram was launched, he wrote to Mallory from Paris to express his reasons why attacking New Orleans and pressing further up the Mississippi River was not a valid option. The ironclads would need escorts to pass over the bar from the Gulf of Mexico. The shifting sands and mudflats at the entrance to the great river would require towboats to help pull the ironclads over the bar into the river channel. If they did not go aground, the ironclads would likely be restricted by the confines of the river 'very much in the condition of a boxer with one arm tied behind his back'.⁶³²

Bulloch proposed something much bolder, but also less hazardous than a mission along the Mississippi. He favoured an attack against the New England coast, a bombardment of the naval facilities at Portsmouth, New Hampshire. The

⁶²⁹ 'Ship Launches on Saturday', *Liverpool Daily Post*, 6 July 1863, 5.

⁶³⁰ John Keegan, *The American Civil War: A Military History*. (New York, 2009), 219.

⁶³¹ *Ibid*, 196, 201.

⁶³² Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 408, 410, 411

former U.S. naval officer was familiar with that port: 'opposite the town is an important national dock and building yard. The whole lies invitingly open to attack and destruction'.⁶³³ As a reprisal for the burning of Southern towns, and as a scheme to help pay for the warships, Bulloch opined that a flag of truce could be sent to the mayor of Portsmouth to demand \$5 million in gold, otherwise \$50 million in 'Greenback' paper notes, or the Confederate ironclads would bombard the town. Enamoured with the visions of his plan, he wrote with an adventurer's flair: 'Suppose our two ironclads should steam unannounced into that harbor [sic] on some fine October morning'.

Bulloch knew they needed the best men to crew these ships as they were not cruisers able to attract men in search of prize money, but the ironclads were ships with a 'grim aspect and formidable equipment clearly show they are solely intended for the real danger and shock of battle'. Bulloch was confident that he could obtain engineers and firemen from Britain and perhaps enough men to man one gun on each ship, but he needed Southern men skilled in the arts of heavy artillery. If such men were pre-assigned to forts around Wilmington, North Carolina, the rams could steam through the Union blockading squadron and take the gunners on board to fill out their crews. From Wilmington, the resupplied and fully manned ironclads could take on the Federal Navy and lift the blockade on their way north.⁶³⁴

Confederate authorities knew a seaborne attack was difficult to resist. Early in the war, the Union naval attack on Port Royal, South Carolina, impressed General Lee who wrote to Richmond: 'Wherever his fleet can be brought no opposition to his landing can be made except within range of our fixed batteries'.

⁶³³ *ORN*. Series II, 2 (1921), 456.

⁶³⁴ *Ibid*, 456.

Lee was careful to place defensive works around Savannah and Charleston in areas which could provide interlocking fire while also positioned where Union warships could not offer direct support to attacking Federal troops.⁶³⁵

A key target for the Laird rams would have been the Union Naval base at Beaufort, North Carolina. This port, captured by a Union amphibious operation in April 1862, provided coal, ammunition, provisions and repair facilities for the Union warships blockading Wilmington, North Carolina, 100 miles to the southwest.⁶³⁶ Beaufort was a busy port and the coal stocks varied in size as warships came in to refuel, generally during the full moon, as blockade runners only attempted to run into Wilmington during dark nights.⁶³⁷ The base was also an anchorage for ordnance supply vessels and storeships. By June 1864, Beaufort had more provisions on hand than the combined stocks of the Baltimore and Washington Navy Yards combined.

The harbour was difficult to enter due to the shifting channels and prevailing winds, but the port brimmed with flammable materials including coal, barrels of tar, and highly combustible turpentine, enough to present a fire hazard to the civilian colliers, Federal men-of-war, and supply ships that usually crowded the bay. Confederate soldiers had burned bridges in the area and their scouts were familiar with the pace of activities at the port.⁶³⁸ The Laird rams (or one of them) would have been unable to avoid bombarding Beaufort, as the benefits of shelling that port far outweighed the risks. An attack on the key base would have disrupted Union resupply operations, and would have greatly hampered the

⁶³⁵ Bern Anderson, 'The Naval Strategy of the Civil War', *Military Affairs* 26 (spring 1962), 14

⁶³⁶ Dan Blair, "One Good Port: Beaufort Harbor [sic], North Carolina, 1863-1864", *The North Carolina Historical Review* 79 (July 2002) 302

⁶³⁷ Ibid, 310-311, 320.

⁶³⁸ Ibid, 310, 314, 316, 317 320.

Federal blockade. With a Laird ironclad operating from Wilmington, the Union Navy would have been compelled to reassign monitors from operations near Charleston to protect their base at Beaufort should Wilmington continue under blockade. As a method of disrupting Federal operations, the base was too inviting a target to bypass if the Birkenhead ironclads were in commission under the Confederate flag and steaming near the Carolina coasts.

Union authorities had mixed views of the Laird rams, but most were growing concerned at their prospects of getting to sea. Adams was increasingly gloomy regarding the outlook of stopping the departure of the vessels later referred to as 'these floating engines of destruction'. One early Union casualty of the two ironclads would have been the exchange rate, as gold was sure to have risen against the Greenback upon news of their sailing from British shores.⁶³⁹ The official exchange rate in 1863 was \$4.85 (U.S. dollars) to £1. Greenbacks depreciated from that level and averaged 70.5 percent of their face value against gold during the mid-war years. A rise in the gold value would have damaged Union revenue from bond sales in Europe as these were purchased in Greenbacks.⁶⁴⁰

Welles wrote in his diary on 17 August 1863, that he sent a response to Dahlgren 'Who has serious apprehensions about Laird's ironclad steamers, which trouble Du Pont', and relayed a report from the State Department confirming Washington was making entreaties to Britain to prevent the Laird

⁶³⁹ James M. Barker, Henry W. Haynes, Samuel A. Green and Charles Francis Adams, 'October Meeting. 1899 Tribute to Chief Justice Field; Tribute to Mr. W.W. Greenough; The Laird Rams; Memoir of Charles Francis Adams', *Proceeding of the Massachusetts Historical Society*, Second Series, 13 (1899-1900), 181, 182.

⁶⁴⁰ Gentry, 'A Confederate Success in Europe: The Erlanger Loan', *The Journal of Southern History* 36 (May 1970), 173, 185.

ironclads from sailing.⁶⁴¹ In his dispatch to Dahlgren, the Navy Secretary detailed a report from Seward which relayed that Adams 'had informed the British Government that if the Rebel ironclads are permitted to come out it will be *casus belli*.'⁶⁴²

Fox sent a copy of plans for one of the Laird rams to John Ericsson, who scoffed at their armament (and construction) when compared with the larger guns of the new Union monitors, 'such a gingerbread affair must not come near our XV inch bulldogs in their impregnable kennels'.⁶⁴³ Bulloch took a different view writing: 'if one of the rams had gone into smooth water, and had suffered a 'Monitor' to make deliberate practice at her with 15-inch shot at short range...no doubt in time her plates would have been loosened and the backing splintered; but their power and speed was such that in open water, with room to maneuver [sic], I think they would have had no difficulty in running down any 'Monitor' then afloat...' ⁶⁴⁴

Endeavouring to avoid alternative history, a brief discussion of ordnance available to the Union Navy and that designed for the Laird rams sheds some light on the results of a possible encounter. The wooden warships of the Federal blockading squadrons lacked sufficient firepower to resist one Laird ram 'long enough for a second broadside', therefore the armament of the larger monitors in service during the Civil War provides the comparison point.⁶⁴⁵

⁶⁴¹ *The Diary of Gideon Wells*, I. (1911), 407.

⁶⁴² *Ibid*, 407.

⁶⁴³ Fuller, *Clad in Iron*, (2008), n. 7, 340.

⁶⁴⁴ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 445.

⁶⁴⁵ Barker, Haynes, Green and Adams, 'October Meeting. 1899 Tribute to Chief Justice Field; Tribute to Mr. W.W. Greenough; The Laird Rams; Memoir of Charles Francis Adams', *Proceeding of the Massachusetts Historical Society*, Second Series, 13 (1899-1900), 180.

The Union Navy had proven the capabilities of the 15-inch Dahlgren smoothbores, the largest naval guns in operational service in the war. Two Confederate ironclads, the *Atlanta*, and *Tennessee*, had their armoured casemates penetrated by shot from these guns, but lighter ordnance was ineffective against the unwieldy Confederate-built armoured vessels.⁶⁴⁶ The 15-inch Dahlgren had an effective range of 2120 yards at 7 degrees of elevation.⁶⁴⁷ The four Blakely 9-inch RMLs on each Laird ram would have been able to out-range the 15-inch Dahlgrens, but the two 70-pounder Whitworth guns intended for each ram had the distinct lead in range by better than two-to-one over a Federal monitor.⁶⁴⁸ Although the 70-Pounder (5-inch bore) Whitworth, was considered by some in the British press to be too light when used against the heavier armour plate entering service (1864), it was considered a superior piece of ordnance in terms of range and accuracy.⁶⁴⁹

As the 294 and 295 were armoured with rolled plates of single thickness, and the Union monitors were shielded with laminated iron, a battle could be decided by those warships armed with heavy guns capable of piercing the latest armour.⁶⁵⁰ A confidential Admiralty paper on ordnance indicated several qualities required of heavy guns in the late 1860s including: accuracy, range, penetrating power, simplicity of use, and strength to withstand heavy powder charges. The

⁶⁴⁶ 'The American Navy in the Late War', *The Living Age* 90 (8 September 1866), 597, Henry Baldwin, 'Farragut in Mobile Bay', *Scribner's Monthly* 13, (February 1877), 542.

⁶⁴⁷ Paul H. Silverstone, *Civil War Navies, 1855-1883*. (New York, 2006), xx, xxi.

⁶⁴⁸ Ibid, xxi, Ross, *Cities and Camps of the Confederate States*. (1997), 151, 'The Late Naval Engagement', *Dublin Evening Mail*, 30 June 1864, 4. This newspaper account compared the *Alabama's* 100-pounder Blakely RML with the *Kearsage's* two 11-inch Dahlgren smoothbores, where Captain Blakely asserted, had the *Alabama* steel shot or shell ammunition for that gun, it could have fired from a distance 'a full mile further than the smoothbores' of the *Kearsage*.

⁶⁴⁹ 'Mr. Whitworth and the "Ironsides"', *Aldershot Military Gazette*, 4 October 1862, 4,

'Experiments at Shoeburyness', *Sheffield Daily Telegraph*, 2 August 1864, 7.

⁶⁵⁰ 'English and American Ironclads', *Greenock Advertiser*, 5 May 1863, 4.

Admiralty was clear as to which quality was most desired: 'The *penetrating power* (italics in original) at ranges under 1,200 yards is certainly the most important under the existing circumstances of naval warfare. It is the most difficult to obtain, and without it all other qualities are useless'.⁶⁵¹ The initial velocity of a shell as it left the muzzle of a naval gun was an indicator of penetrating power. The Admiralty compared several leading guns of the 1860s, and the 9-inch RML, fired with a heavy charge of 43 pounds of powder, developed a muzzle velocity of 1340 feet per second. This compared favourably to the largest American 15-inch guns, which developed an initial velocity of 1220 feet per second when fired with a 60 pound powder charge.⁶⁵²

For the Union monitors, a maximum powder charge firing a shell from a 15-inch gun could have decisive effects at close range. One 15-inch shell had penetrated the layered armour of the Confederate ironclad *Tennessee* at the Battle of Mobile Bay in 1864, a blow which contributed to the surrender of the vessel. Nevertheless, a charge of 60 pounds of powder in a 15-inch gun was considered 'daring' and threatened to burst the barrel if not handled with great care in loading.⁶⁵³

Both Confederate and most Union ironclads were built in America with wooden hulls, mostly from green timbers and suffered structural stresses due to the rapid deterioration of the unseasoned wooden supports and planking. The monitors also lacked enough watertight integrity to insure they could withstand being holed below the waterline, however the Laird rams were adequately

⁶⁵¹ TNA, ADM 1/6083, *Director Naval Ordnance, In-Letters and Papers, 1860-1869*, 2

⁶⁵² *Ibid*, no page.

⁶⁵³ Baldwin, 'Farragut in Mobile Bay', *Scribner's Monthly* 13, (February 1877), 542.

compartmented below decks and were designed with a double bottom to withstand contact with a torpedo.⁶⁵⁴

Another mitigating factor was the quality of shell. Ammunition manufactured in the South suffered from mediocre quality and the Confederate Navy's chief ordnance officer, now Commander John Brooke, warned these inferior shells put their warships at a marked disadvantage against the better equipped Union men-of-war.⁶⁵⁵ This was a partially the result of a lack of adequate materials, but the main reason was the lack of skilled labourers, a dilemma referred to in a report to the Confederate Congress by Mallory as a 'serious evil'.⁶⁵⁶ The Laird rams would have overcome this problem due to the superior quality of rifled guns and armour piercing shell available for the Blakely and Whitworth ordnance.

Had the Laird rams gone to sea with their intended RMLs, they would have had the edge in terms of range and accuracy in a gun duel with the most modern Union ironclads. These monitors had the advantage, in terms of weight of shell during a close range encounter, but the Laird rams also had suitable speed to manoeuvre out of reach if damaged. A likely outcome would have been an inconclusive battle with the Laird ram(s) giving and receiving damage, but Union naval operations along the coasts of North America would have been endangered by the arrival of the Birkenhead ironclads. David G. Surdam wrote: 'although Northern naval superiority alone probably was not sufficient to have defeated the Confederacy, it appears to have been a necessary condition for the

⁶⁵⁴ Gibbons, *Warships and Naval Battles of the Civil War*. (1989), 31, 33, 57, 58, 69, WA ZCL/005/0195/039/040, Description of Laird Rams, likely for Bravay of Paris, dated July 1863. (No Page).

⁶⁵⁵ Anne Kelly Knowles, 'Labor, Race, and Technology in the Confederate Iron Industry', *Technology and Culture* 42 (Jan., 2001), 15.

⁶⁵⁶ *Ibid*, 13-14.

Northern victory'.⁶⁵⁷ The Laird rams threatened to disrupt the Federal Navy's support to the overall Union war effort.

On 8 September 1863, Fox wrote to Lincoln warning that the Laird rams represented a clear threat to the Federal Navy and the coasts of the Union: 'In a naval point of view the departure of these vessels, or even one of them, requires, on the part of this Government, the gravest deliberation'.⁶⁵⁸ The Union Navy had taken steps to offer some protection to Boston and the New England fishing fleet in the event a Laird ironclad steamed near Cape Cod. One newspaper in Ohio reported the steam frigate *Niagara* had been refitted with a heavy battery of guns but the prospect of her action against one of the Laird rams was a source of 'apprehension' for the Union.⁶⁵⁹

The Federal Navy was urged to take other actions to make ready for the new Confederate ocean-going ironclads. Rear Admiral Dahlgren had proposed precautions in anticipation of the first Laird ironclad arriving off Charleston. The Admiral asked that a new monitor, either the *Dictator* or the *Puritan* be ordered to Union-occupied Port Royal, South Carolina, to protect that essential supply base.⁶⁶⁰ Dahlgren also proposed that coal and provisions be moved nearer to the Union lines outside Charleston. This would allow adequate supplies for shallow draught steamers supporting the Federal regiments outside that Rebel-held port, as the arrival of a Laird ram would drive off the larger warships maintaining the blockade.⁶⁶¹

⁶⁵⁷ David G. Surdam, 'Northern Naval Superiority and the Economics of the American Civil War', *The Journal of Economic History* 56 (Jun., 1996), 475.

⁶⁵⁸ Library of Congress, *The Abraham Lincoln Papers*, Letter from Assistant Secretary of the U.S. Navy Gustavus V. Fox, 8 September 1863.

⁶⁵⁹ No Subject, *Ashtabula Weekly Telegraph*, 26 September 1863, 2.

⁶⁶⁰ *ORN*, I, 14, (Washington 1902), 419.

⁶⁶¹ *Ibid*, 419.

Bulloch would state years later, 'The Government of the United States did not exaggerate the importance of preventing the departure of the rams from Liverpool'.⁶⁶² The Governor of Massachusetts also did not underestimate the rams and had dispatched Colonel Harrison Ritchie as his agent to purchase the latest RMLs from Armstrong for the protection of Boston Harbour. Ritchie wrote back to inform the governor that the purchase must be 'managed with great secrecy and caution' to avoid public scrutiny.⁶⁶³

The guns from the Elswick Ordnance Works were a curious choice for the fortifications of a key base of the Union.⁶⁶⁴ The 10 May 1862, edition of *Scientific American* denounced the transition of Armstrong guns from breachloading ordnance to larger muzzleloaders, as a reflection of 'the age of humbug'.⁶⁶⁵ Despite this seeming regression, the development of the Armstrong guns progressed through the early 1860s to become 'very much more of a success than is generally supposed'.⁶⁶⁶ One American journal compared the Armstrong heavy pieces with similar sized U.S. ordnance (15-inch Rodman guns and Parrott 300-pounders), disdainfully noting examples of failed American guns as 'cast-iron abortions'.⁶⁶⁷

The Armstrong patterns offered readily obtainable heavy guns for the protection of Boston, bypassing Washington bureaucracy and industrial backlogs in the Northern States. In London, Colonel Ritchie obtained the Elswick contract

⁶⁶² Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 445.

⁶⁶³ Marshall J. Bastable, *Arms and the State: Sir William Armstrong and the Remaking of British Naval Power 1854-1914*. (Aldershot, 2004), 126.

⁶⁶⁴ *Ibid*, 126, 127.

⁶⁶⁵ 'The Last Phase of the Armstrong Gun', *SA* 6, (10 May 1862), 297.

⁶⁶⁶ 'W', 'The Alleged Failure of the Armstrong Gun', *Living Age* 80 (20 February 1864), 384.

⁶⁶⁷ *Ibid*, 384.

through a third party, the noted shipbuilder, John Scott Russell.⁶⁶⁸ The guns were delayed by slow payments and deception. Russell had made the first installment with money received from Ritchie, but diverted funds to pay for his debts and to finance his shipyard in Cardiff.⁶⁶⁹ By the time the guns were finished, the war in America was over and Russell's embezzlement had been found out.⁶⁷⁰

The quality of work in armour, ordnance, and overall construction, put the Birkenhead ironclads at the forefront of naval shipbuilding in the middle-1860s. Both Confederate and Union officials *believed* the Laird rams would have had a noteworthy impact on the naval war. In 1903, a New York newspaper reported a former Confederate naval officer spoke of the Laird rams, and commented, had the ironclads departed Britain and arrived off the Confederate coasts, 'the effect upon the war might have been very great'.⁶⁷¹

Redefining Neutrality

The Foreign Enlistment Act of 1819 was by the 1860s, at variance with the demands of trade, industrial-scale production of armaments, and the speed of Trans-Atlantic travel. One British periodical would accurately note: 'In truth, the whole system of maritime warfare has been revolutionized by the introduction of steam...'⁶⁷² The neutrality law had become obsolete and so too the methods of

⁶⁶⁸ Bastable, *Arms and the State*. (2004), 127.

⁶⁶⁹ Ibid, 127.

⁶⁷⁰ Ibid, 127-128.

⁶⁷¹ 'Built for the Confederacy', *The Sun*, 28 June 1903, 2.

⁶⁷² Various Authors, *The Nautical Magazine and Naval Chronicle for 1864*. (Cambridge 2013), 101.

enforcing that act.⁶⁷³ Neutrality as it was understood in the mid-1860s, was ill-defined, as it was implemented and changed at a deliberate pace more suited to sail and the horse. New concepts of what comprised neutrality had to travel at the speed of the telegraph if officials responsible for enforcing government actions were to out race the locomotive and the marine steam engine.

The key problem regarding enforcing neutrality was where to begin? The belligerents had imported arms and equipment, and men from Britain had been enlisted in the services of the warring powers, in both military and industrial capacities. The 1819 law warned that British subjects were not to 'knowingly aid, assist, or be concerned in the equipping, furnishing, fitting out, or arming of any ship or vessel.'⁶⁷⁴ Factories in both the North and the South were in dire need of skilled hands and the promise of high wages encouraged some to make the Atlantic crossing. John Snowden returned to his English birthplace to recruit ironworkers for his factory in Pittsburgh, Pennsylvania.⁶⁷⁵ Snowden was the senior partner of the firm Snowden & Mason which built shallow draught Union monitors for service on the Western Rivers.⁶⁷⁶ The Confederates contracted for British foundrymen to travel to the Southern States and begin work casting heavy guns. Bulloch took this mission in hand, arranging with Thomas Ludlam, the foreman of the Low Moor Iron Works in Yorkshire, to travel with a team of skilled men through the blockade in order to set up an armaments shop for the Confederate Navy.⁶⁷⁷ Ludlam and his men were skilled tool makers, experts at

⁶⁷³ Spencer, *The Confederate Navy in Europe*, (1983), 85.

⁶⁷⁴ 'Royal Proclamation', *Reynold's Newspaper*, 19 May 1861, 10.

⁶⁷⁵ William H. Roberts, *Civil War Ironclads: The U.S. Navy and Industrial Mobilization*. (Baltimore, 2002), 62, 133.

⁶⁷⁶ ORN. Series II, 1 (1921), 133, 228.

⁶⁷⁷ ORN. Series II, 2 (1921), 683, 694-695.

the steam hammer, and one of their team was considered 'a practical man of every trade, one who can...make a horseshoe or repair an engine'.⁶⁷⁸

Attempts by Adams to stop the Laird rams from going to sea were hampered by actions undertaken in the United Kingdom by men working on behalf of the U.S. Government. Federal agents had complicated matters for the North by recruiting men in Ireland for the Union Army and some for their navy. One editorial called attention to the recruiting efforts in Ireland to man the Federal Army, but also questioned the legal dilemma regarding the use of weapons sent to the belligerents: 'The Confederates may be shot down with English-made cannon, but the Federals must not have their cotton and tea seized by English-built ships' flying the Confederate flag.⁶⁷⁹

Recruitment was sometimes considered deceitful work undertaken by unscrupulous men. The U.S. Navy was cautious calling at some ports due to the actions of the recruiting agents or 'Sharks' as they were sometimes called.⁶⁸⁰ Captain John Rodgers, U.S. N., had written to Fox to report that he had lost men who had overstayed their leave, and recruiters in New York were keen to acquire seamen, especially English speakers.⁶⁸¹ Merchant ship captains, hoping to avoid Confederate cruisers, were reportedly paying \$50 for men to sign on for a voyage to Liverpool, and the Federal Army was offering a \$150 enlistment bonus.⁶⁸² When the steam frigate *H.M.S. Ariadne* visited New York in the winter of 1861-2, 22 men deserted the ship to take up arms for the Union. The desertions had occurred even though leave was not granted and the *Ariadne* had anchored not

⁶⁷⁸ Ibid, 683.

⁶⁷⁹ 'The Federal Government and England's Neutral Rights', *Westmorland Gazette*, 26 September 1863, 2.

⁶⁸⁰ *Confidential Correspondence of Gustavus Vasa Fox*, II, (1918), 331-332.

⁶⁸¹ Ibid, 331-332, 345.

⁶⁸² Ibid, 345.

near the city, but in the harbour off Staten Island. One officer on the frigate noted 'nationally was of no consequence so long as the men were ready to fight'.⁶⁸³

Rather than recruiting men in Ireland, the Confederates pressed able bodied men into service wherever they found them in the Southern States.⁶⁸⁴ The British Consuls were able to obtain release from the Confederate Army for some men, but Governor Thomas Moore of Louisiana warned that if British subjects volunteered, the local government would not intercede with the military authorities to obtain their release. The use of the bounty seemed to be a key component to military service. Whether sought out, taken under pressure, or after physical abuse, the money in hand meant to the local authorities the man was enlisted in voluntary service.⁶⁸⁵ Despite pressure and coercion, some enlisted due to local ties and personal obligations. One Scottish machinist living in Baton Rouge, Louisiana, enlisted in a state regiment out of a sense of loyalty to his neighbours, and for 'the honour of old Scotland'.⁶⁸⁶

Crown prosecutors would later try men for operating an enlisting service in Liverpool tasked with providing a crew for the Confederate cruiser *Georgia* in violation of the Foreign Enlistment Act. One man, Frank Glassbrook, signed aboard under the assumed name Frank Rimmers, a name he used in the Royal Naval Reserve.⁶⁸⁷ Three men in U.S. naval uniform appeared before a judge in Cork, Ireland for having enlisted aboard the Federal man-of-war *U.S.S. Kearsarge*. These three men, natives of Ireland, plead guilty but one of them

⁶⁸³ Admiral C.C. Penrose Fitzgerald, *Memories of the Sea*. (1913), 181.

⁶⁸⁴ Milledge Louis Bonham, *The British Consuls in the Confederacy*, (New York, 1911), 91, 93-94.

⁶⁸⁵ *Ibid*, 174-176.

⁶⁸⁶ William Watson, *Life in the Confederate Army, Being the Observations and Experiences of an Alien in the South during the American Civil War*. (1887, reprinted New York, 1983), 123.

stated they did not think there was any harm in their actions.⁶⁸⁸ Both the Union and the Confederacy had enlisted British subjects in their service, in breach of British law, and these were actions which were considered in Britain to be ‘the grossest violation of all amicable relationships which ought to exist between friendly powers’.⁶⁸⁹

In August of 1863, the Confederate warship *Florida* returned to European waters and contributed to the rising apprehension over the fate of the Laird rams. The *Florida* steamed into the French port of Brest in need of repairs to her engines and copper hull plates. Her arrival compounded the concerns of Bulloch, and consumed much of the diplomatic good will he had retained through his discretion. Some 35 men from the *Florida* were discharged and made their way to Cardiff in a ragged and worn state, and unintentionally aroused suspicions over the Mersey ironclads. From Wales they traveled to Liverpool and attracted the attention of both Union intelligence operatives, and legal agents of the Crown.

A confidential letter from the Foreign Office to British legal authorities asked ‘whether these seamen, in so far as they may be subjects of Her Majesty, are not liable to be proceeded against’ for enlisting in the service of the Confederate Navy. The law officers were less anxious to seize such a large body of men, as they appeared to no longer be in service of the Southerners and opined the arrest and trial of these men was not worth the effort. However, the arrest of

⁶⁸⁷ LOC, ‘Report of Trials in England of Various Parties for Violation of the Foreign Enlistment Act, in Recruiting for the Rebel Vessels, Case of Jones and Highatt’. *United States Serial Set*, Number 1397, Appendix No. XIV, (Washington, 1869), 553, 554

⁶⁸⁸ LOC, ‘Proceedings Before the Crown Court at Cork in the Case of the Men received on Board the United States Steamer Kearsarge at Queenstown’. *United States Serial Set*, Number 1397, Appendix No. XIII, (Washington, 1869), 547, 548.

⁶⁸⁹ *Ibid*, 548.

those *Florida* men 'anxious to be re-engaged in the service of the Confederate States' would serve as a suitable example to discourage further recruitment.⁶⁹⁰

By the late summer of 1863, the pace of work at Lairds had moved the construction of the ships forward to such a point that their service at sea was becoming a near certainty. One observer to Lairds yard described this construction as being done with a speed which was 'apparently by magic' and the ever present industrial sounds as: 'knocking and hammering...such cyclopedian noise.'⁶⁹¹ The turrets were aboard neither the 294 nor 295 but they were being painstakingly fabricated in the yard, with the chief workmen making frequent references to the plans close by. The turret foundations were largely in place in the lower hulls, their form resembling 'neither more nor less than ordinary railway turn-tables.'⁶⁹²

At 10:45 a.m. on 29 August 1863, the second ram, number 295, was launched in the presence of hundreds of spectators.⁶⁹³ The *El Monassir*, translated as 'Victory', was not a merchantman which could be converted into a cruiser; she was a 'war-ship of extraordinary power...of some other purpose than mere privateering'.⁶⁹⁴ She flew the French Tricolour as a matter of form, but no one was deceived.⁶⁹⁵ The *El Monassir* and her sister were intended for the Confederates. The race to prove complicity and the ruse of both actual and intended ownership was soon to come to the fore.

⁶⁹⁰ TNA, FO 881/2011 'Florida'. No. 70, dated 23 September 1863, No. 71, dated 1 October 1863, No. 73, dated 22 September 1863, Printed November 1871.

⁶⁹¹ 'Visit to Messrs Laird's Shipbuilding Yard', *Dundee Courier*, 19 September 1863, 2.

⁶⁹² *Ibid*, 2.

⁶⁹³ 'Another "Ram" for a "French" House', *Liverpool Daily Post*, 31 August 1863, 5.

⁶⁹⁴ *Ibid*, 5.

⁶⁹⁵ 'Launch of Iron Steam "Rams" at Birkenhead', *Sheffield Independent*, 31 August 1863, 3.

The first Laird ram, the *El Tousson*, was rapidly coming together. Her masts had been shifted, boilers and engines were in place, and the funnel was put on.⁶⁹⁶ Equally worrying to the Federals, four Confederate Naval Engineering officers had arrived in Liverpool on the Cunarder *Asia* from Halifax. By the time her sister was launched, the forward turret was installed and painting was soon to begin on the first ram.⁶⁹⁷ Several coats of thin red lead paint had been applied to the *294* to protect the ironwork from oxidizing prior to the final painting of the hull and upper works in black, white and buff. The three coats of red lead paint applied to the exterior gave the ironclad a dull hue, but the colour was an unmistakable signal to all she saw her.⁶⁹⁸ The first Laird ram was nearing completion and only the installation of her aft turret, final fittings, and finishing paint work was needed to prepare her for sea.⁶⁹⁹

Anticipation, fears, plans of action, and intelligence reports circulated between Britain and Washington, yet the ships were not ready for combat. The guns were not aboard the Laird ironclads, but the ships had one piece of 'equipment' which could not be explained away.⁷⁰⁰ The ram projecting forward from the bows of each ship was described as 'a most effective weapon of war' thus proving that Lairds were building warships for a foreign power. One British newspaper touched on the key point of the Confederate shipbuilding efforts when it

⁶⁹⁶ TNA, TS 25/1274, Letter from Thomas Dudley, United States Consulate, Liverpool, 7 August 1863

⁶⁹⁷ Ibid.

⁶⁹⁸ WA 005/0195, 'Dimensions and Particulars of Vessels Vol. 2, 'Green Book No. 2', (No Date), 039-040.

⁶⁹⁹ Ibid.

⁷⁰⁰ 'News of the Day', *Liverpool Daily Post*, 29 August 1863, 4.

proclaimed that 'there must be some fault somewhere, when we see *the spirit of the law evaded*' (italics in original).⁷⁰¹

The United States had pressed Britain to close the legal loop holes which permitted a ship to leave a British port and later be transformed into a man-of-war flying the Star & Bars. One British newspaper, quoted in a New York magazine stated: 'There is no amendment of the law required. The Government has ample powers, and if it really wanted to put a stop to the fitting out of vessels in our ports for the Confederates, Mr. Davis would be unable to get a fishing smack out of the Mersey'.⁷⁰² This position was supported in another British newspaper when it compared the Laird rams to the attempted procurement of Hale's Rockets for Hungarian revolutionaries in 1853. As with the rockets, ships could be seized in Britain, for 'Laws, we know, can be stretched or tightened at the will of those who are appointed to execute them'.⁷⁰³

The main problem with enforcing the Foreign Enlistment Act as it applied to the Laird armourclads, was the point of ownership. They belonged to a French firm and what happened to them after the owners received them was not a point that *directly* involved the British Government. Interpretations of when an activity permitted by a neutral power ceased to be neutral, and actions by a belligerent involved other nations in a conflict where they had beforehand remained apart, now (late summer to autumn 1863) became the dominate issues of Trans-Atlantic relations. In late October 1863, one British newspaper highlighted the legal dilemmas of neutral trade with belligerents when it stated: 'Of all the

⁷⁰¹ Ibid, 4.

⁷⁰² (No Author), 'British Neutrality', *The Living Age*, Volume 77, Issue 985, 18 April 1863, 138.

⁷⁰³ 'American Slavery and its Abettors', *Dundee, Perth, and Cupar Advertiser*, 28 April 1863, 2.

different classes of the law, the Law of Nations is the most intricate, and consequently to this hour the most unsettled'.⁷⁰⁴

The Laird brothers brought the dilemma to a head in early September 1863 when they informed S. Edward Price, the Collector of Customs at Liverpool, of their intention to take the *El Tousson* out for a short cruise on the Mersey. They intended the voyage to be a short trial run to begin on 14 September, in order to test her machinery, after which the ironclad would return to the shipyard for her final stages of fitting out.⁷⁰⁵ This proposed run was thwarted when the Treasury ordered the Liverpool Customs office to prevent the ironclad from leaving the Mersey until government inquiries into the destination of the ship were concluded.⁷⁰⁶ The first Laird ram was expected to be completed in early October and the second ship by early November if the work schedule was maintained.⁷⁰⁷ The delivery of the two ironclads was an issue which could not be ignored, and the British Government would soon have to choose sides in America's Civil War regarding these warships.

On 11 September the Foreign Secretary wrote to Adams in response to his entreaties against the Laird rams stating:

'With regard to the general duties of a neutral, according to international law, the true doctrine has been laid down repeatedly by Presidents and Judges of eminence of the United States, and that doctrine is, that a neutral may sell to either or both of two belligerent parties any implements or munitions of war... and it is difficult to find a reason why a ship that is to be used for warlike purposes is more an instrument or implement of war than cannon, muskets, swords, bayonets gunpowder, and projectiles to be fired from cannon and

⁷⁰⁴ No Title, *Devizes and Wiltshire Gazette*, 22 October 1863, 3.

⁷⁰⁵ LOC, 'Correspondence Between Her Majesty's Government and Messrs. Laird Brothers Relative to the Iron-Clad Rams'. *United States Serial Set*, Number 1397, Senate Executive Department No. 11, Volume 4, 41st Congress Appendix No. XIII, (Washington, 1869), 260.

⁷⁰⁶ *Ibid*, 260.

⁷⁰⁷ *Ibid*, 261.

*muskets'...In fact, the ship can never be expected to decide a war or a campaign...*⁷⁰⁸

Russell was using America's recent history against Adams to prove that neutrality was open to a wide disparity of interpretation. During the Crimean War, American businesses had supplied arms, and had built ships for the Russians.⁷⁰⁹ One U.S. built steamer, the *America*, was built for Russia and sailed to Petropavlovsk during the Crimean War, under the command of American officers.⁷¹⁰ William H. Hudson, the Captain of the *America*, had allegedly carried arms for the Czar's Pacific garrison buried in the bunkers under the ship's coal.⁷¹¹ Hudson would claim he only carried a few small arms, a barrel of powder and 'Robin shot'.⁷¹² Colt revolvers and other arms were reportedly sent on U.S. flagged and other neutral vessels to the then Prussian port of Memel on the Baltic for overland shipment to eastern Russia.⁷¹³ American mechanics from Baltimore, Maryland had reportedly travelled to Russia in 1855 to take the place of British railway workers who had left due to the outbreak of war

⁷⁰⁸ 'Correspondence between England and America about British Neutrality', *Daily Dispatch*, 1 February 1864, 1.

⁷⁰⁹ 'Miscellaneous', *NYT*, 28 June 1855, 1.

⁷¹⁰ *Hansard*, 27 March 1863, 170, cc 69, 70.

⁷¹¹ 'Mr. J. Laird, M. P., and the United States Government', *Cheshire Observer*, 29 August 1863, 7.

⁷¹² *Ibid*, 7. See: TNA, ADM 231/5, Admiralty: *Foreign Intelligence Committee*, Report No. 43, 'Eastern Siberian Ports and Anchorages' dated January 1885, 61. The *America*, built by New York shipbuilder William H. Webb and completed in 1856, was 166 feet long, had a 28.4 feet beam, and a draft of ten feet aft, eight feet forward. Her engines produced 140 Nominal Horsepower and she displaced 554.67 tons. This steamer remained on service with the local defence force known as the 'Siberian Flotilla' at Vladivostok until summer 1884 when she was reportedly sold at auction.

⁷¹³ Bulloch, *The Secret Service of the Confederate States in Europe*. I. (2012), 83

the previous year.⁷¹⁴ Trade with the allies was more important for the United States both in terms of ready income and relations with the big powers. American clipper ships were chartered to carry troops, munitions, supplies and horses for the British and French forces besieging Sevastopol.⁷¹⁵ Neutrality was still a confused concept in the mid-nineteenth century, but the application of national interest was a key factor and another was profits. During the Civil War, one British journal was to remark:

'Ingenious lawyers and crotchety politicians may contend that there is no distinction between exporting guns and exporting men-of-war. But the results prove the contrary. The Americans have practically lost half their mercantile marine. The Confederate Government are the parties who have directly or indirectly caused these ships to be built in this country, and in so doing they entered upon a deliberate course of violating and evading the laws of England'.⁷¹⁶

In Washington, Lincoln was considering a declaration of war, and on the back of his calling card, wrote his instructions to Seward for him to pass to Adams. The note read: 'Tell Adams to say to Palmerston that another 'Alabama' means war!'⁷¹⁷ Meanwhile, the British Government was taking steps to determine the fate of the Laird rams.

On 22 September 1863, the British Naval Attaché to France, Captain E. Hore, R.N., met with Adrian Bravay to find out the true owners of the

⁷¹⁴ 'Mechanics for Russia', SA 10 (25 August 1855), 395.

⁷¹⁵ 'War News', SA 10 (21 July 1855), 355.

⁷¹⁶ Various Authors, *The Nautical Magazine and Naval Chronicle for 1864*. (Cambridge 2013), 100.

⁷¹⁷ 'Value of Plain Talk', *Omaha Daily Bee*, 1 March 1898, 4.

pair of ironclads.⁷¹⁸ Bravay produced the papers from Laird proving that he was the legitimate owner and reported that the former owner, Bulloch, was involved with the ironclads then under construction at Bordeaux.⁷¹⁹ The meeting also provided Captain Hore with more than supposition regarding the intended end user of the rams, as Bravay punctuated his comments with a series of winks and nods to indicate Bulloch was to be the recipient of the finished ironclads.⁷²⁰

The Prime Minister had also been involved in the search for a way out of the dilemma. He had written to the First Lord of the Admiralty with what was apparently a sales pitch to buy the Laird armoured ships: 'We are short of Iron Clads, [sic] and it takes Time to build them, we want a good many more to put us on our proper level with France; here are Two nearly finished, no doubt well built, fast sailors, and fitted as Rams...'⁷²¹ One Liverpool newspaper chided the seemingly indecisive Foreign Office, announcing that if the impasse over the Laird ships was to continue, the power would rest not in Westminster but with 'any shipowner in England to plunge the nation into war'.⁷²² That newspaper concluded with the call 'Just now we want a Cromwell, not a Russell'.⁷²³

On 28 September, the newly appointed Chief Constructor of the Royal Navy, Edward James Reed, reported to the Admiralty, the results of the

⁷¹⁸ TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', No. 101, dated 22 September 1863.

⁷¹⁹ Ibid.

⁷²⁰ Foreman, *A World on Fire*, (2010), 521.

⁷²¹ Fuller, *Clad in Iron*, (2008), 232.

⁷²² 'The Fleet and the Rams', *Liverpool Daily Post*, 15 September 1863, 5.

⁷²³ Ibid, 5.

interviews he had with the Lairds.⁷²⁴ Reed had met with William Laird and his father John Laird, M.P. on the 21st, 25th and 26th of that month to inquire if the two turret rams would be available for purchase by the British Government.⁷²⁵ The Constructor found the suspicious Lairds 'very reserved' at first but they soon let down their guard and indicated that the issue of French ownership of the two rams was 'apparently mere policy'.⁷²⁶ Work had again slowed on the ironclads due to the increased official interest in the ships, and Reed's inquiries revealed that the Lairds (and the Messrs. Bravay) would be interested in selling the armourclads to the Admiralty. This changed again by the time of his last meeting with John Laird and his son William on the 26th, as the shipbuilders apparently grew wary of Reed's insistent questionings.⁷²⁷ These meetings were likely the beginning of a rivalry and distrust between Reed and the Lairds that would come to the fore several years later, and would follow the two rams throughout most of their service lives.

Reed had been censured before the Commons on 27 February 1863, for his perceived insults written in a letter to a Member of Parliament.⁷²⁸ A controversy had occurred around his appointment as Chief Constructor, due in part to his reported inexperience in constructing warships.⁷²⁹ Laird had asked the Commons on 26 February, the day before the Constructor

⁷²⁴ TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', No.112, dated 28 September 1863, 76, Parkes, *British Battleships*, (1966), 82.

⁷²⁵ TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', No.112, dated 28 September 1863, 76.

⁷²⁶ *Ibid*, 76.

⁷²⁷ *Ibid*, 76-77.

⁷²⁸ *Hansard*, 27 February 1863, 169, cc 887, 888.

⁷²⁹ *Hansard*, 26 February 1863, 169, cc 798-802.

was brought before the bar in the House, to question why accounts in the Royal Dockyards had not been properly kept and had asked that Deptford be sold due to a lack of shipbuilding activity there.⁷³⁰ Several days earlier, Laird asked that work on Reed's broadside ironclad *H.M.S. Enterprise*, and on the *Royal Sovereign*, then fitting out with Coles revolving turrets, be pushed to early completion in order to test the benefits of each design.⁷³¹ Laird was not involved in his censure, but Reed was understandably wary of running afoul of an M.P. so deeply engaged in warship design and the affairs of the naval dockyards. Suspicion was the natural outgrowth of Reed's controversial start.

Following his September visits to Merseyside, the Chief Constructor reported to the Admiralty his views that the Birkenhead Iron Works had not made sufficient progress on the ironclad frigate *Agincourt* then building for the Royal Navy, due to the apparent work priority given to the two turret ships.⁷³² Reed would also criticize the Sheffield iron maker, John Brown & Company, for delaying work on Royal Navy warships, in order to export armour plate to the United States. To the Lairds, Reed likely seemed something more dangerous than a spy or a uniformed emissary from the Admiralty. He had the power to influence future contracts with the government or he could perhaps steer away new orders from would be foreign clients. With so much of their money undoubtedly tied in with the turret rams (the Constructor had told the Admiralty the 294 and 295 might have been undertaken as 'mere speculation' by the

⁷³⁰ Ibid, cc 834.

⁷³¹ *Hansard*, 23 February 1863, 169, cc 669, 700.

⁷³² TNA, FO 412/11 'Correspondence Respecting the Two-Ironclad Vessels Building at Messrs. Laird's Yard, Birkenhead', No.112, dated 28 September 1863, 77.

shipbuilders), the Lairds could not afford to confer too openly with the inquisitorial Reed.⁷³³

The Constructor highlighted the pros and cons of acquiring these ships for the Royal Navy in a confidential report to the Duke of Somerset, the First Lord of the Admiralty. In his report, Reed stated the iron cladding on the rams was less at the bow and stern than the armour fitted on British warships then building or in service, and the iron ribs were 'inferior in size and strength' compared to British armourclads.⁷³⁴ Although low in the water, the raised forecastle and poop would undoubtedly improve the seaworthiness of each vessel.⁷³⁵ Reed wrote the ships were 'formed sufficiently strong to render them sound, safe, and durable', and recommended the First Sea Lord consider the 'immediate' purchase of the two rams in order to add more ironclads to the British Fleet.⁷³⁶

Seizing the Ships

In early September, The Prime Minister wrote to Russell expressing his satisfaction with the move to detain the Laird rams and the ironclad building on the Clyde.⁷³⁷ Palmerston would later write (on 21 September) to his Foreign Minister, 'politically I appreciate it would be best that the

⁷³³ Ibid, 77.

⁷³⁴ TNA, ADM 1/5842, *Admiralty Correspondence*, 'Steam Rams on the Mersey', Letter written by James Reed, 17 September 1863, 4-5.

⁷³⁵ Ibid, 8-9

⁷³⁶ Ibid, 10-13.

⁷³⁷ TNA, PRO 30/22 'Private Correspondence. Lord Palmerston (P) Prime Minister to Lord Russell, (JR) Foreign Secretary', Volume 22, Letter dated 4 September 1863, 243.

South should have them' but he understood this would not occur.⁷³⁸

Palmerston knew the 'ships cased in iron were intended for warlike purposes' and he was waiting for the final excuse to seize them while avoiding a change to the Foreign Enlistment Act which would run afoul of Parliament.⁷³⁹ The Prime Minister suggested to Russell that the ironclads could best serve 'our own interests' in a harbour defence role in British ports.⁷⁴⁰

The excuse came in the form of story likely spun by Union informants regarding the discharged crewmen from the *Florida* preparing a plan to hijack the *El Tousson* on her trial run.⁷⁴¹ The renewed desire by the builders to send their nearly completed *294* on a short run just beyond the entrance to the Mersey presented a hazard which could not be ignored. On 8 October 1863, the Admiralty sent a coded telegram to Captain Edward A. Inglefield commanding the ship-of-the-line *H.M.S. Majestic*, anchored in the river, with instructions to support the Customs officers after they had received orders to seize the two ironclads.⁷⁴² The following day, George A. Hamilton of H.M. Treasury, informed Lairds that threat of

⁷³⁸ Ibid, letter dated 21 September 1863, 258-259

⁷³⁹ Ibid, letters dated, 23 August 1863, 239-240, 4 September 1863, 243

⁷⁴⁰ Ibid, letter dated 21 September 1863, 258,259.

⁷⁴¹ TNA, F.O. 881/1200, 'United States: Corres. Iron-Clad Vessels Building at Messrs. Laird's yard Birkenhead', Part 1. Feb.-Oct 1863, 100-101, LOC, 'Correspondence Between Her Majesty's Government and Messr. Laird Brothers Relative to the Iron-Clad Rams', *United States Serial Set*, Number 1397, Senate Executive Department No. 11, Volume 4, 41st Congress Appendix No.XIII, (Washington,1869), 264.

⁷⁴² TNA, F.O. 881/1200, 'United States: Corres. Iron-Clad Vessels Building at Messrs. Laird's yard Birkenhead', Part 1. Feb.-Oct 1863, 100-101.

'forceable abduction' of one or both of the rams could not be overlooked; therefore, the ships were seized by Customs officials.⁷⁴³

Inglefield ordered a gunboat moved up to the 'Great Float', the entrance gate from the fitting out basin to the Mersey, a well-armed guard boat patrolled the area at night, and a detail of twelve Marines under the command of an officer, was placed on board the *El Tousson*.⁷⁴⁴ The workmen were sent ashore with their tools and no one was permitted aboard other than the Marine guard.⁷⁴⁵ The *El Monssair* was not the focus of attention as she did not have masts, sails, funnel or rudder fitted.⁷⁴⁶ One American magazine quoted a poem from *Punch* entitled 'The Ram of Liverpool', the conclusion of which proclaimed:

*They said he was going to Egypt,
At least so his owners states,
But suppose he mistook the turning,
And made for Davis's straits.
I think that an honest drover
Might prove where he'd made a sale,
And not come smoothing us over
With a cock and bullish tale.
And I think that Policeman Russell,
Who to keep the peace is bound,
Has used a wise discretion
In clapping the Ram in the Pound'.⁷⁴⁷*

⁷⁴³ LOC, 'Correspondence Between Her Majesty's Government and Messrs. Laird Brothers Relative to the Iron-Clad Rams'. *United States Serial Set*, Number 1397, Senate Executive Department No. 11, Volume 4, 41st Congress Appendix No. XIII, (Washington, 1869), 264.

⁷⁴⁴ TNA, F.O. 881/2006, 'Foreign Office Confidential Print, United States: Corres. Iron-Clad Vessels Building at Messrs. Laird's yard Birkenhead', 1863-1864, 89, 119.

⁷⁴⁵ 'The Confederate Rams in England', SA 9 (28 November 1863), 343.

⁷⁴⁶ 'Capture of Mr. Laird's Iron Rams', *Dundee, Perth, and Cupar Advertiser*, 3 November 1863, 8.

⁷⁴⁷ (No Author), 'The Ram of Liverpool', *Living Age*, 79, 1019, 12 December 1863, 528.

The Laird rams, and ironclads in general had acquired a reputation for near invincibility, with the *Scientific American* wryly commenting, ‘The majesty of the law must be the real safeguard: setting a wooden ship to “guard” a ram is like putting a sheep to protect a bulldog’.⁷⁴⁸ The Admiralty felt the precautions were not enough and ordered the recently commissioned ironclad *H.M.S. Prince Consort* to the Mersey to watch over the Laird rams.⁷⁴⁹ The lumbering broadside ironclad, converted from a 91-gun ship-of-the-line while still on the builder’s ways, was the only British ironclad available for immediate duty and was dispatched from Plymouth with a newly assigned crew on 28 October.⁷⁵⁰ The men were temporarily detailed to the ironclad from other ships in dockyard; only the Chief Engineer and the Warrant Officers had been on the ship longer than three days, and no one aboard had experience on the *Prince Consort* in a variety of weather conditions.⁷⁵¹

En route to the Mersey, the armoured frigate encountered a severe gale in the Channel and Irish Sea. The new ironclad struggled against the waves as she began to take water down both her hatchways and the bases of the funnel casings when seas washed over her upper deck. As the huge waves broke over the bows of the ironclad, her main (steam) pump failed, and the ship was in danger of foundering. Her captain knew he could not reach the safety of Liverpool in the face of that storm, and turned instead for Ireland as the ship’s company worked the manual

⁷⁴⁸ ‘The Confederate Rams in England’ *SA* 9 (28 November 1863), 343.

⁷⁴⁹ Ballard, *The Black Battlefleet*. (1980), 121.

⁷⁵⁰ *Ibid*, 121, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 237, ‘The Disaster to the *Prince Consort*’, *Dublin Evening Mail*, 31 October 1863, 2.

⁷⁵¹ Ballard, *The Black Battlefleet*. (1980), 121.

pumps. The crew kept to their stations and the stokers were barely able to keep the pressure up in the boilers as the water rose to their knees. It was a close run escape, and when the people of Britain learned their overdue ironclad had not sunk as was feared, Queen Victoria sent a congratulatory telegram to the officers and men of the *Prince Consort*.⁷⁵² Afloat, but still the worse for wear, the ironclad was not to proceed to the Mersey but, on 5 November, departed Ireland for immediate repairs at the Devonport dockyard.⁷⁵³

Legal manoeuvres continued between the government and the shipbuilders, with Lairds anxious to finish the ships and the other determined to prolong a resolution. Lairds wrote to the Treasury on several occasions to protest the 'arbitrary' seizure of their vessels and pressed for permission to take the *El Tousson* on a trial run.⁷⁵⁴ On 27 October, the Treasury responded to the builders stating they could not take their ironclad out that week 'or within any other suitable time'.⁷⁵⁵ Two days later Lairds answered with an attempted explanation of their secrecy concerning the rams:

'It is a rule well recognized in all Trading Establishments, that an Order whilst under Execution is the property of the person giving it, and that a builder has no right to make public the orders or instructions of his employers. This is a rule of business which must be well known to H.M. Government. We are satisfied that Her

⁷⁵² Ibid, 122.

⁷⁵³ 'Departure of the Prince Consort for Devonport', *Dublin Evening Mail*, 5 November 1863, 2.

⁷⁵⁴ LOC, 'Correspondence Between Her Majesty's Government and Messr. Laird Brothers Relative to the Iron-Clad Rams'. *United States Serial Set*, Number 1397, Senate Executive Department No. 11, Volume 4, 41st Congress Appendix No. XIII, (Washington, 1869), 264.

⁷⁵⁵ Ibid, 266.

*Majesty's Government have lent too credulous an ear to the inventions of designing persons*⁷⁵⁶

Not content to let the matter lie with their opinion of rumours about their turret ships, Lairds warned: 'We need hardly say that we hold the government responsible to us for the large pecuniary loss we shall sustain by these arbitrary proceedings'.⁷⁵⁷

Squabbling over the fate and condition of the rams continued for months. Worsening weather damaged the two unfinished ironclads, now anchored in the Mersey.⁷⁵⁸ On 7 December, Lairds wrote to inform the Treasury that an insurance policy covering fire aboard the *El Tousson* had expired and the shipbuilders asked for advice regarding the payment of insurance protection for the vessels while in government custody.⁷⁵⁹ On the 18th, the Treasury replied saying that the insurance on the two vessels would be paid by the government with the provision that after the fate of the ships was adjudicated, the costs of the insurance would be reimbursed to the public purse.⁷⁶⁰

The case of the Laird rams was finally resolved on 20 May 1864, when Bravay & Company accepted the offer of H.M. Government to purchase the two ships for service in the Royal Navy.⁷⁶¹ The price for the

⁷⁵⁶ TNA, TS 25/1285, 'IRON CLAD SHIPS: Vessels under seizure: To Determine their Destination and Ownership', letter dated 29 October 1863.

⁷⁵⁷ Ibid.

⁷⁵⁸ LOC, 'Correspondence Between Her Majesty's Government and Messrs. Laird Brothers Relative to the Iron-Clad Rams'. *United States Serial Set*, Number 1397, Senate Executive Department No. 11, Volume 4, 41st Congress Appendix No. XIII, (Washington, 1869), 270.

⁷⁵⁹ Ibid, 270

⁷⁶⁰ Ibid, 271.

⁷⁶¹ TNA, F.O. 881/2006, 'Foreign Office Confidential Print, United States: Corres. Iron-Clad Vessels Building at Messrs. Laird's yard Birkenhead', 1863-1864, 171.

incomplete ironclads, having spent months floating on the Mersey, was £195,000 with another £25,000 to be paid to Lairds to complete the ships to planned specifications existing prior to the seizure.⁷⁶²

The purchase provided a two-fold benefit by diffusing a growing American crisis, and prevented France from obtaining a numerical advantage in armoured warships. The Laird ironclads were not purchased for the 'wrong reasons', but were acquired to resolve two pressing strategic issues simultaneously.⁷⁶³ Thus, the ships were acquired 'for prudent reasons', and Britain would fit out two modern men-of-war during a time of rapid industrial change, while also preventing disruption to a key shipbuilding facility.⁷⁶⁴ Although Reed had suggested the 'immediate' purchase of the two rams, their belated acquisition by the British treasury added two powerful but untested armourclads to the Royal Navy.⁷⁶⁵ Britain had avoided a breach with the United States over the feared Confederate procurement of these ships, and the Royal Navy acquired two hybrid turret ironclad rams. Although initially, the British fleet had 'no really useful role' for the two Laird armourclads, the Admiralty would spend decades trying to find a suitable role for them.⁷⁶⁶ That quest would help advance the role of the turret ship in the Royal Navy, while through trial and error, they would eventually fit into a crucial defensive niche.

⁷⁶² Ibid, 171.

⁷⁶³ Archibald, *The Fighting Ships in the Royal Navy AD 897-1984*. (1984), 111.

⁷⁶⁴ 'The use of armour in the Royal Navy, *Hampshire Telegraph*, 30 January 1886, 2.

⁷⁶⁵ TNA, ADM 1/5842, *Admiralty Correspondence*, 'Steam Rams on the Mersey', Letter written by James Reed, 17 September 1863, 10-13.

⁷⁶⁶ Archibald, *The Fighting Ships in the Royal Navy AD 897-1984*. (1984), 111.

CHAPTER THREE

Technological Advances and Failings: The Laird Rams in Service 1865-1880

The completion and commissioning of the Laird ironclads in the autumn of 1865, provided the Royal Navy with two distinctive, but untested armoured men-of-war, built during a time of rapid and almost contradictory change. They were warships that attempted to establish a mixture of defensive and offensive capabilities that would define the ideal warship of the mid-nineteenth century. It was a time when technological inventions were perfected and adapted 'rather suddenly' to introduce 'new dimensions to the conduct of naval warfare'.⁷⁶⁷ Steam propulsion, iron construction, and ever increasing ordnance power marked this time of 'revolutionary' changes in naval might, so much so, that the warship became, as William Ashworth states, 'virtually a new commodity'.⁷⁶⁸

The purchase and completion of the Laird turret ships allowed Britain a further numerical advantage over her European rivals during the transition from wooden ships-of-the-line to armoured warships. The need to strengthen the fleet against a French ironclad building program was pressing, as the armoured frigates of the Royal Navy were not entering active service in enough numbers to give Britain the decisive superiority it needed. Some in London feared that a contest of ironclads in the Channel would be 'an unequal one for the English Fleet'.⁷⁶⁹ The Laird turret ships gave Britain a slight edge over their French rivals and against a

⁷⁶⁷ Lautenschlager, 'Technology and the Evolution of Naval Warfare' *International Security*, 8, (fall, 1983), 7.

⁷⁶⁸ 'A Naval Revolution', *Reynolds's Newspaper*, 9 November 1873, 2, William Ashworth, 'Aspects of Late Victorian Naval Administration', *The Economic History Review*, 22, (Dec., 1969), 494.

revitalizing naval threat from Russia. Palmerston considered the rams could prove useful in any fight against the Czar as they could 'run down and sink the Russian ships in the Black Sea if need were'.⁷⁷⁰

Reed remarked in the late 1860s that the Laird rams were considered perhaps the poorest examples of British armoured vessels. This view was framed by the Constructor's earlier comments in a letter to the First Lord of the Admiralty in which he stated that he would not 'propose the building of exactly such ships as these'.⁷⁷¹ Constructed for a power deprived of the wherewithal of building seagoing ironclads, the Laird rams did not fit into a tailor-made niche for the Royal Navy. As stated, they were valuable additions to the armoured squadrons of the Royal Navy, but were poorly adapted to a blue water role.⁷⁷² Britain established a precedent in acquiring these armoured warships designed and intended for a foreign buyer. London would seize other armoured men-of-war in times of crisis from British shipbuilders before they steamed off under a foreign flag, from the example set by the acquisition of the two Confederate-intended rams built on the Mersey. The seizure, purchase, and completion of the Laird rams also provided Britain with the first purpose-built turret ships to be commissioned in the Royal Navy.⁷⁷³

Historians credit the *H.M.S. Prince Albert* as the first true, keel-up British turret ship, but this is misleading. The *Prince Albert* was the first purpose-built turret ship *ordered* by the Royal Navy; however, she was not commissioned until 1866.

⁷⁶⁹ Baxter, *The Introduction of the Ironclad Warship*. (2001), 319.

⁷⁷⁰ Sandler, *The Emergence of the Modern Capital Ship*. (1979), 188, 294. Palmerston wrote this in a letter to First Lord of the Admiralty, the Duke of Somerset, in mid-September 1863, before the rams were seized.

⁷⁷¹ TNA, ADM 1/5842, *Admiralty Correspondence*, 'Steam Rams on the Mersey', Letter written by James Reed, 17 September 1863, 14.

⁷⁷² Reed, *Our Iron-clad Ships*. (2011), 96.

Therefore the distinction must go to the first of the Laird rams, *H.M.S. Scorpion*.⁷⁷⁴ Overshadowed by the *Warrior*, *Alabama* and the tragic *Captain*, the Laird rams were innovative designs on a compact hull. Built to the specifications of a foreign customer and intended for a contest against a numerically superior enemy, they never saw combat but they deserve more attention than they have received after 1865.

This chapter will survey the details of the first years of the Laird rams while in service with a Royal Navy adapting to the new and unfamiliar features associated with ironclad warships. A secondary aspect of this chapter will focus on the challenges imposed by the technological and operational changes associated with finding a suitable role for these armourclads.

Ships Trials

Both Laird-built ironclads were placed in service with the Royal Navy in the autumn of 1865, with the *H.M.S. Scorpion* commissioned first and the second ram placed in commission as *H.M. S. Wivern* in October of that year.⁷⁷⁵ The *Scorpion* had her initial run on 30 August 1864, with the British press reporting that 'her machinery worked with great smoothness' and she lacked the vibration usually associated with screw-driven ships.⁷⁷⁶ The results were measured from her initial test runs from Birkenhead and the reports were optimistic as they recorded her performance at her highest speed before she had been fitted with

⁷⁷³ Parkes, *British Battleships*, (1966), 78.

⁷⁷⁴ *Conway's All the World's Fighting Ships 1860-1945*. Editor Roger Chesneau, (London, 1979), 19-20.

⁷⁷⁵ Baxter, *The Introduction of the Ironclad Warship*. (2001), 320- 321.

⁷⁷⁶ 'Trial of Her Majesty's Turret Ram *Scorpion*', *Manchester Courier and Lancashire General Advertiser*. 31 August, 1864, 3.

her guns, stores or a full load of coal. It was also stated that the ironclad would draw about another foot of water when fully loaded (13 feet forward, 14 feet 9 inches aft during trials) and although the screw would be more deeply immersed, it was felt this would not affect the speed noticeably. This proved to be untrue as her best speed dropped from 12.34 knots to 10.5 when commissioned.⁷⁷⁷

The *Wivern* had her trial run from Birkenhead on 8 June 1865, and reached a speed of slightly more than 10½ knots. It was estimated that she would reach a top speed of 11½ when the engines were put in order at the builders' yard.⁷⁷⁸ It was not to be, as she too lost speed when fitted out and she only reached slightly more than 10 knots when commissioned.⁷⁷⁹ Fitted with three masts, sails would assist (in theory) the steam engines on long voyages as the ships carried an area of sail that was considered ample or in the case of the second of the class, 'unusually large' for ships of this small size.⁷⁸⁰ The *Scorpion* was praised for her 'handiness' but when the engines were stopped and sail utilized as the only motive power, the ships were hard to control as they steered 'anywhere'.⁷⁸¹

Helm control was a factor when at 3: 40 a.m. on 23 March 1865, the *Scorpion* collided with the merchant ship *Theresa Titiens* while the ironclad was steaming south of Holyhead, en route for her first stop at Plymouth.⁷⁸² The wooden merchant vessel reported damage to her port side when a steamer brushed into

⁷⁷⁷ Ibid, 3. 'H.M.S. Scorpion', *Hampshire Advertiser*, 25 March 1865, 8, Reed, *Our Iron-clad Ships*. (2011), 96.

⁷⁷⁸ 'Trial Trip of H.M.S. Wivern', *Manchester Courier and Lancashire General Advertiser*. 10 June, 1865, 11. She would require further work on her engines after she left Birkenhead on her first commission. See: ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

⁷⁷⁹ Reed, *Our Iron-clad Ships*. (2011), 96.

⁷⁸⁰ Parkes, *British Battleships*. (1966), 80, 'H.M.S. Wivern, Double-Turreted Iron-Clad [sic] Steam-Ram', *ILN*, 16 December 1865, 594.

⁷⁸¹ 'H. M. Turret-Ships Wivern and Scorpion', *Illustrated Times*, 4 November 1865, 282.

her, staving in a portion of her hull. The *Scorpion* stopped engines, furled sails, hung out lights and waited for any sounds from a sinking ship, but none were reported in the dark night. Although aboard the *Titiens*, planking was torn and some of the rigging carried away, the armoured vessel did not escape unscathed in the encounter. The merchantman luckily did not contact the dangerous ram extending from the bow of the *Scorpion*, yet the turret ship was 'bruised' with six feet of her forecastle stove in. Unable to locate the other damaged ship, both vessels continued their voyages and arrived in their respective ports, dented, scratched and torn but without the loss of any crewmen.⁷⁸³

The ram sailed south in an incomplete condition due to a separate mishap involving a government supply vessel, and the *Scorpion* was to be completed when she arrived at Portsmouth. Although the slides for her guns were carried in her two turrets, no armament was shipped. In late February of 1865, the ordnance steamer *Balaclava* (mistakenly identified in the British press as the *Lord Panmure*) transporting the four, 12-ton guns intended for the ironclad, went ashore on the eastern coast of Ireland.⁷⁸⁴ As the *Scorpion* steamed south (manned by a temporary crew from the screw ship-of-the-line, *H.M.S. Donegal*) without her guns, a recovery gang from *Prince Consort*, the one-time intended guard ship of the rams, was dispatched from Plymouth to haul up the

⁷⁸² 'The Collison with the Scorpion', *Cheshire Observer*, 1 April 1865, 7, 'Collison with the Scorpion', *Manchester Courier and Lancashire General Advertiser*. 30 March, 1865, 2.

⁷⁸³ 'The Collison with the Scorpion', *Cheshire Observer*, 1 April 1865,7, No Subject, *Sheffield Daily Telegraph*, 31 March 1865, 2, 'Collison with Her Majesty's Ship "Scorpion"', *Hampshire Telegraph*, 1 April 1865, 4.

⁷⁸⁴ 'Accident to the Screw-Steamer Balaclava', *Belfast News-Letter*, 25 February 1865, 3.

ordnance.⁷⁸⁵ The guns were recovered but had to be forwarded to Woolwich Arsenal to be examined and refurbished.⁷⁸⁶

The gun carriages were a point of contention between those who favoured turret ships and those who supported the broadsides of the central battery ironclads. The *Royal Sovereign* received wooden carriages for her guns while Reed's small ironclad *H.M.S. Research*, received more durable iron models.⁷⁸⁷ Other ships preparing to enter service (including Reed's corvette *H.M.S. Pallas*) were given priority for iron carriages.⁷⁸⁸ The *Scorpion* received obsolete wooden carriages of 'very defective' manufacture and the *Wivern's* turrets were unbalanced and their revolutions impaired when iron was loaded in her turrets to simulate the guns and carriages she would eventually receive.⁷⁸⁹

The second Laird ram was delayed joining the fleet due to a lack of suitable gun carriages. Woolwich Arsenal experienced delays due to the recent adoption of the 'novel invention' of iron carriages, and struggled to manufacture the new gun mounts 'as rapidly as the strength of that establishment admits'.⁷⁹⁰ The delay frustrated the attempts by the Admiralty to outfit the Laird turret ships, with chains and blocks required for the *Scorpion's* guns, and the armament and fixtures for the *Wivern*.⁷⁹¹ Admiralty and War Office officials exchanged letters during the summer and autumn of 1865 regarding the armament for the second

⁷⁸⁵ Ibid, 3, 'Miscellaneous', *North Wales Chronicle*, 25 March 1865, 2, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 189.

⁷⁸⁶ 'Departure from the Mersey of the Ram Scorpion', *Liverpool Mercury*, 20 March 1865, 7.

⁷⁸⁷ 'Turret Ships', *London Evening Standard*, 11 November 1865, 5.

⁷⁸⁸ TNA, WO 55/2182, Records of Ordnance Office, Portsmouth, 'No.7 Minute Book' May to November 1865, 477.

⁷⁸⁹ 'Turret Ships', *London Evening Standard*, 11 November 1865, 5, 'Naval and Military News', *Hampshire Telegraph*, 16 October 1869, 4.

⁷⁹⁰ *Hansard*, 13 June 1867, 187, 1790, 1811-1812.

⁷⁹¹ TNA, WO 55/2182, Records of Ordnance Office, Portsmouth, 'No.7 Minute Book', May to November. 1865'. 110, 326.

Laird ram with the timbre changing from 'as soon as convenient' to one that 'demanded' the gun carriages be supplied.⁷⁹² The completion of the armament for *Wivern* was delayed as she did not have her guns, carriages, shot, and shell from Woolwich aboard until early 1866.⁷⁹³ Finally, on 29 December 1865, the ordnance steamer *Lord Panmure* departed her wharf at the arsenal, loaded with four wrought iron gun carriages and a supply of shot and shell for the four, steel-lined RMLs to be installed on the *Wivern*.⁷⁹⁴

In the mid-1860s, the Royal Navy struggled with the War Office to supply the armament to all ships entering commissioned service. Guns were available, but the necessary accoutrement were sometimes lacking. The supply of adequate gun carriages continued to hamper Navy readiness as the *Liverpool Daily Post* commented: 'We are not deficient in the pieces themselves as far as the fleet is concerned, but we want a sufficiency of iron carriages or, indeed, of any carriages, to support the shock of firing from very heavy ordnance'.⁷⁹⁵ Rifled heavy guns, stout carriages, shot and shell were part of the myriad issues effecting the ever-changing shape and makeup of ships of the Royal Navy during the transitional years away from sail to the armoured all-steam warship.

The *Wivern* had the distinction of being the first ship in the navy to receive tripod masts which were to improve the arch of fire for the guns by substituting the hollow iron legs in place of the numerous stays and shrouds which would have further restricted the training of the guns.⁷⁹⁶ The masts offered a means to

⁷⁹² Ibid, 142,152, 269.

⁷⁹³ Ibid, 384, 544.

⁷⁹⁴ 'Trial Trip of Her Majesty's Ship *Wivern*', *London Evening Standard*, 6 October 1865, 3, No Subject, *Hampshire Advertiser*, 30 December 1865, 12.

⁷⁹⁵ 'Naval Armaments', *Liverpool Daily Post*, 25 September 1867, 10.

⁷⁹⁶ 'Trial Trip of H.M.S. *Wivern*', *Manchester Courier and Lancashire General Advertiser*. 10 June, 1865, 11.

work the topsails and halyards without having to send men aloft as lines passed down through the masts to positions below decks.⁷⁹⁷ The iron masts also offered a reported advantage. They were hollow iron tubes and served as a type of ventilator for the lower decks. Later ships used lower iron masts as ventilators but those masts were seen as a fire hazard as they created an updraught which would have unintentionally fueled a major fire if one broke out below decks.⁷⁹⁸

On the rams, the iron masts would also sink when shot away and not float with rigging trailing behind to risk fouling the single screw during a fight.⁷⁹⁹ Although the *Scorpion* was not fitted with tripod fore and main masts, both ships suffered the limiting factor of turrets on a fully-rigged ship. The *Scorpion* would have to shoot away much of her lower rigging when the guns were brought into action during combat, in order to train the weapons against a moving target. The *Wivern* did not have the same burden of rigging, but the iron legs of the masts still inhibited the guns so much that her captain opined they would have to be shot away to provide an adequate arc of fire during action.⁸⁰⁰ The British press even acknowledged this inevitability: 'should it ever be found necessary in time of war to clear the decks and give both ships their true monitor form, a few powder discharges from the turret guns would speedily effect the desired metamorphosis'.⁸⁰¹

⁷⁹⁷ 'The Birkenhead Rams, Scorpion and Wyvern [sic]', *Manchester Courier and Lancashire General Advertiser*. 12 September, 1865, 4.

⁷⁹⁸ Ibid, 4, David K. Brown, *Warrior to Dreadnought: Warships Design and Development 1860-1905*. (Barnsley, 1997), 68.

⁷⁹⁹ 'The Birkenhead Rams, Scorpion and Wyvern [sic]', *Manchester Courier and Lancashire General Advertiser*. 12 September, 1865, 4.

⁸⁰⁰ TNA, ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern',

⁸⁰¹ 'H. M. S. Wyvern [sic]', *Liverpool Daily Post*, 10 October, 1865, 10. Of course the forecastle and poop decks would also have had to have been removed to permit all-around fire.

Sighting the two guns in each turret could be archived through three small open hatches for the gunner to 'pop his head through' on the turret roof.⁸⁰² The sides and rear of these sighting ports were protected from small arms fire by 'iron bonnets' fitted over the openings. The turret arrangement was proven during the trials and 'the facility with which it was worked was admirable, even with an untrained crew'. The rams offered an advantage as their low silhouettes, only four feet, six inches above the waterline (amidships) when the bulwarks were lowered, presented targets that would be difficult to hit.⁸⁰³ Furthermore, one writer ventured to speculate they would become very difficult to see if painted slate grey like the earlier blockade runners that steamed into the Confederate ports during the Civil War.⁸⁰⁴ Some French harbour defence vessels were also painted this colour in order to complicate enemy gunnery at longer ranges.⁸⁰⁵

The ironclads of the Royal Navy were painted black with white upper works, black or buff funnels, and the masts and yards were usually painted either a bone or a red brick colour. Illustrations and photographs of the Laird rams in the middle to late 1860s show them in this prescribed blend of pigment, complete with a thin white stripe or 'Boot-top' running fore to aft midway along the hull.⁸⁰⁶ The ironclads of the Royal Navy were not camouflaged or obscured; they were painted to be seen. One historian noted the uniformity of the livery schemes gave their black hulls 'a fearsome and sinister' look.⁸⁰⁷

⁸⁰² 'The Laird Rams', SA, Volume 10, 1 October 1864, 224.

⁸⁰³ Ibid, 224.

⁸⁰⁴ 'The Birkenhead Rams, Scorpion and Wyvern [sic]', *Manchester Courier and Lancashire General Advertiser*. 12 September, 1865, 4.

⁸⁰⁵ Ibid, 4.

⁸⁰⁶ Ballard, *The Black Battlefleet*. (1980), 21, USNHC Photo #NH 52526, 'H.M.S. Wivern At anchor in the Hamoaze River, off Plymouth, England, in 1865', 'Armour-Plated Iron Turret Ship, The Scorpion', *Illustrated London Almanack for 1869*, 34.

⁸⁰⁷ C. I. Hamilton, 'The Victorian Navy', *The Historical Journal*, 25, (Jun., 1982), 479.

Appearance was not the only consideration, for in iron ships, rapid deterioration would result from exposure to salt water and air. Paints had to be durable and elastic enough to withstand the elements, and the movement of the hulls, upper works, masts, etc. especially while underway. Paints adopted from those mixed for houses or wooden ships were not suitable throughout an iron ship, as lead based paints were electrically conductive around the positions where copper and iron were near each other, particularly near the lower hull plates, for these properties contributed to a rapid decay of the iron at those points.⁸⁰⁸ Ship painting remained an inexact science for decades as different potions were mixed to provide properties suitable for iron and later steel vessels. Men assigned to coat a ship were exposed to inhalation risks from the noxious mixtures and many succumbed to 'painter's colic'.⁸⁰⁹ Fast drying paints were needed to get a ship out of dockyard as quickly as possible, and when used in poorly ventilated interior spaces, like coal bunkers, the workmen were known to suffer 'bleeding from the nose and ears and temporary dementia'.⁸¹⁰

When preparing to fire the guns, the moveable bulwarks on the Laird rams would pivot from a hinge positioned on the lower edge of the iron shield and attached to the deck.⁸¹¹ Other turret ships were similarly fitted with the iron bulwarks resembling a reverse capital letter 'L'.⁸¹² The bulwarks were supported by two stanchions on a base plate and were inclined inboard at a slight angle of

⁸⁰⁸ Adrian Jarvis, 'Protection and Decoration: A Tentative Investigation into Painting Ships Before the Great War', *The Great Circle*, 22, (2000), 24, 25, 27.

⁸⁰⁹ Ibid, 27, 32, 36,

⁸¹⁰ Ibid, 26, 33.

⁸¹¹ Ballard, *The Black Battlefleet*. (1980), 215, 217.

⁸¹² Ibid, 215.

approximately 10 degrees.⁸¹³ With one edge fixed to the two-inch thick bulwark, the other was secured to a base plate which was in turn, either secured by 'pins' or when removed, freed from the deck. When clearing away, a few men could rotate the movable iron walls over the ship's side where they would hang slightly above the waterline.⁸¹⁴

Other design features provided advantages but also highlighted unintended and sometimes related shortcomings. The three bladed 14-foot propeller enabled the *Scorpion* to answer her helm with a quickness which was regarded as 'remarkable'.⁸¹⁵ The official reports on the Laird rams revealed different performance results than those listed in the press. Under sail, the *Scorpion* performed 'as well as can expected for her small sail power'. The three bladed screw was a clear detriment when not steaming, as the small rudder also contributed to the ship steering 'wildly' when under sail alone or at low speed. She had to have 3 to 4 knots from the screw to enable the ship to answer the helm.⁸¹⁶ The direction the ship was to turn was likely also an issue, as the rotation speed of the screw determined the amount of water washed against the rudder. Some ships of this era turned better when the rudder was at port, as a right-handed screw with an ample pitch would churn more water over the ported rudder than to starboard.⁸¹⁷ This factor undoubtedly influenced the performance of the Laird rams at low speed with a screw designed to rotate to the right.⁸¹⁸

⁸¹³ NMM, Ship Plans, 'Devonport Yard, 'Wivern'', Curator 14142, Box 101. Each stanchion resembled an elongated capital letter 'A' placed on end.

⁸¹⁴ Ibid, 'The Royal Sovereign', *Western Daily Press*, 11 November 1864, 3, 'The Volunteer Review at Dover: View of Dover from the Sea-The Naval Squadron Attacking the Forts', *ILN* 10 April, 1869, 356, 357.

⁸¹⁵ 'The Laird Rams', SA, Volume 10, 1 October 1864, 224.

⁸¹⁶ TNA, ADM 53/9512, *Ship's Log H.M.S. Scorpion*, 2 December 1868-31 December 1869

⁸¹⁷ Ward, *Steam for the Million*. (1860), 117.

⁸¹⁸ 'H. M. S. Wyvern [sic]', *Liverpool Daily Post*, 10 October 1865, 10.

The *Scorpion* (and likely her sister) had a rudder of slightly under 17 feet 5 inches, and experience was to prove that armoured warships needed larger rudders to offset the rotations of the screw(s) and hull weight.⁸¹⁹ This was not a new phenomenon, as some of the post-Crimean War wooden-hulled steam battleships were built with longer hulls for larger machinery spaces. These vessels gave the Royal Navy ships-of-the-line higher speeds, but at the expense of rudder control caused in part by the drag from the screw propeller.⁸²⁰ The steam line-of-battle ships were fitted with a 'banjo' frame whereby the screw could be uncoupled from the shaft and hoisted inboard during sailing. Despite this ability to disconnect and pull in the screw, those steam battleships with finer hull lines did not perform as well under canvas as their earlier companions in the fleet. Some of the ships-of-the-line converted to steam also suffered in performance as they had a tendency to roll after being retrofitted with engines.⁸²¹

In light of these facts, the performance of the Laird rams should be examined with the performance not only of other ironclads, but with other steam warships. For most advantages gained regarding iron construction, heavier guns, steaming qualities, etc., other qualities were sacrificed. This typically meant that steering (especially under sail alone) suffered, and other unforeseen drawbacks were manifested in seakeeping and fuel consumption. Reed had remarked in 1863, that her rig was 'very satisfactory', but this preliminary assessment of the masts

⁸¹⁹ R. F. Scheltema de Heere, 'The Prins Hendrik Der Nederlanden' *The Mariner's Mirror*. Volume 17, (Cambridge, 1931), 51.

⁸²⁰ Andrew Lambert, *Battleships in Transition: The Creations of the Steam Battlefleet 1815-1860*. (London, 1984), 55, 58.

⁸²¹ *Ibid*, 63, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 182, 184, 187, *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill, (London, 1992), 183.

and sails of the *Scorpion* did not hold up to performance at sea.⁸²² A ship which might be a good cruiser usually had to sacrifice some aspects of performance to achieve a different set of compromises required of a sea going warship needed at different stations of the globe. This world ranging capability generally came at the cost of a deep draft, a lack of armour, and a larger crew.

When steaming, the *Scorpion* performed well 'for her horsepower'.⁸²³ The main drawback of the first Laird ram was identified while underway, as she 'rolls very deeply when there is any sea on the beam, which causes her to ship large quantities of water'.⁸²⁴ Flat-bottomed and without a deep keel, the Laird rams had the ability to approach closer to a hostile shore while presenting a low hull profile, but this came at the cost of seaworthiness while underway off the coasts of Britain. Steaming showed the best qualities of the *Scorpion* under ideal conditions. She spent the last three months of 1865 on Home Station where her captain observed 'she behaves very well at sea and her engines are very effective and good, driving the ship in a head sea remarkably well. A heavy head sea and strong head wind do not seem to affect her much'.⁸²⁵ A design feature which restricted the field of fire fore and aft, the forecastle and a poop, improved the rams' performance while underway. Her first captain noted that the forecastle kept the ship relatively dry and 'the ship rises easily and buoyantly at

⁸²² TNA, ADM 1/5842, *Admiralty Correspondence*, 'Steam Rams on the Mersey', Letter written by James Reed, 17 September 1863, 13. Reed did not specifically mention which ship he was referring to regarding rigging and masts, but the 294 had masts and yards nearly ready by that time, whereas the 295 was a recently launched hull, devoid of masts and most topside fittings.

⁸²³ TNA, ADM 53/9512, *Ship's Log H.M.S. Scorpion*, 2 December 1868-31 December 1869.

⁸²⁴ *Ibid.*

⁸²⁵ TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*, See: TNA, ADM 1/5842, *Admiralty Correspondence*, 'Steam Rams on the Mersey', Letter written by James Reed, 17 September 1863, 13. Reed remarked the engines of the Laird rams were well designed, well made and were 'in no way inferior, in my opinion, to the engines of like power in the Royal Navy'.

sea'. She could shrug off a head sea, but waves amidships deluged the vessel between the turrets. The *Scorpion's* commanding officer noted that it was 'dangerous' for the men to work the ship under these conditions as the water washed across the deck.⁸²⁶

The *Wivern* had the most problems of the two sister armourclads, as her trials revealed a tendency for the main shaft bearing to heat 'considerably' when she was at full speed, but she performed satisfactorily when slowed to 50 revolutions per minute. This defect was not corrected until a new main shaft was put in during her first visit to Portsmouth dockyard.⁸²⁷ Her turrets also did not operate as planned. The rollers did not distribute the weight of 180 tons of iron ballast substituted for the yet to be mounted armament (1865) and as a result, the turret could only be worked 'with difficulty and great labour'.⁸²⁸ Also the turret sills were only five inches above the deck and this lack of height exposed the ships to the risk of flooding the turret room and magazines unless corrected.⁸²⁹ Here the advantage offered by a low gun platform, with the base of the turret below deck, was also a drawback. Unlike the American monitors, with their turret bases above deck, the Laird rams also had to contend with the disadvantages of a low turret on a low hull.

Like her sister, the *Wivern's* deck was only four feet seven inches above the water at the gangway when her armoured bulwarks were down. The low hull exposed the ship to flooding not only at the turret sills, but also the hatchways whose lack of height above the deck was termed 'a very serious defect' on a later

⁸²⁶ TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*,

⁸²⁷ ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

⁸²⁸ Ibid, 'H.M. Turret-Ships Wivern and Scorpion', *Illustrated Times*, 4 November 1865, 282.

⁸²⁹ ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

cruise.⁸³⁰ A heavy sea on the beam caused a great deal of water to be shipped aboard the rolling rams and undoubtedly held aboard longer than the scuppers could clear away while the bulwarks or 'flaps' were up.⁸³¹ In essence, the moveable bulwarks kept some water out and held some water in depending on the sea and the position of the ship. The *Scorpion* and *Wivern* proved to be uncomfortable and flawed ships, but they were the seagoing turret ships by which other armoured vessels of their type would be measured. The 8 November 1865, edition of the *Exeter Flying Post* asked if it was 'possible to build an armed vessel upon the model of these rams fit for regular sea service'?⁸³² The answer would be found through trial and error, frequent refits and design modifications. As originally built, the Laird rams were not suitable models for the cruising armoured man-of-war but they showed how to remake the turret ship into a suitable naval weapons platform which would eventually overshadow and then supersede the broadside.

Port Visits and Foreign Dignitaries

On 29 August 1865, the French Channel Fleet from Cherbourg visited Portsmouth. Among the French dignitaries were Minister of Marine, M. de Chasseloup-Laubat, Chief Constructor of the Navy and architect of the *La Glorie*, Dupuy de Lome, and a collection of admirals.⁸³³ Lord Somerset, led the visitors on a tour of several new ironclads at Portsmouth.⁸³⁴ Aside from the large iron

⁸³⁰ Ibid.

⁸³¹ 'H. M. S. Wyvern [sic]', *Liverpool Daily Post*, 10 October 1865, 10, TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'

⁸³² No Subject, *Exeter Flying Post*, 8 November 1865, 5.

⁸³³ 'The French Fleet at Portsmouth', *Reading Mercury*, 2 September 1865, 2.

⁸³⁴ 'The French Fleet at Portsmouth', *Cork Examiner*, 2 September 1865, 4.

frigate *Minotaur*, the Lords of the Admiralty escorted the French delegation to view the new turret ships still fitting out, the *Scorpion* and *Wivern*.⁸³⁵ The French visitors also toured the foundries and armour plate workshops at the dockyard, but the ironclad men-of-war were the chief points of interest.⁸³⁶

The *Wivern* still carried the iron weights in place of her guns when she underwent sea trials from Portsmouth that autumn.⁸³⁷ The ironclad would have to wait to have her deck modified with the more traditional teak planks after the Lairds innovations to deck armour were removed. Lairds had built both ships with a lightly armoured iron deck to provide limited protection from plunging fire, and placed cement over sections of the deck for added defence, and waterproofing.⁸³⁸ The cement also had another role in that it protected the rivet heads on the deck and in the bilges. The continual wash of water in the bilges of iron ships had been found to scour the iron so that the heads of the rivets were worn away, but the application of cement delayed this.⁸³⁹ The *Scorpion* had served as a test of the utility of applying cement to the iron decking for an armoured warship, but the results proved to be an almost instant failure. Small channels were cut in diamond patterns, crisscrossed over the iron deck plates, and filled in with cement to provide a better footing for her crew, but the cement cracked and quickly worked out of the seams. This early experiment of what would later become an anti-slip feature more recognizable to warships of the

⁸³⁵ 'The French Fleet at Portsmouth', *Leeds Mercury*, 1 September 1865, 4.

⁸³⁶ *Ibid*, 4.

⁸³⁷ 'H.M. Turret-Ships Wivern and Scorpion', *Liverpool Daily Post*, 10 October 1865, 10.

⁸³⁸ *Ibid*, 10, WA, 005/0030, 'Dimensions and Particulars of Vessels Vol. 2, 'Green Book No. 2', (No Date), 67.

⁸³⁹ E. J. Reed, *Shipbuilding in Iron and Steel*. (London, 1869), 13, 518.

twenty-first century, was removed and not repeated as the traditional teak decking was applied over the iron.⁸⁴⁰

The British press lamented they were not the best vessels in the Royal Navy. The 'masterpiece of ironclads' the *Warrior*, was in the hands of the dockyard 'gutted' in the process of an extensive refit, and concerns were raised over the costs of the overhaul.⁸⁴¹ The *Times* remarked that the *Wivern* would not have added much to the British squadrons sent from the Channel Fleet on the earlier 1865 visit to Cherbourg, as she was very low in the water for an ocean going cruiser and her tripod masts gave her 'a most experimental appearance, anything but reassuring to a sailor'.⁸⁴² The editorial was perhaps true for those more accustomed to the more traditional displays of naval might in an era of transition but the Laird rams were a demonstration of British innovation and readiness to adapt to meet a variety of threats from would-be hostile powers. The Admiralty was moving at a measured pace to incorporate new adaptations in iron warship construction in order to make units of variable capabilities, for the possibility of meeting rivals with varying combat potential.

The tripod mast configuration was suspect almost from the day they were fitted. During her trials, the *Wivern* was thought to roll more than the *Scorpion* due in part, to the lack of armament aboard the second armourclad. As stated earlier, weights were placed in the turrets to replicate her yet to be completed guns during her voyage south from Birkenhead and these contributed to her rolling.⁸⁴³ The tripod fore and main masts of the *Wivern* proved to be of great

⁸⁴⁰ 'The Birkenhead Rams, Scorpion and Wyvern [sic]', *Manchester Courier and Lancashire General Advertiser*, 12 September, 1865, 4.

⁸⁴¹ 'Naval and Military', *Bath Chronicle and Weekly Gazette*, 17 August, 1865, 7.

⁸⁴² 'The Fleet at Cherbourg', *Times*, 15 August 1865, 7.

⁸⁴³ 'H.M. Turret-Ships Wivern and Scorpion', *Illustrated Times*, 4 November 1865, 282.

strength on her first voyage as ‘there was not the sign of a crack or the starting of the paint’ on these stout structures.⁸⁴⁴ Captain Hugh Burgoyne did not like tripod masts from his first experiences in the *Wivern*. He preferred masts strong enough to stand up in action, but fitted with shrouds during other times.⁸⁴⁵ Although they reduced the amount of standing rigging required, the tripod masts would prove to be unsuitable for any ship carrying sail. One British admiral was later to remark that the stout construction of the experimental masts was a detriment as the rigid legs ‘reacts to a push as well as a pull’.⁸⁴⁶ The tripod legs held the masts firmly in place but virtually eliminated the flex of a more traditionally rigged ship of war. Without the slight movement and sway accepted in masts aboard other ships, the tripods pushed that motion into the ship’s hull and also contributed to the roll.⁸⁴⁷

Although adequately armoured, and provided with sufficient internal compartments for watertight integrity, the Laird rams were poorly ventilated ships when originally constructed.⁸⁴⁸ On her trials in May and August 1865, the temperature throughout the *Scorpion* varied noticeably. The engine room was apparently well ventilated, but the stoke holds were not, and the temperatures in certain sections were sweltering. Heat ranges from deck to engine room varied markedly, but temperatures in the middle stokehold were significantly hotter than the engine room. At one point the mercury registered 122 degrees Fahrenheit

⁸⁴⁴ Ibid, 282, Parkes, British *Battleships*. (1966), 78.

⁸⁴⁵ ‘Sea-Going Turret Ships-III’, *London Daily News*, 18 October 1870, 2.

⁸⁴⁶ Ballard, *The Black Battlefleet*. (1980), 105.

⁸⁴⁷ Ibid, 105, TNA, ADM 1/5842, *Admiralty Correspondence*, ‘Specification of Cowper Phipps Coles Masts’, 10 April, 1862, 2. The mast ‘was stepped to the “kelson” and attached at the main deck, while the two side tubes were fitted to the ‘bilge’ and also attached or ‘keyed’ to the deck. They were joined to the mast at their upper edges, and a separate tube was fitted above the main mast to form the top mast.

(50 degrees Celsius) which influenced the Chief Engineer to remark to the inspectors that ventilation was 'much required'.⁸⁴⁹ The layout was also found to be defective aboard her sister.

During the trials of the *Wivern* in October 1865, the ventilation of the stokehold was found to be 'very faulty'. This was not by accident, but was a reflection of her design influenced by the requirements of her original intended customer, in preparation of a fight against a numerically superior enemy, likely at close quarters.⁸⁵⁰ The smaller area of hatchways and 'other openings on her upper deck' were designed to restrict access to the spaces below if boarders were able to attack the ship and gain access to the main deck. This was a practical measure as navies still practiced with cutlass in hand. The Royal Navy would conduct drills at boarding stations with edged weapons and small arms until 1905.⁸⁵¹

Liverpool followed the news of the French visit to Portsmouth, and was proud of the efforts of the Merseyside shipbuilders and their role in providing the Royal Navy some of their latest armourclads. The *Cheshire Observer* wanted the French delegation to visit the Mersey to see a source of Britain's strength: 'They will find here no yards of the splendid proportions of Cherbourg, but they will find private enterprise teeming everywhere, and performing wonders which even Imperial resources cannot equal'.⁸⁵² With several thousand workers labouring in their compact yard, Laird's was preparing the five-masted steam frigate *Agincourt*

⁸⁴⁸ TNA, ADM 135/417, 'Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'.

⁸⁴⁹ *Ibid.*

⁸⁵⁰ 'H. M. S. Wyvern [sic]', *Liverpool Daily Post*, 10 October 1865, 10, TNA ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'

⁸⁵¹ Arthur J. Marder, *The Anatomy of British Sea Power*. (New York, 1976), 135.

⁸⁵² 'The Invasion of England', *Cheshire Observer*, 26 August, 1865, 8.

for commissioning to meet any seagoing threat Napoleon III dared send forth.⁸⁵³ A distinction between the hurried activities of British yards as compared with the slower pace of French building slips, was not lost on British observers proud of the changes reflected in the growing armoured strength of the Royal Navy.

The fleet exchange visit was a clear message to Paris that Britain was ready to meet any French naval expansion with new iron ships fitted for action with broadsides or a few heavy guns behind armour plated revolving turrets. France would have to meet this dual challenge of the large new iron frigates and the low-hulled copula ships or fall behind her rival. The British press would later criticize the *Scorpion* and *Wivern* as being neither very powerful nor steady as they were hurriedly built. That was the point made by Laird when he built the ships. They were built rapidly, their flat bottoms and lighter draught were well suited for a role in coastal waters, and they were armed with four of the largest guns Britain manufactured at the time behind adequate armour. The rams gave the Admiralty options for defence and attack, and the foreign powers noticed. France and Russia added turret ships and rams to improve their coastal defence forces by purchasing surplus American monitors, and building shallow draught ironclads.⁸⁵⁴

The *Scorpion* and the *Wivern* steamed together from Portsmouth to test their capabilities in the autumn of 1865.⁸⁵⁵ Despite their failings, the rams were important acquisitions for a Royal Navy in an era of continual experiment both at

⁸⁵³ Ibid, 8.

⁸⁵⁴ 'The Launch of H.M.S. Monarch', *London Daily News*, 26 May 1868, 5, Theodore Ropp, *The Development of a Modern Navy: French Naval Policy 1871-1904*. Edited by Stephen S. Roberts, (Annapolis, 1987), 13, 16-17, Sandler, *The Emergence of the Modern Capital Ship*. (1979), 70-71, TNA, ADM 231/3, *Admiralty: Foreign Intelligence Committee*, 'France Effective Armourclads', dated 1 January 1884, 3. The former Union double-turreted monitor *Onondaga*, purchased by France after the Civil War, was referred to as coastal defence ironclad or a 'Garde-Côtes Cuirassés', and was assigned to local defence duties at Brest.

home and from her would-be challengers for maritime supremacy. The British press declared: 'it is satisfactory to know that the English navy alone possessed such a class of vessel as this-fit of either harbour work or ocean cruising, and having such a rate of speed at a comparatively small expenditure of power. The famous American monitors are not so fast by several knots, and they are only coast vessels'.⁸⁵⁶ The Laird rams were capable of both harbour and coastal defence roles, whereas the *Prince Albert* was designed for harbour defence as 'no provision has been made in her calculations and arrangements for carrying masts and sails, or stores for sea-going purposes.'⁸⁵⁷

Despite their disappointing speed, the *Scorpion* and *Wivern* could, under moderate weather conditions, reach closer to enemy home waters without having to stand off shore like the larger iron frigates. While cruising in late October, the rams struggled back into Spithead in heavy seas, disproving a rumour that the *Wivern* had foundered.⁸⁵⁸ An observer from the shore noticed one of the vessels was seen to roll in a manner that was 'very perceptible', a motion which highlighted the problems with the low freeboard, flat bottom, weight of the heavy masts and lower spars, all combining to impair the capabilities of these ironclads.⁸⁵⁹

Seakeeping qualities were their main limitations and ocean cruising was not a task these ships were to undertake except for limited durations. They were

⁸⁵⁵ NMM HND/101/3 Journal of Sub-Lieutenant Swinton C. Holland, *H.M.S Wivern*, September-December 1865

⁸⁵⁶ 'Trial of Her Majesty's Turret Ram *Scorpion*', *Manchester Courier and Lancashire General Advertiser*. 31 August, 1864, 3.

⁸⁵⁷ TNA, ADM 1/5842, *Admiralty Correspondence*, Letter by Controller of the Navy, Rear Admiral Robert Spencer Robinson, dated 6 October 1863. Robinson also noted Coles wanted to fit tripod masts to the *Royal Sovereign*, but Robinson wrote both this ironclad and the *Prince Albert* were 'not intended to be masted'.

⁸⁵⁸ 'Naval and Military', *London Daily News* 30 October, 1865, 2.

failures as seaboats, but the definition of what constituted a failure was highly subjective as many early armoured vessels were prone to quick and deep rolling while at sea. Storms provided a valuable reference point for the performance of ships in commission at the time, as the turret ship *Monarch*, delayed her December 1869 transatlantic crossing due to heavy weather, even though she was considered to be the crack ship of the Royal Navy.⁸⁶⁰

Ship handling changed with the advent of the armoured warship. This was especially true for short-hulled ironclads, and the low-hulled turret ships served as a new test bed for how best to manoeuvre an iron-coated man-of-war. Experience with these ships demonstrated to the commanders, officers, and men of these ironclads, they had to change routines to successfully run their ships while at sea. During the short career of the Confederate ironclad C.S.S. *Stonewall*, the new warship demonstrated her propensity to plow into the green seas and so alarmed the engineers and the crew of the armoured vessel, they appealed to their captain to return to port. A Confederate naval officer aboard persuaded the Danish captain, contracted to return the ship to her French builders, to press ahead as 'the only danger lay in stopping engines; that in a word, the safety of the vessel, and all on board depended entirely on the continuous movement of the engine, and the watchful care of it by the engineers'.⁸⁶¹

⁸⁵⁹ Ibid, 2.

⁸⁶⁰ 'Who's to Blame?' *Hampshire Telegraph*, 18 December 1869, 4. This source reported while other warships sheltered in harbour, the steam ship-of-the line *Donegal* was damaged during the same storm as she struggled down the Channel. She consumed at least 40 tons of coal for very limited headway against the heavy sea.

⁸⁶¹ Captain Thomas J. Page, C.S.N, 'The Career of the Confederate Cruiser "Stonewall"'. *Southern Historical Society Papers*, Volume 7, No. 6, (Richmond, 1879), 263.

In December 1867, Captain M. H. Jansen, the commander of the Dutch turret ship *Prins Hendrik Der Nederlanden*, steamed off Brest to test her seakeeping abilities.⁸⁶² Jansen later reported that, although his ironclad rolled noticeably in the trough of the winter waves, she did come up slowly but steadily. When put into the wind, the performance improved somewhat. Although the funnel was caked with salt from the waves and spray, the *Prins Hendrik* was able to weather the gales.⁸⁶³ Experience in the mid-1860s revealed that these ships could not be steered and worked in a manner similar to their predecessors. The turret ironclads had to be *driven*, and handled like the new and touchy beasts they were.

The Laird rams were slow to obtain proper refits in the Portsmouth dockyard, as ships required for service on foreign stations received priority over those assigned closer to home. This was especially true for the rams; their schedule of alterations to modify them into more efficient seaboats was suspended or delayed as cruisers and heavier draught ironclads came in for refits. The *Scorpion* and *Wivern* suffered from the effects of bureaucratic delay as they did not meet the exact requirements for any fleet. Too unstable to use on long cruises, too untested to warrant a suitable refit when purchased, they were unready during their early years under the White Ensign.⁸⁶⁴

Captain Coles utilized the Laird built rams in his press battle for the turret ship by responding to a report in the *Times* which claimed turrets employed on Royal

⁸⁶² Scheltema de Heere, 'The Prins Hendrik Der Nederlanden' *The Mariner's Mirror*. Volume 17, (Cambridge, 1931), 49.

⁸⁶³ *Ibid*, 46, 49, 50. Jensen performed his test during a storm which sank other vessels, the conclusion was that, if handled with caution, the low-hulled turret ship was adequately safe at sea. Once her heavy rig (including tripod fore and main masts) were removed for two signal poles, the Dutch turret ship shed 66 tons of weight aloft and her performance as a seaboat improved.

Navy ironclads were not viewed as ‘very favourable’.⁸⁶⁵ In reply to this claim, Coles struck a vital point when he defiantly called: ‘I challenge any one to produce a broadside square-box ship that will carry the same broadside of 300-pounders as the *Scorpion* and *Wivern*, designed by Messrs. Laird Brothers, with as much speed, the same tonnage, the same protection and equal buoyancy at sea’. Coles went on to say that his rival, Reed, had no vessel in commission at that time (1866) with as heavy guns as the two rams, and touched on another key point when he stated that heavy guns would be carried on Reed’s ships, then under construction, but those ships were of ‘enormous tonnage’.⁸⁶⁶

As stated earlier, the heavy broadside warship could cruise the oceans but they could not get inshore. The rams were compromises of design and reflected both those advantages and limitations in their construction and employment. They also did not need large crews. The number of crewmen reportedly varied from a high of 170 yet most reports refer to a complement of some 150 per ship to man the turrets, work the guns, steam, and fitfully sail. Britain’s ironclads of the 1860s were usually crewed by hundreds of men. The *Achilles* and *Minotaur* each had 705 men aboard. Indeed only the Reed ironclads *Research* and *Enterprise* required less men than the Laird rams, but only fifteen fewer hands were aboard those experimental warships.⁸⁶⁷

Manning requirements proved to be a benefit for the Laird rams as the number of active duty Royal Marines and seamen in the Royal Navy available for shipboard duty had declined since the early 1860s, and ships on foreign station were reduced to ‘the minimum amount necessary for the maintenance of the

⁸⁶⁴ *Hansard*, 5 June 1866, 183, cc 1940,1941

⁸⁶⁵ ‘Turret Ships’, *London Evening Standard*, 10 January 1866, 3.

⁸⁶⁶ *Ibid*, 3.

⁸⁶⁷ *Ibid*, 3.

honour of the country...'⁸⁶⁸ Further cuts in manpower were pushed by Disraeli's government in an effort to keep to a fixed budget. The Prime Minister reported to the Queen on 15 February 1868, 'without any material increase of expenditure, your Majesty will now have a real & we hope, rapidly increasing naval reserve'.⁸⁶⁹ Other manpower changes were enacted during the late 1860s by reducing the number of boys in the training establishments, reducing the number of stokers in the reserves, (and paying seamen extra to perform that duty), and placing more officers on the retired lists. Limited budgets also meant that some candidates failed to obtain commissions although they passed their entrance examinations, with the result that some appointments were not filled.⁸⁷⁰ During these years, a few more ironclads were constructed to keep up with foreign rivals, but they came at the cost of fewer men and fewer ships ready for sea in the event of an emergency.⁸⁷¹

Performance at Sea

The ocean-going performance of the rams was mixed. The *Wivern* steamed with the Channel Fleet to the west coast of Ireland for exercises in September 1866 to test her capabilities with an armoured squadron. The fleet was battered by a western gale, with the *Research* and *Pallas* having the worst of the tempest although the *Wivern* responded 'remarkably well'.⁸⁷² While underway for Ireland,

⁸⁶⁸ *Hansard*, 8 March 1869, 194, cc 887.

⁸⁶⁹ Richard Millman, *British Foreign Policy and the Coming of the Franco-Prussian War*. (Oxford, 1965), 152 note 3.

⁸⁷⁰ *Hansard*, 8 March 1869, 194, cc 889, 890.

⁸⁷¹ Millman, *British Foreign Policy and the Coming of the Franco-Prussian War*. (1965), 150-151.

⁸⁷² 'The Channel Fleet', *Manchester Courier and Lancashire General Advertiser*. 9 October 1866, 3.

the admiral commanding signaled to ask if the ships could work their guns in the heavy seas. Most could not, as the ships rolled about 25 degrees in the swell. *Wivern* responded that she was able to work her guns, as did the Reed-built ironclad frigate *Bellerophon*, but they did not fire while in transit to Ireland.⁸⁷³

In the Victorian era, the dimension of the degree of a roll was calculated from the entire motion, instead of a one way measurement from an even keel as is done in the modern day, but the deep roll was still uncomfortable for the crew of many ironclads.⁸⁷⁴ A printed illustration from her 1866 voyage revealed the *Wivern* rolling to port, and shipping waters up to the base of her tripod masts as waves surged over the low sides. Nevertheless, with bulwarks down, the turret ship could still 'satisfactorily work' her guns as they were further from the sea than on a broadside warship.⁸⁷⁵ The print showed the *Wivern* struggling in a heavy sea, with all sails furled, men on her forecastle and flying bridge inclined backwards against the pitch of the ship which seemed to prove the naysayers claim that 'she cannot do much in the way of sailing, and she is as a steamer very expensive'.⁸⁷⁶ The storm showed the limitations of several ships during that voyage as the ironclads were contending with increased weights of armour, guns, and engines which had conversely come with a loss of seakeeping agility and crew comfort at sea. The illustration of the *Wivern* struggling in the waves also showed the funnel raised to its full height as the ironclad turret ship fought to make headway.⁸⁷⁷

⁸⁷³ 'Squandering the Taxes', *Liverpool Daily Post*, 13 October 1866, 7.

⁸⁷⁴ Brown, *Warrior to Dreadnought*. (1997), 14.

⁸⁷⁵ 'H.M.S. Wyvern [sic] in a swell of the Atlantic', *ILN*, 27 October 1866, 413.

⁸⁷⁶ *Ibid*, 413.

⁸⁷⁷ 'H.M.S. Wyvern [sic] in a Heavy Sea in the Channel', *Ibid*, 413.

Many ships of the Royal Navy of the 1860s had telescopic funnels which were usually lowered in port and raised when getting underway.⁸⁷⁸ In the early 1870s, one commanding officer adopted a unique solution to raising the funnel. Captain John Hopkins, while in command of the armoured frigate *Agincourt*, had determined to improve drill aboard ship and ordered a series of bugle calls for specific shipboard evolutions.⁸⁷⁹ When the accepted military bugle calls were assigned to more traditional practices, an adoption of a popular tune was utilized. The captain selected the new call, briefed his bugler, and the stokers were mustered to inform them of the change in routine. When the bugler sounded the nursery rhyme '*Polly put the kettle on*', the stokers raced to their winches and the funnel went up in quick order.⁸⁸⁰ The Royal Navy was adapting to mechanical changes brought about by the evolving ironclad warship, and through innovation and drill modification, the routines of shipboard life were changing with them.

During the September 1866 exercises, the fleet was ordered to practice an evolution under sail alone and the new *Bellerophon* failed to perform to satisfaction.⁸⁸¹ While underway, another concern arose due to unexpectedly high fuel consumption rates. The *Wivern* was the first to drop out of the exercise as she was running short of fuel and was ordered to take on more coal at Cork.⁸⁸² The *Wivern* was singled out for additional criticism as Admiral Hastings R. Yelverton later relayed a report from her then commander, Captain Burgoyne, that she was almost always battered down when at sea as the water threatened

⁸⁷⁸ Fitzgerald, *Memories of the Sea*, (1913), 309. Fitzgerald stated the funnels were heavy and the process by which the stokers winched up each section was both labourious and time consuming.

⁸⁷⁹ Ibid, 310, No Subject, *Hampshire Advertiser*, 8 June 1872, 8.

⁸⁸⁰ Fitzgerald, *Memories of the Sea*, (1913), 310.

⁸⁸¹ 'Squandering the Taxes', *Liverpool Daily Post*, 13 October 1866, 7.

to pour in through her gunports.⁸⁸³ It was also claimed that fires in two of her four boilers were doused by a rush of water from the deck while she was steaming down the Channel.⁸⁸⁴

On 26 September, the ships engaged in gunnery practice south of Bantry Bay, off the west coast of Ireland despite a heavy swell which caused some of the ironclads to roll up to 30 degrees.⁸⁸⁵ Each ship was to fire fifteen rounds but some ships could not reach that rate due to the continuing swell. Despite the seas washing over her deck, the *Wivern* was among those able to fire at the floating targets when the other broadside ships could not open their gunports.⁸⁸⁶ The gunnery was uneven as only the *Achilles* performed well, for when firing her broadsides, she was reportedly 'steady as a church' despite the loss of her main and mizzen topgallant masts in the storm.⁸⁸⁷ The fleet gunnery practice was hazardous as the heavy guns threatened to get away from their crews struggling on the pitching decks. The men had to contend with some guns that had their muzzles dunked and their powder ruined in the heavy seas while wrestling to keep the guns from sliding back when their ships rolled and lurched in the waves. Some ships reported their gunports were completely submerged at times.⁸⁸⁸ The ironclad warship, in all its forms, was rarely a comfortable and efficient man-of-war during this age of rapid change.

These training cruises allowed commanders to determine the characteristics of not only each ironclad, but the performance of an armoured squadron as a

⁸⁸² 'The Channel Fleet', *Manchester Courier and Lancashire General Advertiser*, 9 October 1866, 3.

⁸⁸³ *Hansard*, 2 April, 1869, 195, cc 110.

⁸⁸⁴ *Ibid*, cc 110, 111.

⁸⁸⁵ 'Squandering the Taxes', *Liverpool Daily Post*, 13 October 1866, 7.

⁸⁸⁶ 'The Cruise of the Channel Squadron', *Dublin Evening Mail*, 20 October 1866, 4,

⁸⁸⁷ 'The Channel Fleet', *Sherborne Mercury*, 9 October, 1866, 5.

unit. These exercises produced new considerations regarding the various applications of ship handling needed for the ‘formations for attack and defence; all the possible evolutions which ships, divisions or squadrons may be called upon to perform while acting together.’ During this era, the concept of seapower transformed into two distinct expressions. Tactics were evolving into concepts of localized operations separate from the broader context of naval warfare, a different outlook defined as global or strategic in its scope.⁸⁸⁹ This reevaluation of naval thought occurred with the advent of steam propulsion and the armoured warship, and grew apace as the ironclad evolved in its different forms.

The Admiralty and the Laird turret rams

The Laird rams were never popular with the Admiralty. When debating naval budgets in the Commons, the Secretary to the Admiralty, Lord Clarence Paget, called the *Scorpion* and *Wivern* unfit vessels, remarking that the crew spaces were faulty and the men could not be kept clean.⁸⁹⁰ The inference that the ships were dirty was disingenuous. Sub-Lieutenant Swinton Holland kept a log of his time aboard *Wivern* when he was assigned to the ship from September through the end of December 1865.⁸⁹¹ He made 22 references to cleaning the ship, from the holds to the turrets. Holland also mentioned the crew was issued soap and tobacco as rations.⁸⁹² The log of the *Scorpion* made references to ‘cleaning

⁸⁸⁸ Ibid, 5.

⁸⁸⁹ Matthew Allen, ‘The Deployment of Untried Technology: British Naval Tactics in the Ironclad Era’, *War in History*, 15, (July 01, 2008), 269.

⁸⁹⁰ *Hansard*, 15 March, 1866, 182, cc 345.

⁸⁹¹ NMM, HND/101/3, Journal of Sub-Lieutenant Swinton C. Holland, *H.M.S Wivern*, September-December 1865

⁸⁹² Ibid.

ship' during this time, which indicates this was a normal part of ship's routine and not excessive duty aboard the rams.⁸⁹³ The telescoping funnel aboard each ironclad was a probable contributor to coal dust aboard the rams, especially if the funnel was lowered, but coaling procedures were notorious for all steam powered ships.

The coal used was likely the real reason the ships had to be cleaned continually. The Royal Navy used a mixture of North Country coal and Welsh anthracite during the middle Victorian years as a cost savings measure.⁸⁹⁴ The result was a thick cloud of smoke produced by the cheaper North Country variety.⁸⁹⁵ Another reason for this supply concern was due to the well-established collier trade from Newcastle to London, especially by the time of the Crimean War of 1854-56. The supply of Welsh coals was relieved somewhat by the end of that war, but the need for economy meant that the dual coal supply remained in effect.⁸⁹⁶ The Royal Navy would continue to use the dirtier bituminous coals until 1887 when the cleaner burning Welsh coal was utilized exclusively except when supplies were not available.⁸⁹⁷

In 1866 the Laird rams came in for abuse on the floor of the Commons due to their poor performance in the fleet. On 15 March, Paget had mentioned that discipline suffered as a result of the unsatisfactory conditions aboard the Laird rams saying neither vessel was 'fit to put British sailors into'.⁸⁹⁸ His comments were at variance with other remarks he made in the Commons that day. Paget stated, when referring to the *Agincourt*, that he would prefer the command of

⁸⁹³ TNA, ADM 53/8418, *Ship's Log H.M.S. Scorpion*, 10 July 1865 to 1 January 1866

⁸⁹⁴ Lambert, *Battleships in Transition*. (1984), 62-63.

⁸⁹⁵ *Ibid*, 62.

⁸⁹⁶ *Ibid*. 63.

⁸⁹⁷ *Hansard*, 31 May 1894, 25, cc 11, *Hansard*, 18 July 1898, 62, cc 77-78,

⁸⁹⁸ *Hansard*, 15 March 1866, 182, cc 345.

smaller ships, as the larger ironclads were not as handy in turning. His remarks are also curious as he stated that he would prefer the command of smaller ships 'even at some sacrifice' to the performance and firepower of a larger ocean cruising ironclad.⁸⁹⁹ The remarks were a part of a verbal joust with John Laird, who had proclaimed that the rams were not failures, as they were not intended for duty as ocean going cruisers, but they had proved to be 'thoroughly seaworthy' during trials and exercises.⁹⁰⁰ Laird also pointed out that if the rams were troublesome in a seaway, it was because they were not fully modified to meet requirements *before* joining the Channel Fleet.⁹⁰¹

Laird made a clear distinction as to the real benefit of the two ironclads when he observed they had advanced the evolution of the turret ship as test beds for Coles armoured cupolas.⁹⁰² In the mid-1860s, the Admiralty had mixed views of the proper utility of a turret ship, as Paget mentioned the ironclad *U.S.S. Monadnock*, a powerful double turret monitor then en route around Cape Horn, for harbour defence duty at San Francisco.⁹⁰³ Paget compared the American monitor to a rock at half tide, deck awash in a breeze, and a hard vessel on her crew, but he also called her 'one of the most formidable engines of war in existence'.⁹⁰⁴ Paget had said earlier that month (March 1866) that the Laird

⁸⁹⁹ *Ibid*, cc 331.

⁹⁰⁰ *Hansard*, 2 April 1869, 195, cc 119.

⁹⁰¹ *Ibid*, cc. 118.

⁹⁰² *Hansard*, 15 March 1866, 182, cc 331.

⁹⁰³ *Ibid*, cc 342. The *Monadnock* was fitted with a square sail and jib during her voyage, and added 1.5 knots to her speed on average. See: Commander John D. Alden, U.S.N. (Ret.), 'The Old Navy: Monitors 'Round Cape Horn', *Proceedings Magazine*, 100, (September, 1974), 79.

⁹⁰⁴ *Hansard*, 15 March 1866, 182, 342, 343. Also see: Howard J. Fuller, 'Chilean Standoff', *Naval History*, 25, (June 2011), 1-3. This voyage also demonstrated the ironclad power of the United States, as Fuller holds, the American monitor fleet 'spelled doom for the presence of France in Mexico' and the *Monadnock* was an uncomfortable surprise to the Spanish squadron at anchor in Valparaiso harbour in March of 1866 (which included their flagship, the armoured frigate *Numancia*) when Spain was at war with her former colonies of Bolivia, Chile, Ecuador, and Peru.

rams, though not effective as cruisers, would be 'very effective' under certain circumstances.⁹⁰⁵ Laird claimed that the Royal Navy did not know what to do with either the *Scorpion* or the *Wivern* or how to use them properly, and as such, they remained in home waters until they found a suitable role. It would be years before the forlorn ironclads would be adequately modified for the role more suitable to their design.⁹⁰⁶

The *Scorpion* was the first to go out of commission when she was docked for alterations to make her 'one of the most efficient of our armoured vessels' as Laird had hoped, except money was not appropriated in a timely fashion and only five or six men were working on her in July of 1866.⁹⁰⁷ The previous month, the double turreted monitor *U.S.S. Miantonomoh* anchored in Cork, having crossed the Atlantic in the company of two U.S. paddle-driven warships. One British newspaper described the armoured visitor as 'destitute of spars and rigging', noting her low hull was barely visible above the water.⁹⁰⁸ Her sparse arrangement of upper works attracted a curious description with the, 'broad flat base and her confused superstructure...she might very well pass for a novel description of dredging machine'.⁹⁰⁹ The low silhouette of the American monitor was a feature not immediately recognized for seaworthiness yet her arrival in the United Kingdom caused a sensation due to the subsequent impressions of the vessel and the demonstrations of her 15-inch Dahlgren guns.⁹¹⁰ Before the voyage, the addition of a wooden 3½ foot tall wooden breakwater forward aided

⁹⁰⁵ *Hansard*, 1 March 1866, 181, cc 1345.

⁹⁰⁶ *Hansard*, 15 March 1866, 182, cc 331.

⁹⁰⁷ 'Imperial Parliament' *London Evening Standard*, 21 July 1866, 3.

⁹⁰⁸ 'The American Monitor Miantonomoh', *Hull Packet*, 22 June 1866, 7.

⁹⁰⁹ *Ibid*, 7.

⁹¹⁰ Fuller, *Clad in Iron*. (2008), 274-275.

the *Miantonomoh*'s headway, although waves surged inboard, rolling 'halfway up the forward turret' during the crossing.⁹¹¹

A fixture that facilitated her Trans-Atlantic crossing as much as her breakwater, waterproofed hatches, steam-driven fans and pumps, was the 'Hurricane Deck'.⁹¹² This structure, positioned between the two turrets, was described as 'a latticed platform...supported upon pillars, on which when the ship is at sea all the nautical duties are performed'.⁹¹³ The fitting of hurricane decks improved conditions aboard iron warships of the time, and after the Reed armourclad *Research* received hers, she was 'rendered at least safe and comfortable-and she kept her place fairly with the fleet'.⁹¹⁴ By August 1867, the *Scorpion* was fitted with her walkway which extended over her turrets and permitted safer passage from the fore-castle aft to the poop in heavy weather.⁹¹⁵ The Admiralty had taken a step to render the Laird rams and other ironclads more serviceable in British waters; although the bold steps needed to reduce weight aloft and thus lessening some of the rolling, would have to wait for a later overhaul. The *Scorpion* had her masts removed during the 'extensive' refit, but they were placed back aboard ship near the end of her time in dockyard, and an opportunity was lost to convert her into an all-steam ironclad.⁹¹⁶

Weight savings had been achieved in the mid-nineteenth century with the adaption of rope made from steel wire. Although wire rope was first made in Britain in 1832 for collieries, mine owners were slow to switch from the trusted

⁹¹¹ Ibid, 272- 273

⁹¹² Ibid, 273, 275.

⁹¹³ 'The American Monitor Miantonomoh', *Hull Packet*, 22 June 1866, 7.

⁹¹⁴ No Subject, *London Daily News*, 19 April 1867, 4.

⁹¹⁵ 'Naval and Military Intelligence', *London Evening Standard*, 24 August 1867, 3.

⁹¹⁶ 'Naval and Military News', *Hampshire Telegraph*, 26 June 1867, 2.

hemp and only added wire rope when the manufacturing process evolved.⁹¹⁷ By 1859, the Admiralty had fitted three steam frigates with steel rope manufactured by such firms as Webster & Horsfall of Birmingham.⁹¹⁸ The new steel rope was also almost a third of the diameter of hemp, held up well to experimental stress tests, and by the late 1860s, both iron and steel rope was less expensive than hemp.⁹¹⁹ When introduced to the United States, the steel substitute was termed 'an invention of great importance'.⁹²⁰ Traditional hemp rope continued in service as wire rope of steel and especially iron lacked sufficient elasticity until steel manufacturing processes were advanced in the 1860s. Wire rope was made from individual strands, each comprised of six wires of equal diameter. The manufacturer varied the number of strands depending on the size of rope required. Iron rope was preferred for standing rigging as it was cheaper than steel rope and like hemp, was sometimes tarred for waterproofing. Steel rope proved more suitable than iron for work in the various blocks carried on ships, and the use of galvanized wire ropes for both iron and steel resolved the problems of corrosion, and allowed for increased flexibility over the more rigid tarred stays.⁹²¹

Despite these advances, the weight savings did not compensate for the increased weight of the engines and boilers on warships. In November 1867, the wooden-hulled twin-screw gunboat *H.M.S. Plover* was found to be too heavy aloft

⁹¹⁷ 'A New Trade in Birmingham, Wire Rope Making', *Birmingham Daily Post*, 2 April 1866, 5.

⁹¹⁸ 'New Steel Wire', *SA*, 14, 12 March 1859, 221. This source reports the Admiralty standards for steel rope led to changes in rigging, and the steel version was over three times the strength of a similar gauge of iron rope.

⁹¹⁹ 'Rope Trade', *Aberdeen Journal*, 8 January 1868, 7.

⁹²⁰ 'New Steel Wire', *SA*, 14, 12 March 1859, 221.

⁹²¹ 'Steel Ropes', *SA*, 13, (New Series) 23 December 1865, 405, 'A New Trade in Birmingham, Wire Rope Making', *Birmingham Daily Post*, 2 April 1866, 5, 'The Science of Iron and Steel', *SA*, 8 (New Series), 14 February 1863, 105.

as she rolled as much as 20 degrees even in fine weather due to her heavy masts and rigging. She was subsequently reduced in both to render her more stable.⁹²²

Special Duty, Gun Failure and Drill Changes

In July 1867, *Wivern* was present at the Spithead Naval review held in honour of the Sultan of Turkey, Abdul Aziz.⁹²³ Nevertheless, the refurbished *Warrior*, the *Black Prince* and *Minotaur* were the more traditional representations of British naval might. Several turret ships were at anchor during the review although the *Wivern* was the smallest.⁹²⁴ The ship was still at Portsmouth in August when the officers placed an advertisement in a local newspaper announcing that the wardroom would not be responsible for the debts incurred by their steward. Curiously the newspapers still referred to her by the earlier misspelling of her name 'Wyvern'.⁹²⁵

Duty at Portsmouth had been dull for the crew of the *Wivern*, as notices appeared in local papers concerning issues regarding discipline aboard ship. In January 1866, two boys, Charles Peacock, and Joseph Windsor, were tried before the local justice of the peace and charged with desertion. After admitting their crime, the boys were returned to the ironclad.⁹²⁶ Another boy, Harry Cole, had deserted the ship on 5 October 1865, was apprehended and court martialed

⁹²² 'Naval and Military News', *Hampshire Telegraph*, 13 November 1867, 2, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 293.

⁹²³ 'The Sultan in England', *Exeter and Plymouth Gazette*, 17 July 1867, 9.

⁹²⁴ 'The Review of 1867', *Hampshire Telegraph*, 20 July, 1867, 4.

⁹²⁵ No Subject, *Hampshire Telegraph*, 21 August 1867, 1.

⁹²⁶ 'Magistrates Office-Tuesday', *Surrey Advertiser*, 27 January 1866, 2.

years later (January 1870). He was imprisoned at Winchester and sentenced to 18 months hard labour before being discharged from the navy.⁹²⁷

Peacetime discipline was not a new concern for commanders during this era. Admiral Sir Geoffrey Hornby faced a similar problem in the Mediterranean Fleet a decade later and responded by removing an ineffective captain, further court martial proceedings, and keeping his ships at sea more often. Additional time at sea and the rigours of practiced shipboard drill improved crew efficiency and removed the distractions of the shore from the men. Another issue that contributed to a drop in performance and morale was the rapid turnover of trained crewmen, as many went into the reserves.⁹²⁸ Nevertheless, a ship ably led, refurbished, and manned with a trained and stable crew, was a formula for improved efficiency. Retention of a well-trained complement was essential, as the ships entering service in the 1860s were fitted with more unfamiliar weapons, as well as intricate and interdependent machinery. This bewildering array of technical changes required a special breed of men able to absorb the continual fluctuations to shipboard routine while also performing at levels of efficiency necessary for ships more dependent on steam. The changes aboard ships of the Royal Navy perplexed even the best officers, as Hornby later described his Mediterranean flagship, the *Alexandra*, as 'too complicated'.⁹²⁹ This was not the case with the Laird rams. They possessed the same calibre guns and could focus on efficiency with only one type of heavy ordnance to train upon as compared with a variety of mixed guns aboard the larger ironclads.

⁹²⁷ 'Courts Martial on board the *Duke of Wellington*', *Hampshire Telegraph*, 12 January 1870, 2.

⁹²⁸ Andrew Lambert, *Admirals: The Naval Commanders who made Britain Great*. (London, 2008), 268, 269, 277.

⁹²⁹ *Ibid*, 267.

In late September 1867, information concerning a possible Fenian attack in Ireland led to several warships being sent from the Channel Fleet with only a few hours' notice.⁹³⁰ The *Wivern* had been held in a state of partial readiness as she was listed as 'unappropriated' in one British newspaper prior to sailing with elements of the fleet.⁹³¹ The *Wivern* was ordered to Holyhead to serve as the guardship at that harbour in response to rumours of an impending raid.⁹³² The ironclad left without her full complement, as her captain was recalled from leave to join his ship after she arrived at the Welsh port.⁹³³ Emergency orders and a new station changed the routine of shipboard drill aboard the ram, and the added impetuses of possible action undoubtedly lifted morale and helped to improve discipline aboard the turret ship.

The *Wivern* had her first taste of 'action' in September 1867 while at Holyhead when she sent a boat crew to search for members of a Fenian plot who had sailed from Liverpool aboard a ship bound for Cardiff.⁹³⁴ The boat searched a nearby merchant ship for the two Fenian escapees from Manchester Gaol, former Union Army Colonel Thomas Kelly and Captain Timothy Deasey. Kelly and Deasey had been arrested on charges of plotting an uprising in Manchester.⁹³⁵ On 18 September 1867, while being transferred to prison, a Fenian gang attacked the prison van and killed police Sergeant Charles Brett, permitting Kelly and Deasey to flee and reportedly seek passage to America.

⁹³⁰ No Subject, *Cork Examiner*, 23 September 1867, 2

⁹³¹ 'Stations of the British Navy', *Bath Chronicle and Weekly Gazette*, 29 August 1867, 2, 'Preparations of the Admiralty', *Dublin Evening Mail*, 21 September 1867, 3.

⁹³² 'Ireland', *Morning Post*, 23 September 1867, 8.

⁹³³ *Ibid*, 8.

⁹³⁴ 'Kelly and Deasey-Searching a Greek Vessel', *Dublin Evening Mail*, 2 October 1867, 4.

⁹³⁵ 'Escape of Colonel Kelly and Capt. Deasey', *Dublin Evening Mail*, 20 September 1867, 3, 'Colonel Kelly the Fenian Leader, in Manchester', *Manchester Courier and Lancashire General Advertiser*, 18 September 1867, 3.

The attackers were soon captured and William Allen, Philip Larken, and Michael O'Brien were sentenced to hang for their role in the murder of police Sergeant Brett with the execution carried out on 21 November.⁹³⁶ The men would go into Irish folklore as the 'Manchester Martyrs'.⁹³⁷

The boarding party from the *Wivern* did not find any fugitives, but the ironclad was ready to assist with men and firepower if the threatened Fenian plot erupted into a series of full scale riots around the country.⁹³⁸ On 14 November 1867, the ship was involved in another anti-Fenian mission.⁹³⁹ Shortly after midnight, a telegram from Manchester warned that a unit of armed men planned to land at Holyhead and rescue an Irish prisoner scheduled to arrive there. The Coastguard notified the commander of the *Wivern*, Captain George A. C. Booker R.N, who responded by leading a force of marines ashore to search for the armed band. Later that morning, the turret ship fired a shot across the bow of the London & Northwestern Railway steamer (likely fired with a reduced charge) and sent a boat over to search the vessel. Although no suspicious persons were found aboard, Coastguard Chief Officer Rowe and Captain Booker were later praised for the 'greatest activity and vigilance' in the sweep for the reported armed men.⁹⁴⁰

The *Wivern* had remained on duty despite a near tragedy that occurred aboard ship during a routine training event. In early November 1867, a gun in the forward turret (incorrectly identified as the after cupola) blew up during target

⁹³⁶ Pádraig O Conubhair, *The Fenians Were Dreadful Men: The 1867 Rising*. (Cork, 2011), 146-147.

⁹³⁷ *Ibid*, 149.

⁹³⁸ Oliver P. Rafferty, *The Church, the State and the Fenian Threat, 1861-75*, (London, 1999), 89, 93, 169 (endnote 99).

⁹³⁹ 'Intended Rescue at Holyhead', *Cork Examiner*, 15 November 1867, 3.

⁹⁴⁰ *Ibid*, 3.

practice after firing a shell with a 30 pound powder charge.⁹⁴¹ The 'left hand gun' burst while the gunners were firing at a target some 1500 yards distant, and the explosion caused the breech of the gun to be 'blown clean away'. Aside from the gun captain whose legs were grazed when the breech, weighing about a ton, flew backward to strike the turret side and then fell to the deck, no one was injured. This despite a crew of about 15 being in and below the turret at the time of the explosion, as the blast from the failed gun cast up above the heads of the men and the breech blew back and away from all but the gun captain.⁹⁴² The *Wivern* was armed with four 300-pdr RML, two guns per turret, as was her sister ship, indicating that three men were assigned to each gun in the turret and an additional three below for each gun to pass up powder and shell and two other men to bring more ammunition from the forward magazine when needed. With the gun captain in the cupola, this would account for a 15 man crew assigned to each armoured turret above and below decks.⁹⁴³ As a result of the mishap, the *Wivern* was mentioned in the Irish press as having 'A Novel Armament' and with some black humour, was referred to as having 'three guns and a half'.⁹⁴⁴ The failed gun, produced at the Woolwich Arsenal, reportedly had some casting flaws in the iron which contributed to the mishap.⁹⁴⁵ The flawed gun was reported to be a 10½-inch, 12½ ton Armstrong RML made before an improved reinforced breech was adopted in 1863.⁹⁴⁶

⁹⁴¹ 'Explosion on Board H.M.S. Wivern', *Liverpool Mercury*, 21 November 1867, 5.

⁹⁴² *Ibid*, 5, *Morning Post*, 18 November 1867, 3.

⁹⁴³ 'Naval and Military Intelligence', *Morning Post*, 18 November 1867, 3.

⁹⁴⁴ 'A Novel Armament', *Dublin Evening Mail*, 18 February 1868, 4.

⁹⁴⁵ 'Heavy Guns for the Navy', *Newcastle Journal*, 22 November 1867, 4.

⁹⁴⁶ *Ibid*, 4, Marshall J. Bastable, *Arms and the State: Sir William Armstrong and the Remaking of British Naval Power 1854-1914*. (Aldershot, 2004), 97.

The *Scorpion* was initially reported to carry smoothbore cannon, but these and the original armament of the *Wivern*, were earlier RMLs.⁹⁴⁷ An officer in the 18th Hussars, William Palliser, had patented the method to refurbish smoothbores into rifled guns, by inserting a rifled iron and later steel inner core into the old guns. When the breech of the muzzleloader was covered with iron bands to provide additional strength for the increased powder charges, the Woolwich Arsenal (which used the Palliser patent) was able to provide inexpensive rifled guns reconditioned from old smoothbore cannon.⁹⁴⁸ Coincidentally, the change from smoothbores to heavy rifled muzzleloading guns had occurred as the ordnance terminology was changing. By March 1864, the War Department designated the heavy Armstrong guns (and subsequent ordnance) by the size of the bore, not by the weight of the shot or shell as had been the previous practice.⁹⁴⁹ Palliser would later identify the screw threading of the breech plug as the weak point in these early 300-pdr RMLs. The cascable was screwed into place to seal the breech after the rifled tube had been inserted into the rear of the gun during manufacture. The screw threads had been cut from the breech wall instead of the later method of inserting a raised threaded surface for strength. With each firing of the older guns, the force of the blast worked from the inside of the breech down the screw lining to the outer threading of the cascable. Fortunately, few of these guns were made before the stronger breech closing method was adopted.⁹⁵⁰

⁹⁴⁷ 'H.M. Turret-Ships Wivern and Scorpion', *Illustrated Times*, 4 November 1865, 282.

⁹⁴⁸ Bastable, *Arms and the State*. (2004), 97- 98, 'Compound Ordnance', *Dublin Evening Mail*, 10 October 1863, 4.

⁹⁴⁹ Henrietta Heald, *William Armstrong: Magician of the North*, (Newcastle, 2010), 112.

⁹⁵⁰ 'The Accident on the Thunderer', *Times*, 13 January 1879, 10.

As a result of the incident aboard the *Wivern*, the Admiralty ordered the older pattern guns replaced with the improved 9-inch RML.⁹⁵¹ The failed guns were the early Mark I versions with steel rifled tubes built up at the breech with overlapping sleeves of iron ‘hooked together’ for supposed strength, but the breech (and the cascable screw threads) was not strong enough to contain the heavy charges.⁹⁵² The improved 9-inch guns had shed the earlier method of overlying reinforced iron at the breech, for thicker single-layered iron covering from the breech to the trunnions for greater longitudinal support.⁹⁵³ With each modification, the gun changed with the inner steel tube becoming more tapered and less rounded at the innermost part near the vent and with more separation from the cast breech plug.⁹⁵⁴ After changes to the gun, the carriages had to again be modified, as the 9-inch RMLs were termed ‘inconveniently heavy’ for use aboard most warships of the time.⁹⁵⁵ Naval armament had become more of a weapons system and bore less resemblance to the wooden gun trucks and iron smoothbores of the sailing navy. Industrialization was reaching the very heart of the warship and transforming the perceptions of firepower. Man and machine had to work in precise unison to load, direct, and fire the heavy ordnance used to arm the ironclads of the middle-nineteenth century.

Large naval ordnance in a turret represented a challenge to gun drill in the 1860s. The heavy guns of British ironclads during this time were described as ‘short dumpy things like soda-water bottles’.⁹⁵⁶ The muzzles of these guns

⁹⁵¹ ‘Heavy Guns for the Navy’, *Newcastle Journal*, 22 November 1867, 4.

⁹⁵² TNA, ADM 186/869, *Manual of Gunnery for Her Majesty’s Fleet 1885*, (London, 1886), 39.

⁹⁵³ *Ibid*, 39.

⁹⁵⁴ TNA, ADM 1/6083, ‘Diagram Shewing Construction of the Experimental 9 Inch 12 ton Guns’ (Gun Nos. 298, 332 & 333), *Letters, Director of Naval Ordnance* 1868.

⁹⁵⁵ Sandler, *The Emergence of the Modern Capital Ship*. (1979), 103.

⁹⁵⁶ Fitzgerald, *Memories of the Sea*. (London, 1913), 298.

barely stuck out from the gunports of the turrets, and the short barrel length hampered firing due to safety concerns. In 1865 several lieutenants and some of the crew of the *Scorpion* were detailed to the *Royal Sovereign*, to learn the intricacies of working turret guns.⁹⁵⁷

The *Royal Sovereign* was the touchstone of the turret warship for the Royal Navy, and the practical experience gained by the gunners who trained aboard her was invaluable. Originally armed with 10.5 inch smoothbore muzzleloaders, the standardized armament for all turrets aboard allowed for a uniformity of storage and handling of ammunition as well as practice at gun loading and training.⁹⁵⁸ During gun drills in the forward double turret, Royal Marines refused to stand at the muzzle of one gun, ready to load as the other was being fired. The reason was fear of the fire from the muzzle blast of the other gun coming into the gunport while they were handling the powder charge of their yet to be loaded smoothbore.⁹⁵⁹ Two members of the Royal Marine Artillery prefaced their appeal to a lieutenant in the turret by warning 'we are experienced gunners, we have had as much experience as you have'. The solution was to fire the guns almost simultaneously to prevent the blast from one gun inadvertently touching off the powder of the other.⁹⁶⁰ An emphatic warning given by practiced experts overcame faulty procedures to produce a gun drill adapted for the larger ordnance entering service on the ironclads, especially for those guns housed within the close confines of the armoured turrets.

⁹⁵⁷ TNA, ADM 53/8623, *Ship's Log H.M.S. Royal Sovereign*, 15 October 1864 to 10 October 1866

⁹⁵⁸ Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 139.

⁹⁵⁹ TNA, ADM 268/ 97, *Report of a Committee of Naval Officers, Appointed to Examine the Design of a Sea-Going Turret-Ship, submitted by Captain C.P. Coles, R.N.*, (1865), 17.

⁹⁶⁰ *Ibid*, 17.

During her first commission, *Scorpion* carried 25 Marines as part of her then (1 October 1865) overall crew complement.⁹⁶¹ Divided between the crew for a turret provided from the Royal Marine Artillery (R.M.A.), the remaining ten marines would have served as riflemen positioned around the ironclad to shoot down men on an enemy quarterdeck, gunners near an open port, or at their opposites up in a fighting top. The Royal Marines were flanked by the Admiralty and War Office establishments, and were separated from their naval brethren and each other by different uniforms and traditions. The R.M.A, that ‘splendid body of men’, was considered well trained and superior to their army counterparts although they wore blue uniforms patterned after the tunics of the Royal Artillery.⁹⁶² The scarlet-coated riflemen of the Royal Marine Light Infantry (R.M.L.I.) ranked after the 49th Regiment and before the 50th Regiment of the British Army when serving ashore, and earned the distinction of being referred to as the venerable ‘Forty-Ninth and a Half’.⁹⁶³ Marine artillerymen and the R.M.L.I. were trained to double as foot soldiers when needed for an expedition ashore, and their services afloat added a *esprit de corps* wrought from having a dual mission which made them ‘particularly useful’ for the myriad of duties required by the Empire.⁹⁶⁴

Experience aboard the *Royal Sovereign* in May 1865, proved that Marine riflemen could not stand or kneel on the turret roofs as originally envisioned when Bulloch ordered the two Laird rams for the Confederates, as the double-gun turret produced a ‘very serious concussion’ to anyone positioned immediately

⁹⁶¹ TNA, ADM 135/417, ‘Office of the Controller of the Navy Ship’s Book Series 1, *H.M.S. Scorpion*’.

⁹⁶² ‘The Royal Marine Artillery’, *Portsmouth Evening News*, 10 October 1879, 2, ‘The Royal Marine Artillery’, *Dundee Evening Telegraph*, 4 December 1879, 3.

⁹⁶³ ‘The Royal Marine Artillery’, *Dundee Evening Telegraph*, 4 December 1879, 3.

⁹⁶⁴ *Ibid*, 3, Fitzgerald, *Memories of the Sea*. (1913), 187.

above the guns when fired.⁹⁶⁵ The turret was changing drill aboard the ironclads of the Royal Navy, although the Marine riflemen not assigned to a turret were undoubtedly deployed to their traditional positions aloft in the tops of the foremast or mainmast of the Laird ironclads as these were the surviving fighting positions from the sailing navy still carried in these turret ships.⁹⁶⁶

The 9-inch Armstrong was the largest rifled gun afloat on Royal Navy warships of the mid-1860s. Bigger smoothbore guns were afloat under the White Ensign, but the Armstrong was the main RML in service until larger bore heavier rifled guns could be perfected.⁹⁶⁷ Although this 12-ton gun was the premier piece of naval ordnance aboard British men-of-war at that time, the Admiralty experienced problems with those 9-inch RMLs produced by Woolwich Arsenal, guns considered to be 'the pride of the War Department'.⁹⁶⁸ Tests at Shoeburyness had proven the advance of armour had been momentarily halted, but as mentioned previously, the gun explosion aboard the *Wivern*, revealed a design flaw in the earlier breech plug. Complaints in British newspapers also called attention to the bore of the Armstrong 300-pdrs as they worn out rapidly when firing the heavy shells and larger powder charges. The guns usually lasted only one hundred rounds before needing repair or at least detailed inspection as the steel rifled central tube and iron coils wrapped around the breech were unable to endure the blasts from repeated firings. Another problem was that the grooves cut into the bore reportedly contributed to the fire not being carried away

⁹⁶⁵ ORN, II, 2, (1921), 454, TNA, ADM 268/97, Coles, *Design of a Sea-Going Turret-Ship*, (1865), 17.

⁹⁶⁶ Parkes, *British Battleships*. (1966), 78.

⁹⁶⁷ Ibid, 79, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 139.

⁹⁶⁸ 'Shoeburyness', *Aldershot Military Gazette*, 20 June 1868, 3.

from the muzzle immediately after discharge.⁹⁶⁹ Improvements to the muzzle loading naval rifles continued although the projectiles proved to be disappointments. One senior naval officer observed that studded shells broke up in the barrels or tumbled in flight and ‘went in any direction except the right one, but the guns made plenty of smoke’.⁹⁷⁰

In Search of a Role

The British press exhibited a casual dislike of the Laird rams during their early years in service, with one newspaper exclaiming they were hurriedly built and unsteady at sea.⁹⁷¹ By early August 1868, *Wivern* went into the Portsmouth dockyard for a refit and to receive new guns.⁹⁷² She was to be modified along the lines of her sister ship, as the *Scorpion* had been ‘improved greatly’ with new fittings and alterations.⁹⁷³

Despite the alterations, these two turret ships were not significant improvements over their previous configurations. Slightly over five years after being commissioned, the Laird turret rams were already outclassed and ill-suited for work in home waters. Reed remarked (1869) that the *Scorpion* and *Wivern* were ‘the weakest of our armour-clads’.⁹⁷⁴ In a rebuttal to the claim, one writer questioned Reed’s mention of the armament of the two Laird rams as being light and retorted saying ‘we might admire the grandeur of thought which could

⁹⁶⁹ Sandler *The Emergence of the Modern Capital Ship*. (1979), 100, ‘The Armstrong Guns’, *London Evening Standard*, 2 November 1863, 2.

⁹⁷⁰ Marder, *The Anatomy of British Sea Power*. (1976), 138.

⁹⁷¹ ‘The Launch of the Monarch’, *Reynold’s Newspaper*, 31 May 1868, 2.

⁹⁷² ‘Naval and Military Intelligence’, *London Evening Standard*, 5 August 1868, 6.

⁹⁷³ ‘Naval and Military News’, *Hampshire Telegraph*, 12 August 1868, 2.

⁹⁷⁴ Reed, *Our Iron-clad Ships*, (2011), 32.

contemplate a 300-pounder with such a degree of depreciation' as the guns carried in these turret ships were among the principal afloat in the Royal Navy and only three British men-of-war carried larger guns at that time.⁹⁷⁵

Performance issues impacted the reputation of Laird rams during their first years in commission. The *Scorpion* was able to slightly outpace her sister as she reached 10½ knots on at least one occasion.⁹⁷⁶ Although they archived what was then considered a moderate speed, the Laird rams were susceptible to roll as they took seas amidships. During her 1866 cruise with the Channel Fleet the *Wivern* rolled up to 27 degrees in a heavy sea, but this must also be read in context of the Coles-Reed battles in the press.⁹⁷⁷ Coles had remarked earlier that two Reed built ironclads the *Enterprise* and *Research*, were both 'dreadfully slow' and did not perform well at sea, going on to proclaim that the *Research* was an unsafe ship 'the Admiralty have never trusted her 100 miles from our coast since launched'.⁹⁷⁸

The battle between Coles and Reed had been going on beyond design issues regarding the broadside versus the turret ironclad, and also delved into the fittings on the ships. As previously mentioned, the *Scorpion* was originally equipped with wooden carriages instead of newer iron carriages for the Armstrong RMLs.⁹⁷⁹ The British press opined: 'while the captains of Mr. Reed's ship get everything which they require done without a day's delay, the captains of the turret ships find all their requests treated with utter neglect, and are forced to

⁹⁷⁵ 'Turrets v. Broadships', *London Evening Standard*, 2 February 1870, 1.

⁹⁷⁶ Reed, *Our Iron-clad Ships* (2011), 96.

⁹⁷⁷ *Ibid*, 138, 139

⁹⁷⁸ 'Turret Ships', *London Evening Standard*, 10 January 1866, 5.

⁹⁷⁹ 'Turret Ships', *London Evening Standard*, 11 November 1865, 5.

do as they best can with what their own crews can manage to do'.⁹⁸⁰ The *Scorpion* needed adjustments to her gun carriages to render her armament more serviceable and these modifications were undertaken by her crew.⁹⁸¹ The port side gun carriage in the aft turret was altered as several bolts were too long and had to be cut down to prevent injury to the gunners in the confined space between the muzzleloaders.⁹⁸²

Turret ships of the Royal Navy lacked the room associated with an unobstructed gun deck of those broadside armed ironclads favoured in the early ironclad years. The larger armoured vessels carried rope netting or 'mantlets' suspended from the deck above the guns in broadside in order to prevent shell fragments, broken bolts, or nuts from flying unimpeded around the gun deck during action.⁹⁸³ When in place, these rope barriers (some weighing as much as 820 lbs each) would separate each gun crew in a cage-like isolation.⁹⁸⁴ During gunnery tests ashore, the rope mantlets did stop larger fragments and served to deaden the sounds when the guns fired, but they also presented a fire hazard.⁹⁸⁵ When treated with a fire retardant (chloride of calcium), the rope mantlets could be made safer, as they were also considered a barricade to prevent burning powder from entering an adjacent gunport when heavy ordnance was fired from

⁹⁸⁰ 'The Birkenhead Rams, Scorpion and Wyvern [sic]', *Manchester Courier and Lancashire General Advertiser*. 12 September, 1865, 4.

⁹⁸¹ TNA, ADM 135/417, 'Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'.

⁹⁸² Ibid.

⁹⁸³ 'The Shoeburyness Experiments on Plymouth Fort Shield', *Illustrated Times*, 27 June 1868, 14-15, Ballard, *The Black Battlefleet*. (1980), 231.

⁹⁸⁴ Ballard, *The Black Battlefleet*. (1980), 231.

⁹⁸⁵ 'Plymouth Breakwater Fort', *London Daily News*, 23 June 1868, 5, 'Iron Cased Forts', *Sheffield Independent*, 17 June 1868, 2, *Hansard*, 18 July 1868, 193, cc 1430.

a warship during high winds.⁹⁸⁶ The rope mantlets were a valuable method to improve safety aboard the broadside warships but they were not suitable for the turret ships, as overhead beams were needed to secure the rope screens and would have impeded the loading and sighting of the guns.⁹⁸⁷

The refitted *Scorpion* participated in a mock combined arms demonstration off Dover Castle on 30 March 1869, with the *Royal Sovereign* serving as flagship of the squadron.⁹⁸⁸ The 'sham fight' involved the two ironclads reducing the shore batteries manned by the army volunteer regiments as part of their annual review, while gunboats were to provide close-in fire for the invading force. A gale delayed the exercise until the rains abated; a drummer aboard the *Royal Sovereign* beat to quarters as a signal was hoisted ordering the *Scorpion* to clear for action.⁹⁸⁹ High waves prevented the smaller gunboats from putting to sea from Dover as the brig *H.M.S. Ferret* broke loose from her moorings in harbour and was bashed to pieces against a quay.⁹⁹⁰

The gale tossed the mail steamers about 'as if made of cork', and the two ironclads held their positions only through the application of full steam power.⁹⁹¹ The storm tested the abilities of the men and turret ships as both vessels wallowed in the heavy sea and the *Scorpion*, with her flat bottom, rolled in excess of 30 degrees.⁹⁹² Eventually the storm abated and the two turret ships prepared for action after lowering their iron bulwarks, an act the well-trained men of the

⁹⁸⁶ 'Important Gunnery Experiments', *Morning Post*, 30 November 1872, 2, 'Gunnery Trials of the Devastation', *London Evening Standard*, 17 July 1873, 3.

⁹⁸⁷ TNA, ADM 268/97, Coles, *Design of a Sea-Going Turret-Ship*, (1865), 21.

⁹⁸⁸ 'From our Naval Correspondent', *London Evening Standard*, 30 March 1869, 2.

⁹⁸⁹ *Ibid*, 2, 'From our Naval Correspondent', *London Evening Standard*, 29 March 1869, 6.

⁹⁹⁰ 'The Easter Review at Dover', *Hampshire Advertiser*, 31 March 1869, 4. This newspaper also reported that during the storm, a merchant vessel went ashore under the nearby cliffs and soon sank with only her masts visible above the waves.

⁹⁹¹ *Ibid*, 4.

Royal Sovereign completed 'in a few seconds'.⁹⁹³ Some of these men were a picked crew from the gunnery training ship *H.M.S. Excellent*, and the commander of the squadron also commanded both the gunnery establishment and the Royal Naval College.⁹⁹⁴ The flagship opened fire at 4: 30 p.m. as the crew served their 9-inch guns (she had been rearmed in 1867 when her original 10.5 inch smoothbore guns were removed) with a drill that was described as 'smart and exceedingly well regulated' and the rotation of the turrets 'worked smoothly and without a hitch'.⁹⁹⁵ The *Scorpion* joined in, and both ships did 'good service' in providing the invading force with covering fire to reduce the batteries ashore.⁹⁹⁶

An 1869 print from the *Illustrated London News* shows both ships firing, the *Scorpion* employing the guns in her forward turret, the *Royal Sovereign* firing all but the gun from her central-most turret.⁹⁹⁷ The ironclads have hurricane decks, permitting officers and men on the ships better forward and aft as waves are washing over the lowered bulwarks on each ship. The *Scorpion* reveals another aspect of her refit as her armoured casemate surrounding her funnel was no longer visible indicating that the somewhat slender telescoping funnel and armoured sleeve had been removed to make way for the hurricane deck and larger fixed funnel.⁹⁹⁸ Although her topside weight had been reduced with the change to her funnel, the iron masts and yards contributed to her rolling and lesser performance at sea.

⁹⁹² Parkes, *British Battleships*. (1966), 80.

⁹⁹³ 'From our Naval Correspondent', *London Evening Standard*, 30 March 1869, 2.

⁹⁹⁴ 'The Dover Volunteer Review', *Sheffield Independent*, 29 March 1869, 2.

⁹⁹⁵ Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 139-140. 'From our Naval Correspondent', *London Evening Standard*, 30 March 1869, 2.

⁹⁹⁶ 'From our Naval Correspondent', *London Evening Standard*, 30 March 1869, 2.

⁹⁹⁷ 'The Volunteer Review at Dover: View of Dover from the Sea-The Naval Squadron Attacking the Forts', *ILN* 10 April, 1869, 356-357.

Nevertheless, the ships put on a good show. The artillery ashore fired back with 68-pounders, but their response was considered insignificant when compared with the boom of the naval guns as their reports reverberated off the cliffs. Both ships were to fire a round from each gun every three minutes but the *Scorpion* was much slower than the flagship in her rate of fire. At the conclusion of the simulated bombardment, the bulwarks were raised, the guns run in, and the ships anchored.⁹⁹⁹

The sham fight did illustrate a valuable tactical lesson. An invading force, when supported by heavy guns of armourclads within range of a vital stretch of coastline, would greatly complicate the defence. The defending force would have to have the ability to imperil the attacking warships, withstand the bombardment, and hold off the invading ground force or be overwhelmed. The assault force was assessed to have gained the outer works of the defenders after the fire from their guns had become 'ominously slacker, for the heavy artillery of the fleet had succeeded in overpowering and silencing many of the guns of the south-east bastions'.¹⁰⁰⁰ Although the bombardment was only a demonstration, the *Scorpion* would have been effective in a coastal assault role, as her slighter draft would have permitted a closer approach to an enemy shore in wartime. With a crew trained to handle the heavy guns in a seaway, she (and her sister) would have given a good account against a hostile coastal position.¹⁰⁰¹

⁹⁹⁸ Ibid, 356-357. The Laird ram was depicted as rolling more than the *Royal Sovereign* as the *Scorpion* retained her earlier mast configuration with the heavy yards.

⁹⁹⁹ 'From our Naval Correspondent', *London Standard*, 29 March 1869, 6, 'From our Naval Correspondent', *London Evening Standard*, 30 March 1869, 2.

¹⁰⁰⁰ 'The Easter Review at Dover', *South London Press*, 3 April 1869, 11.

¹⁰⁰¹ 'The Volunteer Review', *Dover Express*, 2 April 1869, 4. The wind cleared away the smoke from the turrets of the ironclads almost immediately after the guns fired. Nevertheless, the naval gunfire was likely restricted in duration as the bombardment produced 'a roar that shook the houses in the town'. 'The Great Volunteer Review at Dover', *Dundee Courier*, 31 March 1869, 3

In April 1869 the *Scorpion* was at Portsmouth to receive new 'pointers' for her guns. Artisans formerly employed by the gunwharf establishment at Portsmouth had been let go in a cost saving plan and as a result, skilled workmen had to travel from Woolwich Arsenal to carry out the fittings at almost double the cost.¹⁰⁰² The government responded to the claim by stating that the work was intricate and would have cost the same for the materials and the skilled labour regardless whether the men came from Woolwich or Portsmouth. During a debate in the Commons over this expenditure, the real issue came to the fore. Skilled workmen (113 of them) had been discharged from the gunwharf as the navy was forced into cost cutting measures.¹⁰⁰³ Some men took the offer for free emigration to Canada as a resettlement severance from government employment and Sir James Elphinstone remarked it was 'a thousand pities' for Britain to lose their hard-earned skills.¹⁰⁰⁴

Fiscal restraint was the demand from Westminster as the Royal Navy's funding had contracted by over 40 per cent from the end of the Crimean War to the early 1880s.¹⁰⁰⁵ Despite the occasional funding spikes brought on by the Civil War, Franco-Prussian War, and the 1878 crisis with Russia, British domestic political gravity kept budgets under constraint.¹⁰⁰⁶ Parliamentary pressure for low defence expenditure was answered at the cost of efficiency. The requirements for those ships not in the dockyard to keep to sea, exacerbated the problem of defending a global empire with a navy restricted in size by budget and wear. Ironclads not considered a success by the contradicting requirements of a

¹⁰⁰² TNA, ADM 53/9512, *Ship's Log H.M.S. Scorpion*, 2 December 1868-31 December 1869.

¹⁰⁰³ *Hansard*, 16 April 1869, 195, cc. 991-992.

¹⁰⁰⁴ *Ibid*, cc. 991.

¹⁰⁰⁵ John Beeler, *British Naval Policy in the Gladstone-Disraeli Era 1866-1880*. (Stanford, 1997), 222.

¹⁰⁰⁶ *Ibid*, 222.

service with worldwide commitments, nevertheless meant they had to be retained in degrees of readiness.¹⁰⁰⁷ Britain had to keep ships like the *Scorpion* and *Wivern* in the fleet to maintain enough armourclads available for service while others were in overhaul. Although smaller and slower than the large armoured frigates, and in need of alteration, they were still required. To maintain Britain's maritime security, every ironclad was needed regardless of seakeeping qualities. It was a numbers game.

The *Scorpion* participated in another 'sham fight' off Southsea Castle near Portsmouth on 26 April 1869, when she led a force of six 'enemy' gunboats in a mock attack against the castle, supported by an attacking land force comprised of volunteers and regulars. During the simulated invasion, the castle fell after a landward attack supported by the *Scorpion* and her flotilla, with the ironclad shielding the smaller vessels until they closed the range.¹⁰⁰⁸ The turret ship did not fire her guns (although they were run out and the bulwarks lowered) as it was feared that the blast from her 9-inch battery would shatter the glass of the houses near the shore.¹⁰⁰⁹ A nearby lighthouse had the lenses removed as a precaution against damage from the guns of the flotilla as 'economy-even in glass' was the order of the day.¹⁰¹⁰

After that stage of the exercise, the invading force moved up with skirmishers and field artillery, towards the main objective, the fortress of Portsmouth.¹⁰¹¹ A naval landing party led by an officer from the warships marched with the field

¹⁰⁰⁷ *Hansard*, 4 August 1866, 184, cc. 2053.

¹⁰⁰⁸ 'The Portsmouth Review', *Manchester Courier and Lancashire General Advertiser*, 27 April 1869, 5, 'The Hampshire Volunteer Review', *Berkshire Chronicle*, 1 May 1869, 7.

¹⁰⁰⁹ 'The Review at Portsmouth', *London Evening Standard*, 27 April 1869, 6, 'Playing at Warfare', *Lake's Falmouth Packet and Cornwall Advertiser*, 1 May 1869, 2.

¹⁰¹⁰ 'The Review at Portsmouth', *London Evening Standard*, 27 April 1869, 6.

¹⁰¹¹ 'The Hampshire Volunteer Review', *Berkshire Chronicle*, 1 May 1869, 7.

artillery as the gunboats protected their flank. The flotilla steamed into Portsmouth (in a simulated bombardment) and was reportedly overwhelmed by the fire of the forts, whereupon the invasion collapsed under the weight of counterattacks.¹⁰¹²

The event was conducted under a festival atmosphere as the gunboats slowly moved into position, and the volunteers led by regulars, followed a set schedule with no adjustments for the probable response of a real enemy. The spectators enjoyed a good show and a team of inventors from London brought a pedal-driven sightseeing craft or 'velocipede yacht' to the beach to the delight of the crowds. Although termed 'perhaps the prettiest spectacle yet presented in connection with the volunteer movement', the exercise was dubbed a naval 'absurdity' and the field manoeuvres ashore 'highly indifferent as a military lesson'.¹⁰¹³

Two days later, after being refueled and reprovisioned, the *Scorpion* was at sea again headed for her new assignment in Ireland, arriving at Queenstown anchorage on 1 May.¹⁰¹⁴ With her sister on duty as a guardship, by mid-May 1869 the *Wivern* was back in Portsmouth in the hands of the dockyard for alterations to adapt her for her more suitable role as a coastal defence ironclad.¹⁰¹⁵ Experience gained aboard one turret ship was relayed into refits and modifications with the other turret ironclads as new technology, methods of

¹⁰¹² Ibid, 7.

¹⁰¹³ 'The Review at Portsmouth' *London Evening Standard*, 27 April 1869, 6-7. The *Scorpion* did not fire, but the gunboats reduced Southsea Castle in a 'marvelously brief period'. This account claims the commanders of the warships were in a hurry to end the manoeuvre in order to return to their moorings. Also see: 'The Portsmouth Volunteer Review', *Portsmouth Times and Naval Gazette*, 1 May 1869, 7, This account criticized the training of the volunteer troop formations which were not armed with the Snider breechloading rifle, whereas the Continental powers were changing drill methods to take advantage of the new breechloading infantry weapons.

¹⁰¹⁴ 'Shipping Intelligence', *Belfast Morning News*, 3 May 1869, 2.

drill, and changes to ship handling, remade these vessels. The turret ship was evolving.

The Guardships

In Early May 1869, *Scorpion* took up her duties as guardship at Cork from where she would occasionally put to sea to exercise the crews at the guns.¹⁰¹⁶ On 26 July, she steamed out on what was to have been a week long cruise along the Irish coast.¹⁰¹⁷ The vessel encountered a tremendous storm which caused the ship to 'behave very badly' in the mountainous seas to the terror of her crew.¹⁰¹⁸ The waves washed down on the turrets, the powder stores were damaged when water poured in from the turrets down into the magazines, and the men were drenched as their berths were 'in anything but a comfortable condition'.¹⁰¹⁹ The ship was quick to roll and was taking water on one side of her deck as she was emptying it from the other side.

One day during the cruise, all sail was applied but the results were not satisfactory. Despite this shortcoming, her captain would later claim when steam was used, 'I thought the *Scorpion* as safe as any ship could be'.¹⁰²⁰ She answered the helm when under steam but when under sail only, her steering was

¹⁰¹⁵ No Subject, *Hampshire Advertiser*, 19 May 1869, 3.

¹⁰¹⁶ 'The Guard Ship At Queenstown', *Cork Examiner*, 4 May 1869, 3. The *Scorpion* was to relieve the frigate *H.M.S. Mersey* as the local flagship on 8 May as the *Mersey* was ordered to Falmouth.

¹⁰¹⁷ 'Queenstown Intelligence' *Cork Examiner*, 27 July 1869, 2.

¹⁰¹⁸ No Subject, *Hampshire Advertiser*, 23 October 1869, 8.

¹⁰¹⁹ *Ibid*, 8, 'H.M.S. Scorpion', *Cork Examiner*, 20 September 1869, 2.

¹⁰²⁰ 'The Loss of H.M.S. Captain', *London Evening Standard*, 29 September 1870, 3.

described as 'wild'.¹⁰²¹ Another factor which impaired her performance in a storm was her hurricane deck was too narrow for her crew to safely work her with efficiency.¹⁰²² With her complement exhausted from the ordeal, the storm battered *Scorpion* returned to anchor at Cork a day earlier than anticipated on 31 July.¹⁰²³ This voyage and the experiences with the *Royal Sovereign*, likely contributed to design changes needed for other turret ships as Reed's *H.M.S. Glatton* was fitted with a hurricane deck 11 feet wide to permit suitable room for her crew to move about while the harbour defence ironclad was underway.¹⁰²⁴ The structure (also referred to as the spar deck) on the turret ship *H.M.S. Captain*, was widened to 24 feet to provide room to work all the ropes for the sails, conduct navigation, and provide storage for the ship's boats.¹⁰²⁵

In August 1869, rumours circulated that the *Scorpion* had her masts removed in Cork after her crew protested that she was unseaworthy due to their experiences endured during the July storm. This was not entirely true, but the men were wary of again going out in her.¹⁰²⁶ Despite the claim made in the *Cork Herald* (and repeated in the British press), that the performance of the ship 'occasioned such panic to her crew', the report was exaggerated. However, her captain acknowledged that the *Scorpion* was very uncomfortable in a heavy sea, and the amount of water on the deck during those conditions made it unsafe for the crew to move about except on the hurricane deck, and impossible to work the

¹⁰²¹ TNA, ADM 135/417, 'Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'.

¹⁰²² 'The Loss of H.M.S. Captain', *London Evening Standard*, 29 September 1870, 3.

¹⁰²³ 'Shipping Intelligence', *Belfast Morning News*, 2 August 1869, 4.

¹⁰²⁴ TNA, ADM 268/97, Coles, *Design of a Sea-Going Turret-Ship*, (1865), 299, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 262-263.

¹⁰²⁵ 'The "Captain" Turret Ship', *Graphic*, 19 March 1870, 381.

¹⁰²⁶ 'Her Majesty's Ship Scorpion', *Hampshire Advertiser*, 21 August 1869, 8.

guns.¹⁰²⁷ The low freeboard was a concern for the crew, and although 'not heavily sparred for her size', the heavy iron masts and yards contributed to her top heavy condition.¹⁰²⁸ The double topsails in several Royal Navy ironclads of the 1860s provided little in the way of extra speed, but the weight aloft was excessive. On the larger iron frigates, as much as six tons were added, but the sails and rigging also added to the wind resistance in steam armourclads.¹⁰²⁹

The Laird rams were rarely known as being good sea boats and a month after her arrival in Cork, the *Scorpion* was referred to in one Irish newspaper as a 'tipsy Sinbad the Sailor'.¹⁰³⁰ Ironically, the whimsical story published in the 18 June 1869, edition of the *Cork Examiner* described the *Scorpion* as a seaman on liberty, weighted with back pay or 'having much metal about his hull'. The tale continued with the tar, (*Scorpion*) becoming wrecked after having been 'sorely buffeted by that Old Man of the Sea'.¹⁰³¹ This intended light-hearted musing undoubtedly played on the superstitions of some members of the crew and contributed to their fear during the great storm several weeks later. The Laird rams were regarded as 'equally disreputable' seagoing vessels and some members of the crew stated they would not go to sea in the *Scorpion* again after her July voyage.¹⁰³²

The issue of the ship's seaworthiness was revived when on 16 September orders were read to the crew instructing them to steam to Bermuda to assume

¹⁰²⁷ 'Miscellaneous Naval', *Portsmouth Times and Naval Gazette*, 7 August 1869, 4, TNA, ADM 53/9512, *Ship's Log H.M.S. Scorpion*, 2 December 1868-31 December 1869

¹⁰²⁸ 'An Ex-Confederate Ship of War', *London Evening Standard*, 6 August 1869, 3, 'The Loss of H.M.S. Captain', *London Evening Standard*, 29 September 1870, 3.

¹⁰²⁹ Ballard, *The Black Battlefleet*. (1980), 18, 133.

¹⁰³⁰ 'Cork Drawings-Number One', *Cork Examiner*, 18 June 1869, 2.

¹⁰³¹ *Ibid*, 2.

¹⁰³² 'An Ex-Confederate Ship of War', *London Evening Standard*, 6 August 1869, 3

the duty as guardship there.¹⁰³³ The men came aft and ‘respectfully remonstrated’ against having to put to sea on a long voyage at that time of year ‘in a ship like the *Scorpion*’.¹⁰³⁴ The effect of the crew going aft was a change in the order, and the voyage into the central Atlantic was postponed in the interest of safety. After the weather cleared, the ship was reportedly ordered to proceed to Portsmouth for a refit prior to her circuitous voyage to Bermuda.¹⁰³⁵ The armourclad did not steam to Portsmouth, but the Admiralty took the unusual step of coming to her in Queenstown. When the *Agincourt*, flagship of the Channel Squadron, anchored in the roadstead later that month, the inspecting party proceeded to the turret ship to ascertain for themselves the conditions aboard and to determine her fate. The party consisted of the First Sea Lord, Vice-Admiral Sir Henry Dacres, Commodore G. O. Willes, and the former commanding officer of the *Wivern*, Captain Burgoyne. The report found nothing which prohibited the ram from its mission, and the *Scorpion* was ordered to proceed to Bermuda when her escort ship arrived from Devonport.¹⁰³⁶

Why the hurry to send the *Scorpion* to Bermuda? She was needed at the naval base to reinforce the station with a modern turret warship to defend the key installations, especially the new floating dry dock. The dry dock was essential for a modern fleet. It facilitated command of the local seas, for well-maintained British warships, especially armoured ones had an advantage against an enemy force far from their own home waters. The dry dock was ‘the pivot around which British Imperial strategy was transformed between 1860 and 1890’.¹⁰³⁷ Bermuda

¹⁰³³ No Subject, *Royal Gazette*, 19 October 1869, 2.

¹⁰³⁴ TNA, ADM 53/9512, *Ship's Log H.M.S. Scorpion*, 2 December 1868-31 December 1869.

¹⁰³⁵ ‘The Turret Ship *Scorpion*’, *London Evening Standard*, 24 September 1869, 3.

¹⁰³⁶ ‘The Cruise of the Lords of the Admiralty’, *Star*, 5 October 1869, 2.

¹⁰³⁷ Andrew Lambert, ‘Economic Power, Technological Advantage, and Imperial Strength: Britain as a Unique Global Power, 1860-1890’. *IJNH*, 5, (August 2006), 12, 19.

was the ideal location, within easy steaming distance to Canada, the West Indies, and the American eastern coasts, it was a protected base that provided Britain with a likely launch platform for raids against American harbours and shipping if war occurred. Admiral Milne referred to the island base as the 'key' to the United States, and American observers agreed.¹⁰³⁸ One Washington D.C. newspaper commented as late as 1896 that Bermuda was 'menacing our coast' and hailed the strategic location near the centre of the Gulf Stream, as the 'Watch Station of Great Britain'.¹⁰³⁹ Significantly, the newspaper featured an etching not of a fleet at sea or great gun, but of the cradled *Bellerophon*, her bow sprit extending forward over the men posed along the upper and lower gangways of the floating dock, as an illustration of British Imperial might.¹⁰⁴⁰ The colonial dry docks, gave the Royal Navy an edge over most rivals, as they kept the ships of the Royal Navy not only in repair but also battle ready, for their 'everyday role was to maintain speed and endurance'.¹⁰⁴¹

In the summer of 1869, the Royal Navy undertook one of the most intricate feats of seamanship since the laying of the Trans-Atlantic cable three years before. The floating dry dock *Bermuda* was towed from Britain to the Azores then on to her namesake home in two relays. Described as 'intrinsically ugly', the 381 foot long dock was also acknowledged as a specimen of skilled workmanship that would provide the Atlantic colony with the modern means to overcome the shortcomings of poor soil and coral which prohibited the building of

¹⁰³⁸ Ibid, 17. Also see: TNA, WO 28/348, *Defences of Bermuda*, 'Misc Correspondence and Reports', letter dated 16 October 1869. This report (written before the *Scorpion* arrived on station) proposed in time of war, to consider blocking the main channel by 'sinking hulls laden with stone'.

¹⁰³⁹ 'Like a Big Mosquito Menacing Our Coast', *Morning Times*, 17 May 1896, 18.

¹⁰⁴⁰ Ibid, 18.

a more traditional dry dock.¹⁰⁴² Escorted by ironclads the entire way, this tow was an example of British maritime power executing a seemingly routine transfer to a colonial station with breathtaking skill. It was also a display of naval supremacy as four of Britain's ironclad frigates, including the *Warrior* and her sister the *Black Prince*, escorted the dock from Madeira to Bermuda after the *Agincourt* and *Northumberland* towed the *Bermuda* to the Azores from Britain.¹⁰⁴³

Weighing 8,350 tons, it was dubbed 'the monster floating machine', the largest floating dry dock in the world.¹⁰⁴⁴ Although able to ride on the waves 'like a well corked bottle', she needed a ship to pull her back when she yawed while under tow. That function was served by the venerable paddle frigate *Terrible* after the gunboat *H.M.S. Lapwing* went ahead to inform the naval authorities of the convoy's progress. The dock arrived at Bermuda on 29 July 1869, and came to anchor at her new home at the naval base on the western edge of the archipelago. The Royal Navy now had the means to repair ships on the North Atlantic Station. The tow of the *Bermuda* to her namesake home over 4000 miles of open ocean was an achievement justly commended by the Admiralty to the men of the ships involved in the undertaking, as 'an operation without precedence in the British or any other navy'.¹⁰⁴⁵

In the late 1860s, Britain had naval yards around the Atlantic at Halifax, Jamaica, Antigua, Gibraltar, and the Cape of Good Hope, yet these lacked dry

¹⁰⁴¹ Jarvis, 'Protection and Decoration: A Tentative Investigation into Painting Ships Before the Great War', *The Great Circle*, 22, (2000), 29.

¹⁰⁴² 'The Great Floating Dock for Bermuda', *SA*, 1 January, 1869, Volume 20, 7.

¹⁰⁴³ Captain John Wells, RN, *The Immortal Warrior: Britain's' First and Last Battleship*. (Hampshire, 1987), 144.

¹⁰⁴⁴ *Ibid*, 7.

¹⁰⁴⁵ *Ibid*, 144, 148.

docks.¹⁰⁴⁶ Aside from the floating dock at the island fortress, one other graving dock existed at Quebec for the use of the North American Squadron. However, due to icing up, this facility would not be available during winter.¹⁰⁴⁷ Only the *Bermuda* gave the Royal Navy the year around strategic option of keeping a warship on the coasts of North America and available for service in the South Atlantic without returning to Britain.

On Tuesday, 12 October, the *Scorpion* left harbour with her consort, the paddle frigate *Terrible* recently returned from Bermuda, in close proximity.¹⁰⁴⁸ The British press mistakenly reported that that paddle frigate had been ordered back to Bermuda in order to tow out a dredging machine for use clearing channels around the reef-bound base.¹⁰⁴⁹ Details of *Scorpion*'s brief refit were only hinted at in the British press, but these likely included the removal of her double top gallants for lighter single yard variants to render her a safer vessel.¹⁰⁵⁰

Captain Booker (former commander of the *Wivern*) had identified several deficiencies in the ship during the July voyage and pointed to the flanges around the turrets and the hatches as the main avenues of flooding. By adding screw 'buttons' to tightly hold the flanges to the iron plate which circled the base of each turret, the water would be prevented from entering the ship through the spacing between the deck and the turret wall.¹⁰⁵¹ Raising the height of several hatchways was also required to insure the ship remained dry. These minor

¹⁰⁴⁶ Thomas Brassey, *The British Navy: It's Strength, Resources, and Administration*, 2. (Cambridge, 2010), 227, 228.

¹⁰⁴⁷ Brassey, *The British Navy*, 4. (Cambridge, 2010), 116.

¹⁰⁴⁸ 'The Scorpion', *Cork Examiner*, 14 October 1869, 2, 'Naval and Military Intelligence', *Morning Post*, 7 September 1869, 2.

¹⁰⁴⁹ 'Naval and Military News', *Hampshire Telegraph*, 29 September 1869, 2.

¹⁰⁵⁰ 'Naval and Military News', *Hampshire Telegraph*, 20 October 1869, 2.

¹⁰⁵¹ TNA, ADM 135/417, 'Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'.

alterations were likely carried out before the Admiralty delegation arrived as further fittings were recommended by the inspectors. These included the installation of deadlights to the hatchways to provide more light from above and the fashioning of angle iron to fill in the space between the funnel and pilot house in order to 'carry off the sea'.¹⁰⁵² Captain Booker had made other suggested changes which included widening the hurricane deck and replacing the three-bladed screw for a more suitable two-bladed Griffiths version, but these were not implemented while in Ireland.¹⁰⁵³ The ship had to carry out her mission and steam for Bermuda. Prior to her departure, the main armament was transferred to the *Terrible* to further reduce the weight of the turret ship.¹⁰⁵⁴

The Laird rams were not the only armoured warships to have been unpopular with officers and men of the Royal Navy during the first decades of the ironclad age. Reed ships also received reproofs from the Admiralty. The Reed designed *Vixen* and *Waterwitch* were experimental ships termed failures by the Navy. These small casemate ironclads had a feature referred to as 'plough bow' which restricted the speed of each vessel and held the bow down in the waves.¹⁰⁵⁵ Men aboard both ships were said to have come aft to protest going to sea in them.¹⁰⁵⁶ One admiral referred to them as 'coffins' and the naval experts refuted the subsequent claim by their designer that they were intended for river use.¹⁰⁵⁷

The Reed designed *Viper*, performed better than her unpopular sister the *Vixen*, yet these three vessels were armoured corvettes and carried a few heavy guns on a lighter draught. They suffered from the design disadvantage of a

¹⁰⁵² *Ibid.*

¹⁰⁵³ *Ibid.*

¹⁰⁵⁴ 'Military and Naval', *Reading Mercury*, 16 October 1869, 7.

¹⁰⁵⁵ *Hansard*, 11 May 1868, 192, cc 24, 25.

¹⁰⁵⁶ *Ibid.*, cc. 24.

¹⁰⁵⁷ *Ibid.*, cc. 24, 25.

compromise on a small *experimental* hull form. Observers would comment some twenty years later that the ironclad warship was a compilation of concepts put forth by the gunner, the seaman, the engineer, naval architect, and other nautical experts. The *Times* correctly referred to the rapidly evolving armourclads of the middle nineteenth century as ‘a marvel of theory, compromise, and complication’.¹⁰⁵⁸

The *Scorpion* steamed to Bermuda via the Azores in the late autumn of 1869.¹⁰⁵⁹ Towed by the *Terrible* during some stages of the voyage, the crew of the turret ironclad apparently did not suffer any mentionable ill effects from weather as the ship rolled far less than in the Irish Sea, and was only under sail for several days between Madeira and Bermuda. While in tow of the paddle frigate, coal was conserved as usually only two boilers were lit on the turret ship when not steaming.¹⁰⁶⁰

On 18 November, the *Scorpion* and the *Terrible* anchored at Bermuda ‘all well’.¹⁰⁶¹ Britain had successfully dispatched a turret ship to an overseas base and soon others followed. A turret ship stationed at a distant naval station had a distinct advantage over a broadside equipped ironclad, as a ship fitted with twin turrets could ‘direct all her guns on the same object on more bearings than by any other known plan’, and when the broadside armourclad was navigating an intricate harbour channel, the turret ship would have guns brought to bear while the broadside warship was end on at times and vulnerable.¹⁰⁶²

¹⁰⁵⁸ Marder, *The Anatomy of British Sea Power*. (1976), 8- 9.

¹⁰⁵⁹ ‘Naval and Military Intelligence’, *Morning Post*, 11 November 1869, 3.

¹⁰⁶⁰ ‘The Loss of H.M.S. Captain’, *London Evening Standard*, 29 September 1870, 3, TNA, ADM 53/9512, *Ship’s Log H.M.S. Scorpion*, 2 December 1868-31 December 1869.

¹⁰⁶¹ ‘Naval and Military News’, *Hampshire Telegraph*, 15 December 1869, 2.

¹⁰⁶² TNA, ADM 268/97, Coles, *Design of a Sea-Going Turret-Ship*, (1865), 6.

In December 1869, Britain dispatched the new double turret ironclad *H.M.S. Monarch* to the United States on a good will mission. George Peabody, an American philanthropist known for his work as ‘the great benefactor of the industrious poor of London’, had died in Britain and his remains were returned to Portland, Maine aboard the *Monarch* escorted by the American steam corvette *U.S.S. Plymouth*.¹⁰⁶³ Unlike all other turret vessels, the Reed-designed *Monarch* departed from the contemporary belief in a low freeboard, and with her hull higher above the waves like a broadside armourclad, she became Britain’s first ‘blue water turret ship’.¹⁰⁶⁴ Comparing the *Monarch* with American monitors, one New York newspaper called her ‘a vessel of commanding appearance’ and remarked it was impossible ‘to deny the fact that our war-worn turret vessels are nearly useless by reason of decay’.¹⁰⁶⁵ The British turret ship also had the advantage of her high freeboard, large coal capacity, four 12-inch guns in two turrets, and the then high speed of 14-knots; these factors made her the most powerful man-of-war afloat, and combined with her good seagoing abilities, ‘a cruiser in the literal sense’.¹⁰⁶⁶

A telegram sent by Andrew Carnegie in America was the impetus for her transatlantic voyage when he suggested the ‘first and best service possible for *Monarch*’ was to bring the remains of Mr. Peabody back to the United States.¹⁰⁶⁷ Her arrival at Portland was met with appreciation and awe. When the turret ship steamed into that port on 29 January 1870, she was met by several U.S. warships including the ‘saucy’ double-turreted monitor *Miantonomoh* and dozens

¹⁰⁶³ ‘The Late Mr. Peabody’, *Illustrated Times*, 18 December 1869, 10.

¹⁰⁶⁴ Ballard, *The Black Battlefleet*. (1980), 89, 92.

¹⁰⁶⁵ ‘The *Monarch*’, *New York Tribune*, 10 February 1870, 2.

¹⁰⁶⁶ *Ibid*, 2, Ballard, *The Black Battlefleet*. (1980), 94.

¹⁰⁶⁷ Jay Sexton, *Debtor Diplomacy: Finance and American Foreign Relations in the Civil War Era, 1837-1873*. (Oxford, 2005), 242.

of dignitaries including Admiral David Farragut.¹⁰⁶⁸ When Governor Joshua Chamberlain of Maine, (hero of the fight at Little Round Top during the Battle of Gettysburg) officially accepted Peabody's coffin from Captain Commerell and his escorting party of seamen and Royal Marines, the governor thanked him adding that the *Monarch* had achieved, 'a greater victory than her guns could ever win'.¹⁰⁶⁹

Harbour and coastal defence ironclads came into vogue in the 1860s with new designs created by Reed. In 1867, the Australian Colony of Victoria required a coastal defence vessel to protect Melbourne, and Reed created a twin turret monitor of improved configuration to meet the requirements. A brilliant solution to the problems of the low-hulled monitor design was to place the turrets above the hull on an elevated armoured platform. This platform or 'breastwork' positioned amidships would carry the superstructure and funnel, with one turret on the forward edge and one on the after edge of the elevated deck.¹⁰⁷⁰ A bridge and simple pole mast for signals would complete the profile of the new ironclad (*H.M.S. Cerberus*), heavily armed with two 10-inch MLRs in each turret crowded on to the breastwork, with the decks clear of all but a few iron pieces. Two other

¹⁰⁶⁸ 'America', *Greenock Advertiser*, 1 February 1870, 4, 'Foreign Intelligence', *Exeter Flying Post*, 2 February 1870, 2.

¹⁰⁶⁹ 'Foreign Intelligence', *Exeter Flying Post*, 2 February 1870, 2, Thomas Desjardin, , *Joshua L. Chamberlain, A Life in Letters*, (Harrisburg, 2012), 238.

¹⁰⁷⁰ Brown, *Warrior to Dreadnought*. (1997), 56. See: TNA, ADM 231/3, *Admiralty: Foreign Intelligence Committee*, Report No. 274, Captain Cyprian A. G. Bridge, R.N., 'Australian Station. Naval Geography and Protection of British Ports and Commerce', dated 23 October 1883, 18-20. An attack on Australian ports by Russian armoured warships was assessed as improbable, but Captain Bridge wrote: 'Attacks on these places by squadrons of unarmoured cruisers are not altogether unlikely and should be provided for'. Bridge also wrote of an enemy attack: 'if the chief defence of our Australian colonies consist of coast forts, he may do those colonies immense mischief with but little danger to himself by keeping at a distance from their shores and annoying their commerce'. Regrettably Bridge made no mention of the *Cerberus* in his assessment.

similar turret ironclads or 'floating batteries' (*H.M.S. Magdala* and the *Abyssinia*) were ordered by the India Office for the defence of Bombay.¹⁰⁷¹

Although these 'near sisters' were an improvement over the Laird rams in terms of the position of the turrets above the main deck, the hulls were lower than the *Scorpion* and *Wivern* as their above water height was only a few feet above the waterline forward and aft of the 'armoured redoubt' which stood a further six feet above the decks.¹⁰⁷² The result was a much poorer performance at sea as the low bows speared into the waves, whereas the Laird rams with their higher forecastles and poops, rode over the waves coming ahead or astern. The breastwork monitors solved the problem of all around fire, but they were a setback in terms of seakeeping. With their decks awash even in a moderate sea, their 'low swimming' hulls virtually dove into the waves and the *Cerberus* rolled 40 degrees, when she was beset by storms while en route to Gibraltar on her voyage to Australia.¹⁰⁷³

Discipline broke down aboard ship and the captain had to find replacements for three mutineers when the *Cerberus* docked in Malta.¹⁰⁷⁴ Despite her dangerous performance at sea, the turret armourclad reached Melbourne on 10 April 1871, rendering the colony 'quite invulnerable' to attack.¹⁰⁷⁵ The *Magdala* arrived at Bombay two months ahead of her Australian counterpart, having benefitted from a good passage out from Britain.¹⁰⁷⁶ Both the *Cerberus* and *Magdala* were 'hampered with the absurdity of sails and masts' but the smaller

¹⁰⁷¹ Brown, *Warrior to Dreadnought*. (1997), 56, 57.

¹⁰⁷² Ballard, *The Black Battlefleet*. (1980), 219.

¹⁰⁷³ 'The Cerberus', *Liverpool Mercury*, 29 March 1871, 7.

¹⁰⁷⁴ *Ibid*, 7, 'Naval and Military Intelligence', *London Evening Standard*, 26 December 1870, 6.

¹⁰⁷⁵ 'Our Australian Colonies', *Glasgow Herald*, 15 May 1871, 4, No Subject, *Hampshire Advertiser*, 17 May 1871, 4.

¹⁰⁷⁶ No Subject, *Hampshire Advertiser*, 25 February 1871, 8.

Abyssinia left British shores with only pole masts for signal flags.¹⁰⁷⁷ The lighter turret ship proved that her rig (or lack thereof) was the right fit for an armoured vessel of her dimensions, for she arrived at Bombay on 23 January 1871 without incident.¹⁰⁷⁸ The voyages of the British turret ships to colonial stations influenced the Royal Netherlands Navy to dispatch their turret ironclad, *Prins Hendrik Der Nederlanden*, to the Dutch East Indies in 1876 where she arrived on 24 May. Outclassed in European waters, the smaller turret ships were available for 'general service' in the colonies where they were not expected to meet a larger rival.¹⁰⁷⁹

The voyages of these turret ships were eclipsed by the disaster of another. On 6 September 1870, the new Lairds-built turret ship *H.M.S. Captain* encountered a severe gale in the Bay of Biscay while steaming with a squadron of the Channel Fleet.¹⁰⁸⁰ Under the command of the experienced Captain Burgoyne, the low-hulled armoured vessel rolled in almost any weather, but in the face of the high winds and threatening waves, the *Captain* rolled to a dangerous degree.¹⁰⁸¹ At midnight on 7 September, the winds rose and the turret ship was in grave peril. Burgoyne was on deck giving orders to cut away the few sails that remained as the ship heeled over 18 degrees, but it was too

¹⁰⁷⁷ 'Trial Trip of a New Monitor', *Hull Packet*, 4 November 1870, 8. When the coastal defence ships had sails and heavy masts removed (especially the Laird rams), performance improved. An exception would occur over sixty years later when the monitor *HMS Erebus* was fitted with a foresail between the main mast and a 15-inch gun in the twin turret in the early 1940s to aid steering. Her recently fitted anti-aircraft guns, extra accommodations, radar, and large mizzen mast created wind resistance during heavy weather, and without the foresail, 'she would stubbornly point upwind whatever the steersman did with the rudder'. See: Jim Crossley, *Monitors of the Royal Navy: How the Fleet Brought the Great Guns to Bear*. (Barnsley, 2013), 35, 37.

¹⁰⁷⁸ 'India', *Leeds Mercury*, 21 February 1871, 7.

¹⁰⁷⁹ Scheltema de Heere, 'The Prins Hendrik Der Nederlanden' *The Mariner's Mirror*. Volume 17, (1931), 46, 48.

¹⁰⁸⁰ Ballard, *The Black Battlefleet*. (1980), 110.

¹⁰⁸¹ Brown, *Warrior to Dreadnought*. (1997), 51

late.¹⁰⁸² Other ships in the squadron suffered sails ripped apart or canvass blown overboard, but not the *Captain*. Her sails held in the rising winds and with them in place, the ship was doomed as she rolled beyond the point of stability and capsized. She sank in several minutes taking down 472 of her crew including Coles, the inventor of her turrets and masts. Only 18 men survived.¹⁰⁸³

Sails and heavy iron masts were rarely a successful blend in ironclads and were dangerous in most turret ships. They proved lethal in the case of the *Captain*. One British admiral was to remark of her sinking: 'as the topsail yards were nearly fore and aft and nobody wise enough to let go a lee topsail sheet in time, it is no wonder that she capsized'.¹⁰⁸⁴ Admiral H. J. Rous's comments were exceedingly direct, but the *Captain* did not have time or freeboard enough to matter. During the Court of Inquiry, Gunner James May mentioned the sails, but identified the structure built to aid the crew moving fore and aft was also a contributing factor. Functioning as an unintended barricade or airfoil, the 'wind might have had great force on the under part of the hurricane deck' and when the sea struck, the combined force of wind and wave pushed the ship over as she rolled in the trough of a swell.¹⁰⁸⁵

When the ironclad frigate *Achilles* was completed in 1864, she was the largest warship in the Royal Navy, and with 44,000 square feet of canvas, the most sail ever carried in a warship.¹⁰⁸⁶ Although a 'splendid seaboat and steady gun

¹⁰⁸² Ibid, 51.

¹⁰⁸³ Ballard, *The Black Battlefleet*. (1980), 111-112. One of the fortunate few to escape was, Warrant Officer James May. May, regarded as 'a first-rate seaman and a thorough good gunner', had served in the *Wivern* and had been transferred to the *Captain* at the request of Coles. See: 'The Loss of H.M.S. Captain', *Hampshire Telegraph*, 17 September 1870, 7.

¹⁰⁸⁴ Richard Humble, *Before the Dreadnought: The Royal Navy from Nelson to Fisher*. (London, 1976), 123.

¹⁰⁸⁵ 'Her Majesty's Ship Captain', *Times*, 28 September 1870, 12.

¹⁰⁸⁶ Ballard, *The Black Battlefleet*. (1980), 42- 43.

platform', the *Achilles* was not a safe ship for her crew.¹⁰⁸⁷ In a rough sea, the helm was manned by eight men instead of the normal six. One midshipman was to note that when aloft, the foretopman 'developed the activity of a cat and the grip of a gorilla' to furl the canvas while holding on to whatever provided a secure support, as she had a reputation as a dangerous ship for those men who worked high above the decks.¹⁰⁸⁸ Rous acknowledged that steam propulsion had cost the modern tar the 'feel' of wind, sea, and the ship, proclaiming: 'The fact is, the boiler has emasculated seamanship. No man can serve two masters; he will hold to the tea kettle and despise the canvas. You can no more rear a seaman in a steamer than on the Bridgewater Canal. In ten years time the British seaman will be a rare bird among the sailors in the Royal Navy'.¹⁰⁸⁹

Maintenance and Reserve Duty

As the *Scorpion* was settling into her new role in Bermuda, modifications to the armament of the *Wivern* were made during her refit in the autumn of 1869. Her guns had been removed, and subsequently experimental changes made to her reconditioned armament and equipment.¹⁰⁹⁰ Another modification made to the *Wivern* during that refit was the installation of a hurricane deck to connect her poop and forecastle 'similar to those carried out on board the *Scorpion*'.¹⁰⁹¹ Both Laird rams had received much needed modifications, but these changes were made incrementally. The masts were retained and the armourclads were not

¹⁰⁸⁷ Ibid, 43.

¹⁰⁸⁸ Humble, *Before the Dreadnought*. (1976), 125.

¹⁰⁸⁹ Ibid, 117.

¹⁰⁹⁰ No Subject, *Hampshire Advertiser*, 1 January 1870, 8, 'Naval and Military Intelligence', *London Evening Standard*, 12 October, 1869, 6.

¹⁰⁹¹ No Subject, *Hampshire Advertiser*, 1 May 1869, 8.

allowed a suitable refit to test their true abilities for their role as coastal defence warships. The Royal Navy was reluctant to cast off the large masts and heavy yardarms for armoured ships propelled only by steam.

The Laird rams were needed as other ships were decommissioned, and *Wivern* was ordered to Hull after completing her refit in Portsmouth, to relieve the wooden steam frigate *H.M.S. Dauntless* as guardship at that port. The men from the frigate were to be transferred to the *Wivern* when she was paid off on 31 December 1869, to give the turret ship a complement of 130 officers and men. The gunboat *Rainbow* (a Crimean War vessel built by Lairds) was to serve as a tender for the *Wivern* at her new home.¹⁰⁹² The arrival of the *Wivern* in Hull marked the end of the assignment aboard the turret ship for some of her crew, as this was a temporary arrangement. The remaining complement of the ironclad was comprised largely of coastguardsmen as most of the active service seamen were transferred back to Portsmouth for duty on other ships.¹⁰⁹³

On the evening of 3 May 1870, the routine of the ironclad guardship was disrupted when a fire broke out at a saw mill in Hull. The fire quickly spread towards the Victoria dock, spraying showers of sparks onto the air and silhouetting the ships stranded at the quay.¹⁰⁹⁴ *Wivern* was fortunate as she had been moored at the Albert Dock for six months since her arrival in port, and had cast off and steamed out into the roadstead only that morning.¹⁰⁹⁵ One or two merchantmen had caught fire, but the flames aboard were extinguished as those ships were pulled away from the quays to anchor out with the ironclad and other

¹⁰⁹² 'Naval and Military Intelligence', *London Standard*, 20 December 1869, 3, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 197-198, 225, 228.

¹⁰⁹³ 'Naval and Military Intelligence', *London Evening Standard*, 21 December 1869, 3.

¹⁰⁹⁴ 'The Disastrous Fire at Hull', *Manchester Evening News*, 5 May 1870, 4.

¹⁰⁹⁵ 'Great Fire in Hull', *Hull Packet*, 6 May 1870, 5-6.

ships in the safe anchorage way from the spreading blaze.¹⁰⁹⁶ Assisting the firefighting efforts, were fifty men from the *Wivern* who chopped away some wooden sheds near the docks and carted away timbers to slow the spread of the 'fearfully grand' conflagration.¹⁰⁹⁷ Rowed out from the ironclad in boats, the men were cheered when they marched up from the dock under the direction of the commanding officer of the guardship, Captain Charles W. Hope, R.N.¹⁰⁹⁸

The *Wivern* men immediately began work when the bugle was sounded, and continued for four hours without let up until the bugle called them to withdraw after the danger to the docks had passed. A report circulated that the ironclad's firefighting detail was withdrawn after a dispute occurred with the local police, but the claim was quickly proven to have been erroneous and Hope's men were subsequently praised for their good service. Although the flames continued to spread to a nearby timberyard, the intervention of the *Wivern* men did prevent several ships and stacks of lumber from being consumed in the inferno, and thus helped slow and contain the path of destruction.¹⁰⁹⁹ The discipline of the men of the *Wivern* under the direction of Hope, revealed the positive impact of training and teamwork for a well-drilled crew proud of their role as the home defence ship.

The outbreak of the Franco-Prussian war again disrupted the peacetime routine of the guardship, as the *Wivern* received orders to rejoin the Channel Fleet.¹¹⁰⁰ The ironclad was valued at Hull as an armoured defender of the Humber, and the town council protested her removal in a memorial to the

¹⁰⁹⁶ 'Great Fire at Hull', *York Herald*, 7 May 1870, 3.

¹⁰⁹⁷ *Ibid*, 3.

¹⁰⁹⁸ *Ibid*, 3, *Hull Packet*, 6 May 1870, 5, 'War Notes', *Western Times*, 25 August 1870, 4.

¹⁰⁹⁹ 'Great Fire in Hull', *Hull Packet*, 6 May 1870, 5, 'Great Fire at Hull'. *York Herald*, 7 May 1870, 3.

¹¹⁰⁰ 'England and the War', *Derby Mercury*, 10 August 1870, 3.

government noting that in the event of Britain's involvement in a wider war, only two small forts defended the coast in that vicinity and those garrisons had only obsolete artillery.¹¹⁰¹ Despite the protests from Hull, the *Wivern* was soon on her way to the Channel where she would form part of 'a small but very formidable ironclad squadron' assembled at the Nore.¹¹⁰²

Steam and armour had not only changed concepts of warship design, but had also redefined the concept of positioning for a naval battle. The tactical employment of an ironclad squadron had changed from the time tested line-of-battle, to groups of bow-on formations. By the 1870s, armoured ships were expected to clash with an enemy in a manner similar to a cavalry charge and although the line-of-battle was used, another formation, a grouping of three ships or 'pelotons' was briefly in vogue. This arrangement was intended for mutual support, but even this smaller bunching was difficult to maintain with ironclad warships of different seakeeping abilities.¹¹⁰³

While firing at the rocks of Bantry Bay during gunnery practice later that summer, a dangerous defect was discovered. A log entry from the *Wivern* dated 13 August 1870, indicated that the compressor screws did not hold the guns in place after they were loaded and run out.¹¹⁰⁴ With the ship rolling 15 degrees, the guns were moving back and forth on their slides and presented a danger from an accidental discharge or the crushing weight of an out of control heavy piece of ordnance. The new guns installed after the 1867 explosion in the aft

¹¹⁰¹ Ibid, 3.

¹¹⁰² 'War Notes', *Western Times*, 25 August 1870, 4.

¹¹⁰³ Allen, 'The Deployment of Untried Technology: British Naval Tactics in the Ironclad Era', *War in History*, 15, (July 01, 2008), 269, 275- 276, Jack Greene and Alessandro Massignani, *Ironclads at War: The Origin and Development of the Armored [sic] Warship 1854-1891*. (Boston, 1998), 230.

¹¹⁰⁴ TNA, ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

turret, had not resolved the problems of operating heavy ordnance at sea. The guns proved to be too heavy for their carriages, and the compressors attached to the slides, were unable to hold the combined weight of guns and iron carriages in place. The *Wivern* had to be turned head on to the swell to steady the ship and regain control of the 9-inch RMLs in the turrets. *Wivern*'s commander remarked that her guns could not be 'fought except under extreme risk'.¹¹⁰⁵

Control of the guns while at sea was an ongoing concern, as one officer on the ironclad frigate *Bellerophon* described her (in 1885) as 'quite out of date as a fighting ship'.¹¹⁰⁶ The captain felt the compressors would not hold the guns in place as the frigate crossed the Atlantic to Bermuda, and braced the guns up with timbers to hold them securely near their gunports. In October 1896, the crew of the battleship *U.S.S. Indiana* had to secure the forward turret and the secondary guns with hawsers to the superstructure, after those guns had broken their clamps in a severe gale and were smashing against the upper works of the then-new warship.¹¹⁰⁷

The 1870 fleet exercise highlighted more faults in the Laird rams as the *Wivern* would need modifications to make her suitable for operations in British waters. Admiral C. W. Elliot the inspecting officer returned a scathing appraisal: 'I cannot look upon the *Wivern* as being 'efficescent [sic] as a cruizer' [sic].¹¹⁰⁸ With an extensive refit she could be reshaped into an efficient coastal or harbour defence ship for duty near home. Her guns were the immediate priority as she was in need of modern slides to render her capable of using her armament at

¹¹⁰⁵ Ibid.

¹¹⁰⁶ Admiral C.C. Penrose Fitzgerald, *From Sail to Steam: Naval Recollections, 1878-1905*, (London, 1916), 139.

¹¹⁰⁷ Ibid, 141, 142, 'Passes through Great Perils', *San Francisco Call*, 17 October, 1896, 1.

¹¹⁰⁸ TNA, ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

sea. Despite her obvious drawbacks, the ironclad also was 'quick and handy in turning' and had the advantage of a light draught. With a list of alterations completed in dockyard, this armoured man-of-war would be made into a warship more in line with her potential.¹¹⁰⁹ Her low hull was a concern as the sea constantly washed over the deck between the turrets rendering it 'difficult and hazardous' for the crew to pass fore and aft while underway except via the hurricane deck.

The *Wivern* was recommended for further alteration by removing her heavy iron tripod masts and fitting with light poles to carry fore and aft sails only.¹¹¹⁰ Accepting that the sails would never move the ship, the light rig would help stabilize the ironclad in a rough sea. Seamen in the merchant navy prized the steadying effect a fore and aft sail could have on an iron ship by referring to the stabilizing stretch of canvas as a 'flopper stopper'.¹¹¹¹ With her tripod masts removed, *Wivern* would cut down a considerable amount of topside weight, the loss of which would contribute to an increase in stability. To correct the defect in communications between vital compartments on ship, voice tubes were to be added between the pilot house and the engine room and a speaking tube from the pilot house and the aft turret was also proposed.¹¹¹²

The *Wivern* was placed in the 4th Division reserve that autumn to await her turn in the dockyard.¹¹¹³ She arrived at Devonport on 27 September 1870, and her captain, with the officers and some crew, were transferred to one of Reed's new central battery ironclads *H.M.S. Invincible*, as the *Wivern* was

¹¹⁰⁹ Ibid.

¹¹¹⁰ Ibid.

¹¹¹¹ *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill, (1992), 184.

¹¹¹² TNA, ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

¹¹¹³ Ibid.

decommissioned.¹¹¹⁴ The ironclad ram was also recommended to receive two 64-pounder muzzleloading smoothbores to give the ship greater arches of fire and supplement the restricted turret guns, but the new guns were never installed.¹¹¹⁵ Her refit was again incremental as she was docked in Devonport in October 1873 to have her hull scrapped and painted with two coats of 'Hay's Protective Varnish'.¹¹¹⁶

Ironclads were frequently in the hands of the dockyards for hull maintenance and refit as the reoccurring problem of marine growth was one shared by all iron-hulled vessels. Although iron provided strength to longer hulls, and solved the escalating costs associated with timber shortages, the iron hull was fouled by marine growth at a much faster rate than copper sheathed wooden-hulled ships. If not scrapped and painted regularly, the iron bottom of any warship would resemble a 'lawyer's wig' of shell and sea grass in short order.¹¹¹⁷ In 1871, the *Scorpion* was in the hands of the dockyard in Bermuda to examine the condition of her hull.¹¹¹⁸ One section amidships on the starboard side, was found to have been 'honeycombed', with the corrosion reaching a depth of 1/16 of an inch into the plates and some of the rivet heads partially eaten away.¹¹¹⁹ The remainder of the hull was found to have been in good condition which was a likely indication

¹¹¹⁴ 'Naval and Military News', *Hampshire Telegraph*, 15 October 1870, 4, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 250,

¹¹¹⁵ TNA, ADM 135/512, Office of the Controller of the Navy Ship's Book Series I, 'Wivern'

¹¹¹⁶ *Ibid.*

¹¹¹⁷ John Beeler, *Birth of the Battleship: British Capital Ship Design 1870-1881*. (London, 2001), 32.

¹¹¹⁸ TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'

¹¹¹⁹ *Ibid.*

of the different qualities of iron used in her construction, and a justification for using Hay's Protective Varnish to impede fouling and corrosion.¹¹²⁰

Hay's compound was in general use for the iron warships of the Royal Navy, and was advertised as having 'met with the approval of the Lords of the Admiralty'.¹¹²¹ Hay, who worked as the chief chemist at the Royal Dockyard at Portsmouth, also produced a 'prepared putty' and other protective substances that bore his name.¹¹²² Early anti-fouling substances contained mixtures of copper, mercury, and arsenic, and 'probably killed many painters as well as barnacles'.¹¹²³ These toxic blends were necessary, as after six months in home waters without docking, an iron ship would accumulate enough marine growth as to decrease performance while underway by 25 per cent. Most anti-fouling substances would last about a year before a ship would need to be sent back to dry dock, but more frequent attention was needed if in warmer waters. Despite the need for more regular hull maintenance, the anti-fouling paints saved the admiralty many hundreds of pounds per hull by avoiding more expensive and drag inducing solutions.¹¹²⁴ *Warrior* received coats of the stuff after a visit to dry dock in 1863, and Hay's concoction was termed 'invaluable' in the preservation of the submerged sections of her hull.¹¹²⁵

Although his chemical compositions were a success, Hay's association with a commercial venture while employed with the dockyard was questioned in Parliament. The Admiralty initially defended him as his twenty five years of service had been beneficial to the navy, and his substances coating the ironclads

¹¹²⁰ Ibid.

¹¹²¹ *Hansard*, 15 August 1867, 189, cc 1559-1560.

¹¹²² *Hansard*, 13 June 1867, 187, cc 1846.

¹¹²³ Brown, *Warrior to Dreadnought*. (1997), 158.

¹¹²⁴ Ibid, 158.

¹¹²⁵ 'H.M.S. Warrior', *West Middlesex Advertiser and Family Journal*, 11 July, 1863, 3.

were used with 'considerable advantage'.¹¹²⁶ He is not mentioned in the records of Parliament after 1867 and was last referred to in newspapers in 1886 when his substances were used to coat below the waterline of the *Achilles*.¹¹²⁷ Other concoctions, such as 'International' and 'Moravia' (many later nineteenth and early twentieth century anti-fouling paints were produced by German firms) came into use in 1879 and replaced the earlier mixtures.¹¹²⁸ Success proved costly as Hay and countless other men in the dry docks likely succumbed to the undiagnosed effects of mercury and arsenic poisoning inflicted by the unintended application of the lethal mixtures through their own hands and in Hay's case, of his own making.

One solution to the fouling problem favoured by marine architects was to revert to an earlier method, and provide wooden planking over the lower hull, and plate that section over with copper. Copper could not be joined to the iron plates, as this connection would create an electric charge when the ship was in seawater, causing the iron to corrode at an accelerated pace.¹¹²⁹ The layering of copper and teak over the iron plates of the hull prevented both fouling and corrosion of the iron plates, but it came at the cost of increased drag. Nevertheless, this was considered a worthwhile sacrifice for ships deploying to tropical waters where marine growth occurred at a more rapid rate.

The Chilean broadside ironclad *Blanco Encalada*, returned to Britain in 1885 for her first time in dry dock in over a decade, and the results of her second docking were astounding.¹¹³⁰ Before leaving for the Pacific on her original

¹¹²⁶ *Hansard*, 13 June 1867, 187, cc 1846.

¹¹²⁷ No Subject, *Hampshire Advertiser*, 11 September 1886, 7.

¹¹²⁸ Brown, *Warrior to Dreadnought*. (1997), 158, *Hansard*, 8 November, 1916, 87, cc 165-167.

¹¹²⁹ Ballard, *The Black Battlefleet*. (1980), 116.

¹¹³⁰ 'Heburn', *Newcastle Courant*, 21 August, 1885, 5.

commissioning, she had received a layer of teak planks on her lower hull, and over the planks were attached zinc sheets to prevent marine growth and wear of the iron hull. The combination hull of iron, protected by teak, protected by zinc, was found to have been 'even more successful than could have been hoped'.¹¹³¹ None of the iron plates were eroded in any way, and the wear of the zinc was barely more than had been calculated when she originally sailed for Chile. The trade off was between more time in dry dock and a more expensive hull fitting.¹¹³²

Despite the praise, zinc was not the ideal solution, as it was hard to apply and even harder to adhere. The results seemed to vary from one part of the world to another, for on the China Station the flagship *H.M.S. Audacious* was sheathed in zinc cladding below the waterline and fouled very rapidly.¹¹³³ Serviceability, speed, and expense, were factors in the daily maintenance of a man-of-war, and this was especially true for the ironclads. It was simply too costly to retrofit all armoured vessels with a three-tier hull, so the Royal Navy opted to have more ships rotate in and out of the dry docks for a good scrapping and thorough brushing with the toxic anti-fouling compounds.

Another problem that vexed the merchantmen and men-of-war during the mid-Victorian years was the short live span of the boilers aboard all steam vessels. This was particularly true for warships due in part, to the improved performance of engines and the subsequent decline in the sailing abilities of ships of war, most notably in the ironclads. With the warships more dependent on their engines and thus on their boilers, the insidious circulation of 'fresh' water

¹¹³¹ *Ibid*, 5.

¹¹³² Brown, *Warrior to Dreadnought*. (1997), 19, 158

¹¹³³ Jarvis, 'Protection and Decoration: A Tentative Investigation into Painting Ships Before the Great War', *The Great Circle*, 22, (2000), 29.

back into the boilers through the use of the Surface Condenser, aggravated the situation.¹¹³⁴ Although better performance was obtained after the invention of the condenser in 1855, the decay of boilers accelerated.¹¹³⁵ The condenser allowed for exhaust steam from the pistons to be recycled after cooling back to water and thus, to supply the boilers again.¹¹³⁶

The advantage of increased boiler pressure was also the culprit in the form of water from the condenser. This problem plagued the Admiralty and the Merchant Marine, as the decay was spread through the circulatory systems of the boilers by the heated and reheated water which had become 'excessively foul'.¹¹³⁷ Ironically, recycled water did not provide a benefit as had come in the earlier days when salt water had been used in the lower pressure boilers.¹¹³⁸ The recycled water did not allow for a 'protective scale' to form on the iron surfaces of the boiler interiors.¹¹³⁹

Another problem was intermittent use. In the middle Victorian years of constricted naval budgets, boilers were sometimes drained and refilled when a warship was needed back on patrol. The results were counter to the intended, as the weakness in the boiler iron was discovered in the heating and cooling of the plates.¹¹⁴⁰ The box boiler favored in this era had grown to the limits of its capacity. A Parliamentary committee established to investigate solutions,

¹¹³⁴ *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill, (1992), 112.

¹¹³⁵ Beeler, *Birth of the Battleship*. (2001) 56.

¹¹³⁶ *Steam, Steel & Shellfire The Steam Warship 1815-1905*, Editor Robert Gardiner, Consultant Editor Andrew Lambert , (1992), 175.

¹¹³⁷ Beeler, *Birth of the Battleship*. (2001) 56.

¹¹³⁸ Penn, "Up Funnel, Down Screw!" (1955), 19.

¹¹³⁹ Beeler, *Birth of the Battleship*. (2001), 56.

¹¹⁴⁰ *Ibid*, 56.

received a dire report from the Admiralty which announced, 'boilers in the Navy did not last more than five or six years'.¹¹⁴¹

The water tube boiler offered the promise of greater steam pressure but this was a premature lead. Excessive scale built up in the small diameter water tubes impeding water circulation, and explosions resulted from the uneven water flow when the metal heated.¹¹⁴² One observer warned that any overheated boiler would explode, as the metal with 'any flaws will be stretched out, the flame will penetrate them, and promote their increase (in tensile strain) to the bursting point'.¹¹⁴³ One expedient was to place zinc anodes in the boilers to prevent scale clogging the tubes.¹¹⁴⁴ Each boiler on the flagship of the Mediterranean Fleet, *H.M.S. Alexandra*, carried 200 pounds of the metal and the results were highly effective, as the boilers lasted a phenomenal sixteen years before being replaced.¹¹⁴⁵

Another resource tried by the Admiralty was tubes made from brass. These tubes were installed in the boilers of the sea going ironclads like the *Warrior* and later *Alexandra*, as brass corroded less than iron.¹¹⁴⁶ The *Scorpion* also had brass boiler tubes, likely a detail foreseen by Lairds in the original construction.¹¹⁴⁷ During a Bermuda dockyard overhaul in 1873, iron tubes were fitted to replace the brass tubes on the turret ship which had become foul from

¹¹⁴¹ *Ibid*, 57.

¹¹⁴² *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill, (1992), 112, 113.

¹¹⁴³ Beeler, *Birth of the Battleship*, (2001), 57.

¹¹⁴⁴ Brown, *Warrior to Dreadnought*. (1997), 67.

¹¹⁴⁵ *Ibid*, 68.

¹¹⁴⁶ *Ibid*, 13, 68.

¹¹⁴⁷ TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series 1, *H.M.S. Scorpion*'

the effects of burning bad coal.¹¹⁴⁸ Despite advantages, brass boiler tubes were expensive and as such, were phased out aboard most Royal Navy warships around 1882.¹¹⁴⁹ Iron was the cheaper product, but only with the advent of steel in the construction of the components of the water tube boiler, could the necessary high steam pressures be obtained with safety and efficiency.¹¹⁵⁰ Iron was at its limit.

In 1873, the First Lord of the Admiralty, Lord Goshen, informed Parliament, that six ironclads had to go to the dockyards to deal with their worn out boilers.¹¹⁵¹ The need for more frequent maintenance forced more men-of-war into the dockyards where they were pulled to pieces to get at the offending parts of a ship's boilers and machinery. This bottleneck led not only to delays and increased expense, but to an increased need for those warships already in commission due to a 'presence of a certain number of absolutely unusable ships at all times in Her Majesty's Dockyards'.¹¹⁵²

As observed with the refit of the *Warrior* in 1865, costs associated with the ironclad warship were escalating. By 1874 the Admiralty acknowledged that the expense of refits to the armoured ships of the Royal Navy was 'far greater than had been anticipated'.¹¹⁵³ Mounting costs complicated refurbishments and refits, for during this post-Palmerston era, the Royal Navy had a smaller budget than had the British Army. Although Britain had a small army of 115,000-136,000 men during the years 1866-1885, the navy averaged only 60,000-65,000

¹¹⁴⁸ Ibid. The refit of the *Scorpion* was estimated to cost the Admiralty £620 but the value of the scrap brass tubes was assessed at £700.

¹¹⁴⁹ Brown, *Warrior to Dreadnought*. (1997), 75.

¹¹⁵⁰ Ibid, 75.

¹¹⁵¹ *Hansard*, 24 March 1873, 215, cc 62.

¹¹⁵² Beeler, *British Naval Policy in the Gladstone-Disraeli Era 1866-1880*. (1997), 90-91.

¹¹⁵³ Ibid, 92.

personnel.¹¹⁵⁴ A skilled labour force of an additional 11,000 men toiled in the dockyards, but the manpower levels of the naval establishment, even with an additional 2,500 'hired labourers' at the above strength limit, was not sufficient to prevent an overcrowding of out of service warships at anchor in British waters.¹¹⁵⁵ To keep the naval establishment from expanding, skilled workmen in the Royal Dockyards were let go in the occasional short-sighted drive for economy when times of crisis had passed.¹¹⁵⁶

Engines were yet another reason for ever rising costs. The engines on a warship were more prone to wear out than those on merchant steamers due to the accepted practice of placing engines below the waterline to prevent damage from enemy broadsides.¹¹⁵⁷ Merchant ships during this era were shifting to compound engines which were more complicated, but also had the much more efficient arrangement of vertical cylinders where steam and gravity could work as partners.¹¹⁵⁸ For the navy, the horizontal cylinder arrangement was still required in its ships, especially in the ironclads. A warship with a low hull could not have a taller vertical engine extending above the deck or armour belt.¹¹⁵⁹ Higher fuel consumption and increased engine wear were accepted costs for most warships, as only those of the deepest draught were fitted with the new engines. The Admiralty was not rigid in its approach to new engines, it was justifiably cautious.

The merchant fleet had experienced mechanical problems with the newer style compound engines and had to work through the teething problems

¹¹⁵⁴ Ibid, 53-54.

¹¹⁵⁵ *Hansard*, 19 May 1873, 216, cc 132-133.

¹¹⁵⁶ 'The Condition of the Navy', *Hampshire Telegraph*, 14 March 1874, 3, *Hansard*, 23 March 1874, 218, cc 212.

¹¹⁵⁷ Brown, *Warrior to Dreadnought*. (1997), 67.

¹¹⁵⁸ *Hansard*, 31 May 1870, 201, cc 1759-1760.

¹¹⁵⁹ Brown, *Warrior to Dreadnought*. (1997), 67.

associated with this new development in marine propulsion.¹¹⁶⁰ Trials took place aboard a Royal Navy warship in the mid-1860s with mixed results.¹¹⁶¹ The engines, when in good working order, performed more efficiently and coal consumption dropped, but suffered breakdowns more often as ‘they are of course more complex than single cylinder engines, & they perhaps have been more often defective than Engines of simpler construction have been in performing the same amount of work’.¹¹⁶² The Admiralty did not abandon the idea, it waited for the merchant marine to work through the mechanical drawbacks to achieve greater fuel efficiency and improve engine performance.¹¹⁶³

Refit and a Foreign Station

In March 1878, the British press reported that the *Wivern* was to enter dockyard at her birthplace to undergo a six month refit.¹¹⁶⁴ The turret ship was long overdue for more than a short term patching over as she was towed by the paddle frigate *H.M.S. Valorous*, and assisted by the paddle tug *H.M.S. Scotia* to Birkenhead.¹¹⁶⁵ *Valorous*, the last wooden-hulled paddle frigate commissioned in the Royal Navy (1852), was well suited to the task as her paddle wheels

¹¹⁶⁰ *The Advent of Steam*, Editor Robert Gardiner, Consultant Editor Dr. Basil Greenhill, (1992), 107-108.

¹¹⁶¹ Brown, *Warrior to Dreadnought*. (1997), 28.

¹¹⁶² Beeler, *Birth of the Battleship*. (2001), 58.

¹¹⁶³ *Ibid*, 59.

¹¹⁶⁴ ‘Naval Notes and News’, *Hampshire Telegraph*, 23 March 1878, 4-5.

¹¹⁶⁵ ‘Naval and Military Intelligence’, *Morning Post*, 23 March 1878, 6, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 155, 300.

dampened most rolls of the waves while at sea.¹¹⁶⁶ Her hull length and freeboard also contributed to her being recognized as an ‘easy’ ship due to her superb handling under sail and steam. The ability to use the paddles independently allowed her to remain in position or to manoeuvre with only slight turns of the helm.¹¹⁶⁷ Although one Irish newspaper referred to the frigate *Terrible* in 1867 as being as ‘ancient as a trireme’, these obsolete paddle warships were useful, even preferable, to other vessels for the more routine tasks of ocean surveys, coastal patrols and the underappreciated but vital assignments of towing ungainly armoured men-of-war.¹¹⁶⁸

After the ironclad frigate *H.M.S. Iron Duke* had completed her refit at Lairds shipyard, the *Wivern* was turned over to her builders, not for a refit and the installation of new components, but for a long needed remaking.¹¹⁶⁹ The *Scorpion* was also slated for an extensive alteration, and on 24 June 1878, the Admiralty approved Lairds offer (for £1340) to construct a new funnel, uptakes, and boiler mountings for refitting the ironclad at the Bermuda dockyard.¹¹⁷⁰ By Christmas, the *Wivern* and the ram *H.M.S. Hotspur* were still at Lairds in overhaul. Merseyside was experiencing a slowdown in ship orders at the time, and work on the navy rams was most welcome during a period of ‘considerable decline’ compared with the previous year. The *Wivern* received new boilers, her engines were reconstructed, and she received attention to her hull as part of the

¹¹⁶⁶ Timothy Collins, ‘HMS “Valorous”: Her Contribution to Galway Maritime History’, *Journal of the Galway Archaeological and Historical Society*, 49 (1997), 122,

¹¹⁶⁷ *Ibid*, 124-125.

¹¹⁶⁸ *Ibid*, 125-126, ‘The Great Naval Review’, *Dublin Evening Mail*, 16 July 1867, 2.

¹¹⁶⁹ ‘Naval Notes and News’, *Hampshire Telegraph*, 23 March 1878, 5.

¹¹⁷⁰ WA ZCL/005/0270/004, Letter from Admiralty, dated 24 June 1878.

extensive alterations undertaken to make her more suitable for steaming to an overseas outpost.¹¹⁷¹

In February 1880, the Admiralty announced that the *Wivern* would be dispatched to Hong Kong to provide a naval defence for the colony.¹¹⁷² The decision to send the *Wivern* to Asian waters was ridiculed in the British press as the turret ironclad and her sister were called ‘the weakest of our armour-clad fleet’.¹¹⁷³ She was slow, and rolled in heavy weather, but she was available for service in the Far East. The *Wivern* was the right fit for a defensive role on the China coast. Modifications were made to her again after her stay at the Merseyside shipyard. New fixtures were to have been added at Portsmouth but she had to steam to Devonport without the new machinery aboard. This back and forth steaming was due in part, to issues of heavy loading of support equipment on an already deeply laden hull.¹¹⁷⁴ Reed criticized the decision to send her to the Orient, and referring to her new role proclaimed: ‘for general service in China waters she is, in my opinion, dangerously unfit’.¹¹⁷⁵

The Admiralty did not share Reeds view as the old turret ship had undergone ‘considerable improvements’ which had made her ‘a safe and efficient vessel for the services for which she is intended’.¹¹⁷⁶ To prevent overloading the hull, the ironclad would pick up some components at Malta, dispatched prior to her departure from the Channel.¹¹⁷⁷ Other new weapons would be sent out on

¹¹⁷¹ ‘Shipbuilding on the Mersey during 1878’, *Aberdeen Journal*, 25 December, 1878, 7.

¹¹⁷² ‘Naval and Military Intelligence’, *London Evening Standard*, 12 January 1880, 3.

¹¹⁷³ ‘Naval and Military Intelligence’, *Times*, 14 February 1880, 8.

¹¹⁷⁴ *Ibid*, 8.

¹¹⁷⁵ ‘H.M.S. *Wivern*’, *Times*, 20 February 1880, 12.

¹¹⁷⁶ *Hansard*, 23 February 1880, 250, cc 1196.

¹¹⁷⁷ ‘Naval and Military Intelligence’, *Times*, 14 February 1880, 8.

separate ships, especially two 2nd Class Torpedo boats (TBs) originally intended to be carried on davits amidships on the *Wivern*.¹¹⁷⁸

The boats first intended for the *Wivern* were damaged in a mishap on the night of 5 February during a mock attack on their carrier ship *H.M.S. Hecla* at Spithead. One TB was painted black to render her nearly invisible to the lookouts on the mother ship. Although she was observed while closing on the *Hecla*, the other attacking torpedo boat did not see her. The second boat painted grey to obscure the outline of her features, collided with the hard to see black boat and both were damaged in the mishap.¹¹⁷⁹ Although the thin steel-hulled boats were both pierced and torn, the watertight compartments held, and none of the personnel aboard were injured. With repairs ordered for the camouflaged torpedo boats, two more 2nd Class TBs were substituted for eventual assignment to the *Wivern*.¹¹⁸⁰

Almost two decades after they were accepted by a reluctant Royal Navy, the *Scorpion* and the *Wivern* were still mentioned in Parliament as unsuccessful ships. The *Scorpion* and her lightly armoured harbour defence cohorts at the Atlantic island fortress came in for abuse when Lord Henry Lennox proclaimed that he hoped that Bermuda would never find itself confronted by a serious opponent. Lennox asserted that if the *Scorpion*, *Viper*, and *Vixen*, were all the colony had for naval defence, then their best course of action was not to engage, but withdraw.¹¹⁸¹ The *Scorpion* and the other gunboats on that station would, from 'within the ring of Bermuda reefs', cooperate with the shore batteries and protect the minelaying crews, to defend the channels and harbours (especially

¹¹⁷⁸ *Ibid*, 8.

¹¹⁷⁹ 'Naval and Military Intelligence', *Times*, 12 February 1880, 10.

¹¹⁸⁰ *Ibid*, 10.

¹¹⁸¹ *Hansard*, 8 May 1884, 287, cc 1762.

the naval station and dockyard) at the island base.¹¹⁸² The *Wivern* was also criticized in the Commons as she was among a handful of small ironclads singled out as being no more efficient as seagoing ships than Noah's Ark.¹¹⁸³ This curious reference was an unintended compliment, for like the ungainly ship from the Bible, the *Wivern* was serving her true purpose and was soon to depart for a new station.

Both the Laird rams were to find their optimum roles as coastal defence ships and the Admiralty spokesman, Sir Thomas Brassey, corrected the opposition for speaking 'very lightly' of these (and other small ironclads), emphasizing that they were quite useful in a defensive role, and they enjoyed the added benefit of being in very good repair.¹¹⁸⁴ Although slow and not worthy of the van of a battle line, these ironclads had a role to defend far off stations while other warships patrolled the oceans to show the flag and intimidate Britain's enemies.

The low-hulled Laird rams would never again make the voyage home. Nevertheless, these old armoured guardships had more years of service life in them, keeping the White Ensign flying at distant and vital bases while modern corvettes and ironclad frigates were busy on other 'needful duties'.¹¹⁸⁵ The Royal Navy needed more modern ships to meet the growing combined threats from the French and Russian navies. The old turret ships, and the other forlorn ironclads, remained in harness until newer ships could be built, their crews properly trained, modifications made and tested, and then the more modern warships would be sent out to defend the seaways. The *Scorpion* and *Wivern* helped give the

¹¹⁸² TNA, WO 28/348, *Defences of Bermuda*, 'Misc Correspondence and Reports', letter dated 16 October 1869.

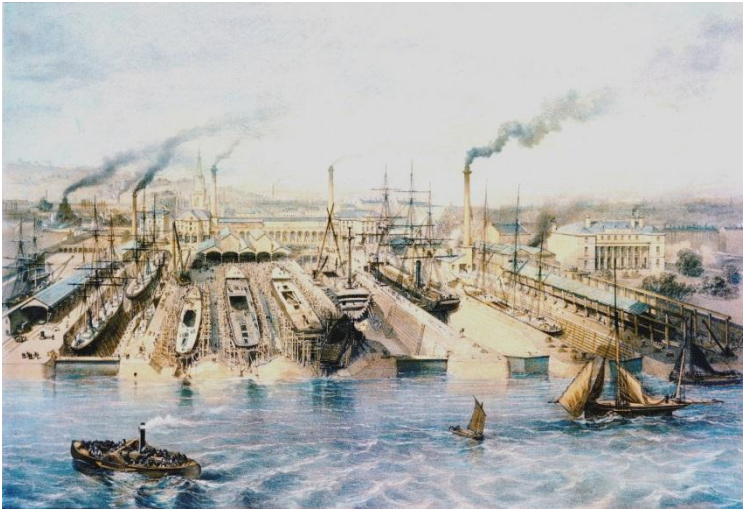
¹¹⁸³ *Hansard*, 20 March 1884, 286, cc 339.

¹¹⁸⁴ *Ibid*, cc 347.

¹¹⁸⁵ 'Naval Notes & News', *Hampshire Telegraph*, 19 December, 1891, 8.

Admiralty the breathing space it needed to build up the fleet as European rivals launched their own versions of improved armoured vessels. The Laird turret ships brought Britain time.

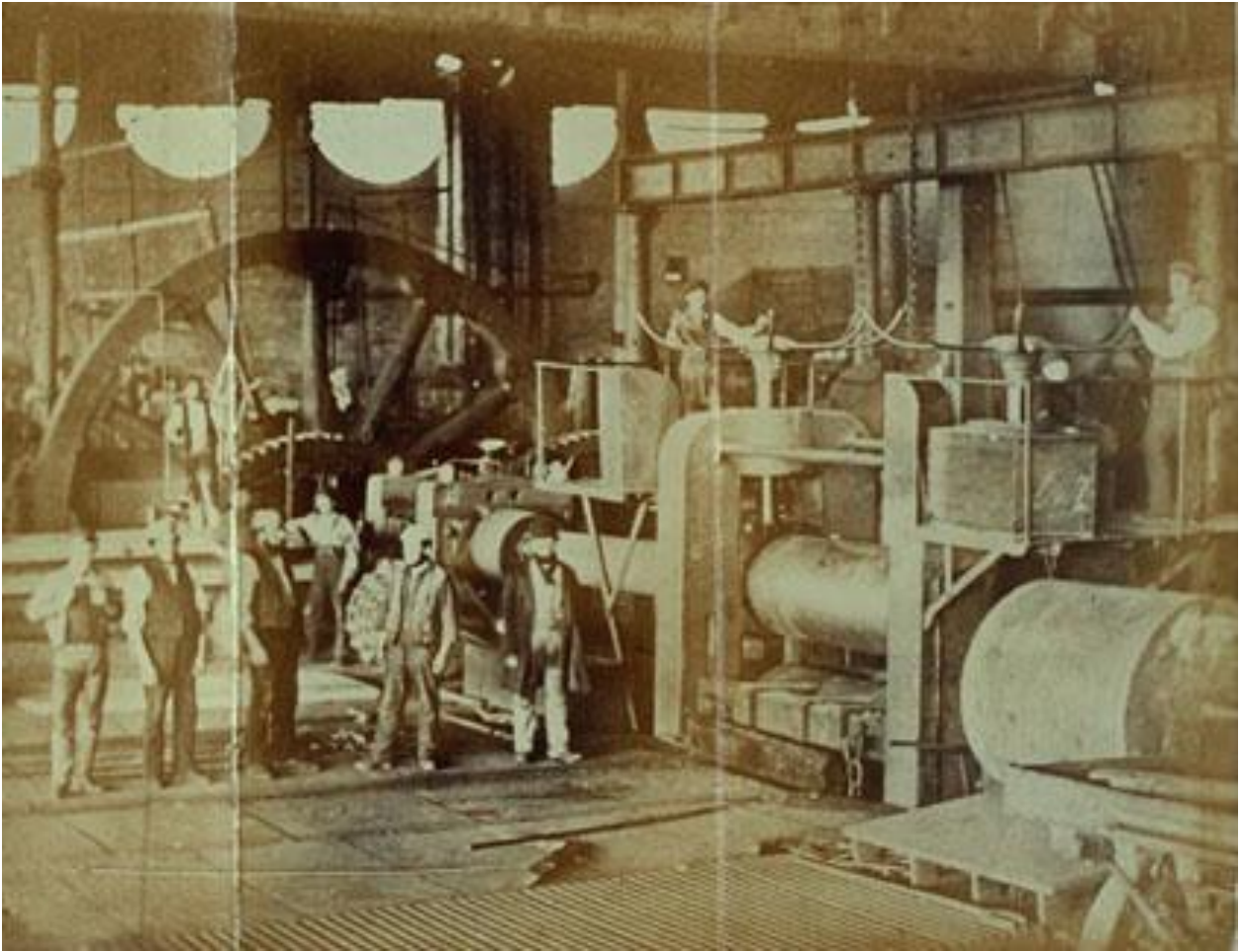
ILLUSTRATIONS



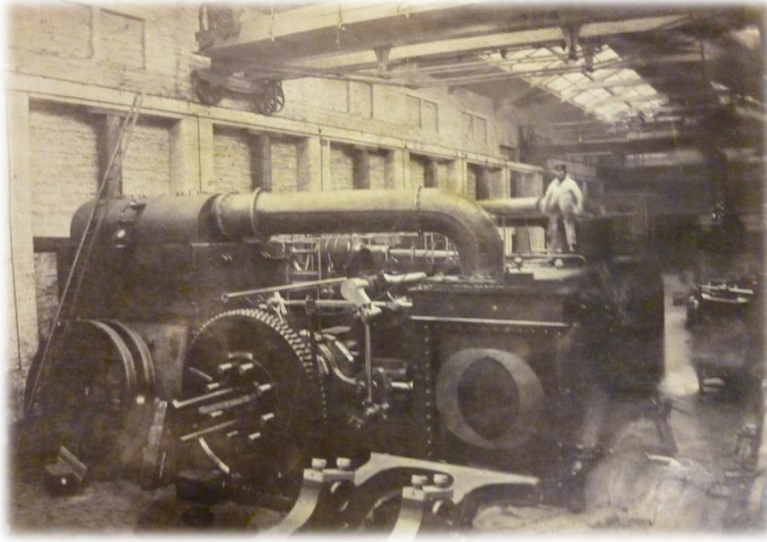
1. Birkenhead Iron Works (1857)
(Williamson Art Gallery & Museum, Birkenhead)



2. Dry Dock No. 4, Cammell Laird (summer, 2015)
The Laird rams were built to the left of the dry dock
(Photo by Author)



3. Armour Plate Rolling Mill, Mersey Ironworks, Liverpool 1863
Image# 10464453,
(Courtesy National Media Museum/Science & Society Picture Library, London)



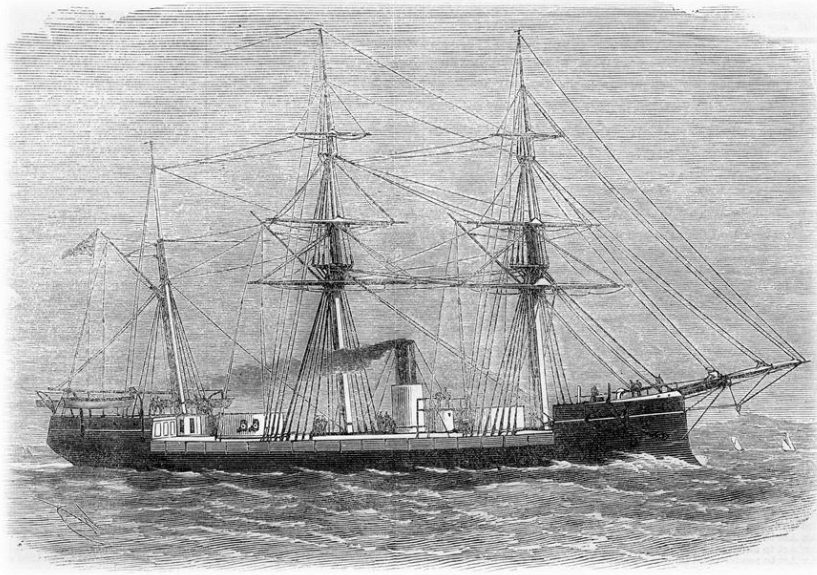
4. Marine Trunk Steam Engine likely at Lairds (circa 1865)
(SAS/25G/1/7 Courtesy of National Museums Liverpool, (Merseyside Maritime Museum))



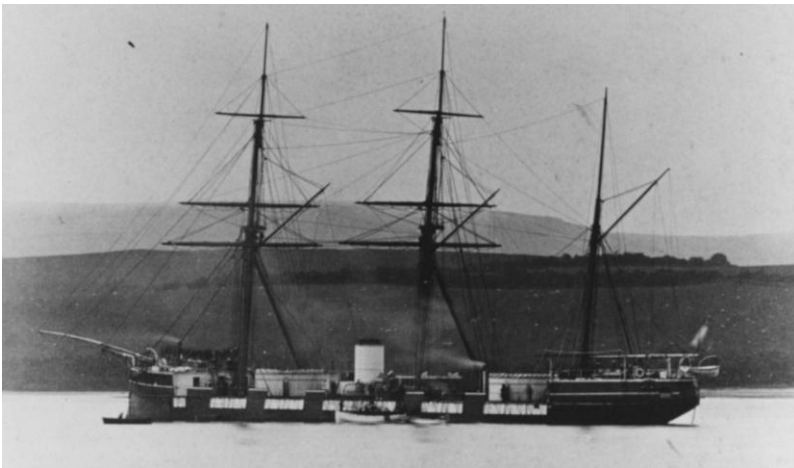
5. John Laird, ILN 27 July 1861
(Author's collection)



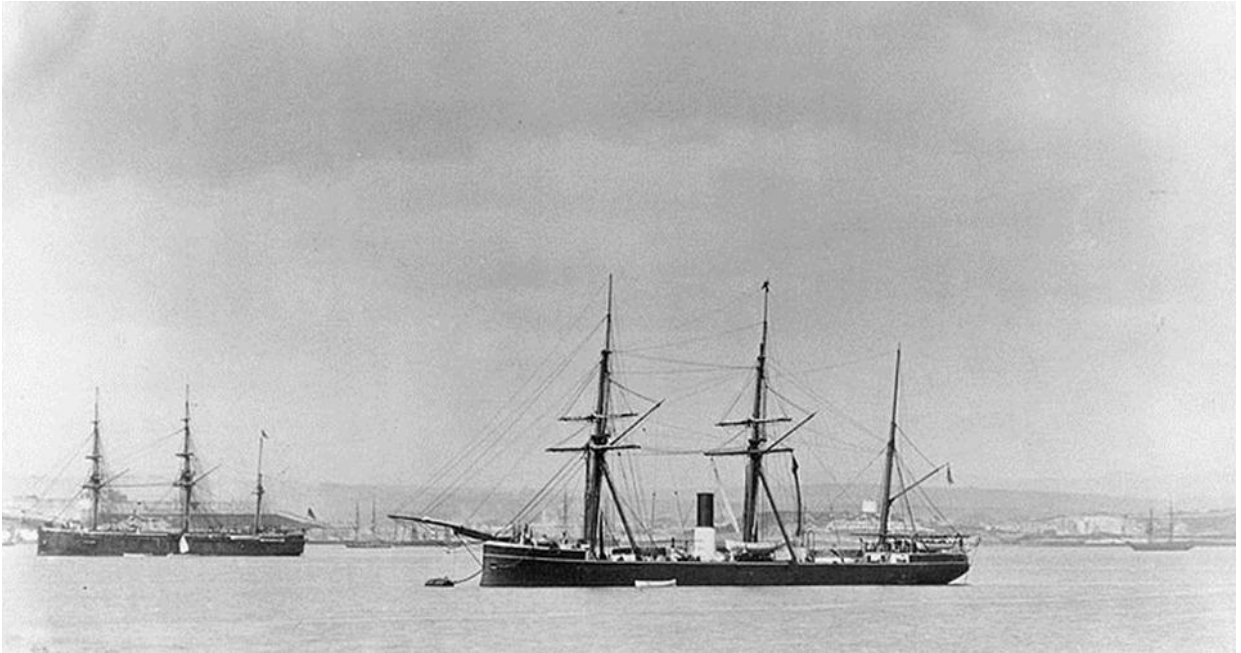
**6. The '294' (foreground) and '295' after being seized in the Mersey
ILN 28 November 1863
(Author's Collection)**



7. H.M.S. SCORPION at Sea
Illustrated London Almanack for 1869
(Author's Collection)



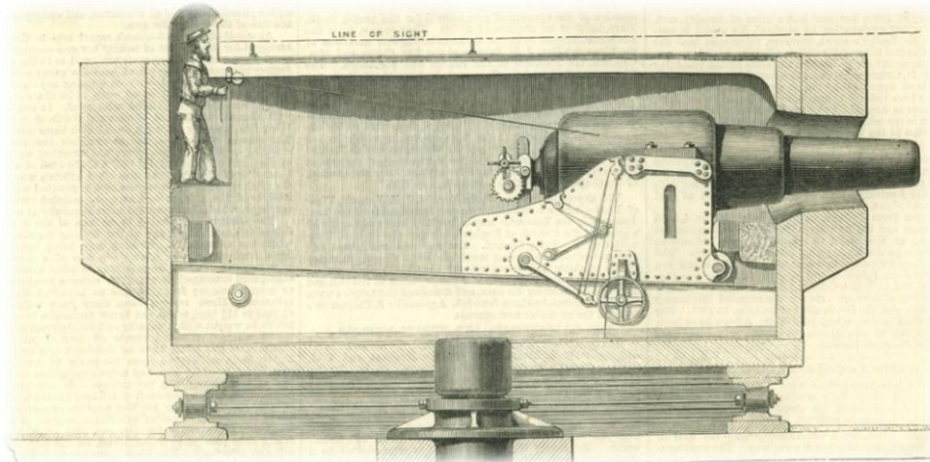
8. H.M.S. WIVERN at Plymouth, 1865
(Image# NH52526, Photo courtesy of Naval History & Heritage Command)



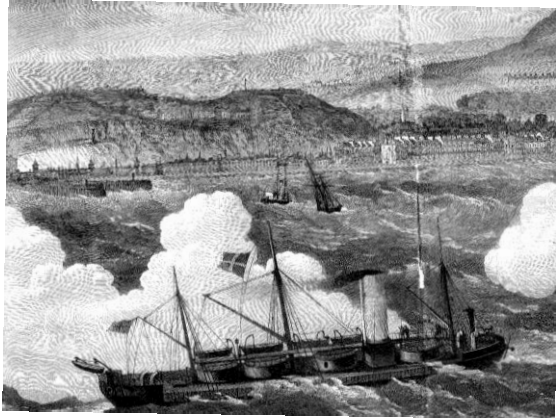
9. H.M.S. WIVERN off Plymouth, 1865
(Image# NH 71211, Photo courtesy of Naval History & Heritage Command)



**10. H.M.S. WIVERN in the Channel,
ILN, 27 October 1866
(Author's Collection)**



**11. Coles Turret with MLR
ILN, 2 December 1871
(Author's Collection)**



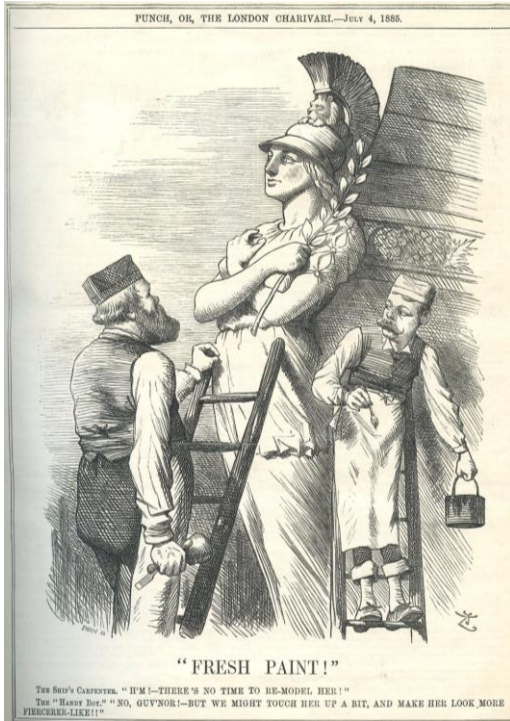
12. Combined arms demonstration: 'Sham Fight' at Dover with covering fire for an invasion force provided by H.M.S. ROYAL SOVEREIGN (on the left) and H.M.S. SCORPION, ILN 10 April 1869 (Author's Collection)



13. Nordenfelt gun for defence against torpedo boats, circa 1880 (Author's Collection)



14. A refitted H.M.S. WIVERN at Portsmouth, 1880 (Image# NH 65901, Photo courtesy of Naval History & Heritage Command)



15. Prime Minister Lord Salisbury and Lord Randolph Churchill repaint Britannia, 1885
(Author's Collection)



16. A refitted H.M.S. SCORPION at Bermuda, Circa 1900
(Author's Collection)



**17. The hulk of the WIVERN departs Hong Kong for the breakers
13 March 1923**

Richard Cox Collection, courtesy of Miguel Sehested Zambras , 7seasvessels.com

CHAPTER FOUR

Naval Weapons and Power Projection: The Laird Rams on Foreign Station 1874-1883

Following the death of Palmerston in 1865, the Royal Navy endured two decades of limited budgets imposed by both Conservative and Liberal governments determined to restrict the costs of Empire following the economic downturns of the 1870s and 1880s. During these years, which Oscar Parkes described as the 'Dark Ages of the Victorian Navy', warship design and construction slowed due to budget limitations, and confusion wrought by rapid changes in heavy guns, armour, and machinery.¹¹⁸⁶ Despite the incremental approach to new construction, the Royal Navy was fully engaged in the role of deterrence. The defensive aspects of this deterrent mission applied not only to the more routine stations of the Royal Navy, but also to the more remote but strategically important bases far from European waters. Notwithstanding the limited budgets and distance from repair facilities in Britain, the British squadrons beyond the Suez and the Channel remained abreast of the latest changes in new weapons and the evolution of tactics.

In the face of evolving threats, commanders of these foreign stations adapted existing ships for the defence of Britain's outermost strategic positions. The Admiralty made do with the warships available, and experimented constantly with modifications to those ships with an eye on improving capabilities. This time of

¹¹⁸⁶ Fuller, *Clad in Iron*. (2008), 277, N.A.M. Rodger, 'The Dark Ages of the Admiralty, 1869-85, Part I: 'Business Methods', 1869-74' *Mariners Mirror*, 61, (1975), 331. Naval spending as a part of the overall budget, dropped from 16.24 percent in 1865 to 11.82 percent in 1883. See: Beeler, *British Naval Policy in the Gladstone-Disraeli Era 1866-1880*. (1997), 222.

innovation and resourcefulness led to the adaptations of existing weapons and platforms in order to maintain a forward presence. Armaments technology during the 1870s and 1880s was punctuated with lags, as new weapons such as the self-propelled torpedo, the improved breechloader, rockets, and the machine gun promised a redefinition of naval warfare. Armaments had to undergo modifications to incorporate micro innovations which would later become the fulfilled promise of the new technologies.

In the 1870s and 1880s, first-generation ironclads were fitted with a mixed lot of old and new, creating a bewildering array of inventions which transformed some of these warships into floating testbeds of new technology. Ironclads no longer suitable for front line service in home waters or the Mediterranean, were remade into armoured guardians to deter would-be aggressors further afield at the outposts of the Empire. Small turret ships, such as the *Scorpion* and *Wivern*, not only relieved other 'sea-going' warships for more urgent tasks, they remained on hand for defensive operations and were ready to attack an enemy coast in the event of war.¹¹⁸⁷

Assignment of the Laird rams to Bermuda and Hong Kong placed two valuable ironclads at key installations and near the thresholds of two separate continents. Coal yards, stores warehouses, magazines, and repair facilities were vital for the maintenance of a modern navy. Armoured warships provided a degree of security at modest cost. Their arrival on colonial stations marked a development in the layered defence of Britain's military springboards.

By 1880, the dry docks and the turret ironclads merged into a symbiotic relationship which permitted the Royal Navy to retain superiority beyond

¹¹⁸⁷ 'Very Latest', *Royal Gazette*, 23 April 1878, 5.

European waters. These installations, and their assigned forces, would help determine the ability to project British naval and military power at key points in Asia and North America in the event of hostilities. This deterrence at the edge of Empire was possible because Bermuda and Hong Kong had the right mix of assets.

This chapter examines the expansion of colonial dockyard infrastructure, the reemergence of the Russian threat, the development of naval intelligence, and the advantages and limitations of the Laird rams during their middle years in service. A secondary feature of the chapter focuses upon the roles these warships played in the Royal Navy's response to the technological challenges and tactical shortcomings of the 1870s and 1880s.

Scorpion and the Bermuda Dockyard

In the early 1870s, the three ironclads of the 'Inshore Defence Squadron', the *Scorpion*, and the smaller *Viper* and *Vixen*, were periodically exercised at sea. These exercises occurred rarely as the ships suffered problems with manning and mechanical malfunctions.¹¹⁸⁸ During a drill in April 1873, the *Scorpion* experienced defective boiler safety valves and was stopped almost immediately after weighing anchor.¹¹⁸⁹ The ironclad also suffered the effects of corrosion on internal and topside iron surfaces and a repair was deemed necessary. To both improve her performance and avoid a total refit, her heavy masts and spars were removed and boilers were overhauled. The store rooms and cabins aft had to be

¹¹⁸⁸ Lt. Cdr. H. G. Middleton, 'H.M.S. Scorpion', *Bermuda Historical Quarterly*, XXXVII, (Spring 1980), 12-13, Stranack, *The Andrew and the Onions*. (1990), 114.

¹¹⁸⁹ TNA, ADM 135/417, Office of the Controller of the Navy Ship's Book Series I, 'H.M.S. *Scorpion*'.

cleared away to repair and paint the rusting iron hull frames below the water line. As a cost-saving measure, the store rooms and the cabins were not reinstalled as the ship was assigned to harbour and coastal defence duties and would likely not cruise far afield.¹¹⁹⁰ Refit of the *Scorpion* created a more streamlined defender capable of employing her turret guns with greater effect after the clutter associated with a sailing cruiser had been removed. Local naval authorities took necessary steps to maintain a degree of readiness without exhausting limited budgets. This was a sensible move as the iron ships at Bermuda appeared to have suffered advanced corrosion in the warm wet climate.

The problem of suitable coal stocks continued to influence naval operations at Bermuda. The British press had stated that the supply of coal from Nova Scotia 'gives us an overwhelming advantage over any European combatant who might endeavour to cripple our Atlantic trade', but that advantage was only a short term benefit. Poor quality coal had damaged the *Scorpion's* boilers and sentenced her to frequent care of the dockyard.¹¹⁹¹ As mentioned in the previous chapter, the use of inferior coals continued until 1887, when cleaner burning Welsh coal was ordered for Her Majesty's warships except when supplies were not available.¹¹⁹² The need for economy and the requirement to maintain fuel stocks meant that supplies of cleaner burning Welsh anthracite could not always be maintained.

Weather was an additional factor and the Bermuda dockyard was particularly susceptible to tidal surges. On 28 August 1878, an Atlantic gale damaged the crucial floating dock when the *Bermuda* was lifted by the storm surge and rammed into the breakwater. The dock had been careened for repairs but with

¹¹⁹⁰ Ibid.

¹¹⁹¹ Ibid, 'British Coal and Coaling Stations', *Pall Mall Gazette*, 3 January 1877, 2-3.

the pending arrival of the storm, it was temporarily 'flooded down' by filling her with water in an effort to limit damage. For generations of Bermudians, the sight of the dock sinking without a ship awaiting repair, was the sign a hurricane was imminent. The *Bermuda* was pumped out and salvaged by crews detailed from the warships on station, and the dockyard workers reassigned to repair the floating dry dock.¹¹⁹³ In late August 1880, the island base was struck by another severe hurricane, but the floating dock 'remained immovable' as the *Scorpion* was inside, keeping the great structure in place at her berth.¹¹⁹⁴

Suitable labour at Bermuda was difficult to acquire. Convicts had been utilized to build the naval base at Ireland Island beginning in 1823, yet the last of the criminal labourers had departed by 1863.¹¹⁹⁵ Royal Marines were occasionally used on work details at the dockyard but it became 'evidently impossible' to rely on Marine contingents. Their tasks were dependent on the needs of the service, and one duty was to help man the ships of the reserve squadron when those ships were required. Workers were requested from the Halifax dockyard to help fill the vacancies left by the Marines, but during emergencies replacements could not be had from Nova Scotia. Available Halifax workers had occasionally been brought to Bermuda on warships and carried out required work during the Canadian winters. When the Marines were needed to augment the crews of British warships during times of crisis, Halifax also had need of their dockyard men. As the Royal Navy readied for conflict, the labour

¹¹⁹² *Hansard*, 31 May 1894, 25, cc 11.

¹¹⁹³ Stranack, *The Andrew and the Onions*. (1990), 54, 'Furious Hurricane at Bermuda', *NYT*, 9 September 1878, 8.

¹¹⁹⁴ 'The Recent Hurricane', *Royal Gazette*, 7 September 1880, 5.

¹¹⁹⁵ Stranack, *The Andrew and the Onions*. (1990), 12, 103-105.

shortage on Bermuda became more pressing.¹¹⁹⁶ Marines were to assist with manning the *Scorpion*, *Viper* and *Vixen*, with approximately 300 officers and men (including some seamen from the guard ship, *Terror*) required to round out the complements of these three seagoing ironclads.¹¹⁹⁷ At other times, health issues prevented the shuttling of skilled civilian manpower between the dockyards of the North American station. On one occasion in 1880, a detail signed on at Halifax to work on the floating dock at Bermuda but after labouring a short time, many became ill and had to be invalided home.¹¹⁹⁸

Bermuda was the key link in the chain of British dockyards and military bases in the New World. Halifax, Bermuda, and the Bahamas were referred to as the 'guardians' of the Gulf Stream, 'freighted...with the exports of half a continent'.¹¹⁹⁹ Bermuda was at the centre of that ring of bases, and the dry dock was the crucial component. That structure, the then largest floating dock in the world, had another advantage. The chambers built into the *Bermuda* could be individually filled or pumped out, giving the floating dock 'a self-careening capability'.¹²⁰⁰ An adjacent addition near the floating dry dock, was the massive sheerlegs built by James Taylor & Company of Birkenhead. Shipped and installed at the naval base in 1875, this 195 ton structure augmented the heavy repair capabilities of that mid-Atlantic station.¹²⁰¹ A photograph, circa 1878, provided a rare glimpse of a Bermuda ironclad, likely the *Scorpion*, moored under

¹¹⁹⁶ TNA, ADM 128/82, *North America and West Indies Station: Correspondence, Reports and Memoranda*. 01 March 1877- 31 May 1882.

¹¹⁹⁷ *Ibid.*

¹¹⁹⁸ 'Sickness on a British War-Ship' [sic], *NYT*, 12 January 1880, 5. Some of the sick were sent to the naval hospital at Halifax to recover.

¹¹⁹⁹ 'The Romance of the Sea', *Dundee Courier*, 22 October 1878, 7.

¹²⁰⁰ Richard A Gould and Donna J. Souza. 'History and Archaeology of HM Floating Dock, *Bermuda*'. *The International Journal of Nautical Archaeology* 25 (1996), 6-7.

¹²⁰¹ Stranack, *The Andrew and the Onions*. (1990), 59.

the sheers for an extensive alteration: masts removed, new funnel fitted, and canvas awning rigged where the aft turret once stood. The armourclad had probably received her new boilers and this stern view revealed her riding high without her earlier fittings, turrets, and guns.¹²⁰²

Despite the dockyard improvements, Admiral J. E. Commerell, a former commander of the *Scorpion*, did not favour Bermuda and termed it 'one of the most tempestuous spots in the world'. Commerell warned that an ironclad that suffered a flooded compartment in the winter months would have a 'lively time of it' waiting offshore for the right conditions of wind and tide to get over the bar and into the dry dock. He also pointed out the necessity of bringing labourers from Britain to repair the dock and to conduct the necessary upkeep of chipping and painting the 'enormously expensive' structure. The Admiral feared the health of the workmen shipped from Britain would 'surely break down' adding to the costs of maintaining the dry dock. Despite these misgivings, Bermuda would remain the key facility for the Royal Navy in the Western Hemisphere until a large dry dock was built at Halifax in the late 1880s.¹²⁰³

Condemned in the British press in 1876 for being 'failures as seagoing vessels', the three ironclads 'stowed away' at Bermuda were overhauled in anticipation of service in local waters.¹²⁰⁴ To refer to these ships as 'failures' discounts another factor that influenced their construction. When launched in the mid-1860s, these ships had armour as thick as that of the *Warrior*, although they were armed with few heavy guns. Despite being poor sea boats, they had

¹²⁰² TNA, ADM 195/5, Bermuda Dockyard. Includes 73 photographs depicting: Royal Navy dockyard and naval base, Bermuda. Dated 1868-1899, 2.

¹²⁰³ 'Cable between Halifax and Bermuda', *Hampshire Advertiser*, 29 September 1886, 3. 'Dry Dock at Halifax, Nova Scotia', *Hampshire Advertiser*, 21 August 1886, 2.

¹²⁰⁴ 'Our Power by Sea', *Liverpool Mercury*, 4 February 1876, 7, No Subject, *London Evening Standard*, 14 May 1878, 5.

another advantage. The *Scorpion*, and the smaller experimental ironclad rams, *Viper*, and *Vixen*, were also capable of steaming up the St. Lawrence as far as Montreal to provide heavy naval firepower should the United States threaten open hostilities. The *Viper* and *Vixen* had the additional advantage of shorter length, beam, and draught to permit the transverse of the locks at Montreal if required, into Lake Ontario should tensions with Washington reoccur.¹²⁰⁵

The shoals, difficult currents, and slender channels of Bermuda made the Atlantic fortress the ideal base for the rams.¹²⁰⁶ An American geographer observed that the main shipping channel (St. George's) was so narrow 'that one could easily toss a biscuit to either shore'.¹²⁰⁷ In Bermuda, the speed of the more modern man-of-war was not a necessity. Here, a warship's position and accuracy of fire were the determining factors in a conflict with any enemy willing to hazard an attack. A ram would have an ample opportunity to fire on, and crash into, an enemy vessel threading its way between the shoals. Bermuda was, according to Richard Gould, 'one of the few places in Britain's overseas empire where geography, in the form of surrounding reefs and limited, narrow channels, favoured the use of steam-powered rams'.¹²⁰⁸

The geographical advantages, both in terms of steaming distance to the eastern United States and Canada, as well as the suitability for defence, were reasons for the improvements made to the Bermuda naval dockyard in the late 1860s. Although the 1866 Fenian raids into Canada from the United States had sparked another crisis in relations with America, the raids failed to provoke a

¹²⁰⁵ *Hansard*, 6 April 1865, 178, cc 846.

¹²⁰⁶ 'Our Power by Sea', *Liverpool Mercury*, 4 February 1876, 7.

¹²⁰⁷ Charles L. Bristol, 'Notes on the Bermudas', *Bulletin of the American Geographical Society* 33 (1901), 243.

¹²⁰⁸ Richard A. Gould. 'The Archaeology of HMS *Vixen*, an early ironclad ram in Bermuda'. *The International Journal of Nautical Archaeology* 20 (1991), 153.

wider conflict. Washington was more absorbed with Reconstruction and westward expansion than with supporting grievances the Irish immigrants held against the British Empire. With the South subdued, Washington dismantled most of its navy and scaled back its army for missions more suited for a home guard. By 1867, Prime Minister Disraeli wrote: 'The Americans have no navy & not an ironclad except for coast defence'.¹²⁰⁹

The Washington Treaty, signed on 8 May 1871, and the subsequent Geneva arbitrations, resolved the Alabama claims and removed one of the last remaining points of contention between Britain and the United States from the Civil War.¹²¹⁰ Britain again turned towards Europe as tensions between old rivals resumed. The French defeat at the hands of the German Confederation in the war of 1870-1871, removed France as a major international naval threat for almost a decade.¹²¹¹ Britain was occupied with propping up the weakening Ottoman and Chinese Empires during the later nineteenth century, and this placed Russia as a rival to British interests in the Near East and Asia.¹²¹² Russian expansionism in Central Asia was restrained somewhat by the British Army in India, and containing them in eastern Asia was 'of the first importance in the Royal Navy's order of priorities on the China Station'.¹²¹³ Russia was not the only concern for British naval stations. Despite the decline of the United States as a rival, the Fenian threat did not completely subside and by the early 1880s, Bermuda was

¹²⁰⁹ Antony Preston and John Major, *Send A Gunboat! A Study of the Gunboat and its role in British policy, 1854-1904*. (London, 1967), 86-87.

¹²¹⁰ Milton, *Lincoln's Spymaster*. (2003), 118-119.

¹²¹¹ Millman, *British Foreign Policy and the Coming of the Franco-Prussian War*. (Oxford, 1965) 26, 151-155

¹²¹² T. G. Otte, 'Great Britain, Germany, and the Far-Eastern Crisis of 1897-1898', *The English Historical Review*, 110, (November 1995) 1160.

¹²¹³ Roger Parkinson, *The Late Victorian Navy: The Pre-Dreadnought Era and the Origins of the First World War*. (Woodbridge, 2008), 73.

under surveillance by Fenian agents planning an attack against key facilities at the base.¹²¹⁴

Overseas dockyards and Imperial Defence

By the mid-nineteenth century, the Royal Navy was in high demand to protect British interests around the globe regardless of the fewer warships and men available. Despite the expansion of trade, the Royal Navy continued to seek ways to maintain their missions under a restricted budget. Merchants, missionaries, and adventurers invariably put pressure on colonial authorities who in turn, put pressure on the Foreign Office to provide protection, and the Admiralty struggled to meet demand. One British admiral complained: 'We are doing or endeavouring to do much more than our force is sufficient for. It is fortunate that the world is not larger, for there is no other limit to the service of the fleets'.¹²¹⁵ The pressure had been building for decades. By 1861, the China and East Indies Station had become the largest station outside home waters. With 66 British warships steaming through those seas, another 15 cruised the distant waters of the Pacific, and nine more warships protected Australia.¹²¹⁶ By 1880, Britain's share of merchant steamers had climbed above half of the world's total. Despite this advance, by the end of the 1880s, sailing ships still carried about 25 per cent of global waterborne freight.¹²¹⁷ Steamers and clippers needed warships of differing capabilities to protect trade routes.

¹²¹⁴ TNA, FO 5/1816 'Fenian Brotherhood', 32, 1 January 1882-31 March 1882.

¹²¹⁵ Paul, Kennedy, *The Rise and Fall of British Naval Mastery*. (New York, 1976), 180.

¹²¹⁶ *Ibid.*

¹²¹⁷ Eric Hobsbawm, *The Age of Capital 1848-1875*. (New York, 1996), 58.

The dry dock was a vital component for any major base and absolutely essential to keep an ironclad on a foreign station. The naval dockyard could ready a fleet for operations and return damaged vessels to sea. During the Franco-Prussian War of 1870-1871, the hulls of the few Prussian ironclads were badly fouled due to limited dry dock space, and a young Alfred Von Tirpitz was 'indignant' at the inability to engage the French fleet blockading the German coasts.¹²¹⁸ Britain made plans to defend her key bases, but an emphasis was placed on attacking those of her potential enemies. Dry docks attracted particular interest as targets of enemy vulnerability.¹²¹⁹ Infrastructure was necessary for power projection and power sustainability as 'only fleets with local bases for supply, repair and concentration could maintain command of key sea areas'.¹²²⁰

Skilled dockyard workers were almost always needed by the naval establishments and the manpower problem was a persistent one for Bermuda. Costs escalated for overseas work and in 1878, when skilled dockyard men were urgently needed on the North American station, men from the Royal Dockyard at Chatham refused to sign on to work on the dry dock in Bermuda for 5s 6d a day. It was only after the Admiralty offered 8s per day that a Portsmouth work force of twenty men, led by a foreman of shipwrights, sign on. The promise of work at the nearby yards proved too strong for most skilled men to exchange the pull of

¹²¹⁸ David Haroldpet, (2001), *Staatkaperei: The German Navy and Commerce Warfare 1856-1888*. (Unpublished doctoral dissertation) University of Saskatchewan, 119-120.

¹²¹⁹ TNA, ADM 231/5, *Admiralty: Foreign Intelligence Committee*, Report No. 51, Captain W. H. Hall, R.N., 'Remarks on a Naval Campaign', 24 September 1884, 17. A dry dock in Martinique, was the only one the French possessed in the West Indies capable of 'taking an armour-clad'.

¹²²⁰ Lambert, 'Economic Power, Technological Advantage, and Imperial Strength: Britain as a Unique Global Power, 1860-1890'. *IJNH*, (August 2006), 12.

home for work in a distant and unfamiliar climate.¹²²¹ Yet, it was this work that made the island more than a stopover. Bermudians knew the Royal Navy provided not only their protection but, also, their livelihood: 'of course it is as a naval station that Bermuda exists...but for this the Imperial Government would have little use or regard for her'.¹²²²

During the middle Victorian years, Shanghai was the epicentre of Western economic efforts in China, but Hong Kong emerged as the 'most important port-of-call for intercontinental shipping lines and for all sorts of vessels employed in coastal shipping'.¹²²³ Unlike the fortress-base of Bermuda, Hong Kong was an international focal point for ships engaged in regional shipping and a centre of eastern trade 'carried on for the benefit of the mother country and the British taxpayer'.¹²²⁴

The main dry docks at Hong Kong were a dual use naval and commercial facility, built with government backed loans issued in 1864 and 1866. Completed in 1867, the Whampoa dry docks, located in Aberdeen Bay (also referred to as the Lamont and Hope dry docks), was the largest in the colony. The only other dry dock was at Kowloon, built after the Whampoa facility, but this dock was too small to take in an ironclad for repair. The Royal Navy made frequent use of the Whampoa dry docks, including the then flagship of the China Squadron, *Iron*

¹²²¹ 'Naval and Military', *Newcastle Courant*, 22 March 1878, 7, 'Naval Notes and News', 15 May 1878, 2.

¹²²² 'Bermuda Dock', *Royal Gazette*, 13 November 1883, 1.

¹²²³ Bert Becker, 'Coastal Shipping in East Asia in the late Nineteenth Century', *Journal of the Royal Asiatic Society Hong Kong Branch*, 50, (2010), 257-258.

¹²²⁴ Lance E. Davis and Robert A. Huttenback, 'Public Expenditure and Private Profit: Budgetary Decision in the British Empire, 1860-1912', *American Economic Review*, 67, (Feb. 1977), 287.

Duke, after she ran aground near Shanghai in May of 1879 and required extensive repair of her damaged hull plates.¹²²⁵

The Hong Kong facilities were occasionally under scrutiny. In the House of Commons, Mr. E. Jenkins, the M.P. from Dundee, criticized the Navy for the expense of maintaining the commodore of the naval yard, whose duties consisted of 'walking about with a telescope under his arm and swearing at the men'.¹²²⁶ This perception was corrected, (by M.P. James Reed), as skilled carpenters from the fleet were regularly detailed ashore to assist with repair work in the dockyard. The commodore was actively engaged in his duties as the senior officer of the port, and the reality was quite different from the blithe existence imagined by Jenkins. Nevertheless, the inference was quite clear and British governments of the 1870s and 1880s were determined to cut the costs of naval facilities wherever they could.¹²²⁷

On 20 January 1882, the Admiralty reacted quickly to a dispatch sent from the Colonial Office. That office had previously received a copy of a dispatch (dated 31 December 1881), from the British Consul in Philadelphia, which described a Fenian plot to blow up the floating dry dock in Bermuda. The plot was at an advanced stage of preparation but the British response was slow. Consul R. C. Clipperton had not sent warning to the Governor of Bermuda until he received a follow-on report that detailed the plot 'being matured'.¹²²⁸ Despite Clipperton's adherence to procedural protocol, secret correspondence concerning the threat

¹²²⁵ *Hansard*, 21 July 1879, 248, cc 847, *Hansard*, 12 May 1879, 246, cc 132, Thomas Allnut Brasseley, *The Naval Annual, 1886*. (Boston, 2005), 43-44.

¹²²⁶ *Hansard*, 31 July 1879, 248, cc 1819.

¹²²⁷ *Ibid*, 1818-1819.

¹²²⁸ TNA, FO 5/1816 'Fenian Brotherhood', 32, 1 January 1882-31 March 1882. The source of Clipperton's intelligence was likely provided by Thomas Beach, a British-born former Union

to Bermuda moved through Whitehall with sufficient speed once in the hands of officials in London. On 26 January, the Admiralty sent a priority letter to the Foreign Office urging them to send instructions for immediate action to the consul in Philadelphia. The Admiralty requested that Clipperton not wait for routine mechanisms of official correspondence catch up to, and incrementally approve his actions, rather he was requested 'to communicate at once with the Governor of Bermuda in regard to the alleged intentions' and to forward 'copies of all such communications to the Governor direct'.¹²²⁹ The Foreign Office complied with the request and on 28 January, a cable was sent to Philadelphia instructing the consul to relay a warning to the Governor of Bermuda.

A coordinated response was implemented and threat information was communicated to the commander of the Bermuda dockyard, the Attorney General for the colony, customs officers, and colonial police. To avoid detection on the frequently used mail steamers from New York, Fenian agents had booked passage to Bermuda on sailing vessels from ports in the southern United States. After the plot unraveled, the Fenians booked return passage on the New York bound steamships as the authorities closed in. The Bermuda dragnet found no bombs, but several suspect local men were found to have possible links to the visitors. These men had worked at the dockyard and suddenly quit to hurriedly book passage for New York. In light of these occurrences, the Attorney General and Chief of Police sent a military detail aboard one passenger ship under the guise of searching for deserters. The search did not discover any incendiaries, but it did reveal Fenian newspapers in the baggage of some suspects. In response to the threat additional ammunition was issued, and guards at the forts

cavalry soldier, who had penetrated the Fenians under the name Major Henri Le Caron. See: Richard Deacon, *The Silent War: A History of Western Naval Intelligence*, London, 1988, 38.

and dockyard were doubled.¹²³⁰ The people of Bermuda had been forewarned and cautioned by newspaper reports that they 'should be well on their guard' against the 'cowardly' attempts to commit the bomb attacks.¹²³¹ The increased alertness was effective, as 'no stranger can walk about the place without attracting as much attention as if in an English country village'.¹²³² Word filtered back to the Fenian plot leaders in New York: they had been found out.

Had it carried, a bomb attack against the floating dock would have achieved very limited damage. Archaeological surveys made of the remains at Spanish Point, Bermuda from the 1980s and 1990s, indicated that the dock would have been a tough target. Despite attempts to scrap the structure when it was sold off after 37 years in service, the lower third of the floating dock remained where it went ashore in 1908 and continues today as a 'testimonial to the robust nature of Victorian-era engineering and construction'.¹²³³

The North American and West Indian Squadron and the Russian War Scare of 1877-1878

Anglo-Russian tensions over the possessions of the declining Ottoman Empire had been increasing steadily in the mid-1870s. As had been the case in 1863 during the Polish insurrection, in early 1877 Russian warships were at anchor in New York and San Francisco awaiting orders. At San Francisco, the Russian squadron received coal and supplies. Additionally, some ships were

¹²²⁹ TNA, FO 5/1816 'Fenian Brotherhood', 32, 1 January 1882-31 March 1882.

¹²³⁰ Ibid, 'Dynamite Operations in America', *Birmingham Daily Post*, 6 July 1882, 8.

¹²³¹ 'Fenian Plots', *Royal Gazette*, 14 February 1882, 2.

¹²³² 'The West Indian Station', *Portsmouth Evening News*, 8 June 1883, 2.

¹²³³ Gould and Souza. 'History and archaeology of HM Floating Dock, *Bermuda*'. *The International Journal of Nautical Archaeology*. 25, (1996), 10, 19.

dry-docked in anticipation of a long sea voyage away from a friendly port. The Russian squadron at San Francisco was rumoured to have set the British North Pacific naval station at Esquimalt, on Canada's coast of British Columbia, as a prime target in order to seize valuable supplies of ammunition and coal.¹²³⁴

When the Russian man-of-war *Kraysser* unexpectedly steamed into Esquimalt a year later on 20 February 1878, the inhabitants of the naval base feared war had been declared between Britain and Russia, as the decks of the *Kraysser* seemed to have been cleared for action. The appearance of the Russian warship was not a hostile act, but the result of storm damage received after she departed San Francisco, en route to the Russian Pacific coast. After obtaining permission to effect repairs at the Canadian base, a Royal Navy corvette escorted the visitor to sea as both exchanged the requisite military salutes.¹²³⁵

The purchase of several fast merchant steamers from U.S. shipbuilders for the Russian Imperial Navy in 1878 marked a return to the debates over neutrality and the threat of commerce raiding on the Atlantic by would-be auxiliaries. Funds to pay for the ships were raised from subscribers across Russia, and the ships were dubbed the 'Volunteer Fleet'. A Philadelphia broker named Wharton Barker was the official owner of the steamers, but it was reported in the American press that he only served as a blind for the real owners, the Russian Government. In a revisit of the fine points of neutrality concerning the Confederate warships built in Britain during the Civil War, the debate relating to intended use and intended ownership resurfaced. The steamers were not armed in the United States, their main guns were made in the German city of Essen by Krupp, and intended to be fitted after the ships arrived in Russia. This shuffle

¹²³⁴ 'The Russian North Pacific Fleet', *NYT*, 1 January 1877, 3, 'The Russian Pacific Fleet' *NYT*, 14 May 1877, 1.

made U.S. officials nervous as William Cramp & Sons, Philadelphia shipbuilder of three of the four ships, noted (likely by Charles H. Cramp) that American neutrality laws were so strict, they prevented shipbuilders from constructing ships for foreign governments in times of peace, 'let alone in times of war'.¹²³⁶ The issues of contractual obligations and the enforcement of the envisioned neutrality came to the fore as it had during the building of the Laird rams, and the *New York Herald* warned Barker's purchase of the steamers, *State of California*, *Columbus*, and *Saratoga*, had brought the 'Washington government face to face with the great question of international duty toward the two great nations', Britain and Russia.¹²³⁷

Barker was well positioned to facilitate the purchase of the American ships for Russia as he was a personal friend of Captain Leonid Pavlovich Semetschkin, the Czar's naval emissary chosen to arrange the purchases.¹²³⁸

Although not armed, these ships were intended as auxiliary cruisers. The American press opined that, if armed and sent to attack merchant ships or colonial property of another power, that country 'could claim damages from the United States'.¹²³⁹ Barker arranged a contract with Cramp to build a fourth steamer for the Russian fleet, and was also responsible for purchasing guns, ammunition and supplies for the ships. Additionally, Barker was the American

¹²³⁵ 'Scared by a Russian Man-of-War', *Portsmouth Evening News*, 23 March 1878, 3.

¹²³⁶ 'Russia's New Cruisers' *NYT*, 22 December 1878, 1, 'The Russian Cruisers' *NYT*, 13 September 1878, 1.

¹²³⁷ Leonid I. Strakhovsky, 'Russia's Privateering Projects of 1878', *Journal of Modern History*, 7. (Mar., 1935), 27, 30,34

¹²³⁸ *Ibid*, 23, 28-30.

¹²³⁹ 'The Russian Cruiser Fleet', *NYT*, 30 May 1878, 1, 'Russia's New Cruisers' *NYT*, 22 December 1878, 1.

representative of Baring Brothers, although that arrangement was later described by the London financiers as 'not intimate'.¹²⁴⁰

Some American shipbuilders remarked that the Russians were having engines built in Britain for several of their new warships under construction in the Baltic, but this argument fell flat. The British press noted that Barker had obtained funds for his ships, via Baring Brothers in London, yet Britain could respond by suspending exports and payments with the announcement of hostilities.¹²⁴¹ Payments would have likely been stopped had Barings been aware of Barker's secret agreement to provide additional guns and ammunition for the volunteer cruisers to take on board after departing U.S. Waters. One arming location later identified, was Santo Domingo.¹²⁴² The legal precedent of the *Alabama* claims was not lost on the American public, and the British press noted that U.S. Secretary of State William H. Evants had served as a U.S. legal advisor during the arbitration of the *Alabama* claims at Geneva. He was likely to uphold a strict interpretation of American neutrality laws and not 'suffer them to be neglected'.¹²⁴³

The activity had not gone unobserved. The *New York Times* noted most of the Royal Navy's North American and West Indies Squadron had assembled at Bermuda by the first week in April 1878 where they 'were constantly at ball practice'.¹²⁴⁴ Increased readiness at the island base was in response to Russian attempts to purchase the commerce raiders in America. British authorities were confident in their preparations and acknowledged that although a Russian

¹²⁴⁰ 'The Financial Crisis', *London Evening Standard*, 21 November 1890, 5.

¹²⁴¹ 'Our American Letter', *Sheffield Independent*, 17 June 1878, 3.

¹²⁴² Strakhovsky, 'Russia's Privateering Projects of 1878', *Journal of Modern History*, 7. (Mar., 1935), 29-30, 35.

¹²⁴³ 'America and Privateering', *Alnwick Mercury*, 15 June 1878, 2.

¹²⁴⁴ 'British Men-of-War', *NYT*, 26 May 1878, 9.

steamer converted into a commerce raider might have initial success on the Atlantic, that success would be short lived: 'We might have some trouble at first' yet the Russians were 'more likely to fall victims to our cruisers than to inflict damage on our merchantmen'.¹²⁴⁵

At Bermuda the pace of activity increased as the ships in reserve were slated for immediate overhaul. The *Scorpion* was to receive two new boilers from Britain, and the small ironclad rams *Viper* and *Vixen* were also in the hands of the dockyard, in preparation for active service.¹²⁴⁶ Armoured warships with heavy guns, when combined with torpedoes, provided a defence against any naval enemy. Bermuda received a supply of torpedo stores in the summer of 1876 and these weapons were held in readiness for defensive or offensive operations. Additionally, Halifax had received a shipment of torpedo related supplies that year.¹²⁴⁷ These weapons, when augmented by the refitted warships, allowed Britain a renewed capability against the handful of cruisers Russia could deploy into the Atlantic.

Britain had taken steps to provide key positions in the New World with sufficient manpower to shuttle to other locations, should need arise. This was especially true if the Royal Marines were needed aboard the warships.¹²⁴⁸ Bermuda was home to 2146 soldiers, Halifax had a garrison of 1831 stationed at that base, and the British Army had another 2000 soldiers available for duty in the West Indies. Several years later, one American visitor to Bermuda remarked on the number of fortifications positioned at key points around the fortress colony and that 'red-coats [sic] and marines should meet you on every street corner'.

¹²⁴⁵ 'The Russian Volunteer Fleet', *NYT*, 17 May 1878, 1.

¹²⁴⁶ 'Naval and Military Intelligence', *London Evening Standard*, 2 April 1878, 3.

¹²⁴⁷ 'Torpedoes', *Edinburgh Evening News*, 2 June 1876, 4.

¹²⁴⁸ 'The British Army', *NYT*, 27 March 1878, 7.

The essayist observed that Bermuda was the 'rendezvous' of the British fleet in that area of the Atlantic, and the fleet was the reason the base held vast quantities of arms and ammunition.¹²⁴⁹

While warships conducted gunnery practice and troopships shuttled replacements and reinforcements to Bermuda and other points of the Empire, the great Atlantic storehouse was supplied by the visiting schooner or hired steamer. As Whitehall prepared for a possible war with Russia, British merchantmen were contracted to supply naval bases and garrisons. The steamer *Lady Tredegar* was chartered by the Admiralty to carry the two new boilers destined for the *Scorpion*, along with 80 tons of provisions, 50 tons of shot and shell, and another 200 tons of ammunition for the army garrison and the naval forces at the archipelago.¹²⁵⁰ These shipments augmented the stockpile sent out in March of that year (1878) aboard the *British Queen*. That steamer had transported a cargo of shot and shell to the island station, along with a new 18-ton gun.¹²⁵¹

Americans were anxious over the Russian naval presence on their Eastern and Western coasts, and newspaper reporters clamoured for details. Russian agents visited the main U.S. ports to obtain data on steamships available for service and likely intended for long cruises. As Russian officers were followed by British spies and hounded by the American press, the Czar's officers complained that the determined reporters gave them the most annoyance.¹²⁵² The Russian need for secrecy was not helped by public pronouncements and overseas travel. One American representative of the Russian government was New England merchant ship captain, H. W. Hunt. Visiting Dublin, Cork, and other places in

¹²⁴⁹ Julia C. R. Dorr, 'Bermudian Days', *Atlantic Monthly*, 52, (December 1883), 784.

¹²⁵⁰ 'Naval and Military Preparations', *Hampshire Telegraph*, 1 May 1878, 2.

¹²⁵¹ 'Preparations for Military and Naval Operations', *Blackburn Standard*, 2 March 1878, 3.

¹²⁵² 'Russian Cruisers', *Western Daily Press*, 4 June 1878, 6.

Ireland in the spring of 1878 prior to his return voyage to Boston from St. Petersburg, Hunt opined that Russia was 'well prepared for the struggle'.¹²⁵³ The Russians had taken steps to forward deploy over 40 officers and 600 crewmen on the steamer *Cimbia* to the American coast of Maine. Once there, they were under orders to standby for a short voyage to Philadelphia when the American-built ships were ready to sail.¹²⁵⁴

The sloop *H.M.S. Sirius* patrolled off the coast of Maine, ready in the event the new Russian auxiliaries steamed out from American harbours after a declaration of war. Other Royal Navy warships in Halifax and Bermuda were also held ready to cruise off the eastern seaboard of the United States should tensions with Russia have escalated.¹²⁵⁵ One British newspaper editor lamented that Britain had relied too much on large armoured warships 'as with our ironclads we have in this branch of service put our eggs in too few and too large baskets'. The editor went on to advocate the chartering of Cunard and P & O steamers to serve as auxiliary cruisers in order to search for Russian commerce raiders, yet this concept was not widely accepted as Britain had, 'vessels enough to guard her coasts and to scour the seas'.¹²⁵⁶

By November 1878, tensions had abated, and two companies of Royal Engineers at Bermuda were ordered to prepare for transport to Gibraltar and Malta.¹²⁵⁷ By late July 1879, the refurbished steamers, *State of California*, *Columbus*, and *Saratoga* arrived in Russian waters. Joining the American built *Zabiaka*, they were renamed as the Russian vessels, *Yevropa*, *Aziya*, and *Afrika*.

¹²⁵³ 'Russian Cruisers in America', *Somerset County Gazette*, 1 June 1878, 7.

¹²⁵⁴ 'The Russian Cruisers' *NYT*, 13 September 1878, 1.

¹²⁵⁵ Strakhovsky, 'Russia's Privateering Projects of 1878', *Journal of Modern History*, 7. (Mar., 1935), 34, 'Military and Naval', *York Herald*, 1 June 1878, 12.

¹²⁵⁶ No Subject, *Dundee Evening Telegraph*, 10 June 1878, 2.

¹²⁵⁷ 'Naval and Military Intelligence', *London Evening Standard*, 9 November 1878, 2.

On 31 July, Czar Alexander II and his official party visited the *Yevropa*, where Barker was awarded the Order of St. Stanislas.¹²⁵⁸

The China Station and the Russian War Scare of 1877-1878

In 1877-1878, London made political overtures to halt the Russo-Turkish conflict in Bulgaria but when those proved unsuccessful, Britain began to mobilize. The Royal Navy purchased new vessels, including torpedo boats, and British press opined that a naval war with Russia would be 'a torpedo fight'. Four new vessels under construction in British commercial shipyards were acquired by the Admiralty, including three broadside ironclads intended for Turkey, and one armoured turret ship intended for Brazil. The precedent set by the seizure and acquisition of the Laird rams in 1863-1864, was utilized by the British government as a method of denying ironclads to a potential rival via a third party. Additionally, the seizures served as a means to expand the number of armoured warships available for the Royal Navy in a time of crisis.¹²⁵⁹

The British Army was also preparing for deployment and the *Times* claimed that although Britain was 'chiefly a maritime power, we should yet be able to strike a telling blow with our Army'.¹²⁶⁰ In Hong Kong the commander of the China Station, Vice Admiral Charles Hillyar, made ready for action in March of 1878. On 4 April, the flagship *H.M.S. Audacious*, with the gunboat *Magpie* in

¹²⁵⁸ Strakhovsky, 'Russia's Privateering Projects of 1878', *Journal of Modern History*, 7. (Mar., 1935), 30-31, 'Departure of A Russian Cruiser', *NYT*, 9 June 1879, 1, 'An American Decorated', *NYT*, 3 August 1879, 9, Glynn Barratt, 'The Visit of the Russian Cruiser "Afrika" to Auckland (1881)', *New Zealand Slavonic Journal*, 1, (1978), 5- 6.

¹²⁵⁹ Sondhaus, *Naval Warfare, 1815-1914*. (2001), 124-125, Lyon & Winfield, *The Sail & Steam Navy List*. (2004), 252, 256.

¹²⁶⁰ 'The British Lion at Rest', *NYT*, 12 March 1878, 4-5.

tow, steamed north 'under sealed orders'. One local newspaper speculated that they were bound for an anchorage just outside Vladivostok, but the British warships only traveled as far as Yokohama, undoubtedly keeping an eye on Russian activities there.¹²⁶¹

With most of the fleet away, Commodore G. W. Watson, the commander of the Hong Kong naval base, took steps to ready the colony for defence. As a precaution, the mastless hulk *Victor Emmanuel* was towed from her moorings to a position closer to the naval base where she could provide 'for the protection of that establishment'.¹²⁶² The immediate danger passed quickly enough and one week later, *Victor Emmanuel* was returned to her usual anchorage in mid-channel. The armoured frigate, *Shannon*, arrived to refuel and reprovision as did the steam corvettes, *Diamond* and *Ruby*. They were soon off to the north to reinforce other British warships in the area. The corvette *H.M.S. Charybdis* was at the dry dock, but she was out and on her way after only two weeks at the facility. Hong Kong demonstrated its value as a logistics hub and repair depot on the China coast: far enough from the main Russian base at Vladivostok, but near enough to provide supply and maintenance facilities.

Hong Kong utilized her available resources to expand defences but these were not adequate for a colony of such importance. A main issue of concern was manpower. With the onset of the crisis, the guns of one battery were to be worked by veterans called back into service. These men from the dockyard

¹²⁶¹ Kathleen Harland, *The Royal Navy in Hong Kong Since 1841*. (Liskeard, 1985), 21-22, Preston and Major, *Send a Gunboat!* (1967), 211.

¹²⁶² *White Ensign & Red Dragon: The History of the Royal Navy in Hong Kong 1841-1997*. Edited by Commodore P .J. Melson, CBE, RN, (Hong Kong, 1997), 39, A9.

police force were to help man some of the cannon. They were 'old artillery men and all know something of great guns'.¹²⁶³

The versatile steam launches provided the wherewithal to deploy mines, and had the requisite stealth for night torpedo attacks against enemy men-of-war. These were not merely courier vessels for the fleet, but first commands and 'an important part in the education and training of several generations of naval officers'.¹²⁶⁴ The *Victor Emmanuel* fitted her steam launch as a spar-equipped torpedo boat, and gunboats usually assigned to patrol area waters, were also issued with spar torpedoes as, 'all the Russian men-of-war are fitted with them'.¹²⁶⁵

A letter dated 19 July 1878, from Commodore Watson identified the dry docks and reservoir as key facilities requiring defence. The naval base was protected by the *Victor Emmanuel* and her limited battery. Four 68-pounders had been positioned at the gunports to augment her usual armament of two 68-pounder muzzleloading smoothbores.¹²⁶⁶ Watson was clear in his definition of priorities and named the reservoir as a major interest of the colony, with the dry docks as a strategic concern of the Imperial Government. To provide more security at the narrow bodies of water around the colony, some approaches were protected with booms and chains, in order to free up skilled gunners for the more crucial fortified positions.¹²⁶⁷ The navy would defend the docks, naval base, and coal yard with

¹²⁶³ TNA, ADM 125/27, *China Station Correspondence. General, Inspections, Hydrography, Defences, etc., and ships*, 1880-1883.

¹²⁶⁴ N. B. J. Stapleton, Lieutenant Commander, R.N.R (Retired) *Steam Picket Boats*, (Lavenham, 1980), xi. (These comments from the forward by H.R.H. Prince Philip)

¹²⁶⁵ TNA, ADM 125/27, *China Station Correspondence. General, Inspections, Hydrography, Defences, etc., and ships*, 1880-1883.

¹²⁶⁶ *Ibid*, *White Ensign & Red Dragon*. Edited by Commodore PJ Melson, CBE, RN, (1997), 9-10.

¹²⁶⁷ TNA, ADM 125/27, *China Station Correspondence. General, Inspections, Hydrography, Defences, etc., and ships*, 1880-1883.

the limited ships, weapons, and personnel remaining on station, and assist the Royal Engineers and the garrison force in defending positions valued by the Colonial administration.

The *Wivern* to the Far East

The opening of the Suez Canal in 1869 led to a decline in Russian overland trade with China. The primary route to Beijing from central Russia, wound down Siberian rivers, and across Lake Baikal to the edge of the Czar's empire. From 1879-1880, Russian expansionism in Asia contributed to a border dispute with China over control of Kuldja (also known as Kuldzha), a frontier town some 100 miles southwest of Lake Balkhash. Overland paths were key smuggling routes between the Great Celestial Empire and Imperial Russia, with one route snaking over the steppes and travelling through the desert to Kuldja, eventually linking to the port of Canton.¹²⁶⁸

Russia's response to border tensions with China was marked with a steady buildup of military and naval forces to Asia. Vladivostok was vulnerable to Chinese troops across the Amur River and the Russian Government responded to this threat by chartering ships to convey 1500 men to this strategic port. Russia also made arrangements with Japan to supply her ships with coal and provisions. Six torpedo boats were dispatched to Vladivostok to defend that port, freeing the Czar's Pacific cruisers for offensive operations. Russia prepared to blockade Chinese ports to counter their preponderance of ground forces during these tensions, and warships were rushed to the Far East to give Russia, as a

British newspaper noted, 'a naval influence in the Pacific superior to any she has ever enjoyed in that quarter of the globe'.¹²⁶⁹ Coal stockpiles were increased at Vladivostok and plans for new floating docks at the naval base were put forward, 'in order not to be entirely dependent on Japanese courtesy'.¹²⁷⁰ The Russian build up was followed closely in the British press: 'Russia, free from the entanglements of Constantinople and Merv, will be ready to carry fire and sword to the pagodas of Pekin' [sic].¹²⁷¹ China stepped up military preparations on the Pacific frontier and a Chinese spy was reportedly captured near Vladivostok with a map of the city.¹²⁷²

The limited numbers of Russian merchant ships available for voyages to the Far East were loaded with government supplies bound for the Pacific as preparations for the defence of Vladivostok were increased. Convicts (referred to as 'The Unfortunates' by the local civilian population in Siberia) were also sent out to improve fortifications in the thinly-populated district described by one writer as, 'a forbidden and mysterious land'.¹²⁷³

Russia dispatched modern vessels, including the ironclad frigate, *General Admiral*, to Vladivostok in order to augment forces already in those waters, which included the armoured frigate *Minin*. The *Minin* was the first Russian ironclad to arrive in Asia, and her armament was considered superior to that of

¹²⁶⁸ Martin Gilbert, *Routledge Atlas of Russian History*. (New York, 2010), 40, 59, 'Russia and China', *London Evening Standard*, 5 May 1879, 5, 'The Kuldja Frontier', *Morning Post*, 1 April 1880 5.

¹²⁶⁹ 'Summary', *York Herald*, 8 July 1880, 4, 'Russia and China', *Bath Chronicle and Weekly Gazette*, 22 July 1880, 6. 'Projected Increase to the Russian Pacific Fleet', *Manchester Courier and Lancashire General Advertiser*, 14 February 1880, 11.

¹²⁷⁰ 'Russia and China', *Bath Chronicle and Weekly Gazette*, 22 July 1880, 6.

¹²⁷¹ 'A Coming Event', *Sheffield Daily Telegraph*, 3 November 1880, 5.

¹²⁷² No Subject, *Manchester Courier and Lancashire General Advertiser*, 6 November 1880, 6.

¹²⁷³ 'The Moscow Cruisers', *Portsmouth Evening News*, 11 March 1880, 3, Stephen Bonsal, 'Eastern Siberia', *Harper's New Monthly Magazine*, 97, (July 1898), 240, 245.

the *Iron Duke*.¹²⁷⁴ Russian ironclads and cruisers were fitted to carry torpedo launches 'constructed after the most approved models', and the *Minin* was assigned three.¹²⁷⁵ More men-of-war arrived in Vladivostok, and Russian capabilities on land were enhanced with the assignment of marines from these warships. The marines stepped up drill regimen at the fortifications in anticipation of the arrival of their big guns from St. Petersburg and seamen aboard the Russian warships, 'were drilled in every way as marines.'¹²⁷⁶ The British government was not content to remain idle, and the *Wivern* was ordered to Hong Kong in response to the Czar's naval build-up. Despite this increase in Russian activity, the Admiralty was questioned in the British press over its decision to send the *Wivern* to Hong Kong as that port had, 'little to fear for years to come' and reportedly, no enemy armoured vessels were stationed in the Far East.¹²⁷⁷

The *Wivern* had undergone engine tests and minor modifications after she arrived at Plymouth on 14 February 1880.¹²⁷⁸ The men removed ammunition into lighters, and the dockyard workers effected repairs as the ship neared her departure time. The crew went about their duties 'as requisite' including cutlass drills, cleaning ship, and preparing boats for the voyage to the Far East.¹²⁷⁹ A photo from this time reveals a ship transformed by extensive refits. Gone were the heavy iron tripod masts and yardarms. In their place were three light masts carrying only fore and aft sails to steady the ship while at sea; the pretence of an

¹²⁷⁴ 'Russian Naval Activity', *Derby Daily Telegraph*, 27 August 1879, 3. 'Russia in the Pacific', *Edinburgh Evening News*, 20 May 1880, 2.

¹²⁷⁵ 'The Baltic Fleet', *Portsmouth Evening News*, 13 May 1878, 3, 'The Russian Torpedo Fleet', *Portsmouth Evening News*, 4 November 1878, 3.

¹²⁷⁶ 'Russia', *Manchester Courier and Lancashire General Advertiser*, 6 April 1880, 6.

¹²⁷⁷ 'H.M.S. Wivern', *Times*, 20 February 1880, 12.

¹²⁷⁸ No Subject, *Hampshire Advertiser*, 21 February 1880, 8.

actual sailing ability had been abandoned. The image, taken from the ship's starboard side, revealed that the earlier telescoping funnel had been replaced by a larger, more standard oval-shaped stationary version. The bulwarks were in the up position and the ship was painted white in preparation for her voyage to Asia. A boat was alongside and hooked to a boom forward of the gangway, with two other cutters secured to davits on either side of the poop. Four empty crutches were visible amidships, awaiting one of two torpedo boats she would obtain at her new homeport. Positioned around a newly added superstructure amidships, forward of the funnel, were bell-mouthed iron ventilators.¹²⁸⁰ These, combined with the two smaller versions forward on the forecastle, were a far cry from the canvass sacks suspended from mast or yardarm utilized in 1865 in an attempt to provide increased air flow to the engineering spaces below.¹²⁸¹ The raised forecastle and poop were cut back and angled inward towards the deck, permitting a greater radius for the turret guns. Devoid of a jib boom, and fitted with only the most rudimentary rigging, the rebuilt *Wivern* had a less cluttered, more rakish look.¹²⁸²

When the *Wivern* steamed to Hong Kong in 1880, she was to have sailed with two 2nd Class torpedo boats aboard. Her plans indicated that torpedo boats were to have been hoisted aboard, one each side of the funnel, at the height of the hurricane deck, with 'torpedo spars' stowed amidships for the use of the two intended torpedo boats. These auxiliaries, TBs No. 51 and No. 53, were not

¹²⁷⁹ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

¹²⁸⁰ USNHC Photo #NH 65901, 'H.M.S. Wivern, probably during the 1870s of 1880s'

¹²⁸¹ Ibid, USNHC Photo #NH 71211, 'HMS Wivern off Plymouth, England' (1865)

¹²⁸² USNHC Photo #NH 65901, 'H.M.S. Wivern, probably during the 1870s of 1880s'

embarked as they would have added extra weight during her long voyage out.¹²⁸³ The ironclad was also to have sailed with a 'water heating arrangement' which would allow the two torpedo boats to quickly get up steam and set off on a separate or supporting mission. This apparatus was not ready when she departed Britain, and it was sent forward for loading at Malta.¹²⁸⁴ *Wivern* was fitted with a 'railway' on the forecastle, and related handling gear for her Whitehead torpedoes, but these weapons were not loaded in the ship on her outbound voyage.¹²⁸⁵

The ironclad was to have been accompanied by the frigate *H.M.S. Raleigh*, but that vessel was required to transport replacement crews to Australia. As a result, the corvette *Curacoa* was assigned the duty of escorting the turret ship to China.¹²⁸⁶ However, that corvette was delayed by dockyard repairs at Devonport and the *Wivern* sailed alone on 13 March, bound for Gibraltar.¹²⁸⁷ Her complement consisted of 13 officers, 34 petty officers, 85 seamen, 16 marines, and 4 boys for a total crew of 152 personnel.¹²⁸⁸

The *Wivern's* plans were retained at Devonport, and revealed a ship incorporating some of the latest weapons in anticipation of her service on the China Station. Twelve Nordenfelt machine guns were carried aboard (only four were part of her permanent armament at this stage), with two forward (one on each side on the forecastle), two positioned aft of the funnel on the

¹²⁸³ NMM Image N5260, "Devonport Yard, 'Wivern' Curator 14142, Box 101, *Hansard*, 23 February 1880, 250, cc 1196, 'News of the Day', *Portsmouth Evening News*, 17 February 1880, 2.

¹²⁸⁴ 'Naval Notes and News', *Hampshire Telegraph*, 18 February 1880, 2.

¹²⁸⁵ NMM Image N5260, "Devonport Yard, 'Wivern' Curator 14142, Box 101, TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

¹²⁸⁶ 'Naval Notes and News', *Hampshire Telegraph*, 25, February 1880, 2.

¹²⁸⁷ No Subject, *Hampshire Advertiser*, 28 February 1880, 8, 'Movements of Queen's Ships', *Portsmouth Evening News*, 20 March 1880, 2.

superstructure, two stowed (not ready for immediate use and further aft on the superstructure), two stowed on the poop, and four positioned (two on either side of the poop) to provide complete coverage of the vessel. She transported some of the stowed guns for other vessels on the China Station and with only 150 Nordenfelts available for service in the Royal Navy by October 1880, the guns were in short supply. On the poop, a Gatling gun and a rifled 7-pounder gun, both on field carriages, were lashed in place, intended for close-in fire support and later service ashore, when the *Wivern* arrived at Hong Kong.¹²⁸⁹

The 7-pounder was a versatile light artillery piece, suitable for service ashore, when mounted on its field carriage, or placed on a small naval carriage and slide for boat operations. Like the slightly larger 9-pounder, these dual-use RML boat guns were shipped aboard British men-of-war to provide a landing party with the ability to fire a shell over three kilometers when elevated to the maximum. The guns were known to have been stamped with the numbers '1° 30' when manufactured by the Royal Gun factory at Woolwich. This reminded the gunner that the barrel deflected to the right, as all British guns were rifled to be 'right handed'. Designed for simple loading and sighting, these guns were recognized as 'weapons of some versatility'. With their rugged and portable design, the small bore muzzleloaders were in service throughout the Empire as mobile light guns with the Royal Horse Artillery and the Royal Navy for over thirty years until the end of the century.¹²⁹⁰

The Nordenfelt gun was available in multiple variations, but these particular versions were four-barreled weapons, capable of shooting a four round volley as

¹²⁸⁸ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

¹²⁸⁹ NMM Image N5260, "Devonport Yard, 'Wivern' Curator 14142, Box 101

¹²⁹⁰ Graham Connah and David Pearson, 'Artifact of Empire: The Tale of a Gun', *Historical Archaeology*, 36 (2002), 60-64.

rapidly as a crewman could move the charge handle forward to fire, and to the rear to reload.¹²⁹¹ This close-in weapon, with its 1-inch shell, was designed to counter torpedo boats and deemed of sufficient size to penetrate the light steel skin of an attacking craft. Additionally, the gun was nimble enough to retrain to a rapidly shifting target. The four barrels of each gun were necessary for an adequate amount of fire to insure a hit against a fast moving attacker.¹²⁹² The machine gun, either the Nordenfelt or rival Hotchkiss, was seen as the naval weapon of choice for an ironclad to sink a TB during the 1880s. One Royal Navy officer stated: 'Suffice it to say, that either of these machine guns, if properly handled, will render a torpedo-boat attack a service of extreme difficulty and danger'.¹²⁹³

Another feature on the modernized *Wivern*, was a single wheel, positioned immediately forward of the iron conning tower. Within a pace to the port side, was the engine room telegraph and speaking tube. Although the *Wivern* retrained her wheel aft, it was now of only secondary, even tertiary, importance. Steering had reached an impasse with the development of the large iron steamship and in 1867, John McFarlane Gray invented a steam-powered mechanism for the unwieldy *Great Eastern* to overcome the limitations of manual steering. Gray's machine was the first to employ a 'feed-back' system, and permitted the large, double and triple wheels familiar to sailing ships to be replaced by smaller, single variants positioned forward.¹²⁹⁴ With steering located at a vantage point forward of the funnel, the need to communicate to the

¹²⁹¹ Thorsten Nordenfelt, *The Nordenfelt Machine Guns*, (Uckfield, Reprint of 1884 edition), 25.

¹²⁹² *Ibid*, 105.

¹²⁹³ Lieutenant C. Sleeman, R.N, 'The Development of Machine Guns', *North American Review*, 139, (October, 1884), 367.

¹²⁹⁴ L.T.C. Rolt, *Victorian Engineering*, (London 1970), 95.

helmsmen aft, thorough shouted commands or by hand signals, was eliminated.¹²⁹⁵ The steam steering gear was likely manufactured by Forrester & Company, (of the Vauxhall Foundry in Liverpool) to Grays patent, as more modern ships in the Royal Navy and mercantile service used this device which was hailed as, 'one of the most important of modern inventions connected with navigation'.¹²⁹⁶ Although still open to the elements, the 'bridge' of the *Wivern* was marked by an elevated wooden grating where a quartermaster and a detail of men could pilot the ship. With binnacles on either side of this forward edge of the superstructure, the ironclad had made another evolutionary step away from sail.¹²⁹⁷

After the *Wivern* arrived at Gibraltar on 18 March, the crew readied the ship for the next leg of her voyage.¹²⁹⁸ The following day, as some members of the crew were engaged coaling ship and loading stores, the gunner armed one of the cutters and trained select men in firing details. This detail fired dozens of shells, and some canister, from the light 7-pounder. Another weapon, a launcher tube designed to fire 24-pound Hale rockets, discharged only two rounds.¹²⁹⁹

Britain officially adopted the Hale rocket in 1867, replacing the earlier guidestick-stabilized Congreve rockets popularized in the American national anthem.¹³⁰⁰ The Hale 24-pounder was slightly over two feet in length and painted red to protect the iron casing from rust. The most distinctive feature was a raised triskelion at the rear of the casing with three vent holes to induce spin

¹²⁹⁵ Ballard, *The Black Battlefleet*. (1980), 43, 44

¹²⁹⁶ 'The New Steamship Adriatic', *London Evening Standard*, 3 April 1872, 3, 'H.M.S. Dreadnought', *Portsmouth Evening News*, 15 June 1878, 2., 'Launch of H.M.S. Phaeton', *Glasgow Herald*, 28 February 1883, 10.

¹²⁹⁷ NMM Image N5260, "Devonport Yard, 'Wivern' Curator 14142, Box 101

¹²⁹⁸ 'Shipping', *Liverpool Mercury*, 20 March 1880, 7.

¹²⁹⁹ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

when the rocket was fired from its tube.¹³⁰¹ The tube went through several iterations and one version employed for shipboard and boat operations, was designed by Lieutenant, later First Sea Lord, John Fisher.¹³⁰² The rocket, referred to as ‘the soul of artillery without the body’, was an erratic weapon that offered the advantage of blast and incendiary capability, but was susceptible to damage as the casing was prone to expand or contract when used in climatic zones of extreme temperature variations.¹³⁰³ When utilized on colonial campaigns, Hale rockets offered the benefit of range (approximately 1200 yards), were light weight, were effective at dispersing enemy formations (especially cavalry), and were frequently employed to burn down grass hut villages. Their main drawback was their erratic, slow flight path, which occasionally resulted in the rocket ricocheting against trees and turning back towards its launching point.¹³⁰⁴ The Hale Rocket, propelled by gunpowder, suffered from a short shelf life and the Admiralty required them to be returned to arsenal for examination every five years. The rocket was useful for brush wars as it, ‘spread danger over a wide area’, but was also considered, ‘almost as dangerous to the firers as to the enemy’.¹³⁰⁵

The *Wivern* departed Gibraltar on 23 March 1880, bound for her next refueling stop at Malta.¹³⁰⁶ While at sea in the central Mediterranean, the crew exercised firing the main 9-inch guns, the Nordenfelts, and discharged a few volleys from their Martini-Henry small arms rifles. During the gunnery exercise, the left 9-inch

¹³⁰⁰ Frank H. Winter, *The First Golden Age of Rocketry*, (Washington, 1990), 26, 42.

¹³⁰¹ *Ibid*, 199-200,207-208.

¹³⁰² *Ibid*, 210, ‘The “Captain” Turret Ship’, *Graphic*, 19 March 1870, 381.

¹³⁰³ ‘War Rockets’, *London Evening Standard*, 27 September 1883, 2.

¹³⁰⁴ Winter, *The First Golden Age of Rocketry*, (1990), 211, 214, 220-223.

¹³⁰⁵ *Ibid*, 202, 224, ‘Naval Notes and News’, *Hampshire Telegraph*, 25 February 1880, 2, ‘War Rockets’ *London Evening Standard*, 27 September 1883, 2.

RML of the aft turret was disabled after the slide split from the effects of the recoil of the gun and carriage. The ironclad also developed a leak and when she arrived at Malta on the 28th, she was placed in dockyard to make good her defects, which included examination of her screw by a diver.¹³⁰⁷

The armourclad departed Malta for Port Said, on the north coast of Egypt, on 4 April, and the crew was employed in the usual shipboard routines of muster, drill, and painting. On 6 April, rough weather prevented some training as seas washed over the deck, but boat crews were later instructed in rockets and lights.¹³⁰⁸ As the *Wivern* steamed westward, the British press noted that Edward Reed described her, and other older ironclads, as being outdated, with 'armour which is no longer worthy to be called armour'. Nevertheless, Reed acknowledged the 'ironclads of the old type...have been rightly and widely repaired and refitted'.¹³⁰⁹

The *Wivern* began her voyage through the Suez Canal shortly after dawn on the 11th. While under the control of the pilot, the ironclad exhibited her propensity to yaw at slow speeds, and although engines were reversed, the ironclad's port side touched the bank of the waterway and the ship grounded. After a short ten minutes aground, the *Wivern* was off and underway. By the 14th, the man-of-war was steaming south through the Red Sea, bound for Aden. The ship's log revealed that her captain, Commander T.G. Jones, kept the men busy painting ship, conducting routine repairs, and hoisting sail to compensate for the ship traveling at half speed. The *Wivern* was slowed to conserve fuel, yet

¹³⁰⁶ 'Naval and Military Intelligence', *Morning Post*, 24 March 1880, 5.

¹³⁰⁷ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880, 'Naval and Military Intelligence', *Morning Post*, 29 March 1880, 6.

¹³⁰⁸ 'Movements of Queen's Ships', *Portsmouth Evening News*, 8 April 1880, 2, TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

¹³⁰⁹ 'The State of the Navy', *Bristol Mercury*, 8 April 1880, 3.

waves washed over her main deck, indicating that higher speeds were preferable to maintain suitable headway in storm prone waters. Jones kept to routine as much as possible in the rough seas, ordering firefighting practice, boats swung out, and a cutter's men provided with life jackets or 'cork dresses' for lifesaving drills.¹³¹⁰

By 21 April, the *Wivern* was at Aden where she was refueled, reprovisioned, and her crew conducted target practice with the Nordenfelts, the Gatling, and the 7-pounder. When underway on the 24th, a log entry indicated that coal stored on the upper deck was used for fuel.¹³¹¹ This reference revealed that refits had increased the stability of the ironclad and permitted her to ship extra coal on her deck. Coaling stations had become a new part of naval strategy as sail was a diminishing consideration for mobility.¹³¹² It was not uncommon for warships to carry a temporary coal supply on their decks to extend range. During the 1869 voyage to tow the massive floating dock to Bermuda, the ironclads *Warrior* and *Black Prince* each carried extra coal on their main decks to ensure adequate and available fuel. This was recognized as an unsafe practice, as warships that carried loads of coal on deck were 'unfit to meet an enemy and doubtfully fit to meet extremes of wind and sea'.¹³¹³ This fear was justified when the new sloop, *H.M.S. Condor*, disappeared in a storm off Vancouver in December 1901. The load of 48 tons of extra coal carried on her deck was assessed to have been a contributing factor in her loss.¹³¹⁴

¹³¹⁰ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880, No Subject, *Hampshire Advertiser*, 21 February 1880, 8.

¹³¹¹ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

¹³¹² A. E. Ekoko, 'The Theory and Practice of Imperial Garrisons: The British Experiment in the South Atlantic 1881-1914', *Journal of Historical Society of Nigeria* 12 (Dec. 1983-Jun 1984), 134.

¹³¹³ Ballard, *The Black Battlefleet*. (1980), 17, 56.

¹³¹⁴ Brown, *Warrior to Dreadnought*. (1997), 173.

After her arrival at Singapore on 21 May 1880, *Wivern* conducted her usual routine of recoaling, reprovisioning, and repainting. She also took on another seaman but this man was excluded from duty as he was a supernumerary and bound for the military hospital at Hong Kong, another facility which differentiated that naval base from a commercial port or coaling stop.¹³¹⁵

On 2 June, *Wivern* steamed into Hong Kong harbour and made ready for her new mission as reserve guardship. Awnings were spread for protection from the sun, and the ship was guided to her anchorage at No. 4 buoy. Four men were discharged to hospital, and the crew began the task of offloading stores for shipment ashore and cleaning ship. Three days later, the log of the *Wivern* noted the arrival of one of the American-built Volunteer cruisers, the *Aziya*, as she steamed into Hong Kong harbour flying the flag of a Russian rear admiral. With the *Wivern*'s crew parceled out in predetermined assignments to other British warships in the Far East, on 14 June, the turret ship was paid off and her pennant lowered for the end of her first commission on the China Station.¹³¹⁶

The *Wivern* was ideal for this role. She was selected to protect the harbour of Hong Kong, and the smaller adjacent islands viewed as potential positions where a hostile warship could bombard the shore while safely shielded from fire by land batteries. Forts were, in this scenario, 'useless' against an enemy sheltered within the islets, and the turret ship was available to chase off all but the largest armoured man-of-war. Additionally, her two torpedo boats posed a fast moving threat and would further complicate the actions of a hostile force.¹³¹⁷

¹³¹⁵ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880, 'Movements of Queen's Ships', *Portsmouth Evening News*, 22 May 1880, 2.

¹³¹⁶ TNA, ADM 53/11329, *Ship's Log H.M.S. Wivern*, 14 January 1880-14 June 1880

¹³¹⁷ 'London Correspondence', *Aberdeen Journal*, 19 February 1880, 5.

With British coastal defences in Asia and Australia improved after the arrival of armoured turret ships at key bases, the Royal Navy had the 'strategic flexibility' to attack enemy harbours and hunt down hostile cruisers.¹³¹⁸ One key British foreign policy goal in the second half of the nineteenth century was to maintain China's stability. The *Wivern* was available for defensive duty in the event renewed Russian tensions with China escalated into war and the Royal Navy became involved.¹³¹⁹ The *Wivern* gave the Royal Navy freedom of action in Asian waters as more British warships were available for operations without leaving Hong Kong exposed.

A permanently based armoured warship in Hong Kong was a welcome sight for colonial officials at that vital possession. One newspaper in the colony summed up the new addition as 'the best fighting ship of her size' on station.¹³²⁰ The Colonial Governor, Sir John Pope-Hennessy, said in his speech on 10 October 1880, 'We have in the harbour at this moment a most efficient turret-ship, the *Wivern*. That ship is here for local purposes. The Admiralty will not carry her away from us...'¹³²¹

Duty on the China Station

¹³¹⁸ Lambert, 'Economic Power, Technological Advantage, and Imperial Strength: Britain as a Unique Global Power, 1860-1890'. *International Journal of Naval History*, (August 2006), 21.

¹³¹⁹ Ian Nish, 'Politics, Trade and Communications in East Asia: Thoughts on Anglo-Russian Relations, 1861-1907', *Modern Asian Studies*, 21 (1987), 667. 'From Our London Correspondent', *Derby Daily Telegraph*, 28 May 1880, 2.

¹³²⁰ 'Another Ironclad for the China Squadron', *Hong Kong Daily Press*, 20 January 1880, 2.

¹³²¹ 'News from the China Station', *Hampshire Telegraph*, 6 November 1880, 5. Also see: Bodleian Library, Oxford, 'Papers of Sir John Pope-Hennessy, GB 0162 MSS.Brit.EMP.s.409, Box 8/2. Letter dated 4 November 1880. In this letter, the Colonial Secretary (Kimberley), replied to Hennessy's complaint (dated 30 August of that year) that British naval forces on the China Station were inferior. Kimberley assured Hennessy the Admiralty could send an ironclad from the Pacific during an emergency to reinforce the station. Kimberley concluded his letter by writing: 'In the present state of our foreign relations I think you need not feel any anxiety'.

The *Wivern* gave Britain an edge over the other Pacific powers. She remained in local waters while the larger ships of the squadron went out to show the flag or, in the event of conflict, hunt the enemy. Following the *Wivern*'s arrival at the Asian colony, officers not remaining on board were divided between the *Victor Emmanuel*, the flagship *Iron Duke*, and gunboat *Kestrel* to round out wardroom billets. Crewmen were also reassigned as needed. As a caretaker ironclad, the *Wivern* was available for service but she was not fully manned.¹³²² Nevertheless she was ready for immediate service, and the Hong Kong press noted that her presence 'can hardly mean that she will lie in this harbour all her commission.'¹³²³ Indeed, she did not remain idle as she was regularly utilized for training voyages.

The turret ship was a subject of particular interest for Governor Hennessy. The governor was invited to travel aboard the ironclad for a trial trip on 6 January 1881, and was impressed with the performance of the ship and her gunnery practice during the journey. In a report to his superior Colonial Secretary, The Earl of Kimberley, Hennessy judged the ram to be 'a most efficient ship' for the purpose of harbour defence. The governor also included 'colonial defence' in his description of the *Wivern*'s role in Hong Kong. The ironclad was, in Hennessy's estimation, 'of more value than a regiment of soldiers', and he asked for Kimberley's support requesting that the Admiralty man the *Wivern* with a full complement and place her on active service. During the trial trip, the crew had been borrowed from the *Iron Duke*. With the turret ship fully manned, wrote Hennessy, a battalion (he referred to it as a 'wing') of the British regiment then

¹³²² 'News from the China Station', *Hampshire Telegraph*, 6 November 1880, 5, *Navy List 1880*, (London, 1880), 253.

stationed in Hong Kong, could be available for deployment elsewhere or returned to Britain, thereby reducing costs on the Imperial establishment.

The Admiralty declined the request, as the expense of taking the ironclad out of reserve and providing her with a full complement of officers and crew would have been 'considerable'. Cost savings was the focus of all branches of the imperial machine, and the priorities of one service prevented a unity of effort in the colony. The Admiralty was not prepared to take on the additional costs of keeping another ironclad in service without an increase in funds. The *Wivern* was placed in reserve to augment the China Squadron in the event of hostilities, yet her role was not envisioned as that of a static guardship. The ironclad gave the Admiralty options, and they specifically mentioned her light draught and heavy armament as useful, not only in defence of Hong Kong, but on rivers where her big guns were likely to be more powerful than those an enemy was expected to bring to bear.¹³²⁴

The Admiralty forwarded Governor Hennessy's proposal to Vice Admiral G. O. Willes, but it was clear that if the ram went back into service, the crew would come from ships already on station. Willes had suggested that the Admiralty post to Hong Kong, twenty five Royal Marine Artillerymen (all assigned to the books of the *Victor Emmanuel*) in order to man the guns of the *Wivern*. The Marines would serve as a nucleus around which more men could be assigned to build a temporary crew in order to provide the turret ironclad with a full complement during times of crisis. Willes' suggestion was overruled by the Admiralty as they did not consider it necessary for 'so large a number' of Marine gunners to be utilized for a standby mission on the *Wivern*. Nevertheless, they

¹³²³ 'Another Ironclad for the China Squadron', *Hong Kong Daily Press*, 20 January 1880, 2.

promised to send out ten Marine gunners when 'an opportunity offers', for the use of Willes as he saw fit. Around these men, a partial crew could assemble to man the *Wivem's* guns and when augmented with several additional hands from the squadron, could prepare the ship for commissioned service.¹³²⁵

The demands of working the larger guns meant that trained gunners were at a premium and the Royal Navy did not have enough to go around, especially for ships not needed for immediate service. The smaller, ubiquitous gunboats were of more utility than a turret ram on the Chinese coasts in peacetime. Showing the flag on coastal waters and Chinese rivers, the gunboats occasionally had to fire a shot over the heads of 'menacing natives' and conduct anti-piracy patrols.¹³²⁶

Crews were generally assigned for as long as the commission of the gunboat or ship lasted, usually three to four years. This was viewed as the longest time men could be assigned to the China Station and away from their families, before morale began to break down. Beginning in 1865, gunboats and some larger warships were recommissioned as required, with relief crews sent to Hong Kong in the troopships from Britain. Other British stations and foreign navies adopted this relay system, allowing for ships at a given base to be adequately manned while other ships remained on location, but without full crews. Troopships such as the *H.M.S. Tamar* had to take care to provide ventilation to prevent sickness from 'jail fever'. These troopships were to arrive in Hong Kong before June and

¹³²⁴ TNA, ADM 125/83, *China Station Records: Correspondence: Naval Establishments, Bases and Stores, Steam Reserve, Ordnance and Torpedoes*.1880-1883.

¹³²⁵ *Ibid.*

¹³²⁶ Preston and Major, *Send A Gunboat!* (1967), 68

July, typically the hottest months at the colony, to allow time for men to recover from the 'debilitating journey' from Britain.¹³²⁷

Manpower limitations were a constraint on operations at Hong Kong in different ways. One British Admiral opined that only three ships could be in the dockyard at any one time to prepare for recommissioning. Therefore routine and preventative maintenance was a necessity to keep ships ready for use and avoid a surge of warships at the overworked dockyard. Additionally, the clerical staff at the Hong Kong naval dockyard was too small for this important station.¹³²⁸

As stated, the turret ram was not relegated to remain at Hong Kong on a continuous basis. In December 1881, she steamed to Canton to show the flag and train her delegated crew, assigned from the sloop *H.M.S. Pegasus*, in the ways of their temporary charge.¹³²⁹ In some instances, showing the flag was likely more related to the occasional intelligence collection mission than a mere excursion and training voyage. In 1878, the Quartermaster General Department of the British Army of India organized a group of officers charged with reporting on events in East Asia. Officers selected to 'Section E', were responsible for intelligence reporting on Nepal, Tibet, Japan, Korea, and French Indochina. China though, was the main emphasis.¹³³⁰ These officers, well versed in culture and language studies, provided detailed reports on Chinese military issues including arms imports, training methods, fortifications (especially coastal defences), and public sentiment around the country.¹³³¹ These reports

¹³²⁷ Ibid, 68, Christopher Lloyd, *The Nation and the Navy: A History of Naval Life and Policy*. (London, 1954), 229, NMM, VHM/3, Private Letters of Admiral Sir Richard Vesey Hamilton.

¹³²⁸ NMM, VHM/3, Private Letters of Admiral Sir Richard Vesey Hamilton.

¹³²⁹ No Subject, *Hong Kong Telegraph*, 20 December 1881, 2.

¹³³⁰ Eric Setzekorn, 'The First China Watchers: British Intelligence Officers in China, 1878-1900', *Intelligence and National Security*, 28, (2013), 184-185.

¹³³¹ Ibid, 185-188, 190, 194.

influenced British policy makers in the region and the cruise of a warship was likely part of, and in response to, intelligence operations in China.¹³³²

In January 1882, the *Wivern* visited the nearby Portuguese colony of Macao and steamed towards Canton.¹³³³ In early February 1883, *Wivern* was again at sea with a crew borrowed from the sloop *H.M.S. Albatross*, after that vessel was dry-docked for repairs. On 5 February, while steaming down river to Hong Kong from Canton, the ironclad ran aground on a bank in the river while in charge of the pilot. Attempts to tow her off were unsuccessful, and the torpedo boats and ammunition were offloaded to lighten ship. On 9 February, with assistance from a civilian paddle steamer, and the gunboat *H.M.S. Swift*, the ironclad was pulled free.¹³³⁴ After reloading the turret ship, the *Wivern* steamed down river in company with the *Swift*, and both vessels returned to Hong Kong on 11 February. The following day, target practice was conducted with the main battery as the ironclad steamed off Hong Kong. After firing four rounds from each 9-inch RML, boats were lowered for torpedo practice. The log entry notes the *Wivern* increased to full speed, 'as requisite for firing torpedoes', indicating at least two of these weapons were launched, not from the TBs, but from the ironclad. On the 17th, the crew was ashore assisting with undocking procedures for the *Albatross* and after days spent returning equipment to that vessel, their mission was completed. The *Wivern* hauled down her pennant at sunset on 23 February 1883.¹³³⁵

¹³³² Ibid, 181.

¹³³³ TNA, ADM 50/299, *Vice-Admiral George O. Willes, C. B., Commander-in-Chief on the China Station*, 1 January 1882-31 March 1882

¹³³⁴ TNA, ADM 53/11744, *Ship's Log H.M.S. Albatross*, 11 August 1882-23 February 1883

¹³³⁵ Ibid.

Some naval traditions of protocol were under assault from the British press in the name of fiscal prudence and safety. The practice of firing salutes from warships was challenged as, 'surely a most barbarous one; and firing guns is but a degree removed from the clanging and hammering that savages resort to on similar occasions'.¹³³⁶ The fitting of massive shell guns to the ironclads meant that smaller guns had to also be carried aboard to offset the cost of powder fired in salute from the larger guns. Dubbing the use of 'pop-guns' a product of, 'a juvenile age', a disdainful British newspaper editor proclaimed that firing salutes was dangerous, and on occasion resulted in the loss of fingers, arms, and probably 'even lives from time to time'.¹³³⁷

This claim was not without merit and had occurred on the *Victor Emmanuel*, on 14 October 1883, when firing a salute. While reloading to fire another blank charge, a Chinese crewman lost his hands as gunpowder exploded prematurely in the gun barrel. Additionally, this mishap provided a rare glimpse of a local solution regarding manning at Hong Kong. Due to, 'the very small number of European servicemen in the ship being continually employed as working parties out of the ship', more of the routine shipboard duties fell to Chinese crewmen recruited locally to fill out the minimum manning requirements for the station.¹³³⁸

A separate gun problem occurred aboard the new flagship in December of that year. On 21 December, the *Audacious* was at target practice off Hong Kong when a gun captain, Leading Seaman William Haynes, was injured as Number 33 gun, a 4-inch rifled breechloader (RBL) was discharged. During the shoot, a vent sealing tube flew backwards and into the chest of Seaman Haynes as the gun fired. The new breechloader had been fitted aboard only on the 12th of that

¹³³⁶ 'The Waste of Gunpowder', *Hampshire Telegraph*, 18 December 1869. 4.

¹³³⁷ *Ibid*, 4.

month, and this firing was likely one of its first aboard ship. Firing from the new breechloaders was halted until the problem with the tube, and the failure of the breech 'shutter' to hold the tube in place, was corrected.¹³³⁹ The British press noted the problems with the China Station, especially concerning the age of some of the warships, and their 'rubbishing guns'. Of the few vessels noted as being 'worth a rap' in those waters, the *Wivern* was listed among them.¹³⁴⁰

Although in reserve, *Wivern* was the armourclad naval defence for the colony, and the ironclad frigate *Audacious*, was the offensive power for the fleet. In 1883, Britain held mastery on the China Station with 24 warships, two being ironclads, the flagship and the *Wivern*.¹³⁴¹ Russia was second with thirteen men-of-war, but the large casemated frigate *Gerzog Edinburgski*, was their only ironclad in Asia. France came in a distant third with five warships assigned to the China Seas. The U.S. Navy also had five warships in those waters but none were ironclads. The British press was satisfied that the Royal Navy had, 'an ample naval force to look after our proper interests in the far [sic] East'. This was an improvement over the situation in 1880 prior to the arrival of the *Wivern*, and the partial improvement of Hong Kong's defences helped to mitigate the threat from foreign cruisers. The preponderance of firepower did not remain static for long. Due to Franco-Chinese tensions over Indo-China, by December 1883, a revived France had sent four more warships to the China coast, three of which were armoured.¹³⁴²

¹³³⁸ TNA, ADM 125/83, *China Station Records*.1880-1883.

¹³³⁹ *Ibid.*

¹³⁴⁰ 'Comic and Gossip Papers', *Bucks Herald*, 30 May 1885, 3.

¹³⁴¹ 'The English Fleet in the China Seas', *Portsmouth Evening News*, 17 March 1883, 2.

¹³⁴² *Ibid.*, 2, 'English and French Naval Forces in the East', *Sheffield Independent*, 10 December 1883, 2, Roger Chesneau, (editor), *Conway's All the World's Fighting Ships 1860-1905*. (Greenwich, 1979), 186.

The log of the *Audacious* made note of this change in an entry dated 17 January 1883. Upon her return from Singapore, details of foreign warships were noted. Besides the names of three ships was written: 'French'! After the names of four other men-of-war was noted: 'Russian'! The only British warships at anchor were a few gunboats (one of which was in the dockyard), the hulk *Victor Emmanuel*, and the ironclad *Wivern*. The British were concerned that while their larger ships were away on other duties, rival powers would anchor in the harbour, reminding them that the Royal Navy could not be present everywhere in sufficient numbers. The situation was reversed that September, when the *Audacious*, in company with several warships of the squadron, paid a visit to Vladivostok. The Royal Navy had an ironclad in the key Russian harbour in the Pacific while their main warships were away. The marines aboard *Audacious* were drilled at the heavy guns to make an impression on the host. Shortly thereafter, the Russian casemate ironclad *Gerzog Edinburgski*, anchored at Vladivostok to rebalance the force disposition.¹³⁴³

Despite frequent exercises and continual maintenance, Admiral Sir Richard V. Hamilton remarked that British warships on the China Station were beginning to look obsolete. He noted that French ships, 'beat us in speed, and in many cases armament', and the American ships, 'even small corvettes', had electric lights. Acknowledging the slow retreat from sail, the admiral lamented that he was 'ashamed' of the heavy-looking British ships compared to the lighter topside rig of the French and Americans. This was all the more regrettable as the admiral noted the more modern ships went to the Channel Fleet or to the Mediterranean, although Hong Kong was the next station in line of importance. Despite its

¹³⁴³ NMM, MIL/1, Vice Admiral Charles Blois Miller, Log Book, *H.M.S. Audacious*, 1883-1884 (log entry dated 10 September 1883)

valuable position, the China Station would rarely receive new ships from Britain; few modern British warships made it beyond Suez as they were needed for duties with a more important fleet based in Malta.¹³⁴⁴

Naval Intelligence and the Telegraph

In response to rapid technological changes and their collective impact on strategic planning, naval intelligence became a separate function of the Admiralty by the late 1880s. The pace of growth for British naval intelligence and its effect on naval planners was uneven during its early years, but the organization was well placed for expansion. Naval intelligence came into being as a result of the cable networks which expanded into global systems of near instant messaging in the last decades of the nineteenth century. The decision to employ ships to a station, in response to tensions or in preparation for changes to defence policy, was influenced by the cable system and the intelligence organization responsible for interpreting foreign threats. Intelligence was a tool for deterrence *before* it helped win battles in 1914.

During the 1878 war scare, steps were taken to relay information on the movements of foreign warships, not by routine dispatches, but via special letters or telegrams. Vice Admiral Sir Ashley Cooper Key, the Commander of the North American and West Indies Station, was instructed to insure that his captains relayed the information directly to the Admiralty, 'by Telegraph or otherwise'. Special care was to be taken that reports were timely and possessed with more

¹³⁴⁴ NMM, VHM/3, Private Letters of Admiral Sir Richard Vesey Hamilton.

than rudimentary details: 'In every case in which a Foreign Ship of War is mentioned, the name of the Ship is reported'.¹³⁴⁵

Britain's global position and commitments were both a source of strength and a defence concern. The distant, unprotected, coaling and telegraph stations were a worry, and one British newspaper reported they were the 'most fatal flaw in England's armour'.¹³⁴⁶ British cable layers linked not only London with the colonies, but also Dutch, French, Portuguese, and Spanish overseas processions with their home governments through global-wide system.¹³⁴⁷

By 1870, the Foreign and Colonial offices were linked with their own lines to this growing global network. A decade later, almost 100,000 miles of submarine cable laced continents together and trailed out to remote stations and harbours.¹³⁴⁸ The British government had honed the art of assistance to cable operations, from direct funding, to modified aid provided by diplomatic officers, and utilizing the Royal Navy in a supportive role. In 1858, the first attempt to link India, via a submarine cable through the Red Sea was a complete failure, and a costly one for the British Treasury. The contractors had not properly surveyed the floor of the sea along the route which was strewn with jagged rocks. Additionally, they had not provided for sufficient slack in the cable and the line was broken before the first message could be sent. Although the Royal Navy

¹³⁴⁵ TNA, ADM 128/82, *North America and West Indies Station: Correspondence, Reports and Memoranda*. 01 March 1877- 31 May 1882. Underlined in the original text, with the word 'name' underlined twice.

¹³⁴⁶ 'Letters about the Navy and Its' Coaling Stations', *Pall Mall Gazette*, 1 Oct 1884, 2.

¹³⁴⁷ P. M. Kennedy, 'Imperial Cable Communications and Strategy, 1870-1914', *English Historical Review*, 86, (Oct., 1971), 740-741.

¹³⁴⁸ Tom Standage, *The Victorian Internet*. (New York, 1998), 102.

continued to provide surveying support for British cable companies, the British Government avoided direct investment in cable operations, again, until 1893.¹³⁴⁹

Russia, handicapped by the long sea route to the Far East and the absence of their own coaling stations along the way, was not crippled by communications. A telegraph line linked St. Petersburg with Siberia by 1865, although this line was a victim of heavy snowfall and frequently broke down in winter.¹³⁵⁰ Russia undertook this staggering project almost immediately following the Crimean War, with the Ministry of Marine funding the line from the Eastern Maritime ports, into the Siberian interior. This was a tenuous link, subject to cuts not only from storms and bandits, but also insurgents. Following unrest in Poland, Polish exiles were deported to Siberia beginning in January 1863, and sentenced to penal colonies in the eastern wastelands.¹³⁵¹ In 1866, they revolted against their Russian guards and raided settlements for weapons. The revolt was initially successful after the Poles cut the telegraph lines, but Russian troops were rushed in from other garrisons and the uprising was crushed.¹³⁵² By 1868, the telegraph line extended from Khabarovsk, on the upper reaches of the Amur River, to Vladivostok. Commentators were awestruck by the global spans of electric wire almost girding the world, and asked: 'Could Aladdin's Lamp work any faster wonders'?¹³⁵³ This crucial Trans-Imperial conduit gave Russia 'incalculable advantages' in communications with China and Japan. It also made

¹³⁴⁹ Daniel R. Headrick and Pascal Griset, 'Submarine Telegraph Cables: Business and Politics, 1838-1939', *The Business History Review*. 75, (autumn, 2001), 48, 560.

¹³⁵⁰ 'No Subject', *Birmingham Journal*, 22 April, 1865, 3.

¹³⁵¹ 'The Martyrs of Poland', *London Daily News*, 21 March 1867, 5.

¹³⁵² 'Revolt of the Exiles in Siberia', *Newcastle Courant*, 31 August 1866, 6.

¹³⁵³ 'Russia', *London Evening Standard*, 20 November 1868, 5, 'The Asiatic Telegraphs', *NYT*, 17 February 1867, 4.

possible the rapid exchange of orders and intelligence with St. Petersburg, impacting diplomatic and military dispositions in the Far East.¹³⁵⁴

By 1872, a submarine cable connected Vladivostok to the international naval and commercial harbour of Nagasaki, Japan. Though ostensibly Danish-owned, it was supported by the British-owned Telegraph Construction & Maintenance Company and funded by a group of British financiers led by John Pender, a former Manchester cotton merchant. London's control of telegraphic communications was to such extent that the submarine cable was referred to as the 'nervous system of Britain'.¹³⁵⁵

The telegraph had transformed global trade in what was then termed 'a wired world', a surprisingly modern moniker more identified with the dawn of the internet age instead of the middle Victorian years.¹³⁵⁶ British telegraph companies supported by businessmen and diplomats, and aided by the Royal Navy, gave the British Empire unparalleled access to global communications. Whitehall had the pulse of the world.

The rapid transmission of war-related information to naval and military decision makers was becoming increasingly vital in the age of steam and the telegraph. In the aftermath of the Crimean War, Russia sought administrative methods to acquire foreign industrial and military information to mitigate their shortcomings. Modern intelligence was born. Russian military attachés were assigned to London in 1856, almost immediately at the conclusion of the Crimean War, and in 1868 an attaché was posted to Washington to learn from

¹³⁵⁴ 'The Telegraph in Russia', *Leicester Journal*, 24 May 1861, 3.

¹³⁵⁵ Headrick and Griset, 'Submarine Telegraph Cables'. *The Business History Review*. 75, (autumn, 2001), 551, 563, Iwan Rhys Morus, 'The Nervous System of Britain': Space, Time and the Electric Telegraph in the Victorian Age'. *The British Journal for the History of Science*. 33, (Dec. 2000), 455.

¹³⁵⁶ 'Fleet Telegraph Ships', *Glasgow Herald*, 3 November 1884, 7.

the experiences of the Civil War. By 1863, Russia established a centralized processing chamber within the General Staff to analyze intelligence. In an acknowledgement of the focus of the Russian intelligence collection priorities, this body was renamed the 'Military-Scientific Committee' in 1867.¹³⁵⁷ At the Russian General Staff Academy, the Civil War was viewed as a source of study, and strategic coastal attacks and defence were key subjects of interest.

American use of the telegraph, railways, and steamships were appreciated as essential tools for modern warfare by the instructors at the academy, and their use by the Union was incorporated into the lectures.¹³⁵⁸ Strategic studies and centralized intelligence collection efforts benefitted both the Russian Army and the Czar's navy. By the late nineteenth century, Russian Naval Intelligence was considered 'the best in the world', and they reportedly knew 'much or more about our navy than the First Sea Lord of the Admiralty'.¹³⁵⁹ Russian Naval Intelligence was 'deeply' interested in gaining information on the actual speeds of British warships as opposed to nominal speed data, indicating plans for commercial warfare.¹³⁶⁰

Britain responded to this Russian threat by forming its own intelligence cell in 1882, stating: 'We, who are ever ready to permit the eyes of deeply interested foreigners to pry into the innermost recesses of our dockyards and arsenals, will now have vigilant and systematic eyes bent also upon their proceedings, and presumably profit as well as pleasure will result'.¹³⁶¹ The war scare of 1878 had

¹³⁵⁷ Gudrun Persson, 'Russian Military Attachés and the Wars of the 1860s', *Reforming the Tsar's Army: Military Innovation in Imperial Russia from Peter the Great to the Revolution*. Edited by David Schimmelpenninck van der Oye and Bruce W. Menning, (Cambridge, 2004), 153-155, 162.

¹³⁵⁸ *Ibid*, 160.

¹³⁵⁹ Fred T. Jane, *The Imperial Russian Navy*. (London, 1983), 448-449.

¹³⁶⁰ *Ibid*, 452.

¹³⁶¹ 'A Naval Intelligence Department', *Portsmouth Evening News*, 11 Dec 1882, 2.

led to the creation of the Foreign Intelligence Committee (F.I.C.) in December of 1882. A naval officer assigned to the F.I.C. described his duties as a mixture of operational planning and intelligence, stating: 'I had to know all about British defended harbours at home and abroad, with their defences and their resources that might be of value to the Navy; about communications (submarine cables) British and foreign; about all foreign guns (at sea and in coast defences), gun-mountings, submarine mines, and experiments connected therewith;' Other duties included 'British and Foreign Commerce, Defence and Attack'.¹³⁶²

The creation of the F.I.C. was facilitated by key leaders in the Admiralty, including: Admirals Hornsby, Cooper Key, and a leading proponent in the Commons, retired Royal Marine Captain, John Colomb, M.P. The appointment of Captain William H. Hall, R.N., to the F.I.C. proved fortuitous, as this gunnery officer from the training ship, *H.M.S. Excellent*, possessed the precision of thought required to form the nascent intelligence cell into an organization which would influence defence policy. Before the end of the decade (the 1880s), this information clearing house, 'wielded great power by the way they presented the briefs to their Lordships, by the turn of phrases in the letters they drafted to the Fleet and to other Government Offices, [and] by the influence they could exert upon the tone of replies from other Departments...'¹³⁶³

Businesses had employed codes to relay detailed information with brevity, thus saving on the costs of each cable, and preventing details from leaking to a competitor. On the sending end as well as the receiving, a code book, 'like a

¹³⁶² N.A.M. Rodger, 'The Dark Ages of the Admiralty, 1869-85, Part III: Peace, Retrenchment and Reform, 1880-85' *Mariners Mirror*, 62, (1976), 123-125.

¹³⁶³ Robert E. Mullins, 'New Ways of Thinking: The Intelligence Function and Strategic Calculations in the Admiralty, 1882-1889' *Intelligence and National Security*, 15, (autumn, 2000), 79-80.

dictionary', enabled the short cables to be read with clarity. By 1882, this compression of data into a few lines of seemingly incomprehensible print sent via submarine cables, gave British merchants another advantage as the codes were 'nearly perfect'.¹³⁶⁴ The ministries in Whitehall had utilized separate codes and, in March of that year, Lieutenant C. Campbell, R. N., was detailed from *Agincourt* to serve on a committee appointed to determine the practicality of creating a universal code which could be used by the key ministries in London for telegraphic messages. In addition to Campbell (sent as the committee member for the Admiralty), the Foreign and Colonial Offices each sent a representative, as did the War Office, which detailed an officer to serve as secretary.¹³⁶⁵ This move represented an early step to a unified crisis planning capability and for operational awareness, not only for the military arms, but also for the other ministries involved with Imperial defence.

Another function of war planning was mapping, and the Department of Hydrography in the Admiralty served as a quasi-intelligence body until the F.I.C. was formed.¹³⁶⁶ In late January 1883, the China Station flagship, *Audacious*, was at sea with the squadron mapping the harbours of the Russian Maritime, and 'exercising steam tactics'.¹³⁶⁷ All warships in the Pacific were frequently engaged in important duties which included showing the flag, but the Royal Navy conducted other efforts to gather intelligence relating to the enemy coasts. The *Audacious* and ships of the squadron drafted detailed charts of not only the main Russian naval base at Vladivostok, but also key anchorages at Port Lazarec and

¹³⁶⁴ 'Telegraphic Codes', *Shields Daily Gazette*, 6 Sep 1882, 7.

¹³⁶⁵ 'Naval and Military Intelligence', *Portsmouth Evening News*, 30 March 1882, 2.

¹³⁶⁶ Mullins, 'New Ways of Thinking: The Intelligence Function and Strategic Calculations in the Admiralty, 1882-1889' *Intelligence and National Security*, 15, (autumn, 2000), 78.

¹³⁶⁷ NMM, MIL/1, Vice Admiral Charles Blois Miller, Log Book, *H.M.S. Audacious*, 1883-1884.

Posiette Bay to the south, and Olga Bay and Vladimir Bay further up the coast.¹³⁶⁸ In the event of war, Britain would be ready to take key positions near Vladivostok in preparation for blockade duties, or to attack Russian coastal fortifications and harbours.

The mission of the Royal Navy was to engage in offensive operations at the outset of war. As Hall noted, the strategic objective was, 'blockading the ports of an enemy, of destroying his trade, attacking his possessions, dealing with his ships at sea, and we may add, of preventing an attack in great force against any special place.'¹³⁶⁹ The maritime aspect of intelligence was separated from the F.I.C. in February 1887, with Hall appointed as the first Director of Naval Intelligence.¹³⁷⁰ When he departed the position to return to sea in January 1889, Hall left behind a small but vibrant office poised to support the Royal Navy's global role, as he had 'established an intellectual tradition that would be sustained' through his successors. By the late 1880s, the Naval Intelligence Department had quickly evolved into a laboratory of strategic thought concerning 'all information relating to maritime matters likely to be of use in war', and was responsible for mobilization and aspects of campaign planning.¹³⁷¹

Colonial Defence and the Torpedo Boat

The Civil War had proven that the torpedo had changed naval warfare, at least in coastal waters. British newspapers feared the new weapon as a force

¹³⁶⁸ Ibid.

¹³⁶⁹ Mullins, 'New Ways of Thinking: The Intelligence Function and Strategic Calculations in the Admiralty, 1882-1889' *Intelligence and National Security*, 15, (autumn, 2000), 81.

¹³⁷⁰ David Ramsay, '*Blinker*' Hall Spymaster: *The Man who Brought America into World War 1*. (Stroud, 2009), 44.

¹³⁷¹ Ibid, 45. 'Naval and Military Intelligence', *Morning Post*, 25 July 1888, 7.

equalizer, and one commented: 'A little powder, an old and worthless boat frame, a simple apparatus for ignition, directed by one or two cool and resolute men, may in a minute send to the bottom all the labour, science, money and valour embarked on vessels such as the *Warrior* or *Royal Sovereign*'.¹³⁷²

The torpedo took on three forms during the 1860s-1880s: spar, towed, and self-propelled. A torpedo boat carried an explosive charge on a spar or 'outrigger', and if able to avoid a fatal shot, steamed the charge into an enemy warship. The explosion was intended to sink or damage the enemy and, hopefully, allow the torpedo boat to steam away if not swamped by the detonation. The spar was 42 feet in length with a diameter of six inches, tapering down to five inches at the forward end which held the torpedo. A three cell battery provided the electric charge which would, if all functioned properly, set off the explosive. A frame with roller bar held the torpedo aloft until the launch closed within striking distance. With the command 'rig out', the spar was pushed forward until it dropped the forward end with the torpedo, some ten feet below the surface. At a distance of 33 feet, the torpedo would be rammed home and set off by the battery. The TBs carried several spars rigged with torpedoes in reserve for contingencies.¹³⁷³

Robert Whitehead, a British engineer working in the then Austro-Hungarian port of Fiume, developed his first generation self-propelled torpedo in 1866, but this weapon was unreliable and slow. Working through complex controls to regulate the depth of his weapon, by 1868 he extended its range from 200 yards to 700 yards, although the speed was still an inadequate 7 knots.¹³⁷⁴

¹³⁷² 'Modern Navies', *Dundee Courier*, 30 August 1865, 3.

¹³⁷³ Stapleton, *Steam Picket Boats*, (1980), 11-12.

¹³⁷⁴ Brown, *Warrior to Dreadnought*. (1997), 81-82.

Another version of the torpedo was towed behind a warship in the hopes of running it into an enemy. The Harvey torpedo, named after its' inventor Commander James Harvey R.N., was the best known of this variety although, these proved to be all around failures and of far more danger to the user than any would be opponent. The 242-pound Harvey torpedo consisted of an explosive charge in a copper casing, placed in a wooden keg encased in iron, and towed behind a warship about 30 degrees from the wake. Fitted with a buoy to maintain the required depth, a pull of a lanyard released the float and allowed the towed charge to sink, should a friendly ship happen in the way. Many large warships of the era carried this torpedo, yet it was impractical and required 'skillful handling and thorough seamanship' to place this charge under an enemy warship.¹³⁷⁵

Necessity forced Russia to take the lead in the employment of the torpedo boat during the Russo-Turkish war in 1877-78. The shipment by rail of the torpedo boats (most of which had been built from the plans of English boat builder Alfred Yarrow), south from St. Petersburg to Sevastopol in 1878, was a significant logistical feat, and gave the Russians a weapon to challenge the Ottoman ironclads in the Black Sea. Despite this, the performance of the Russian torpedo boats was lackluster at best. During a Russian attack against the Turkish ships at Batoum (modern day Batumi in Georgia), the Russians reportedly neglected to remove the safety pins from the torpedoes and the attack failed to achieve the anticipated results. Had the torpedoes been used with more

¹³⁷⁵ 'Harvey's Sea Torpedo', *London Evening Standard*, 24 September 1869, 3.

skill after more planning and training, the results could have been more decisive.¹³⁷⁶

Before reinforcements arrived by rail, the Russians had only two torpedo boats in the Black Sea outfitted to fire the Whitehead torpedo. One boat was equipped to fire the 9-inch weapon from a tube, and the other had the awkward arrangement of launching a Whitehead from a raft carried alongside. With a reach of only 200 yards, these small diameter weapons lacked the range, reliability, and explosive capacity to alter the naval balance of power to Russia's advantage. The small Turkish monitor, *Seife* had been sunk by the Czar's torpedo launches but this success in the Danube was scored by the more dependable spar torpedoes. On the night of 25-26 January 1878, the Turkish wooden gunboat, *Intikbah*, was attacked by two Russian steam launches and became the first ship sunk in combat by a self-propelled torpedo. The torpedo boat and the locomotive torpedo proved their potential in naval warfare, but they also demonstrated their limitations. More development and training was required to bring the weapon and launch system to maturity.¹³⁷⁷

The torpedo and the torpedo boat were not ready for large scale offensive action. In the 1870s and 1880s, tactics were developing, and vessels were evolving with each innovation. Technology had to catch up with the Whitehead variant while the other configurations for spar and towed torpedoes ran to their design dead ends. The Whitehead torpedo was advancing, yet it suffered from defects including faulty steering. The 'frequent loss' of the weapon during

¹³⁷⁶ Ropp, *The Development of a Modern Navy*. Edited by Stephen S. Roberts, (1987), 116, Admiral Pasha Hobart, Imperial Ottoman Navy, 'Systems of Offense and Defense [sic] in Naval Warfare', *The North American Review*, 127, (November-December 1878), 383, 387, 390.

¹³⁷⁷ Chesneau, (editor) *Conway's All the World's Fighting Ships 1860-1905*. (1979), 172, 210, Sondhaus, *Naval Warfare, 1815-1914*. (2001), 124.

training voyages was a source of concern regarding its effectiveness, and by the late 1870s, the cost of £380 per copy made it an expensive and uncertain piece of armament. The Whitehead locomotive torpedo and the various configurations of special boats to transport it, was still an imperfect weapons system at this stage.¹³⁷⁸

Admiral John Locke Marx, R.N., looked back on his time as a junior officer aboard the torpedo training ship *H.M.S. Vernon* in the early 1880s, and noted the weapon was difficult to control. In describing the torpedo, he wrote: 'I do not think much of them'.¹³⁷⁹ One reason for the control problems of the Whitehead, was found in the process of launching. A torpedo boat had to have headway to prevent the weapon from being knocked about by the waves before it got underway. The TB or steam cutter that launched the Whitehead, over the side by means of a carrying frame hoisted by a specially fitted davit, had to maintain a steady helm, or the slow moving torpedo would be deflected off course by the forward edge of the frame. Night operations were preferred for a torpedo attack, but there were no indicators in early torpedo tubes or launching frames to verify if the weapon had been fired, thus complicating an attack under hours of darkness.¹³⁸⁰

On the night of 4 November 1880, a torpedo exercise was held at Bermuda with the anchored armoured frigate *H.M.S. Northampton*, protected by booms, and steam launches. The attacking force consisted of two second-class torpedo boats, and four steam launches supported, by an ironclad. The slow moving

¹³⁷⁸ 'Naval Notes and News', *Hampshire Telegraph*, 16 November 1878, 5.

¹³⁷⁹ *A Naval Life: The Edited Diaries and Papers of Admiral John Locke Marx 1852-1939*. Edited by Mary Jones. (Dulverton, 2007), 138.

¹³⁸⁰ TNA, ADM 125/83, *China Station Records*, 72, 1880-1883, Enclosure No. 1 in Channel Letter. No.193 of 12th June 1880 Torpedo operations conducted in Berehaven.

armoured ram *Viper* was to sweep away the boom and drive home the attack while clearing a path for a torpedo boat. *Scorpion* would have made a better escort, but she was likely still in the hands of the dockyard after the hurricane of late August.

The *Northampton* was able to 'defeat' the attacking force by the combined employment of quick firing lighter caliber guns, and the two electric searchlights, aboard. The hail of fire from the light guns (both mounted and on field carriages), were judged to have damaged and driven off the torpedo boats, launches, and the ram, before they could close the range. The searchlights 'had never previously proved so efficient' in detecting an attacking flotilla, and made the prospects for a successful night attack one of 'very great uncertainty when an electric light is employed by the defence'. Although the attack was deemed a failure, the discovery of the *Viper* in the attacking force proved to be 'an excellent, complete, and great surprise' to the defenders, and another ironclad attacker would have likely imperiled the *Northampton* and her escorts.¹³⁸¹

After she arrived at Hong Kong, the *Wivern* acquired a secondary but important role as a torpedo boat tender. The flagship, *Audacious*, sent men to her for training, and one torpedo party rowed over to the turret ship on 16 February 1883.¹³⁸² A photograph taken at the studio of a Mr. A. King in Hong Kong, reveals a small symbol of the weapons development in the Royal Navy. Circa 1885, the small carte de visité is of an unnamed Royal Navy 2nd Class Petty Officer in blue uniform. On the right sleeve he displays two crossed weapons beneath a six-pointed star: one a breechloading naval gun, the other a

¹³⁸¹ TNA, ADM 125/83, *China Station Records*, 72, 1880-1883, 'Remarks by Captain of "Vernon" on Special Torpedo Practice in H.M.S. "Northampton" in November 1880', 'The Recent Hurricane', *Royal Gazette*, 7 September 1880, 5.

¹³⁸² NMM, MIL/1, Vice Admiral Charles Blois Miller, Log Book, *H.M.S. Audacious*, 1883-1884.

sharp-nosed early Whitehead torpedo under the gun. Although it is not known to what ship he was assigned, the petty officer undoubtedly trained aboard the *Wivern*. There he and the other gunners and torpedomen of the station, maintained and improved their skills on the rapidly evolving new generation of weapons, especially the rapid-fire light guns, and the Whiteheads.¹³⁸³

By the early 1880s, the self-propelled torpedo evolved into a sophisticated projectile, and the mechanisms of which had to be guarded, in part, by non-disclosure agreements signed by those who worked with these weapons. On 17 January 1882, the Admiralty dispatched a letter to the China Squadron commander, Vice Admiral Willes, requiring all torpedo personnel in his ships, to sign form S-321, to protect 'the secret of the Whitehead Torpedo'.¹³⁸⁴

Restrictions regarding the Whitehead were imposed with 'painful exactness' as the training manual was to be left aboard the torpedo training ship, and junior officers were not allowed to remove it for their private study after duty.¹³⁸⁵

In 1883, the Admiralty approved the plan to have more torpedo boats stationed in the colony (but only with partial crews), and sent two 1st Class torpedo boats to Hong Kong. One crew was to man one of the two new torpedo boats following their arrival from Britain. A single 2nd Class torpedo boat would be placed in service by combining most of the crew from the two TBs assigned to the *Wivern*. This rotating plan of manning was a positive step forward in readiness for the embryonic torpedo boat section in the colony, but the Royal

¹³⁸³ Author's collection. The photograph was taken by A. King at his studio, 20A Queen's Road East, Hong Kong. King may have been an Anglicized pseudonym for a Mr. Afong, the 'well-known photographer of Queen's-road' [sic], *Hong Kong Telegraph*, 18 July 1881, 2, as the carte de visite was printed on the reverse in English and also with some Chinese characters.

¹³⁸⁴ TNA, ADM 125/83, *China Station Records*. 1880-1883. Form S-321, originated in December 1880

¹³⁸⁵ 'London Gossip', *Hampshire Advertiser*, 6 August 1881, 3.

Navy continued to be undermanned in those waters. The makeshift situation on the China Station is illustrated by a letter written by Lieutenant Douglas Gamble, the torpedo officer assigned to the *Victor Emmanuel*. Gamble requested a gig and crew be permanently assigned to him in order to perform his duties as the officer in charge of the torpedo boats. Gamble was required to move from the warships at anchor, the dockyard, and his four direct charges, by borrowing a boat and crew from the Chief Engineer of the *Wivern* in order to make his rounds. Gamble had the duty of insuring that all machinery on his boats were 'kept in a state of efficiency', for the little flotilla had to perform at least six runs per quarter with Whitehead torpedoes to maintain proficiency with those weapons. This duty was complicated by the *Wivern's* Chief Engineer, as the boat was frequently needed by this more senior officer, who was also tasked with keeping the turret ship in a state of readiness, visiting the dockyard, and conducting his additional duties aboard the gunboats, *Elk* and *Tweed*.¹³⁸⁶

In 1882, the Admiralty sent out 50 torpedo nets from Britain for the protection of naval assets in Hong Kong. The flagship had a complete set, thus the new nets were assigned to the *Wivern*. The Admiralty also specified that the five corvettes on station were not to be supplied with nets, for in the 1880s, nets were generally provided to armoured ships.¹³⁸⁷ These were likely the nets of steel wire rope which were 'incredibly flexible', yet 'wonderful for strength and evenness of texture'. Made by William M. Bullivant of London (based on his wire rope patent of June 1878), these nets were used by the Royal Navy and foreign powers

¹³⁸⁶ TNA, ADM 125/83, *China Station Records*.1880-1883.

¹³⁸⁷ Ibid, 'Torpedo Nets' *Sheffield Independent*, 12 May 1885, 2, 'Goodbye to the Canada' *The Sun*, 16 May 1885, 2.

alike.¹³⁸⁸ Each section of net (held out from a ship's side by spars), was 25 feet in length, 20 feet wide, and suspended to a depth of nine feet.¹³⁸⁹ These nets gave an added degree of security to ships against torpedo attack, especially while at anchor, and were acknowledged later as, 'an unglamorous but essential phase of naval warfare'.¹³⁹⁰

The enemy cruiser and the Coaling Station

The French proponents of commerce raiding advocated the *Jeune Ecole* concept of naval warfare which centred, not on the battle fleet, but commerce raiders and coastal defence vessels. Developed in the 1870s and 1880s, this French concept of commercial naval warfare was embraced by Admiral Theophile Aube. When he became France's Minister of Marine in 1886, Aube cancelled the building of more costly armoured ships in favour of cruiser and torpedo boat construction as a means to challenge British superiority at sea.¹³⁹¹

The situation changed following the end of the Civil War. The submarine telegraph cable brought distant areas of the globe into instant contact, and an enemy raider could no longer cruise for weeks without the knowledge of her opponent. Hong Kong was linked to the growing cable network in 1870, but Bermuda had to wait another twenty years before it was tethered to the telegraph

¹³⁸⁸ 'Prolonged Patents', *Birmingham Daily Post*, 24 June 1881, 6. 'Marine Engines and Engineering', *Shields Daily Gazette*, 6 September 1882, 5. 'The Fisheries Exhibition', *Morning Post*, 22 June 1883, 3.

¹³⁸⁹ 'The War Preparations', *London Evening Standard*, 4 May 1885, 2. 'The Corvette Canada Keeps a Look Out for Dynamite', *The Sun*, 10 May 1885, 1

¹³⁹⁰ Buford Rowland, 'Revolution in Nets: An Unglamorous but Essential Phase of Naval Warfare' *Military Affairs*, 11, (autumn, 1947), 149.

¹³⁹¹ Ropp, *The Development of a Modern Navy*. Edited by Stephen S. Roberts, (1987), 155, 160, 168, Arne Roksund, *The Jeune Ecole: The Strategy of the Weak*. (Boston, 2007), x-xi, 18-19.

station in Newfoundland.¹³⁹² Although Bermuda was a late addition to the imperial communications network, prior to this, a combination telegraph and flag signal system was in place around the archipelago, with nine telegraph stations throughout Bermuda run by the Royal Engineers, and a flag signal system able to relay, 'the first appearance and subsequent movements of all vessels within sight'.¹³⁹³ This communications system permitted the timely flow of information throughout the fortress base, and (during times of clear weather) provided a means to direct the defences of the colony on shore and in local waters. From the main cable landing stations around the Empire, another form of relay was established to provide timely messages. Dispatch vessels were stationed at the ends of the telegraph cable systems to steam out and inform the fleet commander away at a distant anchorage, of the latest orders. Control of a squadron was becoming less the sole prerogative of the local admiral and more at the direction of the Admiralty in London.¹³⁹⁴

However, naval authorities continued to worry about the threat to merchant shipping from potential enemy commerce raiders. Admiral Fisher had likened cruisers intent on attacking British merchant shipping as 'Armadillos' eating up the ants they came across.¹³⁹⁵ The *Alabama* was the success story of the commerce raider, yet the inability of the Confederates to get many of their foreign purchased would-be-raiders to sea was a fact not entirely overlooked. One such ship was the French-built corvette, *Yeddo*, which the Confederates intended to commission as the raider, *C.S.S. Mississippi*. U.S. diplomatic pressure forced Emperor Napoleon III to intervene and prevent the

¹³⁹² Standage, *The Victorian Internet*, (1998), 102, *Hansard*, 15 July 1890, 346, cc 1725.

¹³⁹³ John Ogilvy, M.D., *An Account of Bermuda Past and Present*. (Hamilton, 1883), 55.

¹³⁹⁴ Richard Hill, *War at Sea in the Ironclad Age*. (London, 2002), 70-71.

¹³⁹⁵ Erich Groner, *German Warships 1815-1945* Volume One. (Annapolis, 1990), 86.

Southerners from acquiring the steamer and her sister ships. The men-of-war were eventually commissioned after the *Yeddo* and her Bordeaux sister, the *Osceola*, were sold to Prussia as warships for that nation's fleet.¹³⁹⁶

The *Yeddo* was commissioned as the *S.M.S. Augusta*, and several years later, she succeeded in capturing several enemy merchant ships during the Franco-Prussian War. On a foray near her Gallic birthplace in early January 1871, she fired on the steamer *Max*, laden with a cargo of war material slated for the hard-pressed French army. That hapless merchantman was the only French vessel sunk at the hands of the small German fleet during the Franco-Prussian War.¹³⁹⁷ The success was not repeated, as French cruisers quickly blockaded the *Augusta* in the Spanish port of Vigo until the end of the war. Telegraphic communications and reinforced French patrols prevented a German commerce raider from having more than a very brief foray against what could have been a rich hunting ground further out to sea. Vigorous pursuit and mobbing by a superior naval force prevented the cruise of the *Augusta* from becoming an *Alabama*-style cat and mouse embarrassment for France. The *Augusta* failed in her mission to pull French resources away from home and drive up war costs. French cruisers were looking for only one corsair, not chasing after several commerce raiders at once as had the Union, with such Confederate ships as the *Alabama*, *Florida*, and their auxiliaries during the Civil War.

Nevertheless, the voyage of the *Augusta* served as warning over the potential impact of a single raider attacking merchant shipping near an opponent's home shore. France enjoyed naval superiority over her German rivals yet that did not

¹³⁹⁶ *Ibid*, 86.

¹³⁹⁷ 'German Prize at Plymouth', *Western Times*, 19 January 1871, 3, 'The German Corvette *Augusta*', *SA*, 20, 7 November 1885, (No page), Lawrence Sondhaus, *Preparing for Weltpolitik: German Sea Power before the Tirpitz Era*. (Annapolis, 1997), 96, 265 (endnote 112).

prevent a single enemy cruiser from capturing the merchantmen, *St. Marc* (laden with flour and bread), and *Pierre-Adolphe* (carrying a cargo of wheat), at the mouth of the Gironde River in January 1871, some 50 miles downriver from the French provisional capital of Bordeaux. With a show of daring, the German captain steamed out into the Bay of Biscay before anchoring *Augusta* near Rochefort, briefly occupying the deserted Fort Boyard, while a boat crew captured a French tug. With these captures and a fourth French ship sunk (the *Max*), the *Augusta* steamed off to neutral Spain.¹³⁹⁸

The siege of Paris and the great land battles sapped French strength and pulled the French fleets away from the Baltic and North Sea blockades. French statesman and future premier, Georges Clemenceau remarked that if the German commander of the *Augusta* had continued the fight, and if more German warships had attacked French shipping, the cost of obtaining supplies from America would have increased tenfold.¹³⁹⁹ These lessons were not lost on the French after the war, when they returned to their global competition with their greatest rival and envisioned their use of commerce raiders against British shipping: 'the surest way of stopping English merchantmen is thus to prevent them from starting'.¹⁴⁰⁰ One London newspaper commented on the effect the lone German raider would have, referring to the commander of the *Augusta* as the, 'forerunner of the men who will be the Nelsons of the Fatherland'. That newspaper also provided a warning, based on the exploits from that lone warship

¹³⁹⁸ Ibid, 265, M. Georges Clemenceau, 'The French Navy' *The North American Review*. 164, (Feb, 1897), 188.

¹³⁹⁹ Clemenceau, 'The French Navy' *The North American Review*. 164, (February, 1897), 189.

¹⁴⁰⁰ Ropp, *The Development of a Modern Navy*. Edited by Stephen S. Roberts, (1987), 164.

for it had, 'quicken'd the intense wish of the German people to gain such a fleet as can put down the navy of England herself.'¹⁴⁰¹

Julian S. Corbett used the example of the *Augusta* in his work, *Some Principles of Maritime Strategy*, and stated that it was impossible to insure a commerce raider would be intercepted before she steamed out to threaten British trade: 'Never in the days of our most complete domination upon the seas was our trade invulnerable, and it never can be'. Corbett made a geographic distinction between 'fertile areas', which were the, 'terminals of departure and destination where trade tends to be crowded', and the open ocean away from these terminals.¹⁴⁰² An enemy squadron or single raider ran a risk in attacking a defended port or coaling station. This was especially true of ports defended by coastal turret ships such as the *Wivern* in Hong Kong, the *Cerberus* at Melbourne, the *Magdala*, and smaller *Abyssinia* at Bombay, and the *Scorpion* at Bermuda. Admiral G. A. Ballard saw the true worth of the coastal defence ships as a deterrent against raiders. Ballard noted that from the late 1860s until the mid-1880s, they were heavily armed and well-suited for their roles. He compared them to be like, 'full-armed knights riding on donkeys, easy to avoid but bad to close with'.¹⁴⁰³ The presence of these ironclads in local waters was a caution for an enemy, as a raider would be wary of approaching and would thus have to stand further out to sea to pick off the unwatchful and isolated steamer, or sailing ship.

In 1884, the Earl of Caernarvon spoke in Parliament for greater defensive preparedness of British naval bases overseas. The bases needed better protection, and infrastructure in the form of fortifications, and defended coaling

¹⁴⁰¹ No Subject, *Daily Telegraph*, 13 February 1871, 5.

¹⁴⁰² Julian S. Corbett, *Some Principles of Maritime Strategy*. (Uckfield, 2006), 236, 255.

stations. Lord Caernarvon described the centres of gravity for Britain's lifeline in commercial, but especially in naval, and military terms. He referred to these stations as 'The Maritime quadrilateral of England'—Gibraltar and Malta in the Mediterranean, and Bermuda and Halifax in the Atlantic. These bases were of primary importance for British security, 'a weighty responsibility', for the defence of the Empire. 'Those four great stations have, for many years past, been the special care of Her Majesty's Government', but sufficient attention to their adequate defences was intermittent during the middle decades of the nineteenth century.

In 1881, the Bermuda garrison was reduced in numbers and consequently, the coastal defence vessels stationed there assumed a greater importance.¹⁴⁰⁴ The realignment of forces was viewed as part of essential changes. British Army manpower had become too dispersed after it was parceled out to garrisons dotted around the globe. The 'scattering of forces' had come to be seen as 'an...evil' which prevented the concentration of regular army units needed for campaigns ashore. The coastal turret ironclads were a method of filling in the defence gaps when the garrisons were drawn down.¹⁴⁰⁵

Caernarvon also highlighted the varying priorities of defending the other sixteen or seventeen coaling stations around the globe to prevent a section of the Empire from being cut off. Not all of these stations were of equal importance, but the upgrade to the defences of Aden, Singapore, and Hong Kong were termed 'urgent'. These bases could not be defended by warships alone. Artillery was

¹⁴⁰³ Ballard, *The Black Battlefleet*. (1980), 218-219.

¹⁴⁰⁴ *Hansard*, 13 November 1884, 293, cc 1540, TNA, CAB11/11, *Bermuda 1885-1907*, no. 89 M, 21 December 1896

¹⁴⁰⁵ Ekoko, 'The Theory and Practice of Imperial Garrisons: The British Experiment in the South Atlantic 1881-1914', *Journal of Historical Society of Nigeria* 12 (Dec. 1983-Jun 1984), 133.

needed at points along the shorelines at these installations to free up coastal warships to operate in local waters. Britain needed more guns to defend these key coaling stations but Caernarvon warned: 'The real difficulty is that we have not got plant adequate to turn out the number of guns we need. We are dependent upon Sir Joseph Whitworth for the steel required for the heavier guns, and I believe the best gunpowder we now use is imported from Germany'.¹⁴⁰⁶ The prioritization of which refueling stops would receive adequate protection, emerged in the early 1880s as a concept later referred to as, 'a coaling station defence strategy'.¹⁴⁰⁷

David Snyder argued that 'access to fuel sources had little impact on the strategic planning of the world's navies until the end of the late nineteenth century'. Although this interpretation is true in terms of the transition to oil from coal for the navies during WWI, it is not accurate regarding the strategic needs for coal, prior to the advent of the oil-fired boiler.¹⁴⁰⁸ The Pacific was relatively 'coal-poor' compared with Europe and North America, and Britain dominated the carrying trade in that commodity. British coaling stations were available to foreign warships and merchantmen, but this access was frequently denied in times of war and curtailed during times of international tensions. Coal was a primary consideration for most men-of-war in the last half of the nineteenth century, especially one en route to a distant station, as 'the necessity of fueling far-flung fleets varied among the navies of various states'.¹⁴⁰⁹

¹⁴⁰⁶ *Hansard*, 13 November 1884, 293, cc 1543, 1545.

¹⁴⁰⁷ Ekoko, 'The Theory and Practice of Imperial Garrisons: The British Experiment in the South Atlantic 1881-1914', *Journal of Historical Society of Nigeria* 12 (Dec. 1983-Jun 1984), 133.

¹⁴⁰⁸ David Allan Snyder, (2001), *Petroleum and Power: Naval Fuel Technology and the Anglo-American Struggle for Core Hegemony, 1889-1922*. Texas A&M, 4, 7.

¹⁴⁰⁹ *Ibid*, 4-6.

The Imperial Russian Navy slowly increased its strength in ironclads, but the emphasis of the building program, begun in 1882, was on long range cruisers.¹⁴¹⁰ Russia was also on the lookout for advantageous coaling stations. In late 1878, the cruiser *Vsadnik*, commanded by Captain Andrei Novosil'skiy, anchored at Penang where he secretly met with Malay representatives of the sultans of Sumatra. The envoys sought a Russian protectorate over their island to prevent being acquired by the Dutch. In July 1879, they petitioned Czar Alexander II to annex Sumatra, but the Russians declined as they were unwilling to anger the Netherlands. St. Petersburg was also undoubtedly wary of placing a Russian installation so far from any of their stations, while being so near to key British bases.¹⁴¹¹ Despite the failure to obtain a coaling station along a key sea line of communications, the Russian Navy expanded incrementally. One British observer noted that the Russian Fleet in the Far East, 'varies in strength according to political exigencies'.¹⁴¹² The operational requirements of a fleet expanding in both numbers and cruising areas, continued to influence strategic thinking in St. Petersburg. By the early 1880s, the Russian Admiralty was, 'focused on the issue of obtaining reliable bases, which could be used both in case of conflict with China, and for commerce raiding operations against European powers, especially Britain'.¹⁴¹³

Sandler noted that protection of merchant shipping and colonial defence, were 'considered subordinate' to the 'great national purposes' of using the first class

¹⁴¹⁰ Anthony J. Watts. *The Imperial Russian Navy*. (London, 1990), 16.

¹⁴¹¹ Alexey D. Muraviev, 'The Russian Pacific Fleet: From the Crimean War to Perestroika'. *Papers in Australian Maritime Affairs*, 20, (Canberra, 2007), 11-12.

¹⁴¹² Colonel Sir George Sydenham Clarke, *Russia's Sea-Power Past and Present or the Rise of the Russian Navy*. (London, 1898), 156.

¹⁴¹³ Nicholas Papastratigakis, *Russian Imperialism and Naval Power: Military Strategy and the Build-Up to the Russo-Japanese War*. (London, 2011), 84.

ironclads of the Royal Navy in a fight in European waters to overwhelm a rival sea power closer to home.¹⁴¹⁴ The events of the 1870s changed that view somewhat. Britain would keep most of her ironclads in the Channel or Mediterranean, but the Admiralty was alerted to the threat of commerce raiders avoiding British cruisers to attack merchantmen or an isolated outpost. The press warned that, 'on a sudden outbreak of war our great ports of trade would be perfectly at the mercy of any daring fellow, who with a good ship under him, a daredevil crew, and the prospect of "loot", would dash into a unsuspecting colonial port, wreak havoc, and escape 'before we can summon a force to resist him'. This fear was answered in part by the coastal defence ironclad, an asset termed, 'a class of ship our navy can never be without.'¹⁴¹⁵

The necessities of defending key British coaling, communications, repair and supply bases were understood in the mid-1870s as a core strategic concern: 'a greater naval problem probably does not, and never did exist' wrote one Royal Artillery officer.¹⁴¹⁶ Yet, discussions of balanced solutions between the defence of main bases, and the naval forces dispatched on offensive operations, centred on economy:

*In maintaining an efficient Navy, therefore, and to obtain the greatest results with a given expenditure, the question must be kept in view how much of that expenditure is to be devoted to the ships themselves, and how much to the harbours, coaling stations, &c., which are absolutely necessary for the ships in time of war.'*¹⁴¹⁷

As the Royal Navy evolved to meet new threats during the last decades of the nineteenth century, the shallow draft turret armourclads remained useful units of

¹⁴¹⁴ Sandler, *The Emergence of the Modern Capital Ship*. (1979), 157-158.

¹⁴¹⁵ *Ibid*, 168-169.

¹⁴¹⁶ Moncrieff, 'On Harbour Defence', *RUSI Journal*, 19, 1 May 1875, 358.

¹⁴¹⁷ *Ibid*, 358.

reserve squadrons at home, but especially on foreign stations. Sandler referred to the *Abyssinia*, *Cerberus*, and *Magdala* as ships that gave 'economical, uneventful service', and they did so in a time of limited defence budgets for the Admiralty, but also for the colonies they were to protect.¹⁴¹⁸ The burdens of costs continued to influence colonial defence planning in the 1870s and early 1880s. In a letter to Governor Hennessy in April 1880, former Colonial Secretary Sir Michael E. Hicks-Beach wrote to inform the governor, that Hong Kong could be safeguarded with smaller vessels, as they would be 'most useful & certainly the least expensive form of defence of this kind'.¹⁴¹⁹

Nevertheless, the turret ships and other, smaller ironclads, were considered in these years as 'the most effective means of defending the larger ports' rather than coastal fortifications, as the armoured ships were able to offer protection for area sea lines of communications, and for harbour facilities, especially the crucial coaling stations and dockyards.¹⁴²⁰ During debates in the Commons on 1 August 1882, Sir John Hay, a former First Lord of the Admiralty, asked the pointed question about coastal defence ironclads: 'how are we going to replace them'?¹⁴²¹ These vessels were not replaced. They were repaired, refitted, and remade, to meet the changing requirements of an Imperial establishment

¹⁴¹⁸ Sandler, *The Emergence of the Modern Capital Ship*. (1979), 163.

¹⁴¹⁹ Bodleian Library, Oxford, 'Papers of Sir John Pope-Hennessy, GB 0162 MSS.Brit.EMP.s.409, Box 8/2. Letter dated 23 April 1880. Hennessy had proposed that a larger ironclad be utilized to defend Hong Kong. Although the name or type of warship was not mentioned, the *Wivern* was en route to the Far East when the letter was written. Also see letter (same source) dated 22 April 1881, Kimberley had written to Hennessy informing him, the Admiralty had turned down the Governor's 'Wyvern' plan, *Hansard*, 19 February 1880, 250, cc 940.

¹⁴²⁰ Thomas Brassey, M.P., 'On a Colonial Naval Volunteer Force', *RUSI Journal*, 22, 17 May 1878, 9.

¹⁴²¹ *Hansard*, 1 August 1882, 273, cc 435.

increasingly aware of its vulnerabilities. Like the dockyards, coal depots, and cable stations, they were an essential part of the infrastructure of Empire.

CHAPTER FIVE

Imperial Competition and Strategic Change: The Laird Rams 1883-1885

In January 1885, a Washington D.C. newspaper observed, ‘the ironclad fleet of Great Britain cannot be intelligibly classified. It embraces not less than twelve distinct types’.¹⁴²² That article went on to claim the British ironclads, built over the preceding twenty years, ‘represent the transition period of naval architecture...and present a variety of type, class, and design that not only bewilders the non-professional mind but often confuses the expert.’¹⁴²³ Despite their differing types, the ironclads of the Royal Navy were acknowledged in one Salt Lake City newspaper from that year, as comprising the force that represented Britain’s ‘floating peace-makers’.¹⁴²⁴

Nevertheless, Britain’s naval superiority in armoured vessels was questioned in Parliament two years before, in May 1883, when a criterion was applied to what elements comprised a suitable ironclad. Among those were armoured belts, performance at sea, fuel capacity, and steel breechloading heavy guns.¹⁴²⁵ France and Russia were building their fleets, and the threat of a combined force equipped with modern ironclads and torpedo boats, was a consideration Britain could not ignore. On 7 May 1883, M.P., W. H. Smith, a former First Lord of the Admiralty, stated in the Commons his views regarding the necessity of maintaining ironclads on foreign stations, but he also warned:

¹⁴²² ‘The Navy that is Needed’, *National Republican*, 31 January 1885, 1.

¹⁴²³ *Ibid*, 1. This article claimed that British ironclads were not designed for ‘our traditions’ (American) and were too deep for U.S. harbours. They obviously forgot about the *Scorpion* and *Wivern*.

¹⁴²⁴ ‘Britain’s War-Ships [sic]’ *Salt Lake Herald*, 17 April 1885, 1.

¹⁴²⁵ *Hansard*, 7 May 1883, 279, cc 76, 84, 112, 114.

*'At this moment, ironclads have to be employed in the China and Australian Seas, in the Pacific, on the Coast of North America, and in the West Indies. Our Fleet is scattered in a manner in which the Fleet of no other Power can be scattered; and while it is discharging duties in three or four different seas, if, unfortunately, we should be engaged in a war, Foreign Powers might be able to concentrate their forces against our Navy.'*¹⁴²⁶

This chapter examines the roles played by the Royal Navy in maintaining an armoured balance of power on colonial stations, as Russian and French imperial expansion was viewed as a threat to British interests, especially in Asia. Naval weapons and strategies were developed to defend key colonial installations with limited resources, and intelligence inputs emerged as a factor influencing war planning, both offensively, and concurrently with defensive preparations. A secondary feature of the chapter focuses upon the support roles of the *Scorpion* and *Wivern* as part of layered defences at key naval bases during the mid-1880s and the war scare of 1885.

Russian Expansionism

On 4 January 1882, newly appointed Russian War Minister Petr Vannovskiie, opened a conference in St. Petersburg with several key officials from the Czar's ministries, to address the issues of British support to China, and Russian expansionism in Central Asia. A circular from the Russian General Staff argued that British influence in China and Japan had been countered somewhat by

¹⁴²⁶ Ibid, cc125-126.

Russian territorial acquisitions in the Far East after the Crimean War.¹⁴²⁷ Colonel Kakov Barabash had traveled through the northeast border region of China's Jilin province on an intelligence collection mission for the Russian General Staff and wrote in his report that Britain had obligations around the globe, but Russia could concentrate a naval force in the Pacific to effect. Once the squadron was in those waters, it 'might be able to inflict serious damage on Europe from the Amur'. The Pacific held the possibility of action to pull British resources away from Europe during a war, and Russian overland activity along the Afghanistan border could prevent Britain from withdrawing forces from India and redeploying them to the Mediterranean.¹⁴²⁸

In the mid-1870s, Captain Fred Burnaby, a British cavalry officer in the Indian Army took leave from his unit stationed on the northwest frontier and traveled north through the Asian hinterlands. While on his journey, he visited his counterparts in the Czar's army and Burnaby noted: 'You cannot be with Russian officers in Central Asia for half an hour without remarking how they long for a war...we ought to be thoroughly prepared and ready for an emergency'.¹⁴²⁹

Russian officers allegedly acting without guidance from St. Petersburg, had been readily employed by the Czar's ministers as a cover story for Russian expansionism. If confronted by a superior rival they would be disavowed, if successful, more territory would be added to the Russian Empire and the process would be repeated. As early as 1869, the Russian Government claimed that ambitious military officers had acted without orders to advance into Central Asia and emphasized this was not an official policy of St Petersburg, thus

¹⁴²⁷ Kimitaka Matuszato, 'The Creation of the Priamur Governor-Generalship in 1884 and the Reconfiguration of Asiatic Russia', *Russian Review*, 71, (Jul, 2012), 382, 383.

¹⁴²⁸ *Ibid*, 383.

¹⁴²⁹ Stephen Wade, *Victoria's Spymasters: Empire and Espionage*. (Stroud, 2009), 58-59, 61.

‘creating the myth that insubordination was the principal cause of the Russian conquest of Central Asia’.¹⁴³⁰

Russia expanded into Asia in part due to imperial competition with Britain, and, as Peter Hopkirk stated, was driven by that part of the Russian character which has ‘an abiding fear of encirclement’. The ‘Great Game’ generated its own momentum, and the ‘fears, suspicions and misunderstandings’ were played out on a global scale.¹⁴³¹ In St. Petersburg, Major General Nikolai Igantiev wrote: ‘The British statesmen should not indulge in pleasant illusions of their colonies being secured’. Part of his concept to challenge Britain’s security, was to strengthen the Russian Pacific fleet.¹⁴³² In Hong Kong, one local newspaper noted the Czar’s military pressure on Afghanistan and observed, ‘Russia can hardly repudiate a treaty, before the ink is dry’.¹⁴³³

Deterrence and the Royal Navy in the Far East

Sir Julian Corbett referred to the amphibious options the Royal Navy gave to the Empire by emphasizing the strategic advantages of ocean borne mobility, or ‘what the fleet makes it possible for your army to do’.¹⁴³⁴ Basil Liddell Hart termed this maritime centric approach to combat; naval actions, blockades, and

¹⁴³⁰ Richard Baffa, ‘The Writing on the Wall: E. G. Browne and the Constitutional Revolution in Persia’, Cambridge, May, 2015, 12-13.

¹⁴³¹ Peter Hopkirk, *The Great Game: The Struggle for Empire in Central Asia*. (New York, 1994), 8.

¹⁴³² Evgeny Sergeev, *The Great Game, 1856-1907: Russo-British Relations in Central and East Asia*. (Baltimore, 2014), 77-78.

¹⁴³³ ‘China’s Concern in the Fate of Afghanistan’, *China Mail*, 7 May 1885, 3.

¹⁴³⁴ Andrew Lambert, ‘The Development and Education of the Royal Navy 1854-1914’, *The Development of British Naval Thinking*. Edited by Geoffrey Till, (Abingdon, 2006), 41.

amphibious operations on the periphery of a continental enemy, as ‘The British way of warfare’.¹⁴³⁵

During the War Scare of 1877-78, Russia planned for commerce raiding against British shipping worldwide and considered attacking ports in the Empire. This was especially true for the Far East as Russian warships were issued charts depicting routes in the Pacific utilized by British merchantmen. Historian John Beeler stated the threat from Russian commerce raiders during the mid-nineteenth century was ‘more imagined than real’, but the British press of that time worried ‘for the want of proper vessels, enough coal, or a few thousand pounds spent on defence of important points, we may lose more in a few weeks by risks and “scares” than would be regained in the whole course of a successful war’.¹⁴³⁶ In 1878, Russian naval planners envisioned a sudden attack against Hong Kong, Singapore and Australia. British intelligence agents intercepted the plans and these likely influenced efforts to reinforce Hong Kong.¹⁴³⁷ The *Wivern* was regarded as being able to ‘do good service’ defending the colony (especially when supported by one or two gunboats) against a foreign naval threat which was termed ‘very far from imaginary’.¹⁴³⁸

Britain had been wary of Russian designs on Turkey, Central Asia, China, and Korea as part of St. Petersburg’s never ending quest for warm water ports. During the Victorian era, the British warships of the China Squadron had the task of containing the Russians in the Far East, a role which was similar to the Cold War missions of the mid-late twentieth century.¹⁴³⁹ In August 1861, *H.M.S.*

¹⁴³⁵ Kennedy, *The Rise and Fall of British Naval Mastery*. (1976), 202.

¹⁴³⁶ Beeler, *British Naval Policy in the Gladstone-Disraeli Era 1866-1880*. (1997), 229, ‘British Coal and Coaling Stations’, *Pall Mall Gazette*, 3 January 1877, 2-3.

¹⁴³⁷ Sergeev, *The Great Game, 1856-1907*. (2014), 166.

¹⁴³⁸ ‘The Fortifications of Hong Kong’, *Times*, 28 October, 1884, 3.

¹⁴³⁹ Parkinson, *The Late Victorian Navy*. (2008), 73.

Ringdove was dispatched from Nagasaki to Tsushima Island to investigate rumours the Russian frigate *Possadnik* had established a station there.¹⁴⁴⁰ The discovery of the 'very comfortable little naval settlement', led the British naval commander, Vice Admiral Sir James Hope, to steam to the Russian Pacific coast and meet with the commander of the Russian squadron. After that meeting, Rear Admiral Likhachev recognized that the game was up and recalled his warship from Tsushima. The Royal Navy had thwarted Russian attempts to 'effect a quiet and unobtrusive occupation' of the strategic island in the straits midway between Japan and Korea. Russian expansion in northern Asia was, for the moment, blocked. In 1885, Britain's China Station warships would again forestall a Russian attempt to 'creep down the coast of Manchuria', this time, into Korea.¹⁴⁴¹ Russia presented a threat to British interests in northern Asia and the goal of the November 1883, Anglo-Korea treaty was to contain Russia 'in her design of extending her influence from Vladivostok southwards'.¹⁴⁴² Nevertheless, Russian plans to move into Korea or gain access to her coasts, was not fully understood in London until after the 1885 crisis.¹⁴⁴³

In the 1880s, St. Petersburg's ambitions in Afghanistan had run afoul of British concerns over India. The British Army in India, resupplied and reinforced by the expanded Indian rail network, could rush forces to the frontline if Russian

¹⁴⁴⁰ Lawrence Oliphant 'A Visit to Tsusima [sic]: An Incident of Russian Aggression', *The Living Age*, 168, 2 January 1886, 19, 22-24.

¹⁴⁴¹ Ibid, 18, Lambert, *Admirals*. (2008), 292, Muraviev, 'The Russian Pacific Fleet'. *Papers in Australian Maritime Affairs*, 20, (2007), 6-7, 52. Muraviev refers to the Corvette *Posadnik*, 52. Likhachev was a veteran of the siege of Sevastopol and was the chief advisor to the Ministry of Marine under Grand Duke Constantine, the brother of Czar Alexander II until his appointment to the Far East in 1859. See: David Woodward, *The Russians At Sea*. (London, 1965), 107

¹⁴⁴² Ian Nish, 'Politics, Trade and Communications in East Asia: Thoughts on Anglo-Russian Relations, 1861-1907', *Modern Asian Studies*, 21, (1987), 671.

¹⁴⁴³ John Berryman, 'British Imperial Defence Strategy and Russia: The Role of the Royal Navy in the Far East, 1878-1898', *IJNH*, 1, (April 2002), 4.

troops advanced south from the Afghanistan frontier. If the crisis developed into war, London would have to apply pressure elsewhere on the Russian Empire to compel her to pull reinforcements away from Central Asia. Britain could conduct a naval war 'all over the world' as she had done during the Crimean War, yet London needed allies to attack the armies of the Czar.¹⁴⁴⁴ No other powers accepted the British offer, and London looked to areas in the Russian Empire for potential sites for military operations. The Russian coastlines at her few outlets to the world offered the best options for a sudden British strike.

Vladivostok

Vladivostok was a target, but some leaders in London saw this as a peripheral area only, with no impact on 'a war either in Europe, or Central Asia'.¹⁴⁴⁵ Nonetheless, Vladivostok was more than a naval base; it was Russia's springboard in northern Asia. In the years since 1880, Vladivostok a former 'fishing and trading village', had grown into 'a city ...with dry docks of the largest capacity and fortifications which make it impregnable'.¹⁴⁴⁶ Nonetheless Vladivostok was ice-bound part of the year, and in a move to keep the fleet dispersed but ready for action, warships of the Russian Pacific Fleet usually wintered over in Japan, particularly at Nagasaki, where they could receive dockyard attention as needed.¹⁴⁴⁷

¹⁴⁴⁴ R. A. Johnson, "Russians at the Gates of India"? Planning the Defence of India 1885-1900', *Journal of Military History*, 67, (Jul. 2003), 735.

¹⁴⁴⁵ Robert Johnson, *The Penjdeh Crisis and its impact on the Great Game and the Defence of India, 1885-1897*. University of Exeter, Sept. 1999, 221-222, 240-242.

¹⁴⁴⁶ The Hon. Lorrin A. Thurston, "The Growing Greatness of the Pacific", *The North American Review*, 160, (April 1895), 455.

¹⁴⁴⁷ Papastratigaskis, *Russian Imperialism and Naval Power*. (2011), 61.

The Russian Pacific coast was 'frustrated by the rigor [sic] of nature, as the Winter temperature along the western coast of the Pacific is much lower than in corresponding latitudes either in America or Europe.'¹⁴⁴⁸ Vladivostok had a fine harbour, three miles in length, permitting the ships of the Pacific Fleet to anchor close to shore. The entrance to the bay was protected by shore batteries (and during times of crisis, submarine mines), but the headland that separated the bay from the sea was narrow. During a conflict, hostile warships could elevate their guns to fire over the spit of land and into the anchorage or upon key shore facilities. Although not free from ice, Golden Horn Bay was usually frozen over late in December but thawed in mid-February. This was under ideal conditions, as ice could block the port sometimes until mid-April.¹⁴⁴⁹ After the ice thawed, a surge in shipping would enter the anchorage and soon the bay would be 'well filled up with vessels'.¹⁴⁵⁰ Not a perfect outlet to the Pacific, but it was the best available for the Russians to take belated advantage of a weakening Chinese Empire.¹⁴⁵¹

Vladivostok was initially 'strategically insignificant', but that changed during the later nineteenth century. Russia had undertaken incremental steps to improve its main outlet to the Pacific.¹⁴⁵² The port shared a similarity with Bermuda as the land was not suitable for the construction of a conventional dry dock. Whereas the Atlantic island base stood on incompatible porous stone, the main Russian naval facility in the Far East was perched on a narrow strip of land,

¹⁴⁴⁸ 'Russian Designs on Corea [sic]', *NYT*, 19 December 1881, 6.

¹⁴⁴⁹ 'Weather and Navigation', *Shields Daily Gazette*, 28 April 1883, 4, TNA, FO 925/2746, 'Plan of Valdivostock [sic], Showing Defences.' 3 December 1878, 'Russia in the North Pacific', *NYT*, 26 September 1880, 3.

¹⁴⁵⁰ 'Weather and Navigation', *Shields Daily Gazette*, 6 July 1883, 4.

¹⁴⁵¹ Muraviev, 'The Russian Pacific Fleet'. *Papers in Australian Maritime Affairs*, 20, (2007), 10.

¹⁴⁵² Beeler, *British Naval Policy in the Gladstone-Disraeli Era 1866-1880*. (1997), 228.

bounded by seas and high hills, and locked most of the year in permafrost. The solution was a floating dry dock built on the same lines as the dock at Bermuda. In July 1880, Russia ordered an iron floating dry dock from a British shipbuilder for its Pacific base.¹⁴⁵³ This dock (301 feet in length), was built on the lines of a similar floating dock built by Clark, Stanfield and Company of London for the Russian Navy to hoist its circular 'Popovka' ironclads.¹⁴⁵⁴ The new dock was capable of lifting 7430 tons, and would provide the Siberian port with the ability to repair or clean the hull of any cruiser in the Russian Navy of the time. Vladivostok was making strides to earn its moniker 'The Sebastopol of the Pacific', but this base remained an isolated port until the end of the century when it became the terminus of the Trans-Siberian Railway. Steady improvements were made to the naval base, but it remained an alternative post for the Russian Pacific Squadron, in favour of the warmer waters of Japan and the large dry docks at Nagasaki and Yokohama.¹⁴⁵⁵ In September 1883, Vladivostok received its floating dry dock from Britain, and Russian officers would 'cherish the hope that their ships will now become independent of Japanese ports'.¹⁴⁵⁶ In the event of war, Vladivostok would be defended by mines and torpedo boats as the Russian Pacific Squadron, at least at the outset of the conflict, was expected to operate against British commerce.¹⁴⁵⁷

¹⁴⁵³ 'China and Russia', *Bath Chronicle and Weekly Gazette*, 22 July 1880, 6

¹⁴⁵⁴ No Subject, *Dundee Courier*, 6 February 1882, 3, 'Proposed Dock Accommodation for Dartmouth', *Exeter and Plymouth Gazette Daily Telegram*, 14 December 1882, 4. No Author, *Particulars of the War Ships [sic] of the World*. (London, 1893), 39, Woodward, *The Russians At Sea*. (1965), 110.

¹⁴⁵⁵ *Particulars of the War Ships [sic] of the World*. (1893), 38, 39, 'Points', *Leeds Times*, 18 May 1882, 4, Bonsal, 'Eastern Siberia', *Harper's New Monthly Magazine*, 97, (July 1898), 247, 259.

¹⁴⁵⁶ 'Epitome of News', *Tamworth Herald*, 15 September 1883, 7.

¹⁴⁵⁷ Papastratigaskis, *Russian Imperialism and Naval Power*. (2011), 84.

Sir Henry Brackenbury, the Director of British Military Intelligence felt that an attack on Vladivostok would not have any impact on affairs in Europe.¹⁴⁵⁸ Nevertheless, blockade and attack against Russia's only Pacific fortress would influence St. Petersburg at the other end of the long Russian telegraph line and would cut the Czar's Pacific cruisers off from a home base. Vladivostok was one place where 'England's power could make itself felt', but actions against the Russia coasts (aside from the certainty of blockading all Russian ports) in the Baltic and Black Sea would be heavily contested, and the deployment of a corps-sized British Army Expeditionary force of 36,000 men would not have a guarantee of success in the Baltic unless, Russia was 'in a very enfeebled condition'.¹⁴⁵⁹ Vladivostok was considered 'the only vulnerable point of the Russian Empire in the event of war'.¹⁴⁶⁰

Commerce Protection and Coal Supplies

Arthur J. Marder wrote in *The Anatomy of British Sea Power* that a Russian war against British commerce was never feared in Whitehall. The reason was due to Russia's geographical position as it 'was a poor one in a naval war; she had few cruisers and coaling stations'.¹⁴⁶¹ This appears true only in retrospect when compared with the much larger and closer threat from Germany in the early years of the twentieth century.

¹⁴⁵⁸ Johnson, "Russian at the Gates of India"? Planning the Defence of India 1885-1900', *Journal of Military History*, 67, (Jul. 2003), 710, 735.

¹⁴⁵⁹ TNA, CAB 37/13, 'England's Means of Offence against Russia', No. 36, (1884), 1-3.

¹⁴⁶⁰ Jane, *The Imperial Russian Navy*. (1983), 397, 399.

¹⁴⁶¹ Marder, *The Anatomy of British Sea Power*. (1976), 88.

Of the 22,000 or so British merchant ships in service in 1875, slightly more than 3400 were steamers, whereas over 18,000 were sailing ships. Of the steamers, only some 300 had a speed of 12 knots or over.¹⁴⁶² The tramp steamers were considered to be 'an absolute necessity for the actual support of life' in Britain. Most British steamers plodded along at a speed of advance closer to 8 knots. The dependable and thus predicable tramp steamer was the commerce raiders' 'inevitable prey'.¹⁴⁶³ The tramp steamer might have been the main quarry of an enemy commerce raider, but the forlorn sailing ship, gliding along with a partial cargo of coal en route to an a remote harbour, could provide fuel to a hostile warship if it was unlucky enough to be captured.¹⁴⁶⁴

Sailing ships supplied coal to ports on distant oceans, especially in the Pacific, and the P & O line operated 170 sailing colliers to maintain the supply for their steamers traveling to India.¹⁴⁶⁵ British coaling stations aided other powers such as the French and Russians, in shuttling reinforcements and replacements to and from their overseas colonies and remote bases. As one contemporary observer put it: 'In peace-time, the redistribution of naval force can be arranged without any difficulty by the aid of foreign ports, and the successive reinforcements and reliefs of the Russian squadron in the Far East have been facilitated by the British coaling stations of Aden, Colombo, Singapore, and Hong-Kong'.¹⁴⁶⁶

¹⁴⁶² Brown, *Warrior to Dreadnought*. (1997), 87-88.

¹⁴⁶³ Ropp, *The Development of a Modern Navy: French Naval Policy 1871-1904*. Edited by Stephen S. Roberts. (1987), 320.

¹⁴⁶⁴ Daniel R. Headrick, *The Tools of Empire*. (Oxford, 1981), 169, Corbett, *Some Principles of Maritime Strategy*. (2006), 244.

¹⁴⁶⁵ Brown, *Warrior to Dreadnought*. (1997), 108.

¹⁴⁶⁶ Clarke, *Russia's Sea-Power Past and Present*. (1898), 157.

Britain, held an 'unrivalled chain of stations on the routes to the China Seas', and used these possessions to her advantage for the benefit of her navy and merchant marine, and on occasion, to restrict the movements of a rival during times of increased international tensions.¹⁴⁶⁷ In 1885, the Russian Navy discovered the liability of having to depend on British coaling stations on the route to the Pacific via Suez. During one encounter, a Russian cruiser was followed by the British ironclad *Orion* until the Russian warship was left astern as the *Orion* steamed ahead to the next coaling station. When the Russian warship arrived at Aden, it discovered that the Royal Navy, acting on Admiralty orders, had bought up the entire coal supply at that port. Only a small amount was made available for the Russians, and the same was true when the cruiser arrived at Colombo. The lack of fuel restricted the Russian warship to half speed in order to conserve its already inadequate supply of coal.¹⁴⁶⁸ The type of coal made available to them was likely not the best Welsh anthracite as those stocks were usually reserved for British warships.¹⁴⁶⁹ Thus, during a time of increased tensions between the two empires, Russia could be hamstrung if not prepared to provide her own fuel sources on the route to their Pacific coast.

The coaling station at the northern Borneo port of Labuan, a necessary stop for warships travelling to Hong Kong during the monsoon season, had plans to move the coal inland during wartime where the fuel stockpile could be defended by a small redoubt.¹⁴⁷⁰ On 11 April 1885, the senior British naval officer at Singapore relayed (via telegram) information concerning the arrival of a Russian

¹⁴⁶⁷ Ibid, 164-165.

¹⁴⁶⁸ Parkinson, *The Late Victorian Navy*. (2008), 72-73.

¹⁴⁶⁹ Brown, *Warrior to Dreadnought*. (1997), 108.

¹⁴⁷⁰ Donald Mackenzie Schurman, *Imperial Defence 1868-1887*. Edited by John Beeler, (London, 2000), 113.

immigrant ship bound for Vladivostok. In that report, he asked permission to purchase 2000 tons of Welsh coal stored in Borneo to prevent the Russians obtaining the supply.¹⁴⁷¹ In early May 1885, W. B. Dalley, acting Colonial Secretary for New South Wales, telegraphed a request to the other Australian colonies asking their financial support to all merchants who refused to supply coal to Russian cruisers in their waters.¹⁴⁷²

Russia was aware of her fuel limitations, but petroleum offered a solution. Steamers on the Caspian and locomotives in southern Russia burned it with only a few adaptations to existing boilers, and it offered advantages in loading and costs over coal. The adoption of oil as substitute for coal would give the main petroleum suppliers, America and Russia, an advantage over the trade in coal dominated by Britain.¹⁴⁷³ During the crisis of 1885, the Royal Navy would need over 3500 stokers if full mobilization were implemented, but liquid fuel offered the hope of a manpower reduction for some smaller warships as stokers were not required for oil-fired boilers. If tests proved the serviceability of the new fuel, weight and space could also be saved as fans for forced draught aboard torpedo boats would no longer be needed.¹⁴⁷⁴ In August and early September 1885, experiments with liquid fuel were held aboard the British torpedo boat, No. 22, in Portsmouth. The trials were not successful, as the coal oil produced an intense amount of smoke, and 'disagreeable' smell, but the main fault was a difficulty in

¹⁴⁷¹ TNA, ADM 50/299, *Journal of Vice-Admiral Sir William M. Dowell, K.C.B. Commander-in-Chief on the China Station*. 1 April 1885-30 June 1885. (The report was telegraphed to Admiral Dowell, aboard *Audacious* then at Nagasaki)

¹⁴⁷² 'Patriotic Proposal in Australia', *Sheffield Daily Telegraph*, 7 May 1885, 5. Dalley's request was based on a paper written by then Rear Admiral George Tryon, the Commander of the Australian Station

¹⁴⁷³ No Subject, *Dundee Evening Telegraph*, 16 May 1885, 2, 'Petroleum for Steamers', *Peterhead Sentinel and Buchan Journal*, 20 May 1885, 3.

maintaining steam.¹⁴⁷⁵ The 'revolution' of the oil-fired boiler was beginning, but technology had to mature before a new fuel would supersede the proven coal stockpiles already in place at strategic locations around the world.¹⁴⁷⁶

The ownership of these vital coaling stations gave the Royal Navy the ability to refuel at will and, combined with the submarine telegraph cable, the ability to concentrate at a point of danger when required. During the last years of the nineteenth century, Britain was, in the words of Georges Clemenceau 'isolated from all, but free in every motion', largely due to her navy and her interconnected coaling stations and communications links.¹⁴⁷⁷

France Resurgent

Chinese and French moves to occupy positions in northern Vietnam led to open conflict with Beijing after the government of Jules Ferry in Paris issued an ultimatum to China on 12 July, 1884. China refused to comply with the demand, prompting a French attack which began with a bombardment of the port of Keelung on northern Taiwan. France embarked on an undeclared war with China that brought French successes at sea, but her naval operations tested the limitations of neutrality.¹⁴⁷⁸ The conflict would place Britain in an uncomfortable position as the leading neutral power in the region, with Hong Kong serving as the main supply base for the French fleet operating against Chinese coastal positions and squadrons. France made use of Hong Kong to coal, supply, and

¹⁴⁷⁴ 'Is Our Navy Ready for War?', *China Mail*, 24 April, 1885, 3, 'Torpedo Boats', *Exeter Flying Post*, 19 August 1885, 3.

¹⁴⁷⁵ 'News of the Day', *Portsmouth Evening News*, 9 September 1885, 2.

¹⁴⁷⁶ 'Petroleum for Steamers', *Peterhead Sentinel and Buchan Journal*, 20 May 1885, 3.

¹⁴⁷⁷ Clemenceau, 'The French Navy', *The North American Review*, 164, (Feb, 1897), 181.

¹⁴⁷⁸ Piotr Olender, *Sino-French Naval War 1884-1885*. (Sandomierz, 2012), 28, 38-40.

repair warships, but her logistical undertakings there strained relations with London as the conflict continued.

Access to Hong Kong was the reason Paris did not declare war on China as Britain would have been compelled to enforce neutrality laws during the conflict.¹⁴⁷⁹ This was a clever diplomatic tightrope walk, as the British colony provided France with an essential base and ‘without the use of Hong Kong the war would have been impossible’.¹⁴⁸⁰ Ironically, Chinese stevedores at Singapore and Hong Kong were reportedly compelled to help coal French warships en route to the conflict and this drew the attention of M.Ps in Westminster as they questioned aspects of British neutrality.¹⁴⁸¹

One officer aboard the French cruiser *Primauguet* complained that refueling had taken three days in Hong Kong, as the British supplied coal was ‘doled out to us sparingly, so as not violate their neutrality’.¹⁴⁸² The French use of Hong Kong had generated tensions with the local Chinese and by the autumn of 1884, strikes, protests, and rumours of sabotage raised tensions further. In September, Chang Chih-tung, the newly appointed viceroy in Canton, feared a French attack on his city, and issued a call for ethnic Chinese workers in the European colonies (Penang, Singapore and Vietnam) to kill French personnel through either direct

¹⁴⁷⁹ *Ibid*, 41, 62

¹⁴⁸⁰ ‘The Defences of Hong Kong’, *Manchester Courier and Lancashire General Advertiser*, 26 December 1884, 6.

¹⁴⁸¹ *Hansard*, 24 Oct 1884, Volume 293, cc 157-8.

¹⁴⁸² David Wilmshurst, ‘Hong Kong during the Sino-French War (1884-1885): Impressions of a French Naval Officer’, *Journal of the Royal Asiatic Society Hong Kong Branch*. 50, (2010), 157. Note: This officer, Charles-Dominique-Maurice Rollet de l’Isle, was honored when Rollet Island, Antarctica was named for him during a French expedition in those seas, 1903-1905, see page, 162.

attack or by poison. Hong Kong was not directly mentioned, but Chinese working there and Macao were certainly made aware of the proclamation.¹⁴⁸³

The tensions with the French squadron in Hong Kong led British authorities there to provide an escort of Sikh policemen for the second in command of the French fleet, Admiral Sebastian Lespres, when he was ashore in the colony.¹⁴⁸⁴ Protests against the French led to riots in Hong Kong on 3 October, and the Sikh police, imposing in their white uniforms and high red turbans, rushed in to quell the disturbances. When the protestors threw stones, the Sikhs opened fire with their carbines and drew swords. One hundred men from the East Kent Regiment (the local garrison) marched to the scene of the riot with fixed bayonets, and the warships of the China Station were put on alert.¹⁴⁸⁵ The disturbance had been brought to a close, but a detail from the *Audacious* was to be landed in the event a rumoured arson campaign got underway in the city.¹⁴⁸⁶

The French naval build-up caused a stir in British newspapers but with warships including the *Wivern* held in reserve at Hong Kong, Britain had 'far from an "insignificant fleet" out here, in spite of the croaking of alarmists at home'.¹⁴⁸⁷ Despite this claim, in a December 1884 London newspaper article, Admiral Sir J. C. Dalrymple feared that Britain was unprepared to meet a French surprise attack launched on a global scale. In his fanciful 'Kreigsspiel', he stated 'that

¹⁴⁸³ Elizabeth Sinn, 'The Strike and Riot of 1884-A Hong Kong Perspective', *Royal Asiatic Society Hong Kong Branch*, 22, (1982), 66, Lewis M. Chere, 'The Hong Kong Riots of October 1884: Evidence for Chinese Nationalism', *Royal Asiatic Society Hong Kong Branch*, 20, (1980), 58.

¹⁴⁸⁴ Wilmshurst, 'Hong Kong during the Sino-French War (1884-1885): Impressions of a French Naval Officer', *Journal of the Royal Asiatic Society Hong Kong Branch*. 50, (2010) 146.

¹⁴⁸⁵ Sinn, 'The Strike and Riot of 1884-A Hong Kong Perspective', *Royal Asiatic Society Hong Kong Branch*, 22, (1982), 65, 70.

¹⁴⁸⁶ *Ibid*, 71. Although French naval officer Rollet de l'Isle recorded in his diary that 26 were killed by the police, only one protester was killed but several more were wounded. See: Wilmshurst, 'Hong Kong during the Sino-French War (1884-1885): Impressions of a French Naval Officer', *Journal of the Royal Asiatic Society Hong Kong Branch*. 50, (2010), 155.

modern wars begin without declaration' and then described how Admiral Courbet's squadron at anchor in Hong Kong would suddenly spring to a pre-Christmas attack upon receipt of secret sealed orders from Paris.¹⁴⁸⁸ With his four ironclads, Courbet would ram the *Audacious* and the 'nondescript' *Wivern*, sinking both and thus put Hong Kong at his mercy. The colony would have been forced to surrender or the port, dry dock and shipping would have been fired. Recoaling from captured stocks, Singapore would have been next to fall under the guns of the attacking ironclads. The fast moving and unhindered French would then have charged into the Indian Ocean by early January 1885, seizing coal and destroying dockyards as they went. If the coastal defence ironclads *Abyssinia* and *Magdala* put up a fight at Bombay, they too would have been sunk in a similar attack run to that faced by the hapless Hong Kong ironclads. This was Dalrymple's alarmist 'coup' where the ram featured prominently in this fictitious surprise thrust against the British Empire.¹⁴⁸⁹

British naval officers in the Far East felt they had an advantage in morale and training. One Royal Navy officer at Hong Kong compared the warships of Britain with her rivals, calling the foreign 'specimens' of France, Germany and Russia 'a dirty, miserable obsolete lot...one does not know whether to laugh or cry over them'. He further noted most of the French vessels 'would not be used for coal hulks in the Royal Navy'.¹⁴⁹⁰ One British correspondent compared the disciplined crew of the *Audacious* with the men of the French ironclad *Galisonniere* and concluded the visitors 'had a lot to learn'. The claim was disingenuous, as the

¹⁴⁸⁷ 'News from the China Station', *Hampshire Telegraph*, 22 November 1884, 8.

¹⁴⁸⁸ 'England's Peril in Case of War', *Morning Post*, 6 December 1884, 3.

¹⁴⁸⁹ *Ibid*, 3.

¹⁴⁹⁰ 'Naval News from the China Station', *Hampshire Telegraph*, 29 August 1885, 8.

writer also noted France was 'our greatest and most dangerous rival for maritime supremacy'.¹⁴⁹¹

The French archived victories in China thorough a combination of naval actions and amphibious landings, and one western journalist claimed that Paris had spread western influence in China with 'the aid of the chassepot and mitrailleuse'. Despite these gains, she could not hold key islands in the face of determined British diplomatic opposition.¹⁴⁹² Hostilities officially ended on 9 June 1885, with the signing of the Treaty of Tientsin. France withdrew from Chinese territory, evacuating Keelung on Taiwan on 21 June and the Pescadores on 22 July, but she achieved her strategic objective as she obtained a free hand in Indo-China.¹⁴⁹³

The Royal Navy and Defensive Preparations 1885: The Penjdeh Crisis

The French undeclared war with China occurred during the siege of General Gordon's Egyptian forces at Khartoum by the Mahdi's army, and during a time of increased tensions along the Afghanistan frontier, as Russian forces pushed south causing concern for India's safety. The possibility of a multi-front war with Russia while facing a large-scale colonial campaign of 'incalculable dimensions...in the heart of Africa' was a heavy drain on British resources, especially manpower.¹⁴⁹⁴ Nevertheless Russian advances into northern Afghanistan represented the greater threat and the Royal Navy moved to prepare

¹⁴⁹¹ 'Naval News from the China Station', *Portsmouth Evening News*, 31 January 1885, 4.

¹⁴⁹² Thomas W. Knox, 'European Influences in Asia'. *The North American Review*, 141, July 1885, 90-91, Ropp, *The Development of a Modern Navy*. (1987), 150.

¹⁴⁹³ Olender, *Sino-French Naval War 1884-1885*. (2012), 101, 103.

¹⁴⁹⁴ 'Is Our Navy Ready for War?', *Pall Mall Gazette*, 13 March 1885, 1.

for hostilities from the Baltic to the Pacific. Russian troops occupied the frontier village of Merv in February 1884, prompting war planning in London should the Russians continue south.

In March 1885, Russian forces attacked the army position at Penjdeh on Afghanistan's northern frontier with the Russian Empire and the Gladstone Government in London prepared for war.¹⁴⁹⁵ Russian expansionism into Afghanistan had come not from individual officers acting rashly, but as part of a combined War and Foreign Ministries cooperation which 'made Russian policies unusually flexible and vigorous' [sic].¹⁴⁹⁶ The British response to the incursion would force the issue in St. Petersburg, and belatedly the Admiralty and the Minister of War were compelled to admit to the Czar that Russia was not ready for a conflict with the British Empire.¹⁴⁹⁷

Britain had flexible responses to Russian aggression. A plan to provide 30,000 British troops to reinforce India in the event of heightened tensions with St. Petersburg over activities in Central Asia was abandoned, as that would (according to General Sir Garnet Wolseley) 'play Russia's game'.¹⁴⁹⁸ The War Office would retain the options of an expeditionary force in Britain, ready to strike a Russian weak point.

One such place, as proposed by a British Military Intelligence officer, Major J. S. Rothwell, was to attack along the Russian railway line at their extreme southwestern flank in the Caucasus region, with the goal of threatening their

¹⁴⁹⁵ Peter Morris, 'The Russians in Central Asia 1870-1887', *The Slavonic and Eastern European Review*, 53, (Oct. 1975), 528.

¹⁴⁹⁶ *Ibid*, 522.

¹⁴⁹⁷ *Ibid*, 528, 529. Also see: Sergeev, *The Great Game, 1856-1907*. (2014), 208, A Russian diplomat later remarked on the Anglo-Russian tensions of 1885: 'One sometimes wonders how peace could have been maintained'.

supply lines via the Caspian Sea.¹⁴⁹⁹ Rothwell proposed that maps of the area around the Black Sea port of Batumi, 'should be studied with as much care as is bestowed on the military features of a district in England'. As those maps did not exist in the detail required, the Major suggested that two Russian-speaking officers, under cover as sportsmen or artists, travel to the area to collect the required intelligence.¹⁵⁰⁰ With updated information on the region, the railway to Baku would serve as a likely conduit for British operations into the Caspian, cutting a vital Russian supply route to Afghanistan.¹⁵⁰¹ In May 1885, Demetrius R. Peacock, the British Vice-Consul at Batumi was reportedly arrested by Russian police while making sketches at a Caspian port. He had journeyed extensively around the Trans-Caucasus and had attracted the attention of the Russian police due to his visits to key locations during his travels.¹⁵⁰²

In July 1885, an article in an Australian newspaper detailed the advantages of a British combined arms attack against Russian possessions in the Caucasus region, claiming these would prove to be of 'more service here than in knocking its strength out uselessly against the fortifications of the Baltic'.¹⁵⁰³ After an amphibious landing at the Georgian ports of Poti or Batumi, an overland expedition would move to secure the railway for the transport of a special naval unit:

'Torpedo-boats, gunboats, armed flats, and other vessels adapted to the circumstances would have been provided, to be taken across on rail and

¹⁴⁹⁸ Johnson, "Russian at the Gates of India"? Planning the Defence of India 1885-1900', *Journal of Military History*, 67, (Jul. 2003), 735.

¹⁴⁹⁹ TNA, CAB 37/13, 'England's Means of Offence against Russia', No. 36, (1884), 4-6.

¹⁵⁰⁰ *Ibid*, 6.

¹⁵⁰¹ *Ibid*, 4.

¹⁵⁰² 'Reported Arrest of A British Consul in Russia', *Sheffield Daily Telegraph*, 19 May 1885, 5, No Subject, *Leeds Times*, 4 June 1892, 3.

¹⁵⁰³ 'A Military Forecast', *Brisbane Courier*, 22 July 1885, 3.

launched on the shallow waters of the Caspian, and the upper hand once gained here would be truly decisive'.¹⁵⁰⁴

The concept of using British torpedo boats on the Caspian was later known to the naval authorities in St. Petersburg. A fictitious account of a Russian commerce raider (written in 1887), describes how one of the Czar's cruisers sinks British merchant ships and men-of-war in a series of surprise attacks in the South Atlantic and Indian Ocean during a war with Britain, which had begun over imperial competition in Central Asia.¹⁵⁰⁵ In this 'imaginary story', the commerce raider *Russia's Hope* captured a British steamer carrying pre-fabricated torpedo boats and charts of the Caspian.¹⁵⁰⁶

The North American and West Indian Squadron and the Russian War Scare of 1885

The actions of the corvette *H.M.S. Garnet* on the West Indies and North American Station in April 1885 provided an example of Nelson's reported maxim 'Close with a Frenchman and out manoeuvre a Russian'.¹⁵⁰⁷ Captain H. Hand of the *Garnet*, exceeded his orders and did both as he closed with and out manoeuvred the Russian corvette *Strelak* from Havana. The *Garnet* was under orders to proceed to Bermuda via Key West, but Hand trailed the Russian

¹⁵⁰⁴ Ibid, 3.

¹⁵⁰⁵ Anonymous, '*The "Russia's Hope" or, Britannia No Longer Rules the Waves: Showing How the Muscovite Bear got at the British Whale*', Translated from the original Russian by Charles James Cooke, (London, 1888) ii, iv, 17, 50, 55, 57.

¹⁵⁰⁶ Ibid, 106-107. This book reportedly inspired Karl von Müller, captain of the German cruiser *S.M.S. Emden*, to attack the ports of Madras and Penang during the first months of World War I. See: Woodward, *The Russians at Sea*, (1965), 118.

¹⁵⁰⁷ Clarke, *Russia's Sea-Power Past and Present*. (1898), 128.

corvette and followed her to Norfolk, Virginia where he anchored close to his quarry.¹⁵⁰⁸ Both captains were on cordial terms, but the attitudes of the officers were noticeably different. In interviews published in American newspapers, one British officer stated that the men on the *Garnet* were 'anxious for a fight'. A Russian officer aboard the *Strelok* responded to another American reporter by saying that the Russian sailors had 'no particular desire to fight against England', but that they would do their duty. Acting on orders from St. Petersburg, Captain Sarydloff escaped his ship's British shadow by slipping out of Norfolk after midnight on 1 May. The *Strelok* steamed at full speed (dropping off the pilot beforehand) to 'cut the water like a swan', in order to anchor in New York Harbour and temporarily break away from her pursuer.¹⁵⁰⁹ The heavier *Garnet*, delayed by weather, arrived at New York two days later.¹⁵¹⁰ Her presence hampered Russian efforts to obtain key materials from America, as five Russian merchant ships stayed at anchor in the harbour as tensions with Britain remained high.¹⁵¹¹

In the early morning hours of 5 May 1885, the *Garnet* was the target of a demonstration to test the utility of another form of torpedo. After 1 a.m., Paul Boyton, the inventor of an early inflatable wetsuit, swam out from Staten Island to attach a new weapon to the British corvette anchored less than one third of a mile offshore. This weapon was equipped with a clockwork timer, crushed stone to simulate an explosive charge, and empty sub-compartments to aid in floating or submerging the torpedo, or as it would be known today, limpet mine. Boyton

¹⁵⁰⁸ 'Ready for a Fight', *NYT*, 25 April 1885, 1.

¹⁵⁰⁹ *Ibid*, 1, 'The Strelok in Our Port', *NYT*, 1 May 1885, 1,

¹⁵¹⁰ 'Arrival of the Garnet', *NYT*, 3 May 1885, 9.

¹⁵¹¹ 'Russian Cruiser Watched', *Nottingham Evening Post*, 29 April 1885, 2. The Russian corvette remained at New York to be near a neutral telegraph link. See: 'A Visit to the Strelok', *Sacramento Daily Record-Union*, 11 May 1885, 4.

succeeded in securing the mine to the ship's starboard side undetected, but when he swam away, he utilized his paddle and the splashing sound led to his discovery by the watch. Intercepted by the *Garnet's* steam launch, Boyton was released, but his stunt had proven his assertion that 'no ship at anchor is safe from certain methods of torpedo warfare'.¹⁵¹²

Repercussions were swift. By 15 May, a naval inquiry held at Halifax resulted in the marine sentry on duty aboard the corvette being sentenced to 45 days confinement for failing to detect the swimmer, and the officer of the watch, a Lieutenant Gardner, was to be tried by Court-martial for releasing Boyton.¹⁵¹³ Hand was replaced by the Honourable Victor A. Montague as the ship's commander within days of the *Garnet's* arrival at Halifax from New York.¹⁵¹⁴

During the night of 25 May, a man rowed near the corvette *H.M.S. Canada* and nearby warships at anchor in Halifax. When the boatman failed to respond to a hail from the sentry, he was fired upon and picked up by a launch from the corvette. Later released for being 'more stupid than malicious', the warships of the squadron were on increased alert.¹⁵¹⁵ Reports of Fenian activity in western Canada, (with infiltrators coming from New York City and Buffalo), had raised alarms that spring.¹⁵¹⁶ These reports, combined with Boyton's stunt, and Russian efforts in North America, compelled British authorities to improve area defences to meet the diverse challenges.

¹⁵¹² 'Against the Garnet's Side', *New York Daily Tribune*, 7 May 1885, 1. The news of Boyton's mock mine attack was relayed to St. Petersburg via enciphered message by Russian agents in New York. See: 'Another British Cruiser', *The Sun*, 8 May 1885, 1.

¹⁵¹³ 'Captain Hand to be Tried', *New York Daily Tribune*, 16 May 1885, 1. 'The Alarm on H.M.S. Garnet', *Newcastle Courant*, 22 May 1885, 3.

¹⁵¹⁴ No Subject, *Hampshire Advertiser*, 23 May 1885, 8.

¹⁵¹⁵ 'General News', *Manchester Courier and Lancashire General Advertiser*, 13 June 1885, 11.

¹⁵¹⁶ 'Fenian Warfare', *Royal Gazette*, 24 March 1885, 3. 'A Fenian Expedition', *Royal Gazette*, 14 April 1885, 5.

As the *Garnet* was following the *Strelok* from Havana, the Bermuda garrison was strengthening local defences.¹⁵¹⁷ On 23 April a suspicious fire broke out aboard the troopship *H.M.S. Wye* as she was loading condemned stores at Bermuda. A week later, the *Canada* also caught fire at the dockyard. Although the fires were extinguished in time and no injuries were reported, these incidents led to increased vigilance by the military and naval authorities on the island fortress as fears of a Fenian sabotage plot were raised.¹⁵¹⁸ That summer the *Scorpion* was only mentioned in the navy station lists published in British newspapers. Her readiness can only be guessed at for the Bermuda papers did not discuss her during the crisis.¹⁵¹⁹ Despite the lack of news reporting, the warships of the squadron and the gunners of the fortress received over 100 tons of ordnance stores as 'considerable activity' occurred at Woolwich to forward supplies to Bermuda.¹⁵²⁰

The Russian minister to Washington was reportedly attempting to induce an American naval officer to help him select steamers for purchase, with an eye to converting them into auxiliary cruisers.¹⁵²¹ Russia was apparently interested in acquiring fast steamers from a Philadelphia shipbuilder in a repeat of the Volunteer cruiser acquisitions of 1878.¹⁵²² The shipyards along the Delaware River gave rise to what was termed 'The American Clyde', as this was the centre

¹⁵¹⁷ 'War Preparations', *Sheffield Daily Telegraph*, 30 April 1885, 5.

¹⁵¹⁸ 'A British War Ship [sic] on Fire', *Yorkshire Gazette*, 23 May 1885, 10, 'Suspicious Fires aboard the Wye and Canada. Supposed Fenian Plots', *Manchester Courier and Lancashire General Advertiser*, 23 May 1885, 15.

¹⁵¹⁹ 'Navy Stations for May, 1885', *Lloyd's Weekly Newspaper*, 3 May 1885, 3. 'Stations of the British Navy for July', *Liverpool Mercury*, 13 July 1885, 3.

¹⁵²⁰ No Subject, *Sheffield Daily Telegraph*, 16 June 1885, 8, 'Naval and Military Intelligence', *Morning Post*, 3 September 1885, 5.

¹⁵²¹ 'Excitement in India. Active War Preparations', *Portsmouth Evening News*, 13 April 1885, 3.

¹⁵²² 'Russian War Cruisers', *Portsmouth Evening News*, 26 March 1885, 2.

of American shipbuilding in the post-Civil War United States.¹⁵²³ On 3 May 1883, Philadelphia shipbuilder John Roach received a contract from Washington authorizing his firm to build the first steel warships of the U.S. Navy. These four ships would consist of the small cruisers *Atlanta*, and *Boston*, the larger cruiser *Chicago*, and the dispatch vessel *Dolphin*, the so called 'ABCD' of the U.S. fleet.¹⁵²⁴ Boggled down by the difficulties of working with steel and additional design modifications, Roach reportedly offered to sell the ships to Russia. The *New York Times* commented on the design failings of the new steel warships by referring to them as 'Mr. Roach's marine curiosities', noting that they were 'too slow to overtake anything even when their machinery does not breakdown...have no guns worth mentioning and are more or less unseaworthy'.¹⁵²⁵

The warships of the British North American and West Indian Squadron were positioned at key locations near the continent in readiness to respond to a Russian corvette or an auxiliary cruiser purchased from American ship owners and armed in international waters. The British warships 'comprised an effective coastguard on duty from Halifax to Havannah [sic], and also in the Gulf of Mexico', with administrative control from Bermuda.¹⁵²⁶ As the island fortress was not then connected to the Empire via submarine telegraph, the corvette *H.M.S. Tenedos* was held at Halifax in readiness to steam to Bermuda at short notice and carry sealed orders to the colony if war was declared on Russia.¹⁵²⁷

¹⁵²³ Harry Kyriakodis, *Philadelphia's Lost Waterfront*. (Charleston, 2011), 34.

¹⁵²⁴ J. D. Jerrold Kelly, *The Question of Ships: The Navy and the Merchant Marine*, (New York, 1884, Reprinted 2009), 128, 130, 209.

¹⁵²⁵ Kenneth G. Hagan, *American Gunboat Diplomacy and the Old Navy, 1877-1889*. (Westport, 1973), 40, 42. 'Our Neutrality in Danger', *NYT*, 16 April 1885, 4.

¹⁵²⁶ 'Russian Naval Preparations', *Hampshire Advertiser*, 25 April 1885, 2.

¹⁵²⁷ 'Latest Foreign News', *National Republican*, 2 May 1885, 1.

The China Station and the Russian War Scare of 1885

The number of warships Russia could hope to employ against British commerce or a colonial outpost was never large, but the threat was not only against ships or a given locale, but also against a strategic object: Britain's submarine cables, which, during times of war, were exposed to 'special and peculiar risks'.¹⁵²⁸ Regarding the supply of spare telegraph cable, on 14 April 1885, The Earl of Carnarvon warned Parliament:

*In 1878, when there were great alarms as to a Russian war, the Russian Government, who were, perhaps, more alive to the circumstances of the case than we generally were, had taken measures for cutting the submarine cables, and for equipping ships for that special purpose. It was said at the time and on good authority, and was generally believed, that there was a carefully elaborated scheme for taking measures against our submarine cables in the Eastern waters.*¹⁵²⁹

The fear of attack against the cables led to an 1886 circular which warned colonial governors that a break in communications via the submarine cable during times of international complications, should be interpreted as an apparent indication hostiles between the British Empire and the unfriendly power had begun.¹⁵³⁰ This possible indicator was not a reliable one, as the single Hong Kong cable connecting to Saigon occasionally suffered breakdowns and remained the only southern link until another cable was laid from Labuan to Hong Kong in 1894.¹⁵³¹ One precaution proposed by an Edinburgh newspaper, envisioned that cable repair vessels would be protected by cruisers of the Royal

¹⁵²⁸ *Hansard*, 14 April 1885, 296, 1605.

¹⁵²⁹ *Ibid*, 1606.

¹⁵³⁰ Donald C. Gordon, 'The Colonial Defence Committee and Imperial Collaboration: 1884-1904'. *Political Science Quarterly*, 77, (Dec., 1962), 530

Navy during war-time operations when dispatched to repair a severed communications link.¹⁵³² From Honolulu, one newspaper reported a rumour that Russian cruisers were prepositioned at ports in the Pacific 'in readiness, in case of war, to cut the ocean cables connecting England with China, India and Australia'.¹⁵³³ Although Russia was only a 'second rate' naval power, the Czar's admirals had 'made a very good disposition of her forces abroad', in preparation for a war with Britain.¹⁵³⁴

During the 1885 Afghan crisis, the Russian Navy sent reinforcements to the Pacific in order to add more potential threats to British shipping on the Asian sea lanes.¹⁵³⁵ The Royal Navy reacted to the increased tensions by following all Russian warships at sea in relatively close proximity in a manner that can be described as aggressive shadowing.

The Russians frantically prepared their coastal defences to offer some counter against the British naval bombardments they feared were inevitable: 'Russia, if challenged, must fight at Vladivostok' and they 'would fight at a great disadvantage', according to one British writer.¹⁵³⁶ In late April 1885, a rumour was reported in St. Petersburg that 'four English monitors are cruising in the vicinity' of Vladivostok. Russian naval authorities were 'at fever heat' over the report, and asked for increased funding of 25 million rubles (then approximately £5 million), to strengthen their navy.¹⁵³⁷ The garrison commander at Vladivostok reportedly sent the women and children away from the city, fearing civilian

¹⁵³¹ K.R. Haigh, *Cableships and Submarine Cables*. (London, 1968), 118.

¹⁵³² 'Protection of Submarine Cables', *Edinburgh Evening News*, 11 May 1885, 4.

¹⁵³³ 'Foreign News', *Hawaiian Gazette*, 27 May 1885, 6.

¹⁵³⁴ 'Russia's Naval Strength', *Dundee Evening Telegraph*, 13 June 1885, 3.

¹⁵³⁵ Muraviev, 'The Russian Pacific Fleet'. *Papers in Australian Maritime Affairs*, 20, (2007), 11.

¹⁵³⁶ Clarke, *Russia's Sea-Power Past and Present* (1898) 149.

casualties if the Royal Navy commenced a bombardment. The port was closed to foreign ships unless under the control of a Russian pilot, and mines were sown in an effort to protect the port from a hostile British squadron.¹⁵³⁸

In late April, the *New York Times* speculated that Chinese waters were ‘the point where England would suffer’, and stated that except off the Asian coasts, ‘the Russian Navy cannot assume the offensive’. That article mistakenly claimed the peacetime force of British corvettes and gunboats were ‘non-values’ during the threatened war. These warships in Chinese waters would not assist the Royal Navy as those vessels were unarmoured and inadequately armed...‘they will do little good and less harm’.¹⁵³⁹ The newspaper had not taken the *Wivern* into account.

In Hong Kong, the *Wivern* had been reconditioned in anticipation for a return to active service. On 11 February 1885, she went out to fire her guns while the fleet commander was aboard. She had been fitted with two iron fighting tops, both of which were equipped with a Nordenfelt, as part of the overhaul to render her ‘into first class fighting efficiency’.¹⁵⁴⁰ The masts no longer carried sails but were two ‘posts that supported the circular framework’ of the fighting top. With the machine guns behind iron shields, the Nordenfelts could fire ‘a bullet as big

¹⁵³⁷ ‘England and Russia’, *Birmingham Daily Post*, 28 April 1885, 8, ‘The Anglo-Russian Quarrel’, *NYT*, 25 April 1885, 1.

¹⁵³⁸ ‘Birmingham Arms for Russia’, *Tamworth Herald*, 9 May 1885, 6. ‘Immense Naval and Military Preparations’, *Dundee Evening Telegraph*, 29 April 1885, 3, ‘Port Hamilton’, *Shields Daily Gazette*, 14 May 1885, 3.

¹⁵³⁹ ‘Ships Ready for War’, *NYT*, 18 May 1885, 5. This article understated British ironclads strengths on the both the North American and China Stations as it also did not mention the *Scorpion*.

¹⁵⁴⁰ ‘Naval News from the China Station’, *Hampshire Telegraph*, 4 April 1885, 8, also see: ‘The China Station’, *Portsmouth Evening News*, 7 January 1885, 4. This account describes the *Wivern* being fitted with her tops, and with her two TBs aboard, ‘presents a formidable appearance, quite in contrast to the comical-looking Frenchmen, half-funnel, half-cork ram’.

as a pigeon's egg' against any hostile target within range.¹⁵⁴¹ The military mast of the late Victorian era was considered by one New York journal to be 'a position perhaps the most dangerous in all naval warfare'. Describing the difficulties of manning that position during a battle, the newspaper commented: 'It is no easy task to fire from a platform placed at the bob end of a pendulum, swinging irregularly, and the results attained testify to the value of the drill and to the physique of the individual'.¹⁵⁴²

Drill was a strong suit of the Royal Navy. Although outnumbered by the foreign warships on the China Station, one observer wrote: 'British men-of-wars men are superior in physique, discipline, and stamina', to the seamen on French, Italian and Russian warships.¹⁵⁴³ Jan Morris, in her *Pax Britannica*, made a comparison of *esprit de corps* between British men-of-war and those of her nearest rivals during these years: 'Group photographs of ships' companies emanate a delightful sense of cocky cheerfulness, very different from the moustachio'd melancholy that seemed to hang around the crews of French or Russian ironclads'.¹⁵⁴⁴

The British press reported the *Wivern* was to be commissioned in preparation for steaming to join the British warships off Vladivostok, yet the China Squadron needed reinforcements, and was 'fully occupied' with the needs of local defence.¹⁵⁴⁵ The land defences of Hong Kong were considered inadequate, and the *Wivern* with her torpedo boats, was in demand. Nevertheless, her status as

¹⁵⁴¹ 'Arrival of the Agamemnon', *China Mail*, 25 March 1885, 3.

¹⁵⁴² 'The Man in the Military Mast Fills a Post of Deadly Peril', *Salt Lake Herald*, 1 May 1898, 20. (From an undated article in the *New York Tribune*. An article in a Dodge City, Kansas, newspaper referred to the French versions of the military mast as 'Growths'. See: 'The Evolution of the Fighting Top', *Globe-Republican*, 7 July 1898, 2.)

¹⁵⁴³ 'Naval News from the China Station', *Portsmouth Evening News*, 31 January 1885, 4.

¹⁵⁴⁴ Jan Morris, *Pax Britannica: Climax of an Empire*. (New York, 2002), 428.

a reserve warship escaped the attention of one observer, Charles-Dominique-Maurice Rollet de l'Isle, aboard the French warship *Primauguet*. The French officer wrote: 'The British do not have a large naval force in the region...they have quite a few gunboats in China, but most of them are obsolete, wooden craft. They won't put up much of a fight against the new Russian cruisers and ironclads'.¹⁵⁴⁶ The local press noted the Royal Navy had only two ironclads on station, the *Audacious* and *Wivern*, but the Russians had the armoured frigates *Vladimir Monomakh*, and the *Minin* in nearby Asian waters, and another armourclad frigate, the *General Admiral* was en route. The new turret ship, *H.M.S. Agamemnon* was steaming for the Far East via the Suez Canal, but the advantage in size of the ironclads lay with the Russians as the Hong Kong daily felt the 'contrast is not pleasant'.¹⁵⁴⁷

Russian crews employed a deception known in Russian military parlance as *Maskirovka*, loosely described as camouflage or concealment designed to appear stronger than they were. Russian officers in unprotected warships, were known to place false gun shields or 'dummy armour' over their guns in attempts to deceive visiting British officers. As late as 1899, crewmen aboard an armoured Russian man-of-war filled in the joints of the ill-fitted plates with wood

¹⁵⁴⁵ 'Naval News from the China Station', *Hampshire Telegraph*, 25 April 1885, 8.

¹⁵⁴⁶ Wilmshurst, 'Hong Kong during the Sino-French War (1884-1885): Impressions of a French Naval Officer', *Journal of the Royal Asiatic Society Hong Kong Branch*. 50, (2010), 158. Regrettably, the French officer made no mention of the *Wivern* or her torpedo boats, but did write, 'The residents of Hong Kong were worried about the possibility that the Russians, who have quite powerful forces in the vicinity, might bombard the town'.

¹⁵⁴⁷ 'Is Our Navy Ready for War?', *China Mail*, 24 April, 1885, 3.

and putty to give the appearance of a more uniform protective belt around the hull.¹⁵⁴⁸

In 1885, the numerical advantage in armoured ships in the Far East remained with the Russians as the *Wivern* was to be held back (at least initially), in order to be available for 'judicious use' to supplement the Hong Kong fortifications in the event of a Russian attack.¹⁵⁴⁹ On 28 March 1885, Rollet de l'Isle observed the 'great commotion' aboard the recently arrived *Agamemnon* as she hoisted her two torpedo boats aboard, and weighed anchor. The Frenchman observed the loading with professional curiosity writing: 'They (the torpedo launches) were hoisted aboard by means of a crane mast set up at her stern. This manoeuvre, delicate enough in a harbour, would have been impossible at sea. Why, we wonder, has she taken the trouble to load her torpedo launches?'¹⁵⁵⁰ Rollet de l'Isle again made no mention of the *Wivern* or her torpedo boats. The French officer likely did not observe the turret ship during his brief visits to the colony; he only saw a limited part of Hong Kong, as his ship was assigned to an anchorage reserved for warships, whereas the *Wivern* would likely have been anchored closer to shore near Kowloon where her guns could protect the coal depot.¹⁵⁵¹

Nevertheless, Lieutenant Gamble would have agreed with his assessment of the difficulty in loading the torpedo launches at sea. Gamble reported his concerns that the two TBs carried on the *Wivern* would have been damaged by the blast from the main turret guns, and noted the boats could not be hoisted out

¹⁵⁴⁸ Fred T. Jane, *The Russian Imperial Navy*, (London 1983), 531. Timothy L. Thomas, *Recasting the Red Star, Russia Forges Tradition and Technology Through Toughness*. (Fort Leavenworth, 2011), 385.

¹⁵⁴⁹ 'Naval News from the China Station', *Hampshire Telegraph*, 4 April 1885, 8.

¹⁵⁵⁰ Wilmshurst, 'Hong Kong during the Sino-French War (1884-1885): Impressions of a French Naval Officer', *Journal of the Royal Asiatic Society Hong Kong Branch*. 50, (2010), 158-159.

unless in a calm sea 'as the derrick only just-takes the boat clear of the ship's side'. Gamble proposed that a permanent facility be built ashore at Kowloon to house the torpedo establishment. Until that facility was completed, the turret ship would continue in her dual role as coastal defence ironclad and depot ship for the torpedo boats.¹⁵⁵²

Despite her limitations, the *Wivern* was valued in Hong Kong. An assertion made in the *Pall Mall Gazette* (in late 1884), that British gunboats on the China Station were 'slow tubs mainly manned by Chinese', generated some ire in Hong Kong. This article, combined with Sir Edward Reed's claim that the *Wivern* was 'a weak old gunboat', was met with some surprise in the China Squadron. The retort against the false claims of the London newspaper criticizing the preparedness of the China Station was continued in the *Hong Kong Telegraph* which proclaimed the 'Wivern is undoubtedly the most formidable fighting ship of any nation ever seen in Hong Kong Harbour'.¹⁵⁵³

The demands of a global conflict meant the Royal Navy could not spare more than a few ships for reinforcements to the Far East: 'little beyond the resources of Her Majesty's Squadron in China will be available' for the intended roles of coastal defence, protection of forward operating bases, blockade duty, and offensive operations.¹⁵⁵⁴ But the mission of shadowing Russian vessels around

¹⁵⁵¹ Ibid, 141, 157, TNA, MPI 1/492, *A Plan of Gun Boats [sic] Moorings at Kowloon laid down May 1881*.

¹⁵⁵² TNA, ADM 125/83, *China Station Records: Correspondence: Naval Establishments, Bases and Stores, Steam Reserve, Ordnance and Torpedoes*. 1880-1883. Enclosure No. 3, 'Suggestions Concerning Torpedo Service at Hong Kong', 3 January 1884.

¹⁵⁵³ 'Naval News from the China Station', *Portsmouth Evening News*, 31 January 1885, 4. A British correspondent aboard the *Audacious* remarked that the allegations against the China Station were 'so absurdly false that it deserves only to be laughed at.'

¹⁵⁵⁴ ADM 125/83, 'Report on the Defences of Port Hamilton', 24 Apr 1885, National Archives, (NA) Kew

East Asia was carried out 'with diligence'.¹⁵⁵⁵ In April 1885, the Admiralty sent a telegram ordering all commanding officers of British warships to cable the commander of each station, details of the movements of any Russian ships they observed.¹⁵⁵⁶

The tensions had been building for several months. In late March, China Station commander Vice Admiral William M. Dowell, asked the British Consul in Manila to inform him if the Russian warships coaling in that harbour had departed, and if so, their heading. The admiral asked the same of the British Minister in Tokyo.¹⁵⁵⁷ When the *Minin* steamed out of Nagasaki in late March 1885 bound for a Russian base on the Baltic, the band of the *Audacious* struck up *God Save the Czar*, and *Home, Sweet Home*, as a sendoff to their rivals. But the men aboard the British ironclad grumbled at having to cheer the 'oily-wad-eating, tallow-chowing, sons of guns', as they saw their anticipated prize money steam over the horizon. Two hours later, the *Audacious* and two British corvettes weighed anchor and followed the Russian ironclad to confirm she was headed away from Japan.¹⁵⁵⁸

The submarine cable network gave Dowell and the Admiralty a clear picture of Russian naval movements in the Far East, and permitted the deployment of forces to ensure an adequate defence of Hong Kong. This communications network also facilitated the assembly of British men-of-war at select positions in

¹⁵⁵⁵ Nish, 'Politics, Trade and Communications in East Asia: Thoughts on Anglo-Russian Relations, 1861-1907', *Modern Asian Studies*, 21, (1987), 669.

¹⁵⁵⁶ TNA, ADM 50/299, *Journal of Vice-Admiral Sir William M. Dowell, K.C.B. Commander-in-Chief on the China Station*. 1 April 1885-30 June 1885. (The order was telegram 'No. 40', dated 12 April 1885)

¹⁵⁵⁷ TNA, ADM 50/299, *Journal of Vice-Admiral Sir William M. Dowell, K.C.B. Commander-in-Chief on the China Station*. 1 January 1885-31 March 1885. (The order was telegram 'No. 57', dated 8 May 1885)

¹⁵⁵⁸ 'Naval News from the China Station', *Portsmouth Evening News*, 23 May 1885, 4.

order to secure local naval superiority against individual Russian warships or squadrons. The telegraph cable allowed the Royal Navy to mob the Russian men-of-war before they could reach a Russian port or while on their voyages to and from a neutral one.

Regarding the Royal Navy's surge in activity in the Far East, one London newspaper reported: the 'British squadron...is displaying considerable activity. The English ships follow the Russians in every direction: Indeed, each Russian man-of-war is followed by several English vessels, so that in case of war the Russian squadron could not easily join the fleet at Vladivostok'.¹⁵⁵⁹ At Yokohama, the *Agamemnon* encountered the Russian ironclad *Vladimir Monomakh* at anchor, ready for action with guns trained on the British warship. Like the *Garnet* in the Atlantic, the *Agamemnon* had shadowed the Russian warship, but the *Vladimir Monomakh* exhibited a hostile intent as a 'grudge match' developed between the two warships. This incident developed into a separate diplomatic flare up, with the British captain protesting the Russian's belligerent behaviour in a neutral port as being 'opposed to international interests', whereas the Russians considered the *Agamemnon*'s close shadowing into Yokohama to be a 'menacing and hostile act'.¹⁵⁶⁰ Steps were taken if another 'misunderstanding' occurred between the British and Russian warships at anchor in Japanese harbours. Dowell sent a telegram to the Admiralty asking they cable directly to the captain of the *Agamemnon* if war with Russia was declared, as it was feared that the Russian admiral in Japanese waters would not

¹⁵⁵⁹ 'The Franco-Chinese War', *Lloyd's Weekly Newspaper*, 31 May 1885, 12.

¹⁵⁶⁰ Parkinson, *The Late Victorian Navy*. (2008), 72.

respect the neutrality of those ports.¹⁵⁶¹ Clearly the tensions had elevated to the point where a miscalculation could lead to an elevated response, which could unintentionally spark hostiles.

Russia was eager to acquire swift steamers, and was anxious for her ships at sea near the shadowing corvettes and ironclads of the Royal Navy. At the northern terminus of the Suez Canal, the Russian shipping agent at Port Said received orders for the transports *Nostronia* and *Petersburg* to coal and steam for Vladivostok. They were under orders to avoid British ports on their long voyages to the East. This order hampered Russian deployments to Asia, as coal was not the only vital item of supply needed on the long voyage. Over a decade later, a Russian convict ship bound for the Far East suffered a water shortage as the vessel avoided all British ports except Singapore. The transport did not call at Hong Kong, ostensibly to avoid a storm, but when she arrived at Vladivostok, her potable water supply was almost exhausted.¹⁵⁶²

Britain had advantages of coaling stations, and enough ships either in service, ready reserve, or fast merchant steamers commissioned for temporary duty. With war in the Pacific viewed as increasingly likely, forward bases were needed. The remote reaches of Russia's Maritimes made 'Hong-Kong an important source of supply and means of refitting...but, now as always, the difficulties of carrying on naval war increase with the distance from the central sources of national strength'.¹⁵⁶³

¹⁵⁶¹ TNA, ADM 50/299, *Journal of Vice-Admiral Sir William M. Dowell, K.C.B. Commander-in-Chief on the China Station*. 1 April 1885-30 June 1885. (The order was telegram 'No. 57', dated 8 May 1885)

¹⁵⁶² 'Russian War Vessels in the Suez Canal', *Sunderland Daily Echo and Shipping Gazette*, 13 April 1885, 3.

¹⁵⁶³ Clarke, *Russia's Sea-Power Past and Present*. (1898) 165.

The Russian Navy was well aware of Hong Kong's strategic value and a rough concept for a surprise attack against that colony involved an expeditionary force of 2000-3000 men, landed from two troopships at or prior to the start of hostilities, while under the guns of two or three Russian men-of-war.¹⁵⁶⁴ A plan put forward in 1877 by the Russian Military Attaché in London, Major General Alexander Gorlov, envisioned hiring select Chinese living in Hong Kong to conduct sabotage attacks against British military and naval targets in the colony during wartime.¹⁵⁶⁵

The Russians also formulated concepts for an attack against western Canada and several Australian ports.¹⁵⁶⁶ A Honolulu newspaper reported in May 1885, that a Russian spy posing as a fur trader was observed in Victoria, British Columbia, making sketches of the harbour and fortifications there.¹⁵⁶⁷ A Sacramento newspaper refuted the story as a 'canard', but also claimed that statements made by a Canadian militia official were contradictory regarding emergency precautions in the colony.¹⁵⁶⁸

Concerns of a surprise attack on a distant British overseas port, prompted the Colonial Office to issue a confidential memorandum in the late 1880s which cautioned against allowing foreign men-of-war and troopships unrestricted access to key harbours and coaling stations. Foreign troopships were prohibited

¹⁵⁶⁴ Papastratigaskis, *Russian Imperialism and Naval Power*. (2011), 86.

¹⁵⁶⁵ Sergeev, *The Great Game, 1856-1907*. (2014), 165-166.

¹⁵⁶⁶ Papastratigaskis, *Russian Imperialism and Naval Power*. (2011), 86. In one fictional account, the Russian fleet blockades Melbourne, bombards a port in Ceylon, Russian cruisers burn Vancouver, and St. Petersburg obtains Hong Kong, and Port Hamilton in a favourable peace treaty with Britain at the end of the conflict. See: '*The "Russia's Hope"*', (1888), 168, 172.

¹⁵⁶⁷ 'In British Columbia' *The Pacific Commercial Advertiser*, 9 May 1885, 5.

¹⁵⁶⁸ 'British Columbia', *Sacramento Daily Record-Union*, 29 April 1885, 1. Over a year later, a Russian national, Stalef Aumelefer, was arrested in Port Moody, British Columbia, with sketches of the harbour, allegedly addressed to a representative of the Russian Government. See: 'Arrest

from sending men ashore to drill or exercise at key stations where it was feared the local garrison would be outnumbered. These stations included Bermuda, Halifax, Hong Kong, Malta, and Singapore.¹⁵⁶⁹ Several colonies were to restrict the number of warships and troopships a foreign power (two warships or one troopship) would be granted permission to enter harbour, with the only exception being during times of adverse weather.¹⁵⁷⁰

The *Wivern* was recommissioned for active service on 19 April, 1885, with a crew gathered from other warships recalled to Hong Kong. During a short gunnery exercise in April 1885, the turret ship conducted target practice although the weather conditions were described as 'unfavourable'. The effects of her reconstructions and frequent maintenance were telling, as the practice was termed 'very satisfactory' despite the bad weather.¹⁵⁷¹ Commissioning the *Wivern* was a temporary measure to provide security for the port with more foreign ironclads on station, but she was placed back into reserve when armed merchant steamers were ready to receive their crews at Hong Kong. Here speed was a priority over armour and heavy guns. The Royal Navy did not have enough men to fully crew all ships in reserve and also provide the complements for the auxiliary cruisers temporarily acquired to patrol the shipping lanes.¹⁵⁷²

of a Russian Spy in Canada', *Manchester Courier and Lancashire General Advertiser*, 18 November 1886, 3.

¹⁵⁶⁹ TNA, CAB 8/1, 'Measures of Precaution required for the Security of British Ports Abroad', No. 26, 20 April 1887, 2, 6, 7. The Indian Ocean coaling station of Diego Garcia was also included.

¹⁵⁷⁰ *Ibid*, 2, 3. The recommendations originated from an 1883 F.I.C. report which also addressed some concerns over a proposed Channel Tunnel. Among the seven ports listed, Bermuda and Hong Kong were included.

¹⁵⁷¹ No Subject, *China Mail*, 21 April 1885, 2.

¹⁵⁷² 'The Defence of Hong Kong', *Portsmouth Evening News*, 23 May 1885, 4, 'Naval and Military', *London Daily News*, 28 July 1885, 6. In 1884-5, the combined force of the Royal Navy and Royal Marines, was slightly under 57,000 personnel on active duty, down from a total of 84,000 in 1860-1. The number (from 1884-5) would double over the next sixteen years. See: William Ashworth,

The *Wivern* was returned to reserve status, and her improvised crew sent back to their ships on 22 July 1885, but the local authorities were 'very undecided as to be the proper course to adopt'. The uncertainty was due in part to war tensions with Russia, yet health was another consideration, as cholera outbreaks were reported along the southern coast of China, and getting men back to sea was likely a precaution.¹⁵⁷³

The Royal Navy needed a convenient harbour from which to blockade, or attack Vladivostok and constrict Russian naval activity in the Pacific. London did not wait until Russia presented another *fait accompli* as it had in Afghanistan, and the Admiralty was ordered to occupy a strategic position on the southern coast of Korea—the islets of Komundo, collectively referred to as Port Hamilton.¹⁵⁷⁴ From this location, the Royal Navy had a forward base from which to attack Vladivostok 850 miles to the north.¹⁵⁷⁵ To help secure the anchorage, the auxiliary merchant cruiser *Pembroke Castle* sailed north from Hong Kong with marines and stores aboard, ready to disembark as a nascent garrison.¹⁵⁷⁶ A detail of eight men (including a Lieutenant) were transferred from the *Wivern* to

'Economic Aspects of Late Victorian Naval Administration', *The Economic History Review*, 22, (Dec., 1969), 500.

¹⁵⁷³ TNA, ADM 53/12239, *Ship's Log H.M.S. Wivern*, 19 March 1885–22 July 1885, 'Naval News from the China Station', *Hampshire Telegraph*, 29 August 1885, 8.

¹⁵⁷⁴ Terry Bennett, *Korea: Caught in Time*. (Reading, 2009), xii, 4, 40, 41. Also see: TNA, ADM 231/2, *Admiralty: Foreign Intelligence Committee*, 'Port Hamilton', 1883–1884, 82. The anchorage of Port Hamilton was formed by the small islands of Tunodo, Observatory Island, and Sodo. British warships had visited the anchorage before, and in 1882 reported no cattle on the islands (which varied from 500 to 700 feet in height above sea level) and other food supplies were 'not plentiful'.

¹⁵⁷⁵ Berryman, 'British Imperial Defence Strategy and Russia: The Role of the Royal Navy in the Far East, 1878–1898', *IJNH*, 1, (April 2002), 4. Britain would occupy Port Hamilton until February 1887 as a precaution against Russia utilizing the port or another anchorage (Port Lazarev) on the Korean peninsula.

¹⁵⁷⁶ 'Naval News from the China Station', *Portsmouth Evening News*, 29 August 1885, 8.

provide part of the 150 man crew of the auxiliary cruiser.¹⁵⁷⁷ Britain had taken the bold step of occupying Port Hamilton and in a stroke, had forestalled another Russian land grab. Elements of the Royal Navy appeared at Port Hamilton on 15 April 1885, thus blocking a repeat of the 1861-style Russian temporary encampment as on Tsushima Island. In St. Petersburg, the Russian press denounced the British occupation of Port Hamilton as 'impudent', and claimed that the Russian operations at Penjdeh was a 'good answer' for the British flotilla anchoring at the strategic Korean islands. In Germany, the news was viewed quite differently as one newspaper called the British move 'a political and military masterpiece'.¹⁵⁷⁸

Mine Warfare and Colonial Defence

During the 1885 crisis, the naval mine was considered a weapon which rendered British ports like Hong Kong 'reasonably secure', but these were not the only defence, as it 'would be dangerous to trust too much in them, (mines) with the various means which ingenuity and science are constantly devising to circumvent such engines of destruction'.¹⁵⁷⁹

In addition to his duties as Torpedo Officer at Hong Kong, Gamble was charged with devising methods to both place, and foil mines. He proposed that a mine facility be built ashore at Kowloon to house the mines, cables, associated gear, and fuses sent from Britain. He also requested a steam launch (similar to

¹⁵⁷⁷ TNA, ADM 53/12239, *Ship's Log H.M.S. Wivern*, 19 March 1885-22 July 1885, 'Naval and Military Intelligence', *Morning Post*, 28 July 1885, 5, 'British Cruisers in Eastern Seas', *Dundee Evening Telegraph*, 6 August 1885, 3.

¹⁵⁷⁸ 'Asking a Vote of Credit', *NYT*, 22 April 1885 1, 'England and Russia', *Derby Daily Telegraph*, 22 April 1885, 4.

¹⁵⁷⁹ 'The Fortifications of Hong Kong', *Times*, 28 October, 1884, 3.

the type used by the Royal Engineers), be provided for the purpose of training the seamen in the proper methods of mining, and for 'counter-mining', the approved methods utilized to clear a path through an enemy field near a hostile naval base.¹⁵⁸⁰

The employment of the submarine mine in British service was largely influenced in 1868, when Lieutenant John A. Fisher wrote *A Short Treatise on Electricity and the Management of Electric Torpedoes*, after attending training with the Royal Engineers at Chatham.¹⁵⁸¹ Naval instruction for both torpedoes, and submarine mines was conducted aboard the training ship *H.M.S. Vernon* at Portsmouth after that vessel was attached to the gunnery training ship *Excellent* in 1872.¹⁵⁸² In 1882, the Admiralty determined that training in gunnery, and the use of torpedoes was 'an essential qualification for a higher rating of petty officers'. To obtain these skilled men, trainers such as Gamble were a valued asset to the *Vernon*.¹⁵⁸³ Gamble was assigned to the ship from 30 September 1881 to 16 July 1883, where he gained his 2nd Class torpedo certificate. Reassigned to the China Station in 1883, Gamble developed a reputation as an 'Excellent Torpedo Officer', and was the link between the Royal Navy and Royal Engineers, the military organization responsible for mining the waters off Hong Kong.¹⁵⁸⁴

¹⁵⁸⁰ TNA, ADM 125/83, *China Station Records: Correspondence: Naval Establishments, Bases and Stores, Steam Reserve, Ordnance and Torpedoes*.1880-1883. Enclosure No. 3, 'Suggestions Concerning Torpedo Service at Hong Kong', 3 January 1884.

¹⁵⁸¹ Peter F. Halvorsen, 'The Royal Navy and Mine Warfare, 1868-1914', *Journal of Strategic Studies*, 27, (2004), 686-687.

¹⁵⁸² *Ibid*, 687.

¹⁵⁸³ Naval Notes & News, *Hampshire Telegraph*, 26 July 1882, 2.

¹⁵⁸⁴ TNA, ADM 196/87/69, Officers Service Records (Series III), *Admiral Douglas Austin Gamble*, Entry dated October 1885, 69.

Beginning in 1874, the Admiralty limited mining operations to the temporary emplacement of minefields (using mines controlled from the shore), and to minesweeping. The mine was considered the 'weapon of a weaker power', and the Royal Navy saw the British use of the mine as a defensive, short-duration armament for use in emergencies. This view prejudiced the British development of independent contact mines, as those weapons would interfere with fleet operations.¹⁵⁸⁵ The mine was also a dangerous weapon in the hands of unskilled men. On 5 March 1881, a boat crew from the turret ship *Cerberus*, unfamiliar with the intricacies of minelaying, took a mine, and associated gear recently transferred to the ironclad, offshore at Queenscliff south of Melbourne, for a demonstration. As the mine was put over the side, it exploded, destroying the boat and killing the six man crew. An inquiry found the event was marred by a 'general laxity', and the cruise of the ironclad 'resembled more a voyage for pleasure than one for the purpose of improving the defences of the colony'.¹⁵⁸⁶ Three years later, at a banquet held for foremen from Woolwich Arsenal, War Department Professor of Chemistry Sir Frederick Abel, claimed the mine was a 'diabolical instrument', a device he considered to be sneaking and underhanded. He wished it had never been invented. Despite his loathing of the weapon, Abel warned it 'was destined to play a fearful havoc in the wars of the future'.¹⁵⁸⁷

During the 1885 crisis, the submarine mine was depicted, along with war rockets, shot and shell, and 'other features of modern war', in a fireworks demonstration held at London's Crystal Palace.¹⁵⁸⁸ At Bermuda that year, a

¹⁵⁸⁵ Halvorsen, 'The Royal Navy and Mine Warfare, 1868-1914', *Journal of Strategic Studies*, 27, (2004), 685-686, 688.

¹⁵⁸⁶ Colin Jones, *Australian Colonial Navies*. (Canberra, 1986), 43.

¹⁵⁸⁷ 'The Armaments of England', *St. James's Gazette*, 29 September 1884, 12.

¹⁵⁸⁸ 'Crystal Palace', *London Evening Standard*, 15 July 1885, 1.

civilian team of 30-40 men were hired to assist the Royal Engineers in laying mines near key coastal positions. In November, the Legislative Council of the colony acknowledged the role of the naval mine as a weapon 'which is daily growing into greater importance as an indispensable component of the defences of our seaports'.¹⁵⁸⁹ Despite this claim, the mines did not provide sufficient protection for Bermuda. Planned minefields lacked the number of mines, trained crews to properly place them, and were not covered by coastal guns. They would have required a gunboat, or one of the local armourclads to protect the minefields against enemy clearing operations.¹⁵⁹⁰

One area in mine warfare where Britain continued to experiment and likely excelled over her European rivals, was in the development of early minesweeping techniques.¹⁵⁹¹ The favoured methods, referred to as 'Sweeping and Creeping', were processes whereby steam launches would move into a suspected enemy minefield at night and clear a channel for friendly warships to move within range of an enemy port or coastal batteries.¹⁵⁹² When 'Creeping', a steam launch would 'fish' for an electrical mine cable attached to an 'Observation' mine controlled from the shore, with a grapple carrying a small explosive charge. When the target was snagged, it was hauled up until the mines were pulled together. An electric battery was connected to the grappling cable and the electrical mine(s) were detonated at a distance from the steam

¹⁵⁸⁹ 'Proceedings of the Honorable Legislative Council', *Royal Gazette*, 17 November 1885, 1.

¹⁵⁹⁰ *Hansard*, 22 March 1886, 303, cc 1560-1561.

¹⁵⁹¹ Halvorsen, 'The Royal Navy and Mine Warfare, 1868-1914', *Journal of Strategic Studies*, 27, (2004), 687, John Thompson Bucknill, *Submarine Mines and Torpedoes as Applied to Harbour Defences*. (Uckfield, 2009, Reprint of 1889 edition), 211.

¹⁵⁹² TNA, ADM 125/83, *China Station Records: Correspondence: Naval Establishments, Bases and Stores, Steam Reserve, Ordnance and Torpedoes*. 1880-1883. 'H.M.S. Hecla, May and June 1880, Submarine Mine Defences Berehaven', Bucknill, *Submarine Mines and Torpedoes as Applied to Harbour Defences*. (2009), 211.

launch. The other method, 'Sweeping', employed a wire hawser between two boats. This hawser would be fitted with three floats to support the line or 'sweep', and grappling hooks would be attached between the floats. Two small explosives would be suspended from the sweep as the launches dragged for a mine cable. When contact was made, electrical batteries on the launches were attached to the sweep and the impulse detonated the small charges, setting off the snagged mine.¹⁵⁹³

The fear of an enemy flotilla employing clearing operations near a friendly port, meant the submarine mines would have to be protected. Torpedo boats and steam pickets armed with Nordenfelt guns were required to attack an enemy force attempting to clear a minefield. Coastal fortifications would provide heavy gunfire against enemy warships tasked to provide cover for the sweeping steam launches.¹⁵⁹⁴ Where the guns of the British forts could not provide fire support, the Royal Navy's coastal defence ironclads would be available to shift positions to protect the minefields and picket boats on patrol.¹⁵⁹⁵ One New York newspaper claimed, 'at best, the armored [sic] vessel is effective only as a floating fort for harbor [sic] defence in connection with torpedoes (mines), and then is of merely secondary value...'.¹⁵⁹⁶ In the autumn of 1885, the German steamer *China* failed to observe the red warning flag at Port Possiett in the

¹⁵⁹³ Patrick A. Moore, *The Greenie: The History of Warfare Technology in the Royal Navy*. (Stroud, 2011), 40-41, 'Naval Manoeuvres', *London Evening Standard*, 22 July 1896, 3.

¹⁵⁹⁴ *Hansard*, 17 July 1885, 299, cc 1030, 1033, 'English Policy and National Defence', *Times*, 26 May 1885, 11.

¹⁵⁹⁵ P. T. Oppenheim, 'The Paper Fleet or the Ships that Never Were, Part Two: 1870 to 1900. *The Great Circle*, 12, (1990), 15, 21, Colin Jones, *Australian Colonial Navies*. (Canberra, 1986), 111.

¹⁵⁹⁶ 'The Danger to British Commerce', *The Sun*, 27 April 1885, 2.

Russian Far East, and steamed over two rows of mines without any damage, as the mines failed to detonate.¹⁵⁹⁷

The submarine mine of the mid-1880s was not a reliable weapon and as such, could not replace the local coastal defence warships. The presence of Russian ironclads in the Pacific virtually mandated the added security of a local British ironclad to confront an armoured attacker in neighboring waters or defend within the mined harbour, against a surprise attack. This layered approach to harbour defence was essential as the Royal Navy maintained an offensive policy:

*The Admiralty had always resolutely opposed the principle that any of Her Majesty's ships should be told off to remain stationary at any particular port. They considered it necessary that Her Majesty's ships should be free to go wherever necessary in time of war.*¹⁵⁹⁸

And by going to sea instead of protecting British ports, the mission of the lead components of the Royal Navy (as repeatedly announced in the Commons), was to attack:

*It had been the policy of successive Boards of Admiralty...that Her Majesty's Fleets must be used in attacking the enemy and the enemy's squadrons in all parts of the world.*¹⁵⁹⁹

The Royal Navy prepared for an offensive, but also a defensive war at sea in the late Victorian years. Port visits in distant waters were intelligence collection opportunities to assess the strengths and vulnerabilities of a foreign colonial harbour or series of coastal fortifications. Commanders of British warships

¹⁵⁹⁷ 'A Russian Torpedo Scandal', *St. James Gazette*, 14 November 1885, 10.

¹⁵⁹⁸ *Hansard*, 27 March 1885, 296, cc 817.

¹⁵⁹⁹ *Hansard*, 17 July 1885, 299, cc 1038, 1039.

visiting the Spanish colonies of Cuba and Puerto Rico in the early 1880s and evaluated the positioning of guns within Spanish fortifications, conditions of repair and upkeep of the walls, channel buoys, etc. and concluded Spain's Caribbean colonies were vulnerable to sudden attack from seaward. For a night attack against San Juan Puerto Rico, a British ironclad frigate supported by four corvettes from the North American and West Indian Station could reduce the coastal batteries in four to six hours by constantly moving and altering the range. Boats and small steamers could sweep the channel for mines after the enemy guns were silenced. Once in the harbour, the ships would bombard the garrison into surrender.¹⁶⁰⁰

An attack against Havana would meet with success, provided it was 'taken by a *coup de main* if the ships had been sent down the moment war was declared'.¹⁶⁰¹ Planning considerations for attacking French colonial harbours was also an essential focus of British naval intelligence experts during these years. Select warships of the Royal Navy, were to attack key French installations including the dry docks, headquarters, government and private dockyards, but particularly coal depots. In a naval attack against French colonies, especially in

¹⁶⁰⁰ TNA, ADM 231/4, *Admiralty: Foreign Intelligence Committee*, Report No. 33, 'West Indies. Foreign Coast Defences (Exclusive of French Colonies)', 1881-1884, 19-21. The plan envisioned an attacking force of the ironclad *Northampton* supported by four (or as few as two) corvettes. Machines guns were to be employed in order to sweep the Spanish gun emplacements as the ships closed the range.

¹⁶⁰¹ *Ibid*, 15. Also see same source, 25-26. During U.S. tensions with Spain in 1874, Captain W. Gore Jones, R.N., the British Naval Attaché in Washington, wrote Havana had attracted 'much interest' by American military officials and felt the 'American ironclad squadron might have entered the harbour and destroyed the town without any loss, and the forts would probably have been given up to them...' As the U.S.N. had no broadside ironclads by this time, an attack on Havana would have involved American monitors. U.S. ironclads had visited Havana before. Two Federal monitors, the single turret U.S.S. *Canonicus* and the double turret, *Monadnock* with wooden escort vessels of the Union 'Special' Squadron, anchored in Havana on 29 May 1865, to take possession of the surrendered Confederate ironclad ram *Stonewall*. This was the first visit of U.S. ironclads to a foreign port. See: ORN Series I, Volume 3, (Washington, 1896), 535.

the Caribbean and Pacific, if the 'blow was stuck as soon as possible', British squadrons would be able to destroy French harbour facilities and capture their coal stocks for their own use.¹⁶⁰²

Preparations for a defensive war at sea, provided Britain with secure launching points to conduct offensives against enemy harbours. It was the difference between utilizing ironclads for attacking enemy-held harbours and defending key ones or 'the contradiction between coastal assault and coastal defence'.¹⁶⁰³ Protected harbours made power projection missions possible: 'A modern navy without proper harbours is somewhat analogous to a modern army without a commissariat and transport'.¹⁶⁰⁴ Defence considerations and attack planning for the Royal Navy in the later Victorian years had blended into an a series of mutually supporting factors as 'the fleets of England can no longer be independent of them'.¹⁶⁰⁵

During a lecture at the U.S. Naval War College, Captain Reginald R. Belknap, U.S.N., considered the role of logistics in terms of supply, movement, and refit of warships from an efficient and secure base. Belknap observed: 'Logistics, which deal with necessities and possibilities, influence the decisions of strategy, often to a controlling degree'. The secure base and its peacetime readiness was what gave a naval power the ability to exert a 'sustained military effort' during wartime.¹⁶⁰⁶

¹⁶⁰² TNA, ADM 231/5, *Admiralty: Foreign Intelligence Committee*, Report No. 51, Captain W. H. Hall, R.N., 'Remarks on a Naval Campaign', 24 September 1884, 17.

¹⁶⁰³ Fuller, 'John Ericsson, the Monitors and Union Naval Strategy', *IJNH*, 2 (December 2004), 17.

¹⁶⁰⁴ Moncrieff, 'On Harbour Defence', *RUSI Journal*, 19, 1 May 1875, 358.

¹⁶⁰⁵ *Ibid*, 358.

¹⁶⁰⁶ Captain Reginald R. Belknap, U.S.N., 'The Study of Strategy', *Naval War College Review*, (spring, 1997), 114. Belknap delivered the lecture on 9 August 1922 and recounted some of his

The coastal defence turret ships like the *Scorpion* and *Wivern* proved to be versatile assets at those key naval bases that provided the Royal Navy with the protected logistics centres for power projection capabilities on a global scale. T. E. Lawrence remarked: 'Range is more to strategy than force', but that range rested on a support base.¹⁶⁰⁷ British naval power was to protect her oceanic commerce, but it also served to 'counterbalance the military supremacy of other first-class powers.'¹⁶⁰⁸ British military operations had to have secure naval ports from which to move troops for any mission:

'Invasions cannot be attempted, nor can we move even a drummer-boy beyond our shores without a naval operation, great or small, being the primary step of military movements so far as we are concerned'.¹⁶⁰⁹

The 'range' Lawrence spoke of was the logistical capability to maintain a balanced military force in the field, or a squadron at sea for a distance and duration longer than an enemy was able to counter. The coastal defence ironclads kept in ready reserve at key British bases, provided the essential elements of security necessary for those naval stations to make that range possible.

experiences commanding a minelaying flotilla employed on the North Sea Barrage against German U-Boats in 1918, 112, 114.

¹⁶⁰⁷ T.E. Lawrence, 'Guerrilla Warfare'. (2016). In *Encyclopædia Britannica*. Retrieved from <http://www.britannica.com/topic/T-E-Lawrence-on-guerrilla-warfare-1984900>. Lawrence, writing for the 14th edition of the *Encyclopedia Britannica* in 1929 at the request of his biographer, and the *Britannica's* military editor, Sir Basil Liddell Hart, was referring to Bully Beef which he said had modified warfare 'more profoundly than the invention of gunpowder' as it gave the military strategist a degree of surplus and the freedom to project a force beyond the locally available fresh food supplies.

¹⁶⁰⁸ Moncrieff, 'On Harbour Defence', *RUSI Journal*, 19, 1 May 1875, 358.

¹⁶⁰⁹ Captain J. C. R. Colomb, 'Naval Intelligence and Protection of Commerce in War', *RUSI Journal*, 25, 13 May 1881, 558.

CONCLUSION

Exit the Ironclad: The Laird Rams 1885-1923

In July 1885, a cartoon in *Punch* depicted a Royal Navy unprepared for combat. Britannia as the figurehead of a British warship, holds only an olive branch as two workers discuss how best to prepare her for a return to duty. The carpenter (resembling Prime Minister Lord Salisbury) acknowledges there was no time to modernize the warship before she must go to sea. The carpenter's helper (Lord Randolph Churchill, the Secretary of State for India) stands on an adjacent ladder with paint brush at the ready, and recommends a cosmetic change to give the appearance of power.¹⁶¹⁰ The 1885 crisis revealed a lack of coordinated planning to mobilize the reserves in order that both the older men-of-war, and newly constructed warships of the Royal Navy, were ready to meet the contingency of a global war with Russia.¹⁶¹¹

By the late 1880s, few of the Royal Navy's ironclads were similar, as each had been built around competing developments of armour and ordnance, and were a reflection of the technological moments when they were completed. Rapid changes in armoured warship design of the middle Victorian years manifested as a peculiar collection of differing types and hybrids, so much so that Admiral Sir John Commerell remarked in 1887, that some British warships looked like something 'between a clock case and a bathing machine'.¹⁶¹² Many older armourclads like the *Scorpion* and *Wivern* were refitted, and provided with a few modern apparatus to keep pace with technological developments. If the costs of repairs and refits were not excessive, a man-of-war received dockyard attention

¹⁶¹⁰ 'Fresh Paint', *Punch*, 4 July 1885, 5, 'The Change of Ministry', *Times*, 29 June 1885, 5.

¹⁶¹¹ Marder, *The Anatomy of British Sea Power*. (1976), 132-133.

¹⁶¹² *Hansard*, 18 July 1887, 317, cc1266.

as it was 'extremely difficult to draw the line at the precise stage at which a ship becomes obsolete as a vessel of war'.¹⁶¹³ This was especially true for ironclads as armour, even if penetrated at close range, offered protection at longer distances and gave the armoured ship under fire 'a utility out of all proportion to its ability to withstand shot on the proving ground'.¹⁶¹⁴

The coastal defence role was the one best suited for the Laird rams, but that role had two distinct components, one was 'coastal assault', and the other was for defence of a local area from a seaborne threat.¹⁶¹⁵ The low-hulled ironclads could be used for either mission, but some British low-hulled ironclads were intended more for the assault.¹⁶¹⁶ Which coastal defence vessels would be assigned an attack mission, and which were to remain closer to home port, depended largely on *where* these ships were stationed when a conflict threatened. In an 1884 war plan against France, British Naval Intelligence detailed which types of ships could be used in a series of rapid global strikes, and which would remain behind. The *Cerberus*, *Scorpion*, *Wivern*, and the Bombay coastal defence ironclads, were not to be earmarked for an attacking force as 'they will be required and used for the protection of the several ports they are intended for and are allotted to, and will not therefore be available to take part in an *offensive* (italics in original) policy'.¹⁶¹⁷

¹⁶¹³ *Hansard*, 6 May 1886, 305, cc372. Comment made in the Commons by Secretary to the Admiralty, Sir John Hibbert

¹⁶¹⁴ Bernard Brodie, *Sea Power in the Machine Age*. (Princeton, 1941), 212.

¹⁶¹⁵ Fuller, 'John Ericsson, the Monitors and Union Naval Strategy', *IJNH*, 2 (December 2004), 17.

¹⁶¹⁶ Fuller, *Empire, Technology and Seapower*. (2013), 63, note 7. Here Fuller quotes from Lambert who had held that 'coastal defence vessels were "really" for attack.'

¹⁶¹⁷ TNA, ADM 231/5, *Admiralty: Foreign Intelligence Committee*, Report No. 51, Captain W. H. Hall, R.N., 'Remarks on a Naval Campaign', 24 September 1884, 25. Captain Hall also stated that five coastal defence ironclads in Britain '*might* (italics in original) be employed in some operations' against the northern coast of France, including on blockade against Cherbourg.

The types of offensive missions each station was to conduct also restricted the role of the coastal defence ironclads, especially for those assigned to colonial ports. While the major British warships assigned to foreign stations were to hunt for enemy men-of-war, and attack or blockade their ports, the coastal defence armourclads were to provide security for the main British bases.¹⁶¹⁸ These ships were to provide the heavy guns of a 'coast covering force' for the key colonial ports they protected.¹⁶¹⁹ The coastal defence ironclads, with the few 1st and 2nd Class torpedo boats remaining at the installation, would comprise the 'Mobile Defences' of the base. As these units were patrolling or engaged off the coasts, boats or launches of 'less speed' were to be armed with spar torpedoes for defence of the harbour.¹⁶²⁰ Another proposal envisioned utilizing fast civilian river steamers as improvised torpedo boats and harbour tugs would be available

¹⁶¹⁸ Ibid, 36-37. The China squadron was to attack French warships, and patrol key straits, but was only to 'watch' Saigon. On the North American and West Indies Station, the Royal Navy would seek to engage French warships and attack, Fort de France (Martinique), Guadeloupe, and nearby Les Saintes.

¹⁶¹⁹ Colomb, 'Naval Intelligence and Protection of Commerce in War', *RUSI Journal*, 25, 13 May 1881, 572. Also see: TNA, ADM 231/7, *Admiralty: Foreign Intelligence Committee*, 'Russia. Naval Manoeuvres in Gulf of Finland, between Hango and the Helsingfors', August 1885, 2, 6, 7. This report details Russian naval manoeuvres held off the coast of southern Finland in late August 1885. Torpedo boats, supported by coastal defence ironclads, protected the coast against a mixed 'attacking' force of a modern armoured frigate, several corvettes, gunboats, and torpedo boats. In addition to exchanging broadsides with some attacking warships, a main purpose of the defending force was the protection of area minefields and booms from the torpedo boats of the attackers. The actions concluded after five days, on 29 August, with the attacking force driven off.

¹⁶²⁰ TNA, ADM 231/2, *Admiralty: Foreign Intelligence Committee*, Report No. 8, 'France. Naval Dockyard Ports', February 1884, 101-102. This report details a plan from March 1880 whereby the French 'intended' to arm these smaller boats with spar torpedoes 'to be held in readiness for use in the event of an enemy passing the outer fleet of torpedo boats and getting into the harbour'. Also see: TNA, ADM 231/5, *Admiralty: Foreign Intelligence Committee*, Report No. 43, 'Eastern Siberian Ports and Anchorages' dated January 1885, 61. The Admiralty refers to the Russian 'Siberian Flotilla' as providing the *mobile* (Italics in original) defence of Vladivostok in company with the torpedo boats the Russians had on station.

for use as rams and rocket ships if a British harbour fell under attack.¹⁶²¹ Within these various concepts of naval attack plans and needs for protection both at home and in key colonies, the coastal defence ironclad remained an essential element of British naval strategy, both for offensive and defensive purposes, until the end of the century.

Size had become a concern for the modern warship of the later Victorian era as, according to one writer of that time, 'you cannot put a quart of power into a pint of displacement'.¹⁶²² The Laird rams, fitted with armour plate and the heaviest guns in use aboard the warships of the Royal Navy in the mid-1860s, had proven it could be done, but technological advances outstripped the pint-sized *Scorpion* and *Wivern*. Technology transformed the man-of-war into a new being. It became a vessel with steam-powered engines and a host of electrical motors for the ever-growing capital warship, a vessel of 'monster' proportions, a 'Frankenstein' of the sea.¹⁶²³ The armoured warship in all its forms had, by the end of the nineteenth century, become 'a floating factory'. It was, according to one Hong Kong newspaper 'a machine crammed with other machines', requiring more space to house the new devices.¹⁶²⁴

In 1901, both the *Scorpion* and *Wivern* ended their sea service and became surplus. *Scorpion* was utilized as a target for gunnery tests beginning on 14 May, and was later patched up and sold for scrap to shipbreakers in New

¹⁶²¹ Captain R.A.E. Scott, R. N., 'The Maritime Defence of England including Offensive and Defensive Warfare', *RUSI Journal*, 20, 30 June 1876, 6-7. This force was to 'supplement' the turret ships and gunboats, and the river steamers and harbour tugs could 'under the flag of a dashing Commodore, throw a hostile force into confusion and render a landing impossible'.

¹⁶²² G. W. Steevens, *Naval Policy: With Some Account of the Warships of the Principal Powers*. (London, 1896), 120.

¹⁶²³ H. W. Wilson, *Ironclads in Action; A Sketch of Naval Warfare from 1855-1895, With Some Account of the Development of the Battleship in England*. Volume, II. (London, 1896), 168, 241.

¹⁶²⁴ *Ibid*, 214, 'Is Our Navy Ready for War?', *China Mail*, 24 April, 1885, 3.

Brunswick.¹⁶²⁵ She sank on 16 June 1903, in a storm 150 miles east of Cape Cod while under tow from Bermuda to the Canadian coast.¹⁶²⁶ At Hong Kong, the *Wivern* was at sea for her final gunnery exercise on 4 March 1901, and was afterwards converted into a distilling ship to provide fresh water for the China Squadron.¹⁶²⁷ Sold to Chinese shipbreakers around September 1921, the armourclad was stripped of all useful equipment before she was to cast off for the last time. As she was towed away on the morning of 13 March 1923, one Hong Kong newspaper referred to her as the 'old, crippled warhorse'.¹⁶²⁸

A photograph taken as the *Wivern* departed Hong Kong was a testament to her true impact. The ironclad was moved from her moorings by two tugs, and had been long deprived of her turrets, guns, funnel, and torpedo boats. Her two masts, fighting tops still fitted, stood above her rust-streaked hull. The scene was not as stark as would normally be imagined for an obsolete warship on her way to a cutting torch. She had a full complement of men lining her sides and peering through the stern gunports to send her off, not as a forgotten hulk, but as an honoured veteran of a bygone age. The *Wivern* was acknowledged as representing one of the last of her kind. It was a suitable tribute for the 'old warhorse' and a farewell to the ironclad era.

¹⁶²⁵ 'Old Warship for a Target', *New York Daily Tribune*, 5 May 1901, 2. No Subject, *Royal Gazette*, 12 May 1903, 5, 'Custom House-St. George's', *Royal Gazette*, 13 June 1903, 2, 'Sinking of the Scorpion', *Royal Gazette*, 30 June 1903, 1. During the gunnery tests, one 6-inch shell from the armoured cruiser *H.M.S. Crescent* (the then flagship of the station) burst inside the *Scorpion* and 'practically wrecked everything on board'. See: 'British Naval Gunnery', *Sheffield Daily Telegraph*, 28 May 1901, 5, TNA, ADM 53/13180, Log, *H.M.S. Crescent*, 15 April 1901-24 March 1902.

¹⁶²⁶ 'Sinking of the Scorpion' *Royal Gazette*, 30 June 1903, 1.

¹⁶²⁷ TNA, ADM 53/16609, Log, *H.M.S. Wivern*, 11 September 1899-7 March 1901, 'H.M.S. Wivern', *China Mail*, 29 May 1902, 4..

¹⁶²⁸ 'Passing of the "Wivern"', *Hong Kong Telegraph*, 13 March, 1923, 7. This account referred to her as 'a link with the past, and the old days of the Navy in the East'. Parkes claims she was sold in June 1922. See: Parkes, *British Battleship*. (1990), 81.

The primary question of this thesis: *were the Laird rams failures?* The answer must be no, as they were successful warships when utilized for the colonial coastal defence role. The British coastal defence ironclads of the Victorian navy, incorrectly termed as ‘almost valueless,’ were in fact ‘required’ as area denial weapons on foreign stations.¹⁶²⁹ Although as Sondhaus stated, ‘the force which best deters is not necessarily the force which has the greatest practical value in warfare’, the Laird rams were essential components of colonial deterrence and were well-suited for their roles at their assigned stations.¹⁶³⁰ They never fired a shot in anger, but like the famous *Warrior*, ‘it does not matter the battles actually fought but those prevented’.¹⁶³¹ The Laird rams were not failures, as they best served the Royal Navy as coastal defence ships, and performed well in that role until the modern steel navy arrived. They proved that iron, steam, and turret, when divorced from the weight and tether of sail, could defend the important bases at the edges of the British Empire. They deserve a better reputation than that imposed on them in most histories of the ironclad warship.

¹⁶²⁹ Buxton, *Big Gun Monitors*. (1980), 11., TNA, ADM 231/5, *Admiralty: Foreign Intelligence Committee*, Report No. 51, Captain W. H. Hall, R.N., ‘Remarks on a Naval Campaign’, 24 September 1884, 25.

¹⁶³⁰ Sondhaus, *Naval Warfare, 1815-1914*. (2001), 228.

¹⁶³¹ Fuller, ‘The *Warrior*’s Influence Abroad: The American Civil War’, *IJNH*, 10 (October 2013), 1, 6. Here the author also notes that the ‘*Monitor*, like all early ironclads, was expected to fulfil a variety of frequently “urgent” yet conflicting roles’. The same can be said for the Laird rams.

Glossary of Terms/ Abbreviations

C.S.S.	Confederate States Ship
C.S.N.	Confederate States Navy
DC	Direct Current
H.M.S.	Her Majesty's Ship
ILN	Illustrated London News
IJNH	International Journal of Naval History
LOC	Library of Congress
M.P.	Member of Parliament
NMM	National Maritime Museum
NYT	New York Times
PSI	Pounds per Square Inch
ORA	<i>The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies</i>
ORN	<i>The Official Records of the Union and Confederate Navies in the War of the Rebellion</i>
RBL	Rifled Breechloader
RML	Rifled Muzzleloader

R.M.A.	Royal Marine Artillery
R.M.L.I.	Royal Marine Light Infantry
R.N.	Royal Navy
RUSI	Royal United Services Institute
SA	Scientific American
SBML	Smoothbore Muzzleloader
S.M.S.	Seiner Majestät Schiff (His Majesty's Ship)
TB	Torpedo Boat
TNA	The National Archives
U.S.S.	United States Ship
U.S.N.	United States Navy
WA	Wirral Archives

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