"Seagoing purposes indispensable to the defence of this country:" Policy Pitfalls of Great Britain's Early Ironclads

Howard J. Fuller

La suprématie navale anglaise avait été remise en cause par les frégates "blindées " instaurées par Napoléon III; elle fit néanmoins face aux affaires impériales et maritimes mondiales ainsi qu'au conflit avec le Nord durant la Guerre Civile. Le but était de maintenir un "pouvoir de projection" faisant concurrence aux avancées technologiques; de la vapeur aux obus, du blindage à l'artillerie lourde. La France et les Etats Unis semblaient jouir des avantages d'une protection maximale voire de l'un des pluspuissants des armements car la "défense cotiere" avait été renforcée aux dépens des capacities des flottes de longue tenue.

Great Britain's early ironclad program developed in direct response to the establishment of the seagoing, broadside-ironclad fleet of Napoleon III. In the 1859 pamphlet *Maritime States and Military Navies,* Captain Sir Adolphus Slade warned that "every Maritime State has, presuming on an innate nautical superiority, deemed by it unattainable by others, viewed carelessly the endeavours of its military neighbour to form a navy."[1] By 1858, the Royal Navy held a precarious edge in screw-propelled, steam-powered wooden-hulled ships-of-the-line.[2] To Slade, this was a condition "in the opinion of those who should be well informed, discreditable to the country, and unsafe for its interests."[3] With Britain on the verge of gaining a decisive lead once more, the French ironclad *Gloire* seemed to change the rules

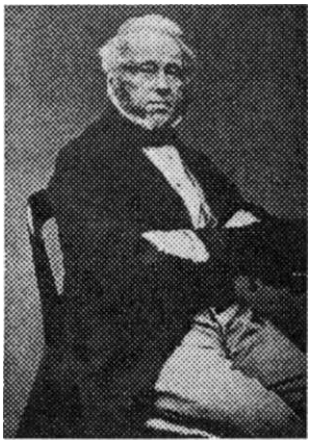
[1] Captain Sir Adolphus Slade, *Maritime States and Military Navies* (London, 1859), 3.

[2] *Navy Ships Building, &c: An Account, showing the Expenses incurred on Her Majesty's Ships Building, Converting, Repairing, Fitting, &c, during the Financial Year 1859-60^.3* February 1861, lists £1,018,061 expended for "Ships and Vessels building", most of these sailing ships still converting to screw, either before or after launching. Ironclad vessels are not listed. Public Record Office, Kew, (PRO), A D M 1/5765.

[3] Slade, *Maritime States,* 47. William Romaine, the Permanent (or Second) Secretary of the Admiralty, suggested nothing less than "50 sail of the line in commission and fully manned and exercised," as the "best chance of escaping a War with France," 4 July 1859, Romaine to the Duke of Somerset, "Memo on the necessary Naval Force in Commission, by William Romaine, 18 May 1859."Buckinghamshire Record Office, Aylesbury, Somerset Papers Collection, D/RA/A/2A/268.

The Northern Mariner/Le marin du nord, **XIII, No. 1 (January 2003), 19-36.**

again.[4] Following the evident success of the *Gloire* concept and design, French Ministry of Marine added to the ironclad's sisters still under construction with a sweeping plan for an entire fleet of iron-plated frigates. As Oscar Parkes notes, "the French had not laid down a wooden ship-of-the-line since 1855," and indeed there would evidently be no more.[5] The ambitious scale of the program (quickly engineered by the brilliant naval architect Dupuy de Lome, and decisively endorsed by the Emperor himself) suddenly made the British response of the Warrior-class, vessels superior in virtually every aspect of sea-keeping, powerfully armed and strongly protected,[6] seem inadequate.



Henry John Temple
3rd Viscount Palmerston
1784-1865

The new Board of Admiralty, headed by Edward Adolphus Seymour, the twelfth Duke of Somerset, under Lord Palmerston's new Liberal Coalition government (1859-65), met in early 1861 to discuss the urgency of a full-scale response.[7] The immediate nature of the threat to British security was seemingly that of invasion. Coupled with the massive fortification and modernisation of the strategic port of Cherbourg, it was obvious to the naval members of the Board that "immediate steps should be taken to meet so formidable a force. Otherwise the spring of 1862 might see the French in possession of such a fleet of iron-cased ships as could give them the command of the Channel."[8] Though this reflected a fairly routine popular "Panic," decried by Radical leader Richard Cobden (busily securing British rapprochement with France through new trade agreements),[9] it was not a politically calculated alarmist sentiment.[10] To the professional navy such a likelihood was embarrassing and unthinkable."

[4] C. I. Hamilton, *Anglo-French Naval Rivalry 1840-1870* (Oxford, 1993), 90.

[5] Oscar Parkes, *British Battleships: A History of Design, Construction and Armament* (London, 1970), 14.

[6] See Andrew Lambert's detailed analysis, *Warrior: The World's First Ironclad Then and Now* (London, 1987).

[7] For a flattering analysis of Somerset's service as First Lord see Colin F. Baxter, "The Duke of Somerset and the Creation of the British Ironclad Navy, 1859-66", *Mariner 'sMirror,* 66 (August 1977), 279-84.

[8] Minutes of the Naval Members of the Board, 13 January 1861. PRO, A D M 1/5765: J. P. Baxter surmised 13 February as the more likely date of this minute, given the reference to a Foreign Office report dated later, *The Introduction of the Ironclad Warship* (Cambridge, 1933), 171, ff. The Board noted: "the Emperor of the French has ordered this year to be laid down in the different Ports of France ten sea-going iron-cased Frigates of the largest class, in addition to the six already launched or nearly completed. ... Of the ten ships three named **La** Savoie, La Provence, La Revanche, are ordered to be built at Toulon and the rest in the Atlantic Ports, and **a** special credit of 100,000,000 francs has been opened for their completion."

[9] Richard Cobden, *The Three Panics*(London, 1862); John Morley, *The Life of Richard Cobden,* (London, 1881) 2: 148,375.

[10] Andrew Lambert, "Politics, Technology and Policy-Making, 1859-1865: Palmerston, Gladstone and the Management ofthe Ironclad Naval Race," **r**/ieAfort/ie/TïMor/**Mer, m,** No. 3 (July 1998), 9-38.

[11] And perhaps unjustifiable. Paul Kennedy observes "it would be a great error to suppose that it was British naval supremacy alone which [enabled the success of British foreign policy, if not the Pax Britannica]; the disinclination of the European nations for war was of equal significance." *The Rise and Fall of British Naval Mastery* (Malabar, Florida, 1982 ed.), 159. This concurs with Gerald S. Graham's analysis, *The Politics of Naval*

As a result, the Controller (formerly Surveyor), Admiral Sir Baldwin W. Walker, presented designs to the Board for the new Valiant-class broadside-ironclad. Taking into account the public as well as professional criticisms of the *Warrior,*[12] and the two successor broadside-ironclads of considerably smaller dimensions, *Defence* and *Resistance,*[13] the new ship was "proposed to place 30 of the guns on the Main Deck, which is to be protected by Armour Plating from end to end." This would give *Valiant* (and *Hector)* substantially more protection than the unarmoured ends of the first four broadside-ironclads. Yet even while the battery itself was now to be fully protected, the waterline protection was still less than complete, being "within 30 ft of the Stem, and 35 ft of the Stern Post" five feet below the load waterline. If the ships heeled or rolled during action and suffered a penetrative hit in this unprotected stretch of 65 feet, the consequences could instantly be disastrous. If they did not sink, they could be seriously crippled.

This was not the only disadvantage. By increasing armour protection over the first four broadside-ironclads, Walker cautioned "it will scarcely be questioned that this amount of security against injury from Shot and Shell is not to be obtained without compromising important qualities of sea-going ships." The added weight towards the ends of the ships would contribute to heavy pitching at sea and thus make them "unsuited for general service.

If the challenge to British naval supremacy began with the waters separating England from France, if not Europe in general, *Warrior* was intended at the same time to operate anywhere in the world if need be. Defending her design at the Institution of Naval Architects, Sir John Pakington, the former First Lord responsible for her and President of the Institution, remarked:

> Shall I not be correct if I say that in constructing a man-of-war it is most important to combine in these days great speed with good seagoing qualities?...Now, the *Warrior* and other vessels of that class were designed with the express intention of securing these two great qualities, even at the expense of total protection. It was the desire of the Admiralty in trying that experiment that these ships should not be mere floating batteries, but fit to encounter the worst seas, and to go to India, America, or wherever the exigencies of the country might render their presence

Supremacy: Studies in British Maritime Ascendancy (Cambridge, 1965), 119-20. For a diverging view see Peter Burroughs, "Defence and Imperial Disunity," in Porter (ed.), *The Oxford History of the British Empire,* 320-45.

[12] Especially that of Captain Cowper Phipps Coles; see for example *Shot-Proof Gun-Shields as Adapted to Iron-Cased Ships for National Defence, A Lecture on the 29th of June, 1860, at the Royal United Service Institution by Captain Cowper Phipps Coles, R.N.* (Westminster, 1860).

[13] HMS *Defence:* 280' length; speed 11.228 knots, from G. A. Ballard, *The Black Battlefleet: A Study of the Capital Ship in Transition* (London, 1980), 241,247.

[14] From Surveyor, 1861-1862), 10 January 1861., PRO, A D M 1/5774.

desirable...[15]

This initial distinction, apparently special to British interests, also led to a unique and fundamental confusion of what these armourclads were intended to accomplish. If the strategic command of the Channel was really at stake, long-range "cruisers," partially protected, were not the clear and obvious solution to a manifestly local threat, and thus, the French conception of a fully-armoured frigate held an important tactical advantage.[16] Captain E. P. Halsted, RN, condemned the *Warrior* as "unworthy to be called a warship at all," a remark which drew Pakington's response.[17] But even Palmerston had his misgivings, repeatedly pressuring Somerset whether it would be "impossible to strengthen the Stem and Stern of the *Warrior* and her Companions without materially impairing her Sea going qualitiesf?] She is at present, there is no denying it, a fine yacht, but not an efficient Ship of War."[18] Similarly, if the Board expressed alarm at the French ironclad program in January 1861, it is significant that these statements came *after* the designer of the *Warrior,* Chief Constructor Isaac Watts, provided the Admiralty with an improved *Warrior* in the form of the *Achilles;* and only two weeks after the Valiant-class submission was approved. Some of the original problems with the first four ironclads were solved in the new design. The first iron ship to be constructed in a Royal Dockyard (at the newly re-facilitated Chatham),[19] the *Achilles* was armoured entirely along the waterline, widi modifications which saw to the protection of the rudder and steering gear, dangerously exposed on the preceding ironclads.[20] As with the first ships, little more than half her bulwarks and battery were covered by the armour plating at first; within a year all the unprotected guns were removed. But the *Achilles'* full armour protection (4½ inches of wrought iron plating on 18 inches of teak, identical to *Warrior's),* combined with the need for speed and seaworthiness, again produced an ironclad as long as the *Warrior,* with a gigantic spread of sail 30,133 square feet carried

[15] The *Times* (London), 31 March 1862. The debate was intensified by recent news from America of the battle of Hampton Roads, 8-9 March.

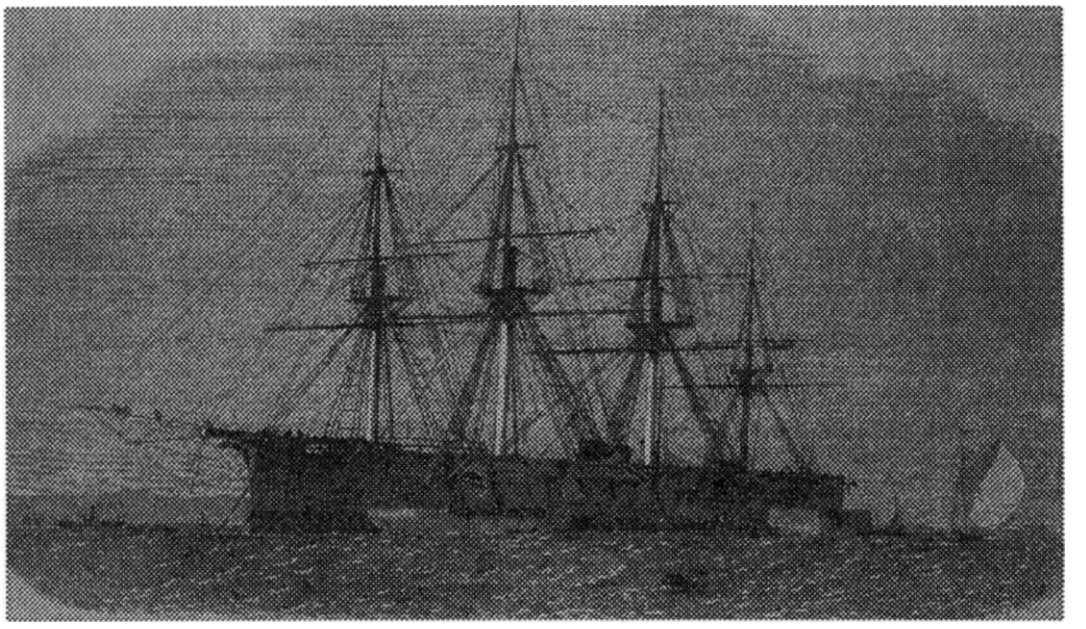
[16] See Bryan Ranft, "The protection of British seaborne and the development of systematic planning for war, 1860-1906," in Bryan Ranft (ed.), *Technical Change and British Naval Policy 1860-1939* (New York, 1977), 1-22. He points out the Admiralty's growing concern for protection of commerce in the age of steam. The conception of Britain's early ironclads as *frigates* might therefore support the notion that these were intended to serve as cruisers as well as in a Line of Battle; but would they therefore be effective in *either* capacity?

[17] See also Halsted's series of lectures on "Iron-Cased Ships," *Journal of the Royal United Service Institution,* Whitehall Yard, V, 1861-2 (London, 1862), 121-267.

[18] Palmerston to Somerset, 11 June 1862, Somerset Papers, D/RA/A/2A/38.

[19] D. K. Brown, *Warrior to Dreadnought: Warship Development 1860-1905* (London, 1997), 15.

[20] Baxter seems to have overlooked the fact that the new Controller, Admiral Robert Spencer Robinson (appointed 7 February 1861), recommended changes "very essential to the efficiency of the Ship to carry a belt of Armour Plating of *AVÏ* inches in thickness right round the Ship in continuation of that which exists at present only for about 200 ft.," only well after the original plans of the ship were approved by the Board and the ship was ordered on 10 April 1861; and that "the Stern of the 'Achilles', designed after that of the 'Warrior' and 'Black Prince', should be remodelled to resemble that of the 'Royal Oak' class, by which a complete protection can be given to the Rudder head and Steering Apparatus, and greater safety from shot ensured to the Screw," From Surveyor, 1862-1863,31 May 1862, PRO, ADM 1/5802; Baxter,*Introduction,* 166-7, ff. 167. Parkes may have repeated this oversight; *British Battleships,* 40.



HMS *ÀcMks*
The Illustrated London News, 23 July 1864

on four masts and a bowsprit (later reduced to three masts). Speed was comparable, yet the draught exceeded *Warrior's* at 27'**/2** feet. This stupendous warship was Victorian overkill, if the original concern of the Board was better actual protection for this most expensive naval investment, when the length of time involved in its construction, given the unforeseen problems occurring with the other ships, meant that Britain herself was vulnerable longer. When an ironclad of this reasoning was finally produced its armour was no longer superlative but inferior, and the problem of where to station her even in home ports and docking facilities remained. Nor did the new broadside monster solve the problem of unhandiness in combat, especially in confined waters such as harbours or inlets. But under Walker's direction at least, the emphasis was more upon sea-keeping than the fullest possible protection and most powerful armament. His resignation shortly afterwards did little to reassure the Board or the public that the French threat was properly met.

On 3 May 1861 the new Controller, Rear-Admiral Robert Spencer Robinson, recommended to the Admiralty a new strategy which would address the fact that Britain was in danger of losing a numbers game at least. "The further building of Line of Battle Ships being for the present suspended," Robinson noted, "it would be very advantageous to erect the Frames of such of these ships as are nearly completed, with a view of preparing them for 50 Gun Frigates to be covered with Armour plating." This next step, the introduction of the wooden-hulled conversions of the Royal Oak-class, was regarded as an improvement on the Valiant-class, with a fully protected battery (and along die waterline), though his submission

added they "would be a sufficiently good Sea Boat to go to the Mediterranean if required...."[21]

However, with wooden hulls, the ships of this class could be seen as more free ranging in that there was no worry of the excess marine fouling endemic to iron hulls. Conversions also saved time and money.[22] They likewise made the most of government resources while the private firms struggled with iron-hulled ironclads already on order. Britain's economy was strong, yet a growing number of critics were crying out for reform which naturally interfered with large naval and military estimates.[23] While much of the populace supported the notion of unquestioned naval mastery over France or any other power - indeed, the lore of the older generation demanded it - the price involved was such that "wooden ships and hearts of oak" could not suffice in the industrial age without additional costs. Taxation was for every household income more real, generally, than patriotism and world prestige.[24] It therefore looked an inconvenient time, when the Empire was "happily at Peace with all Sovereigns, Powers, and States," for an expensive, technologically-perplexing naval arms race with Britain's nearest and most dynamic continental neighbour.[25] For every ironclad the French emperor was prepared to lay down, the Admiralty felt compelled to answer.[26] Furthermore, if the threat took the form of ocean-going ironclads, the British response was virtually pre-decided as well.[27] Already the Royal Dockyards were filled to capacity working on the completion of the unarmoured steamships insisted upon in the previous administration to outnumber French steam ships-of-the line

[21] 8 May 1861, PRO, A D M 1/5774.

[22] From Surveyor, 1862-1863, PRO, A D M 1/5840; the report dated 25 March 1862 notes the original estimate price per ton for *Warrior* as £31.5, the actual cost at £41.67 per ton; while the *Black Prince* contract estimate at £37.25 per ton rose to £39.78. These figures were later adjusted to: *Warrior* final rate per ton £42.25; *Black Prince* £41.57. The *Warrior* cost £239, 646.01, "Iron-Cased Ships—Statement of Cost," 25-3-1862, No. 408, A D M 1/5802. The cost for the improved Warrior-class, the *Achilles,* laid down on 1-8-1861, was estimated at the time at £354,410, "Drawings for Iron-cased Ships," A D M 1/5774. J. P. Baxter noted a final cost of £444,380, when she was finally completed for sea on 26 November 1864, *Introduction,* 167. *Royal Oak* cost £254,537 according to Parkes, *British Battleships,* 50.

[23] See Bernard Semmel, *Liberalism and Naval Strategy: Ideology, Interest, and Sea Power during the Pax Britannica* (Boston, 1986). Paul Kennedy describes the mid-Victorian attitude as exceedingly content with its laissez-faire prosperity; this made the need for large defence expenditures seem unnecessary and provocative, *Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (London, 1988), 193-203.

[24] Tensions were rife in Parliament and the Cabinet over security *and* retrenchment during this period; *Hansard's Parliamentary Debates,* 166 (London, 1862), 31 March 1862,263; Phillip Guedalla, *Gladstone and Palmerston: being the Correspondence of Lord Palmerston with Mr. Gladstone 1851-1865* (New York, 1928). See also N.A.M. Rodger, "British Naval Thought and Naval Policy, 1820-1890: Strategic Thought in an Era of Technological Change", in Craig L. Symonds (ed.), *New Aspects of 'Naval History* (Annapolis, 1981), 142-5.

[25] *Proclamation by the Queen* [on American Civil War neutrality], 13 May 1861, PRO, A D M 1/5765.

[26] Palmerston observed on the question of a pre-arranged naval arms limitation treaty with France and the British addendum for twice the number of French ironclads, discussed in Parliament in July 1861: "the Emperor would laugh at us and say 'By all means! I must have 20 or 24 Iron-cased ships—you are quite welcome to have 40 or 48, and I hope you will find the money to build them; but do not expect that I am to sit with my hands crossed till you have done so!'" Parkes, *British Battleships,* 49.

[27] Hamilton, *Anglo-French,* 140.


PUNCH, OR THE LONDON CHARIVARI.—FEBRUARY 7, 1863
THE NATIONAL CRINOLINE.
MR. PUNCH. "TELL YOU WHAT IT IS, MARM, ALL YOUR GEARING WON'T KEEP YOU OUT OF THE FIRE, UNLESS YOU REDUCE SOME OF THAT."

decisively, and reach a two-power standard in addition to the new ironclads.[28] When Cobden complained to Foreign Secretary Lord John Russell about rising national defence expenditures, which undermined the amiability of the commercial treaty with France, Russell replied with crisp irritation:

> The Emperor wishes to defend France, he completes Cherbourg, he adopts a peace army of 600,000 men. Not a word of complaint. We add to our Navy, and propose to fortify the arsenals where they are built and repaired. We are accused immediately of warlike intentions. Is it to be deliberately said that France may be armed, but that we should be unarmed? Belgium, Antwerp, Dover and Portsmouth would in that case soon fall into French possession. I am anxious for the completion of the commercial treaty. But I cannot consent to place my country at the mercy of France.[29]

There can be no denying that the pace and scale of British industry now set to task was tremendous. While Lord Lyons, Britain's Minister to the United States, informed Vice-Admiral Sir Alexander Milne (commanding the North American and West Indian Station) of the hostile reaction in Washington to the Queen's Proclamation of Neutrality, and warned the Federal government was unlikely to "abstain from provoking language or even aggressive conduct," the Admiralty Controller argued *against* the commissioning of gunboats for exercising Coast Guard crews and RN Volunteers, since "nearly the whole force of the Dock Yards is more than absorbed in die Repairs of Ships lately paid off, and in completing new ships for service, leaving a smaller proportion than usual employed in building the new ships urgently required."[30]

Yet during the war scare with the United States over the *Trent* Affair, from the end of November 1861 until the new year, the Controller's attitude towards private contractors soured a great deal. The same company which launched the *Resistance* nearly a year before, Westwood, Baillie, Campbell & Co., was also responsible for the new ironclad *Valiant* and informed the Admiralty "we have a claim of £12,000 for Extras, etc., which we are satisfied could not be reduced to £8,000 if disputed..."[31] Robinson objected to these claims three weeks earlier, observing that "in dealing with the *Warrior's* case their Lordships were induced to consider it as favourably as possible for the Firm employed in building that Ship, for reasons which were obvious, and which must be so fresh in Their memories that they need not be repeated." Though the *Resistance* was as new a ship in design and structure to its builders as the *Warrior* was to Thames Iron Shipbuilding, "the Firm had ample means of

[28] Colin Baxter notes Somerset's willingness to continue construction of unarmoured wooden line-of-battle ships as well, however, until the future of ironclad vessels became more clear, "The Duke of Somerset," 280.

[29] Russell to Cobden, 31 July 1860, West Sussex Record Office, Chichester, Cobden Papers Collection.

[30] From FO, January-June, 1861, PRO, ADM 1/5767; FO, 6 November 1861; Lyons to Milne, 25 May 1861; Robinson to Board, 14 June 1861, ADM 1/5774.

[31] 28 March 1862, enclosed letter from James Campbell of Westwood Baillie to Lord Clarence Paget, Admiralty First Secretary, dated 26 March 1862, PRO, ADM 1/5802.

judging of the nature of the work required of diem, and of their resources for executing it." By taking on the *Valiant* at £42 per ton after twelve months of construction on the former ironclad, at £44 per ton, the contractors signalled their confidence in enjoying a profit from extra work, and Robinson coolly remarked "it certainly is not the province of the Aa"rtiralty to take care that no loss should fall on the Parties who, as Men of Business, had every means of knowing how best to conduct their own affairs." Now the *Resistance* was delivered far later than hoped, the *Valiant's* progress was in jeopardy and the final bill calculated by the Controller's Department was £157,972.11.02—a figure which put the Admiralty "ten thousand pounds beyond what...[the firm was]...strictly entitled to by the terms of the Contract."[32] Robinson accused them of more than carelessness in accepting the burden; in his opinion the builders were simply wasteful and negligent with the job itself. The issue of added cost was, if anything, a justifiable complaint *by the Admiralty*.

Referring back to the 13 January minute, the Lords Commissioners of the Board of Admiralty recited to the Cabinet on the 23 May 1861, the discomforting progress of French ironclads. Against them the navy could only offer "two Frigates of the First Class afloat and plating, [in margins: *Warrior, Black Prince,* 46 guns each]... Two of an inferior class afloat and plating. *[Resistance, Defence, 22* guns each]...Two of a superior class the tender of which was accepted in the end of January last *[Hector, Valiant,* 32 guns each]... And one of the First class the keel of which is not yet laid *[Achilles,* 50 guns], making a total of seven afloat building and ordered." It was therefore a matter "of urging on Her Majesty's Government the necessity of adopting immediate measures for the construction of iron plated vessels of the first class with such improvements as experience has suggested," and "to ask for authority to call for tenders for new iron cased ships from the private trade as well as to employ additional hands in building and converting wooden ships to carry armour." The pressure behind this minute appears to have come from the Senior Naval Lord, Vice-Admiral Sir Richard Dundas, who in a minute to this one confessed to a degree of uncertainty between strategic and tactical range and protection which did not seem to hamper the French:

> ... at present [we have] not more than four ships of classes with which we are perhaps less well contented, and of which two only can be considered as well adapted for seagoing purposes indispensable to the defence of this country. Considering therefore that under these circumstances we are in a great measure forced to a decision, and that even a wrong decision and certain progress may tend to postpone a rupture, while evident superiority might tempt France to encroachments, it seems advisable to yield to the

[32] 6 March 1862, PRO, A D M 1/5802. One contemporary civilian authority, at least, felt differently, defending the private shipbuilding industry of Britain while attesting "no man... can know the [Royal] dockyard and naval system of this country without being at a loss for words sufficiently scurrilous to convey a proper sense of his indignation," P. Barry, *Dockyard Economy and Naval Power* (London, 1863), xi-xii. The chief points of criticism were the "need" to defend dockyards when private shipyards were more numerous and valuable; lack of more efficient division of labour practices in government yards (unlike those in America and France); and bureaucratic red tape, private patronage, and corruption stifling any administrative reform.

> necessities of the case and determine to construct not less than 10 new Ships [6 of them built of iron by private contract] of the best description which we can devise.[33]

This was to be an improved *Achilles,* the *Minotaur?*[34] But exclusive to the Minotaur-class was the introduction of a new armour scheme which called for thicker plates, now ***5Vi*** inches, backed by only 10 inches of teak to compensate for the greater weight in iron. Somerset identified two possible objections, "chiefly financial and political." A demand for increased outlay beyond the £12 million estimates, for even greater iron vessels than *Warrior* or *Achilles,* when the former had yet to be tried at sea, could be seen by Parliament as "preposterous". As serious as the fact that the new combination was untested was the implication that all previous armour-protection arrangements were inadequate. "The political objection would be equally strong," he continued, "as such an application to Parliament would be ascribed to some new distrust, at a moment when a good understanding with France may most usefully tend to the removal of difficulties in our relations with the United States."[35]

Somerset's political message was overlooked.[36] The Board's minute re-emphasised the danger of French naval power in and of itself, not the potential *diplomatic* manipulation of it. Thus, despite the initiation of two smaller improvements of the first four partially protected broadside ironclads; a more protected version of the *Warrior* that was to lose none of its essential seagoing qualities, particularly its speed; and four immediate wooden-hulled conversions (to be named *Royal Oak, Prince Consort, Ocean,* and *Caledonia),* and despite growing uncertainty over the private shipyards' ability to cope with this peace-time drive, the Admiralty insisted upon the construction of three (rather than six) more large iron-hulled broadside-ironclads as a necessary response to the perceived threat from France.

Meanwhile, naval events in the American Civil War took a dramatic turn shortly following the humiliation of President Abraham Lincoln's administration over the *Trent*

[33] "Iron Cased Ships," 23 May 1861, PRO, A D M 1/5765. Dundas's minute is enclosed but undated.

[34] "The longest and largest single-screw fighting ships ever built, and the heaviest in the Navy for the next ten years, uniquely favoured in a rig which comprised the spectacular array of five masts," Parkes, *British Battleships,* 60.

[35] 23 May 1861, PRO, A D M 1/5765. The mutual suspicion endemic to modern civil-military relations was clearly manifest in mid-Victorian Britain; "[The principle of publicity] on a variety of unfamiliar subjects, made separately and a considerable intervals, have almost necessarily failed to convey any satisfactory general view, either of the state of the Navy, or of the system by which it is governed... This difficulty has been increased by the habit of regarding the Navy as a subject apart from all ordinary knowledge, involving a maze of technicalities and contradictions not be unravelled by inexperienced persons; thus matters of the most momentous interest to the country are often discussed in the House of Commons under the constant apprehension of a count-out, for naval questions act as a general signal for a rush to the doors, and the Government whip on no occasions finds it more difficult to keep a House together," Capt. the Hon. Joseph Denman, *Admiralty Administration: Its Faults and Its Defaults,* (London: Longman, Green, Longman, and Roberts, 1861), v-vi.

[36] See Baxter, "The Duke of Somerset," who also suggests Somerset was averse to "a crash programme" of additional ironclads until both the seagoing qualities of previous classes and the proposed armour configuration could be fully tested; 281-2. Either the French threat was urgent, or it was not.

Affair. On 8 March 1862, the converted casemate ironclad-ram CSS *Virginia* (or *Merrimac)* attacked and destroyed two powerful wooden Union frigates at Hampton Roads, and was set to finish off the rest of the Union blockade squadron the next day. But the North had already taken steps to produce its own ironclads, including a radically-designed, turreted steam-battery from John Ericsson, the genius Swedish-American inventor-engineer. In 100 days the small coastal ironclad was built and dispatched in time to fight the *Virginia* on 9 March to a standstill. The blockade was preserved; the Federal army could proceed with its campaign up the Peninsula to the rebel capital of Richmond; and the United States Navy had discovered a unique weapon with which both to help subdue the South and insure that any future threatening gestures from the Royal Navy would be confidently answered. Ericsson named his vessel *Monitor* and explained why:

> The impregnable and aggressive character of this structure will admonish the leaders of the Southern Rebellion that the batteries on the banks of their rivers will no longer present barriers to the entrance of the Union forces. The iron-clad intruder will thus prove a severe monitor to those leaders. But there are other leaders who will also be startled and admonished by the booming of the guns from the impregnable iron turret. "Downing Street" will hardly view with indifference this last "Yankee notion," this monitor. To the Lords of the Admiralty the new craft will be a monitor, suggesting doubts as to the propriety of completing those four steel ships at three and a half million apiece. On these and many similar grounds, I propose to name the new battery *Monitor*.[37]

News of the action at Hampton Roads took the British public, press, and Parliament by storm. Large wooden steamers were clearly helpless against smaller armour-plated foes. Ironclads were fighting ironclads. Perhaps most significantly, the Americans had produced them in far less time and expense than either England or France. In the House of Lords Somerset, however, was quick to ridicule the *Monitor,* (which was semi-submerged, with an overhanging upper hull which protected the rudder, screw and lower hull from shot or ramming), as "something between a raft and diving bell."[38] Indeed, to admit a superiority of the American ironclad-battery concept would have disgraced the British government's own program, already fully committed, not to mention Palmerston's even more controversial series of anti-(French) invasion coastal fortifications.[39] The final criticism was, of course, that the *Monitor* was nowhere near as seaworthy as the *Warrior,* and therefore much less versatile.

Then again, with crucial "inside" Navy Department support from Assistant Secretary Gustavus Fox, John Ericsson now offered improved monitor-ironclads devoted almost

[37] Quoted from John Ericsson, *Contributions to the Centennial Exhibition* (New York, 1876), 465-6.
[38] *Hansard's Parliamentary Debates,* 166 (London, 1862), 31 March 1862,263; 3 April 1862,433^1.
[39] See Michael Stephen Partridge, *Military Planning for the Defense of the United Kingdom, 1814-1870* (New York, 1989).

entirely to two overriding principles: impregnable defence, in the form of low freeboard submersion and even thicker turret armour, and irresistible offence, in the form of a small number of massive, experimental 15-inch calibre smoothbores.[40] "The state of the naval defences of the country being so intimately connected with its international relations," Ericsson wrote to Secretary of State William Seward, "I deem it my duty to report to you that under orders from the Secretary of the Navy, keels for 6 vessels of the Monitor class of increased size and speed have already been laid." Against the 15-inch gun, throwing 450-pound shot, "the *Warrior, Black Prince,* and the razeed line-of-battle ships, will present only a 5-inch plating... .Under its terrific impact the sides will be actually crushed in." These were purpose-built, *ironclad-killing* ironclads.

Thus the Union's technological solution to the growing ironclad problem was even more focussed on tactical supremacy first, and strategic domination, or at least protected isolation in the case of the American Civil War, second. Ericsson accepted the challenge of making future "monitors" more seaworthy without sacrificing their real power and therefore approached a common problem from a remarkably opposite perspective. He knew the United States, unlike the British Empire, could now afford to wait. "The speech of the Duke of Somerset in the house of Lords on the 4th instant and the news from England today in relation to the expedients now adopted by the Admiralty to avert the dangers to England suggested by the recent developments in naval warfare, tend to prove that this country now occupies the vantage ground."[41]

Back in London, troubles continued to emerge from every corner in broadside-ironclad construction which must have eroded Robinson's original optimism even when private contractors did feel obliged to 'tax their resources to the utmost'.[42] On 5 May 1862, Robert Napier & Sons wrote to William Romaine, Permanent Secretary of the Admiralty:

> We can easily imagine from the manner in which the difficulties experienced in the construction of the *Warrior* have been brought before my Lords that their Lordships may have been led to understand the precedence of the *Warrior* relieved us from similar difficulties...but...the precedence of the *Warrior* was of no practical assistance to us, but was in many respects, and more particularly in the details of finishing the *Black Prince* after her launch, seriously detrimental from having to receive very often our instructions at second hand from the *Warrior's* Inspector.
> … in endeavouring to meet the urgency with which their Lordships required the Ship for the Public Service, we used the utmost dispatch working all night, as well as by day, when the nature of the work permitted it to be

[40] Such heavy weapons could only be mounted on centre line, rotating turrets, not on the broadside. See Spencer Tucker, *Arming the Fleet: U.S. Navy Ordnance in the Muzzle-Loading Era* (Annapolis, 1989), 218-23; Donald Canney, *The Old Steam Navy (Volume Two), The Ironclads, 1842-1885* (Annapolis, 1993), 77-80; and Frank M. Bennett, *The Monitor and the Navy Under Steam* (Boston, 1900), 214-19.

[41] Ericsson to Seward, 23 April 1862, American Swedish Museum, Philadelphia, PA, John Ericsson Papers.

[42] 31 August 1861, A D M 1/5774.

> done, and employing on the *Black Prince* in the Building Yard alone fully 1600 men, and which by this means we made so much progress that we were often in many important parts ahead of the *Warrior,* and only two months later in launching...[43]

In addition to overruns of £8,463, Napier claimed an absence of actual profit in building *Warrior's* sister-ship, echoing directly the appeal made by Thames Iron the previous November. But Robinson disputed the figures as erroneous and the evident client jealousy as suspicious. In fact, "neither of the contractors received the whole command named for their respective Ships, each of them failed to deliver the Ship complete, and from the sum of £255,164 which the *Warrior* cost, £3,578 was deducted on account of works done in the Dock Yard; and from the sum of £251,071 which the *Black Prince* cost, £10,818 was deducted for work done in the Dock Yard to complete die Ship."[44]

Nor was the problem restricted to the shipyards. The relatively sudden, large scale manufacture of iron armour plates appears to have caught everyone unprepared. Between the delays occasioned by the ships themselves and the Admiralty's hesitancy in committing fully to designs from inception to actual achievement, the rigid standards set by government examiners for 4**'/2**-inch slabs of uniformly-welded iron were sources of impediment. Hence, on the same day Napier was writing to Romaine, Robinson was obliged to report to the Board that "the supply of Armour Plates is in an unsatisfactory state."[45] On 12 March 1862, he also reminded them that "the *Warrior* having 4**'/2**-inches of iron Plating over 18 inches of Teak and the *Minotaur* and her class having 5**'/2**-inches of Iron Plating over 9 inches of Teak," the new armour scheme for the Minotaur-class broadside ironclads was still uncertain until the Iron Plate Committee, which seemed "to be rather doubtful whether 5**'/2**-inch iron plates of good quality can be manufactured, though the Contractors for building these ships do not doubt that they can easily be procured," actually conducted its tests. By 15 May nothing was accomplished and again the Controller submitted an urgent request for a target to be fired upon at the testing grounds at Shoeburyness.[46]

The results when they came were more than disappointing. Firing at the target with the new Armstrong 12-ton gun (with cast-iron spherical, 150-lb. shot, and a 50-lb. charge) at a combat range of 200 yards, "the *general damage* was much greater than in the *Warrior* Target, aldiough die latter was subjected to much more severe fire." After only four heavy shots die target itself was battered beyond service. The first shot alone "hit the centre plate...and made a hole through the plate 12.5" x 12.2", and about 13" deep," while the

[43] 8 May 1862, enclosed letter dated 5 May 1862, PRO, A D M 1/5802. The import of this complaint should not be underestimated, since "the credit for laying the foundations of the Clyde warshipbuilding industry belongs to Robert Napier," who had by this time been constructing iron-hulled warships for the Royal Navy for nearly twenty years. The contracts for *Black Prince* and then *Hector* nearly broke Napier, who "never fully recovered from the débâcle," Hugh Peebles, *Warshipbuilding on the Clyde: Naval Orders and the Prosperity of the Clyde Shipbuilding Industry, 1889-1939* (Edinburgh, 1987), 8-15.

[44] *Ibid.* Robinson's reply dated 8 May 1862.

[45] *Ibid, S May* 1862.

[46] *Ibid,* 12 March 1862.

second hit struck the bottom plate and passed clean through, making a hole "13" x 12.5"..." The test only proved the comparative inferiority of the *Minotaur's* defence; the crucial differences in iron plate manufacture (as some plates submitted by different firms reacted better or worse than others); the inadequacy of the fastenings of the through bolts of even the first generation ironclads (less than two inches in diameter), and the power of the heavier gun, since the much vaunted, traditional 68-pounder smoothbore fired immediately afterwards produced serious dents but no penetration.[47]

By now the situation seemed to be getting worse rather than better, with British iron shipbuilding in the hands of private industry. The Controller noted five firms in particular, Napier, Thames, Laird, Samuda, and Mare, which were unacceptably delinquent with their orders. The situation with the Minotaur-class *Northumberland* was worst. "The Contractors have been repeatedly written to and urged to expedite this Ship, but without effect. She should be launched in February 1863, but there is no prospect now of her being launched earlier than April 1864." The advice of the Admiralty Solicitor, moreover, was that the contract could not be withdrawn and handed to another builder for no other reason than "slow progress," as this was not a specific clause in the contract.[48] A letter to Thames Iron regarding the "backward state" of the *Minotaur* met with a list of numbered complaints which included the alterations to the ship's design and construction ordered subsequently by the Admiralty. These involved the changing of a raised screw while under sail, as with the first generation ships, to a fixed one requiring the re-working of the complicated stern posts, and changes in the armour itself in proportion to its wood backing. Robinson addressed these points one at a time, "in order to prevent the Board of Admiralty from being placed at a disadvantage at any future time, if the Company should become remiss and fail to complete the Contract within the stipulated time." Even so, he must have felt that Thames Iron was not alone as "the case of the *Valiant* has been already reported on, and the progress of that Ship has been far less satisfactory dian that of *the Minotaur."*[49]

Robinson's unequivocal belief that "the ordinary wooden Ship is sure to be immediately destroyed by the ordinary artillery of all nations, and the larger the Ship the more certain the destruction," probably refers to the only such engagement known by 1863; the destruction of the Union frigates by the ironclad-ram *Virginia.* Not just France, but "every maritime power, according to its means, has considered it indispensable to clothe its Military navy in Iron Armour," yet because the greatest of these (and the nearest to England) had "perfected and prepared a large number of [sea-going] Ships," Robinson recapitulated die basic decision of the Admiralty: diat such ironclads "can only be met on equal terms by a similar description of Force... a certain number of Ships which can contend on equal terms with our neighbours." Hence the determination to employ numerous commercial iron

[47] Promiscuous, A-H, 1862,22 July 1862, PRO, ADM 1/5809.

[48] 26 September 1862, PRO, ADM 1/5802; also 2 July 1862, where the Solicitor's enclosed letter dated 3 July 1862 identifies the loophole in the contract: "the Admiralty have no power reserved to them by such Contract to enter and finish the Vessel until the period limited by the Contract for completing it has expired. There is no penalty for the non-progress of the Work."

[49] 26 November 1862, PRO, ADM 1/5802.

shipbuilders, a recourse of little alternative when the Royal Navy itself was obliged to maintain in its own facilities such a large force afloat for the protection of British interests worldwide.[50]

Nevertheless this solution led only to more problems; "the work is slow, very expensive, requires an immense amount of inspection as to Workmanship and materials and in no case has such a ship been perfected without large expenditure of time and money in the Dock Yards." Even if iron shipbuilding was found to be unquestionably better than wooden conversions, Robinson was severe in his judgment that "our past experience teaches us that no reliance whatever can be placed on private Shipbuilders keeping any engagements they may enter into with the Admiralty."[51]

Since the Controller maintained "that our present large force afloat, and the reliefs that it requires, are insuperable objections to any considerable reductions in the expenditure of Wages in our Dock Yards," the natural conclusion would be to favour wooden conversions into ironclads in the government facilities. It was the second plan adopted by the Admiralty in May of 1861, along with the privately built iron-hulled ironclads, and it was bound to mitigate any "new discovery of the power of Artillery," which "disturbs all foregone conclusions," (and therefore suggested time-consuming iron-hulled ventures were short-lived in any case). This would both modernise the Navy and free it from any commercial exploitation or failures. It would also give the Controller, the Navy, and the Government much more direct and encompassing control over the means of ironclad construction. After all, Robinson made sure to point out "whatever may be said as to Iron Ships Armour Plated it is to be remembered that we have not yet afloat one Ship of that description plated from end to end, while several powers have actually sent to Sea wooden Ships so protected."[52]

This marked a personal preference by the Controller for more fully-protected ironclads, more quickly produced, at less cost, and perhaps handier as well, if limited to some degree in range, although range was defined inevitably as the ability to be at least as good as the French examples.[53] It was a discussion of these very principles which suited the Royal Navy best in the mind of its Controller that contributed to the famous debates with turret-ship advocate Captain Cowper Phipps Coles. Likewise, it was the preference of Rear-

[50] "British naval supremacy...rested both on number of ships and in the possession of bases (many recently acquired) all over the world, and on British industrial superiority. British interests were so much more numerous and widespread than those of other western powers that the Royal Navy became, in effect, the policeman of the globe, carrying the main burden of suppressing piracy and the slave trade. In addition, the Navy became heavily involved in surveying the seas, exploration and scientific research," John B. Hattendorf, R.J.B. Knight, A.W.H. Pearsall, N.A.M. Rodger, and Geoffrey Till (eds.), *British Naval Documents 1204-1960* (Aldershot, 1993), 563.

[51] 3 December 1862, A D M 1/5802.

[52] *Ibid.*

[53] Robinson defended the broadside-ironclads against the criticisms of their own Channel Squadron Commander-in-Chief, Rear-Admiral Sir Sydney Colpoys Dacres, in 1864. In mentioning the capabilities of the Prince Consort-class [Royal Oak-class] at sea he stated "after seeing the French and Italian Iron-clads, which perform all the service required of them in the Mediterranean, and elsewhere, I have no hesitation in saying that these ships are fully equal to them, and need not shrink from any comparison with any wooden Iron-clads afloat," From Surveyor, October-December, 1864,19 November 1864, PRO, A D M 1/5892.

Admiral Robinson for ships of the Royal Oak-class that sealed up the possibility for any large introduction of turret ships based on Coles's designs. By the time the Admiralty was willing to reconsider seriously the inventor's claims, in the wake of the public furor which accompanied the news of the American ironclads, the nation's dockyards were already fdled with wooden conversions and standard repair and fitting of wooden steam vessels on the one hand, and massive iron-hulled constructions on the other, which were consuming the full attention of those contractors they did not break altogether.

The driving force behind the character of Britain's early ironclads was in fact her political conception of foreign policy. The early 1860s saw Lord Palmerston at the height of his popular power; conservative opposition was fragmented and weak, while strong arguments from leading radicals Cobden and John Bright were openly dismissed with laughter from the Prime Minister. Although Parliament mounted several efforts to curb inflated peace-time defence estimates, "Old Pam" could safely resort to patriotic rhetoric which saw him escape political extinction (as with the notorious Don Pacifico affair) and assume an almost supra- party national character which *Punch,* for example, absolutely idolised.[54] Defending *his* government's carte blanche ironclad program in the House of Commons, Palmerston recited:

> ... it is part of the duty of Parliament to enable the Government of this country to hold a proper position with regard to the affairs of the world, and, without interfering by force of arms, at all events to exert a moral and, I will not say, preponderating, but at all events a powerful influence in favour of the principles which this great nation so heartily and cordially approves. But to do this, it is essential that we should be in a position of perfect self-defence; and by self-defence I mean not merely self-defence upon the shores of these islands; we have interests all over the world; we have possessions in every part; and the perfect defence of the country means that we should... have the means not merely of defending our shores, but also of protecting those vast interests, commercial and political, which we have in every part of the world."[55]

It was this diffuse mass of contradictory values, between position and interference (yet without war); moral influence and naval preponderance; and the self-defence of interests all over the world, which taxed British shipbuilding, industry, and administration to perhaps unnecessary extremes.[56] Cobden regarded Russell's belief that the country would be at the

[54] B. Kingsley Martin, *The Triumph of Lord Palmerston* (London, 1924), 46-76; Jasper Ridley, *Lord Palmerston* (London, 1970), 492-6; 515-33.

[55] *Hansard's Parliamentary Debates,* 167, 3 June 1862, 327-8. See also Daniel R. Headrick, "The Tools of Imperialism: Technology and the Expansion of European Colonial Empires in the Nineteenth Century," *The Journal of Military History,* 51, Issue 2 (June, 1979), 231-263, on how expanding British commercial and political interests and naval technology were often mutually supportive; and Robert Kubicek, "British Expansion, Empire, and Technological Change," in Porter (ed.), *The Oxford History of the British Empire,* 247-69.

[56] See Muriel E. Chamberlain, *'Pax Britannica'? British Foreign Policy 1789-1914* (London, 1988), 5.

mercy of France without such efforts "lamentable," since "a liberal government [was] made the instrument for laying unparalleled burdens on the taxpayers to guard against dangers which, if a full investigation were entered into, would be found to have no existence."[57] The production of a relatively small fleet of "super" broadside-ironclads could show the flag in an established way, and it is not difficult to imagine how impressive the *Minotaur* would look anchored at Malta. But other nations were investing in rival technologies to make their coasts veritable killing grounds for just such an occasion.

By the end of 1864, the Controller submitted to the Board of Admiralty revealing "General Remarks on the Classification, Distribution, and Construction of Armour-plated Ships." Though the dreaded French seagoing ironclad force of 1860 had clearly stalled under its own construction restraints, few of the miscellaneous British ironclads afloat could manoeuvre as an homogenous squadron in line-of-battle. Nor could the "Class A" broadside-ironclads {*Warrior, Black Prince, Achilles, Minotaur* and *Agincourt* [Minotaur-class]) "at present be docked out of England," which automatically limited their intended effectiveness beyond the English Channel; while "the unprotected extremities of two ships in Class A, and of two in Class C, detract very considerably from their utility as fighting ships." Only with the addition of three more "central battery" ironclads of die new Bellerophon-class (pioneered by the talented Chief Constructor Edward Reed), and monitors for coast defence, would Britain "not be taken at a disadvantage if forced into a war, with the one exception of the protection to be given to our commerce from privateers and [an] enemy's fast-sailing wooden cruizers."[58] This last referred to the serious damage inflicted upon the Union merchant marine worldwide by the British-built CSS *Alabama* and the host of commerce raiders which the US Navy was building for an expected retaliation.[59] This, coupled with the widespread failures of the 110-pounder rifled breech-loading Armstrong guns, implied that Britain remained less protected than expected.[60] Indeed, Palmerston was obliged to admit to his increasingly frustrated Chancellor of the Exchequer, William Gladstone, not only that "we must keep Pace with France, America and Russia," and that "the Fleets numerically smaller of the lesser Maritime Powers will tell more effectively than in the olden Time

[57] Cobden to Russell, 2 August 1860, Cobden Papers. See also David Newsome, *The Victorian World Picture: Perceptions and Introspections in an Age of Change* (New Brunswick, NJ, 1997), 101-15.

[58] From Surveyor, October-December, 1864, 13 December 1864, 1-5, PRO, ADM 1/5892. See also Stanley Sandler's examination of Reed's drive for ironclads of greater concentration of armour protection, with fewer, heavier guns, in *The Emergence of the Modern Capital Ship* (Newark, 1979); and Reed's own self-promoting work, *Our Ironclad Ships; Their Qualities, Performances, and Cost* (London, 1869).

[59] The threat of a war of revenge against British complicity with the South was real until the assassination of President Lincoln, which seemed to have had a remarkable cooling effect on heated Anglo-American relations during the Civil War; see the "Report on Ships of the United States Navy 1864, Capt. James G. Goodenough, RN," From Captains A-G, 1864,21 October 1864, PRO, ADM 1/5879; and Richard M., William E. Geoghegan, and Frank J. Merli (eds.), "A British View of the Union Navy, 1864: A Report Addressed to Her Majesty's Minister at Washington," *American Neptune,* 27, (January 1967), 30-45.

[60] See the numerous Ordnance Select Committee reports on the subject of failed Armstrong 110-pounders, PRO, W.O. 33-11 to 16; The Times (London), 30 July 1866, 13 August 1866, and "Warships and Monitors", in *The Nautical Magazine and Naval Chronicle for 1866: A Journal of Papers on Subjects Connected with Maritime Affairs* (London, 1866), December 1866,675-80.

because of their modern Construction," but that "we are as yet unprovided with Cannon of sufficient power. There is little use in firing at an Iron Clad Ship unless you can send your Shot or your Shell through her Armour Plating—and I believe that at present with the exception of some [experimental] Armstrong Guns, and they are few, our Land Batteries and our Ships of War are not provided with guns that will send a shot through Iron Plates."[61]

Even in terms of imperial defence, an 1859 Colonial Office memo on the "Question of occupying the Feejee Islands" astutely concluded it was one of "Naval ascendancy", rather than "multiplying the demand for Garrisons and protecting Ships." In the event of a maritime war, "the real battlefield would be the Channel and the Mediterranean, and whoever conquers there would command the Ocean and the Antipodes."[62] Captain Slade put it even more succinctly; "England...requires for her defence a highly organized permanent Channel fleet, *in British waters"* Anything else, anything *more,* would ultimately prove that "the lust of ambition prevails over the instinct of defence."[63]

[61] Palmerston to Gladstone, 19 October 1864, University of Southampton, Palmerston Papers ("Broadlands"), MS 62.

[62] 3 May 1859, PRO, CO 325/48. See also C. J. Bartlett, "The Mid-Victorian Reappraisal of Naval Policy", in K. Bourne and D. C. Watt (eds.), *Studies in International History* (Hamden: Archon Books, 1967), 189-208.

[63] Slade, *Maritime States,* 48-55. See also the arguments of Clark G. Reynolds, in *Command of the Sea: The History and Strategy of Maritime Empires* (Malabar, FL, 1983), that "Great Powers have evolved to the height of their political prestige and might by becoming imperial nations," and "for *maritime* nations, the navy has been the main strategic arm of the nation's defensive structure, dominating the defensive policies of the home government, maintaining a generally *offensive* stance, and operating mainly on the "blue water" of the high seas," though "the ultimate expression of naval superiority comes when naval power can be projected inland against the vitals of the enemy homeland," 3,12-13.