

## **International Journal of Naval History**

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**August 2006**

**Volume 5 Number 2**

**Economic Power, Technological Advantage,  
and Imperial Strength:  
Britain as a Unique Global Power, 1860 – 1890.**

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Between 1860 and 1890 Britain greatly expanded her formal and informal empire, and her commercial activity, while avoiding war with any other major power. Although this period witnessed a revolution in the technologies of war, communication and transport, and profound changes in the European state system Britain secured her interests on low and falling defence estimates. This combination of circumstances was neither accidental, nor fortunate. It reflected a coherent response to the problems facing the state, and the development of core capabilities for a truly global strategy. In examining the development of British strategy between 1860 and 1890 this study will focus on the major influences, expanding and changing commercial activity, the emergent technologies of iron, steam, and telegraphy, and the vast extent of the potential defence commitment. <sup>[1]</sup>

### **The British Economy 1860-1890.**

By 1860 the British economy had adapted to the 'Free Trade' policy that followed the repeal of the Corn and Navigation Laws in the 1840s. Any adverse effects were largely disguised by tremendous expansion

of the world economy, the beginning of a ten fold increase in trade between 1850 and 1910, and the introduction of iron steam ships. The impulse provided by American and Australian gold discoveries, and the ability of railways to open continental regions to trade, and falling long distance freight rates sustained this expansion. Britain's share of this expanding world trade was relatively stable, partly because her extensive empire provided secure markets and key raw materials when American and European markets were becoming more competitive, and subject to tariff barriers.

While the empire was a valuable segment of the economy, it was never dominant, occupying about 25% of the market in most areas. The most dynamic sector of the British economy was the export of capital, by 1890 almost £100 million annually, much of it invested outside the empire. This sector was intimately linked to the financial services and commercial support systems of the City of London . The pre-eminence of the City of London in finance and trade was reflected in British dominance of world shipping and related services. By 1900 Britain had over £2,000 million invested overseas, providing an income to cover the balance of payments deficit on manufactured goods and food.<sup>[2]</sup>

Sterling and Free Trade made the world system fluid.<sup>[3]</sup> In this era of 'Gentlemanly Capitalism' the City of London and financial services came to dominate the economy, with links between the City and Governments growing ever closer. Agricultural values were in decline, while manufacturing remained provincial. The wealth generated by the City gave it enormous influence and made it a vital source of state revenue. In turn the City made certain governments recognised that the dominant roles of sterling and the City in global trade reflected cheap government, low taxes, balanced budgets, a gold standard, and the security afforded to trade and investments by the Royal Navy. In balancing these qualities, in effect settling the

premium to be paid on national wealth in the form of defence expenditure successive Governments tried to steer a fine line between running risks and over-taxing the national resource. In August 1857 Liberal First Sea Lord Sir Charles Wood, a one time Chancellor of the Exchequer, defended the post-Crimean War retrenchment from Royal criticism by referring to the unique staying power of the British economy. While Russia and France were effectively exhausted by two years of war Britain was, 'more willing and more able to continue the war than at its commencement.'<sup>[4]</sup> Most liberal economists believed that this long term power had been created by low levels of taxation and expenditure in peace time. This orthodoxy would be taken to new levels by Gladstone .

The major political benefit of economic success came in the collapse of mid-century political agitation, one of the key arguments used in favour of 'Free Trade'. Limited political reform, domestic prosperity, and opportunities for emigration defused the unrest of the 1840s.<sup>[5]</sup> Throughout the century the aggressive expansion of trade into non-imperial areas was a key government task, notably for Lord Palmerston, Liberal Foreign Secretary and Prime Minister (1830-41, 1846-51, 1855-58, 1859-65). For Palmerston the answer to economic distress at home was an ambitious foreign policy to open new markets.<sup>[6]</sup> After the Second Reform Act of 1867 British politics was dominated by domestic and economic concerns, which replaced foreign policy and defence as the key concerns of statesmen. The dominant figure of this era, William Gladstone, Liberal Chancellor of the Exchequer (1852-55, 1859-66) and Prime Minister, (1868-74, 1879-1885, 1892-94) took a less interventionist stance. Confident that British trade would always triumph, and taking British power as a given, he presided over a period of very low defence spending, as part of an overall small government stance.<sup>[7]</sup> He did not value the empire and ignored colonial defence scares, cutting both the defence budget

and the colonial share of that budget. Gladstone's financial policies led to a marked fall in the cost of servicing the National Debt, the legacy of previous wars, from 41% of government expenditure in 1860 to 27% in 1890.<sup>[8]</sup>

While the Conservatives under Benjamin Disraeli were less economically minded, and became more avowedly imperialist in the mid 1870s both men found their external policy influenced by economic issues, notably the acquisition of the Suez Canal shares in 1875, and the occupation of Egypt in 1882.<sup>[9]</sup> In 1888 the City shifted to a Unionist/Conservative posture<sup>[10]</sup> and awarded the Conservatives the ultimate accolade, supporting a major conversion of National Debt that reduced interest on £500 million of stock by ½ %. This demonstrated the City's confidence in peace and stability. As Niall Ferguson has suggested: 'The Victorians appeared to have achieved empire without overstretch'.<sup>[11]</sup> Such optimism would not last, but the 1888 conversion was a high-water mark of imperial power.

The financial elite knew that the British economy would only prosper if the world was open to trade, and the seas, the great common across which goods and services were exchanged, were open to British shipping. In this context 'Imperial Defence' takes on an entirely different meaning. World trade was the basis of British power, and the security of that trade, rather than of the British Empire provided the mission of the Royal Navy. The fact that some trade was with the empire complicated the picture, but it did not affect the fundamentals.<sup>[12]</sup> The empire was a mechanism to stabilise the international capital market for the City, not an object to be defended. In essence Britain could not function without international trade, and this ensured the success of the City when challenged by manufacturing and protectionist interests in the early twentieth century.<sup>[13]</sup>

The only serious threat to the economic basis of British power was Europe. This was not an economic issue, but a strategic problem.

British investment in Europe had fallen from 50% of total capital exports in 1854 to only 5% by 1900.<sup>[14]</sup> Unsurprisingly trade followed the same pattern, although the decline was less marked. In an increasingly protectionist market British trade suffered. However the rest of the world took up the slack, and the British economy continued to grow strongly down to 1914. While Europe was stable, balanced and prosperous British interests were secure. The wars of 1864, 1866 and 1870-71 did not threaten vital strategic or commercial interests, although these were signaled to the belligerents, notably the need to respect the independence of Belgium in 1870. Therefore Britain did not need to intervene. Only the threat of a potential hegemonic power occupying the Rhine/Scheldt region would force Britain to act. This did not occur until after 1890.

As Britain had no positive interests that would be served by taking part in a European war in this period, she used the ideology of 'Free Trade' to position her all-powerful fleet as a 'world-policeman', rather than the cutting edge of a national strategy. This image, actively fostered by contemporary publicists, continues to confuse the unwary. In reality the link between trade and power was clear. The import duty on Chinese tea more than covered the cost of the Royal Navy in 1850, and was still meeting half the cost in 1857.<sup>[15]</sup> By contrast the self governing colonies made a minimal contribution. Britain spent £1.14 per head per annum on defence, the self governing colonies 12p, respectively 37% and 3-4% of central government spending.<sup>[16]</sup> Consequently the British Government was unimpressed by colonial alarmism, the more so when it was often linked to protectionist measures against British goods. With no serious threat in Europe, or the wider world, defence spending remained low until 1889.<sup>[17]</sup>

War threatened the British system in three related ways. First it would reduce access to markets, calling into question the underlying economic strength that was the basis of British power. Secondly it

would raise expenditure and taxes, making Britain less attractive for investors. Finally it would re-open fundamental questions about the existing social system, as it had during the Crimean War (1854-1856), when the middle class demanded a greater share in government.

Therefore when British access to markets was called into question the City of London pushed for a major naval build-up, as an 'insurance premium' on the existing order. Founded in 1882 as a City pressure group the London Chamber of Commerce persuaded the Conservative Government of 1886-1892 that their mutual interests required extra naval protection. In 1889, only one year after the conversion of the National Debt, the Government introduced the Naval Defence Act which, as Prime Minister Lord Salisbury told the Chamber, was intended to protect their trade.<sup>[18]</sup> Little wonder the City abandoned the Liberals, although the imperialist urge was tempered by a continuing preference for investing outside the formal empire. The City interests requiring protection were global; they were not restricted to formal and informal empire. The only effective defence was based on naval mastery, preferably secured through arms races rather than war.

However, the naval build up that began in 1889 should not be seen as a negative, defensive, response. Under the aegis of a renewed Royal Navy Britain secured control of South African gold and diamonds, much of sub-Saharan Africa, and improved control of non-imperial markets like South America.<sup>[19]</sup> Britain recognised that trade and investments might have to be protected by war, but economic, social and political concerns made fighting the policy of last resort. Instead Britain used financial power to secure markets, and create the naval might to back up her careful diplomacy. It was for this deterrent role against other major powers that the Royal Navy was maintained at a high level, not the defence of outlying imperial assets. The Naval Defence Act fleet was designed to win battles in European waters, not patrol the colonies. The empire, however, defined, would continue to be secured

by maintaining the peace and stability of Europe . If war broke out rival fleets would be blockaded in their homeports, or destroyed in battle. Only as a last resort would ships be dispatched to the distant corners of the globe. They could be sent quickly, and operated effectively anywhere in the world because Britain , and Britain alone, had the facilities to direct and support them.

Much of the infrastructure that sustained and extended the economic dominance of the City of London was also used to maintain global power. Between 1860 and 1890 the globe was effectively encircled by London centred, British owned, laid and operated submarine telegraph cables, largely sustained by everyday economic use. The cable generated new types of business and internationalised the financial world, increasing the primacy of London .<sup>[20]</sup> By 1890 the City, as the centre of ‘an expanding world economy knit together by instant communications’ dominated the British economy, and ensured governments understood and supported its concerns.<sup>[21]</sup>

The prime mover of world trade, the largely British built iron steamship, depended on the cable for market information, and supplies of British coal for motive power and a guaranteed export cargo. Along with the London insurance and shipping markets these assets gave Britain the ability to monitor the cable traffic and shipping movements of rival powers. The intimate relationship between economic activity and Imperial strategy limited the government role and expenditure in providing vital infrastructure to subsidies for cable companies, defending coaling harbours, and occasionally pushing specific projects like the ‘all-red’ cable routes. The main burden was borne by the private sector.

### **Technological Advantage.**

The astonishing development in military and related technologies between 1860 and 1890 profoundly altered the relationship between

land and sea based strategies, to Britain 's advantage. Power projection capabilities, economic leverage and speed of communications of sea based systems were all enhanced by technology. Between 1840 and 1860 steam warships, heavy, shell firing guns and the iron hulls and armour transformed the strategic relationship between land and sea.<sup>[22]</sup> Steam ships could pass existing shore defences built to resist sailing ships, while armoured firepower and long range guns could destroy forts, or the arsenals and cities that lay behind them. Merchant steam ships enabled ever larger expeditionary forces to be moved, and sustained by sea.<sup>[23]</sup> Land based systems were unable to cope with this expanding power projection capability because of the sheer scale of the defensive task. It was economically impossible to provide fixed defences for the entire seaboard of Russia , France , or the United States against British maritime power. By contrast the ability of the British to concentrate their mobile forces, using the same assets in any quarter of the globe, greatly enhanced their deterrent effect and limited their cost.

This enhanced capability had been carefully cultivated. Britain pioneered many of the key technologies, and their less obviously warlike ancillaries in the 1840s, to counter a French challenge to her sea control. When the Crimean War broke out in March 1854 British planners simply transferred the plans for an attack on Cherbourg to Russian arsenals.<sup>[24]</sup> Once the massive British private shipbuilding and engineering industries had been harnessed to build anew flotilla the coastal warfare concept was applied. In a two day bombardment the dockyard at Sweaborg was destroyed by long range fire without the loss of a single man<sup>[25]</sup>. Subsequent British plans to attack Cronstadt and St. Petersburg with a much larger force, including ironclads, encouraged Russia to sue for peace in 1856. Nor was the lesson lost on other powers, the armament built for Cronstadt was demonstrated at Spithead on St. George's Day (April 23<sup>rd</sup>) 1856. *The Times* declared:



A new system of naval warfare has been created.... We have now the means of waging really offensive war, not only against fleets, but harbours, fortresses and rivers, not merely of blockading, but of invading and carrying the warfare of the sea to the very heart of the land.<sup>[26]</sup>

The Review demonstrated to the assembled diplomatic corps that the Cherbourg Strategy could be applied equally well to elsewhere. Among the more important examples would be the 'Trent Crisis' of 1861<sup>[27]</sup> war scares with Russia in 1878 and 1885, and the 'Fashoda Crisis' of 1898. On each occasion the threat of an attack on a major naval base/fortress/city deterred actions inimical to British interests well short of war.

These positive developments have been ignored by historians of British power. Adopting a declinist model<sup>[28]</sup> they argue that Britain would be starved into submission by a serious attack on her shipping. This argument is unsustainable in the face of British dominance of global shipping, coal, insurance markets and communications. These reduced, rather than increased the threat. A 10 fold increase in world trade between 1860 and 1900 translated into an almost equal growth in the annual tonnage of shipping movements.<sup>[29]</sup> Furthermore, the increasing efficiency of the marine steam engine<sup>[30]</sup> captured the key trades from sailing ships, and channelled shipping into narrowly defined routes. The argument that these developments harmed Britain was logically unsound, to restate it today requires an uncritical acceptance of the deliberately alarmist case made by the City of London and the Naval Intelligence Division in the late 1880s, solely to push up naval spending.<sup>[31]</sup>

In fact the threat to oceanic shipping was declining. Contemporary warships depended of frequent access to major bases for effective

operation. Their complex, high performance engines demanded extensive skilled maintenance.<sup>[32]</sup> Speed and range were also influenced by underwater fouling, which could only be removed in a dry dock. Without a sheltered anchorage warships could not even refuel, and by 1890 navies could not rely on sails. Only Britain had a global network of naval bases and commercial harbours from which well maintained, fully fuelled cruisers could sortie to meet any threat. Her rivals had few bases outside the metropolitan area, and none approaching the size and quality of those under British control. Any attack on British oceanic commerce in this period, already hamstrung by the abolition of privateering, would have been short-lived and ineffective.<sup>[33]</sup>

Naval planners recognised that Britain had the power to stop the shipping of any rival, with serious implications for their ability to wage war. At the same time economic blockade was a major feature of the new wave of navalist writing that began to emerge in 1890.<sup>[34]</sup> While Britain had always used her naval power to cripple the economic life of her rivals, the effectiveness of blockades had been greatly enhanced by naval technical development between 1860 and 1890.

Although the effective power of British forces was growing, rather than their size, the key to using them effectively to secure British interests was improved control. (The modern concept of network centric warfare.) After 1815 Britain applied substantial financial and technical assets to the provision of superior long distance communications, pioneering oceanic steamships and submarine telegraph cables. These developments, although essentially commercial, were aided, directed and influenced by the application of Government funds. At every stage speed and reliability were enhanced, improving the ability of the centre to control the periphery, and more significantly, of the centre to direct forces from the centre or

other parts of the periphery to reinforce a threatened area. In this way the Empire, formal and informal, was welded into a single strategic entity.<sup>[35]</sup> Improved communications were especially useful to Britain, because Britain alone had the capability to use the information to move her forces across the globe. She could also deny such communications to an enemy. As Britain controlled the sea, and almost all the submarine cables, and cable-laying tonnage enemy cables could be cut, or re-used.<sup>[36]</sup>

The submarine telegraph cable had been pioneered in the 1840s, attracting immediate naval interest. First used to link Dover and Calais in 1851 it created a new type of global power. Effective communication links improved central control, reducing local freedom of action and allowing centrally directed forces to reinforce any region under threat. North America was connected by 1867, India by 1870, Australia and Japan by 1872, Brazil by 1873, and the rest of the world quickly thereafter. Links between the main telegraph company, Eastern, and Government were close<sup>[37]</sup>, and in times of crisis, notably the occupation of Egypt in 1882, the company went beyond what might be expected of a commercial concern.<sup>[38]</sup>

The Zulu War of 1878 was one of the first significant conflicts in which strategic communications were used to shift forces, with a new cable being laid from Aden to Durban to improve central control.<sup>[39]</sup> Empire, however defined, was now defended as a single unit, rather than as a series of geographically and intellectually distinct areas. In 1899 it took only two months to lay 3,000 miles of cable from the Cape Verde Islands to Cape Town for the South African War.<sup>[40]</sup> Little wonder the French considered the cable network more important to British power than the navy.<sup>[41]</sup>

However, the effective exploitation of these epochal developments in ship, weapon and communication technology relied on a relatively unnoticed element in the totality of Imperial defence infrastructure.

The dry-dock would be the pivot around which British Imperial strategy was transformed between 1860 and 1890. They were the basic requirement for sustained local operations. Dry docks were developed when ships became too large to be beached for repairs, and by the seventeenth century had been transformed into major stone structures with pivoted gates.<sup>[42]</sup> Although costly such docks were an invaluable force-multiplier. They underpinned the adoption of a blockade strategy by the English in the 1690s, while the construction of docks at Bombay in the mid 18<sup>th</sup> century gave Britain command of the India Ocean<sup>[43]</sup>, but the great age of the dry-dock was a product of the steam age. Screw propelled steam ships needed frequent docking to keep their hulls clean, and until the late 1860s to maintain their critical stern glands. This work was only possible in a dry-dock. The construction of docks with adequate depth of water at the sill, and the necessary width was complex and costly. Unless the area was blessed with suitable geology massive structural underpinning was required to support the stonework. This, in turn, had to be strong enough to withstand the weight of water and ship, and resist the upward pressure of ground water. Dock design and construction were specialist tasks, in which large British engineering concerns specialised.<sup>[44]</sup>

Nor were these structures without precedent. The single most important factor in the rise of British naval mastery in the long 18<sup>th</sup> century had been the sustained application of capital to the creation and expansion of naval bases, both at home and around the Empire. Only fleets with local bases for supply, repair and concentration could maintain command of key sea areas. While bases were expensive, they proved invaluable. Between 1815 and 1860 new bases were developed, to meet the expanding demand for naval support from the aggressive, expansionist British commercial sector. These included the Falkland Islands, Aden, Hong Kong and Sydney. Existing bases at Malta, Gibraltar, Bermuda, and Halifax were improved, while

facilities at Esquimalt , Singapore and Cape Town were useful, as were naval depots in foreign harbours, at Rio, Valparaiso , Callao and Hawaii . The expansion of support facilities was driven by the need for squadrons to follow economic activity, but limited by cost. A planned new Indian Ocean base at Trincomalee was aborted as Britain 's easternmost economic interests shifted into the China seas.<sup>[45]</sup>

The spread of docking accommodation between 1860 and 1890 was driven by technical change, commercial pressure and strategic need. Dry-docks would enable the Royal Navy to send squadrons to any part of the globe, and maintain them there. They were vital to the effective use of naval units. In areas of overwhelming strategic need, where economic activity was inadequate to support them, docks were built in Imperial Fortresses. Elsewhere the Navy encouraged the construction of commercial docks, providing government financial assistance to ensure they were configured for, and gave priority to, warships. The emergence of an effective policy followed a period of haphazard development at the outer reaches of Empire.

The development of Imperial docks before 1860 was limited to the Home islands and Malta . While a dock had been started at Malta in 1812 it was only after the Syrian crisis of 1840 and the threat of war with France that a new dock was ordered. It opened in 1848. The total cost of £111,000 fell on the Government. By 1857 the dock had to be extended to take the longest ships, but was still too shallow for first rate steamer, or the ironclads that followed in the 1860s. The telegraph connection arrived in 1857. A second dock built between 1866 and 1871 at a cost of £150,000, with two more in 1890-92 and 1899 as battleships became deeper and broader.<sup>[46]</sup> The development of a major base at Gibraltar provided additional docking accommodation at a vital point by the turn of the century.<sup>[47]</sup>

Outside European waters the defence of British interests was a question of trade and communications rather than territory. This

required a dominant Navy to control the world's oceans. British territories and markets had always been secured by the blockade or destruction of enemy fleets in European waters. Any threat outside European waters would be limited. Consequently the development of docking accommodation could be more reactive. The East India Company docks at Bombay were the first such structures outside Europe, providing a model of state and commercial inter-action that would be developed in the next century. The first new Imperial/Commercial dock was built in Australia. Sydney had become a significant naval base by the 1830s, because it was supporting extensive commercial shipping.<sup>[48]</sup> It provided victuals and a naval stores depot<sup>[49]</sup>, but the Navy had no plan to build a dock. In 1845 the local administration suggested that a dock capable of holding warships would be of great advantage to the Colony and the Empire. Despite the initial refusal of the Admiralty to offer financial support the project went ahead, and in 1847 the Admiralty reconsidered, offering a substantial sum, provided the dock could take 'a large frigate or steamer' and warships received priority. The dock finally opened in September 1857, and the first vessel to enter was a warship.<sup>[50]</sup> Growing commercial demand had created a maritime infrastructure at Sydney capable of supporting a Royal Navy squadron, which was then established to protect the commerce.

The contribution of the dock to the defence of Australia was obvious. It acted as a force multiplier for Royal Navy units, enabling them to refit and repair more effectively, and more rapidly, than any rival force in the region. However useful Sydney was as a naval base it was first and foremost a thriving commercial port, situated in a colony with responsible government. Consequently there was no need for the full cost of the dock to be met by the Imperial Government in London.

The example of Sydney was followed at Hong Kong in the early 1860s, because the existing accommodation at Whampoa was 'scanty'

and insecure.<sup>[51]</sup> Whampoa dock, near Canton , had been built to dock iron hulled P&O liners. Opened in 1855 it was wrecked shortly afterwards during the Second Opium War, prompting the Admiralty to urge the Hong Kong merchants to develop a dock on the Island . This was quickly built, opening in mid 1860, with a larger structure, suitable for first class frigates opening in 1862, and an even grander effort in 1867, with enough depth of water for battleships. The Admiralty and Commander in Chief, Sir James Hope, had been heavily involved in the process, offering a loan of £5,000 for every foot of depth over the sill below 21 feet, up to 24 feet. With Whampoa re-opening and further docks building at Kowloon and the Japanese naval base at Yokohama in 1875 the available dock accommodation in China seas was positively luxurious.<sup>[52]</sup> Singapore opened a dry dock in 1859 and a second dock in 1890.<sup>[53]</sup>

In 1864 the House of Commons set up a Select Committee to consider Admiralty plans to increase the docking accommodation at Portsmouth and the other Home Dockyards, but within two months the remit was extended to include docking accommodation at Malta and on all Foreign Stations. Membership of the Committee, which included two former First Lords of the Admiralty, two Political Secretaries and a naval officer together with members representing political and engineering concerns, suggested high level Admiralty involvement and a prepared agenda. The current Political Secretary, Captain Lord Clarence Paget, took the chair. Only a handful of naval witnesses were called, although they included the three key policy makers, First Lord of the Admiralty the Duke of Somerset, First Sea Lord Admiral Sir Frederick Grey and Controller of the Navy Rear Admiral Sir Robert Spencer Robinson. The report was ready within two months.<sup>[54]</sup>

Somerset revealed the Admiralty approach:

it would be an advantage if you always had a dock to run to whenever you wanted it; that difficulty may be met, perhaps, by some opportunities of getting additional accommodation from some commercial dock.

The purpose was to provide a focal point for strategic concentration, and for this role he greatly preferred locating any dock on a defensible island, citing Bermuda .<sup>[55]</sup> Vice Admiral Sir Michael Seymour, recently commanding in China , considered it ‘very advisable’ to follow the Hong Kong example to ensure that private docks would be useful to the Navy in regions ‘such as China and Australia ’.<sup>[56]</sup> Grey recommended the Hong Kong subsidy method, and reported that projects were under consideration at Cape Town , Vancouver and the Falkland Islands . He favoured Bermuda for the American Station dock, as Halifax was iced up for four months every year. Robinson also spoke the language of the new policy. He stressed that: ‘the Navy would be worked more economically if there were docks on certain foreign stations, than it is now’.<sup>[57]</sup> In order to achieve this object he and Grey revealed that the new capital ships of the *Bellerophon* class would be shorter than the current *Warrior* type, thereby increasing the number of available docks, and reducing the cost of modifying those already built.<sup>[58]</sup>

Rear-Admiral Richards, Hydrographer of the Navy, produced a table of existing docking accommodation. There were 37 in the United Kingdom , although only 9 were suitable for the biggest ships while 18, left over from the sailing ship era, were too short for modern heavy ships. The dock at Malta and five small ones at Bombay were joined by 20 more commercial docks in colonial territory, although only two, the Fitzroy at Sydney , and the projected Hope Dock at Hong Kong were really suitable for naval use. They were the only two with a



subsidy. None of the others could take a vessel larger than a corvette, fully loaded for sea.<sup>[59]</sup>

The Committee was struck by the lack of any suitable dock in the Americas , Admiral Milne had advised building at Bermuda, the ‘key’ to the United States<sup>[60]</sup>, while Admiral Seymour preferred Halifax , but the Committee agreed with Grey, Milne and Somerset . Admiral Hope, who had negotiated the dock agreement at Hong Kong, was now in the West Indies with orders to report on Bermuda . The Committee called for a first class dock. Elsewhere they were content to extend the Hong Kong approach, offering a loan to the dock owners based on a fixed proportion of money for every foot below the 21 foot depth of water over the sill that was created, to a maximum of 24 feet. The extra four feet were ‘of the deepest importance’ to the Country, and call for ‘much expenditure.. to preserve the naval position of this country.’

The need for heavy investment in docks had:

become almost indispensable, in consequence of the conversion of the Navy into a Steam Navy. In former times it was the practice to have ships down on careening wharves when in want of repair; but this expedient is not resorted to in the case of steam vessels, as their machinery would be deranged by the operation, and consequently, on stations where there are no Docks of sufficient size, it is necessary to send them home whenever their bottom require to be either cleaned or repaired. During their absence from their stations, the cost of wages, victuals, coals, and of wear and tear, is a dead loss, and this loss would be of constant recurrence in the case of iron ships; as it is necessary to dock them, for the mere purpose of cleaning their bottoms, at least four or five times in the course of the ordinary duration of a commission.

To offset the cost the Committee suggested that the minor Home Dockyards of Deptford, Woolwich and Pembroke might be sold to fund the capital costs.<sup>[61]</sup> The first two were closed by Gladstone 's ministry in 1868 when they adopted the new Imperial strategy. More immediately new docks at Portsmouth and Malta were funded, while the proposal to offer loans for suitable docks, in British possessions, was placed on the Statute book in 1865. Drafted by the Admiralty team of Captain Lord Clarence Paget, the Political Secretary, and Junior Civil Lord Hugh Childers the Act made up to £300,000 available through the Bank of England, with each dock being eligible for a loan of up to £20,000 for 21 years at 4%, secured by a priority mortgage.<sup>[62]</sup> This Act, and the work urged by the Dock Committee would form the corner stone of the new Imperial Strategy.

The recommendation to create a dock at Bermuda was accepted by Government, while initiatives at Halifax , Singapore and Vancouver would bear fruit in due course. By the mid 1880s the docking situation of the British Empire had improved, while the Hydrographer's Department began to issue a comprehensive list of all docks and basins.<sup>[63]</sup> The architects of this policy, Paget and Childers, treated docking accommodation as integral to the new Imperial Strategy. Docks were both the basis of local defence, and a link in the imperial system.

Outside European waters the extension of docking would be intimately linked to the floating commerce that required protection. When the Admiral commanding the North American Station proposed building dry dock at Halifax in 1852 he stressed that the commercial sector should carry much of the cost, and named Cunard as a key supporter.<sup>[64]</sup> While commercial interest was still being cited in 1864<sup>[65]</sup>, nothing was done. Naval demand would not justify an Imperial dock, and the commercial sector would not pick up the cost at

this time. When the Halifax Graving Dock finally opened in 1889 it was a commercial project, although encouraged by an Admiralty subsidy of \$10,000 a year.<sup>[66]</sup> In the interval the North American Station acquired an Imperial dock at Bermuda , where the strategic importance of the island was far greater than the commercial demand for a dock. In addition the local geology made a conventional structure impossible.<sup>[67]</sup> In a bold measure the Admiralty adopted a new technology effectively straight off the drawing board. An iron floating dry dock was towed out in 1869 by two of the largest battleships afloat. This innovative technology enabled the Royal Navy to operate first class ironclads in the New World , although such ships were rarely dispatched. The first mastless capital ship, designed to operate from first class bases, HMS *Devastation* was begun in 1869. The threat posed by this new combination of floating dock and ironclad was not lost on the more acute observers in the United States .<sup>[68]</sup>

In other areas the relatively low level of threat allowed the Government to wait until commercial needs required a private dock. Cape Town was typical. Here the development of commercial harbour facilities on a grand scale began shortly after representative government was granted in 1854. From the outset the Admiralty pressed for a big dry dock, but it was only begun in 1876 and completed in 1882.<sup>[69]</sup> Such slow progress reflected the absence of any naval conflict, and sensible Treasury refusal to carry the full costs. New Zealand wanted an Imperial naval presence, so it built a very large dock at Auckland between 1884 and 1888. Together with the offer of land and facilities close by, the dock made the city attractive to the Royal Navy.<sup>[70]</sup> The dry dock at Esquimalt , British Columbia , opened in 1887, linked with local coal supplies and trans-continental rail and cable communications, to ensure Britain dominated this remote, but far from unimportant quarter of the globe. Begun by British Columbia , with Imperial assistance provided under the

Colonial Docks (Loans) Act of 1865, it was completed by the Canadian Government as part of the Union of Canada.<sup>[71]</sup>

When Admiral Sir John Fisher spoke of ‘Five strategic keys that lock up the globe!’

they were Dover , Gibraltar, the Cape, Alexandria and Singapore .<sup>[72]</sup>

He might have added Bermuda , but the concept was correct. These bases either had, or were very close to major dockyards, they were connected by cable, defensible and, in the hands of a superior navy, secured global power.

### **Imperial Strength.**

The development of imperial communications and docking accommodation were directed by a clear strategy, and met the core concerns of British statesmen. British strategy had been under constant review since 1815, and remained fundamentally commercial, not territorial. In 1815 Britain had handed valuable colonies back to Holland and France , but kept key naval bases. Territory was only useful to secure trade, or strategic harbours. Britain had demonstrated the capacity to engage larger states with powerful armies in prolonged wars of attrition, using maritime power to avoid defeat, and bolster state finances. The key issue remained stability and peace in Europe . If this could be secured any threats to outlying imperial possessions would be minimal. Consequently the main British forces were stationed in European waters, where their war role would be the blockade or destruction of enemy naval forces. There was little chance of French or Russian warships attacking the empire if their own coasts were under attack.

Down to the late 1850s the strategy of Imperial Defence was essentially unaltered, however much the political and economic aspects of the problem had been debated. Local garrisons and stationed naval forces were largely self-sufficient, working closely with the

colonial governors, and rarely able to consult London before acting. While the three main strands of British political thought, tory, whig/liberal and radical, held different views on the level of military force to be stationed in the colonies, they agreed that British forces should not be tied down on internal security duties, consequently the size of the Army deployed in the colonies fell consistently from 1815. In 1846 Earl Grey, Secretary for War and the Colonies, imposed some logic on the system. He began by handing over the forts and barracks in New South Wales to the Colony, and removing the British troops. He also concentrated the troops deployed in Canada into the two major fortresses of Quebec and Halifax.<sup>[73]</sup> With responsible government came responsibility for internal security. External security remained a naval question, although local bases and supplies had an important role.

The central role of docking accommodation in Imperial Strategy becomes obvious when viewed alongside the provision of coast defences. Fixed defences were provided for naval bases and ports, not territory. The level of coast defence reflected the degree of threat felt by the local Legislature, and the level of support available from the Imperial Government.<sup>[74]</sup> The absence of effective coast defences threatened to tie Royal Navy units to local and harbour defence in the event of war, a role which would negate their mobility and strategic flexibility. The Admiralty believed that the floating trade of the Empire should be defended by the Royal Navy, but that colonial harbours were the responsibility of the colonial authorities. When responsible government was granted to New South Wales in 1856 London expected the colony would contribute to its' own security<sup>[75]</sup>, providing internal policing and harbour defence, to protect the Royal Navy's local base.

While the Crimean War reminded the colonies of the need for defence, it also witnessed profound changes in material, tactics and

strategy that forced the British Government to re-examine national strategy.<sup>[76]</sup> The French threat, based on ironclads, coastal offensives and an invasion from Cherbourg , forced the ministers to redistribute the fleet, and re-consider Imperial defence. The other driver was economic. New fortification programmes were limited to the major dockyards and Alderney, which effectively countered Cherbourg , while a new ironclad fleet and the powerful coast assault fleet built to fight Russia defeated the French challenge. However, their cost forced the ministers to investigate other aspects of defence expenditure.

The Admiralty's attention was drawn to global strategy by the Queen. Alarmed by what she had seen on a visit to Cherbourg in April 1858 she demanded that her naval advisors, the Board of Admiralty, report on the naval tasks in the event of war with the France . Third Sea Lord Rear Admiral Sir Alexander Milne stressed the primacy of securing command of European waters, and taking the initiative against the French harbours. Milne estimated force levels for overseas stations, but admitted the navy was simply too small to spare such forces.<sup>[77]</sup> Fourth Sea Lord Captain James Drummond went further:

Our extensive Colonies would in war prove a weakness. They *must be considered after our home defences* are in a measure provided for; and it becomes a question to what extent the Colonies could be independent, and provide towards their own defence, by raising men and fortifying their harbours.

We should also require to consider our several coaling stations abroad, and the protection necessary to keep them available.<sup>[78]</sup>

The Admiralty stressed that colonial defence was primarily a naval and global question, which should not be hampered by local considerations. Consequently if the colonies wanted their own naval forces the Admiralty encouraged them to acquire local defence craft,

and to contribute towards the cost of Imperial squadrons.<sup>[79]</sup> A review of the forces in Australian waters in 1859 led the Admiralty to argue that this was a question for the Cabinet<sup>[80]</sup>, furthermore the squadron was:

necessary not only to provide for the defence of the Colony, but, in the event of war, to give periodical convoys to treasure ships proceeding home either by the Cape of Good Hope or Cape Horn.

While the Admiralty was prepared to send more ships 'as soon as the home defence is sufficiently provided for'<sup>[81]</sup>, that sufficiency was never achieved. The station had relied on a handful of small ships before the discovery of gold in the early 1850s increased the value of Australian shipping. Even so the Admiralty expected any attack would come in the Atlantic . However, the formation of an enlarged and separate Australian Station in March 1859, based at Sydney , recognised both the increased threat and the ability of the colonies to support such a force.<sup>[82]</sup> By 1861 a 'Royal Colonial Navy of Victoria', wholly owned, operated and paid for by the Colony could conduct local policing tasks, reducing the need for Imperial forces in peace time. Local fortifications mean that in war time the local Commander could take the initiative, confident 'the principal ports on the station were free from the attack of a single vessel.'

Looking to the vast demand that would be made upon the Board of Admiralty for the protection of the Colonies of Great Britain, in the event of war with a Great Naval Power, my Lords consider that the simple plan of encouraging each colony to trust in a great measure to its own means of naval defence is one which must be decided on by the Country.<sup>[83]</sup>

This statement reflected a new Imperial strategy, adopted earlier that year, acknowledging the primary role of the Royal Navy in defending the colonies from external threat, and securing their shipping from hostile cruisers. The Colonies would be left to develop their own local defence forces.

The new policy stemmed from an initiative by the Conservative Secretary for War General Peel. In 1859 he set up an inter-Departmental Committee to establish general principles in colonial defence. The Treasury, War and Colonial Office group found no principles, and little method, just years of ad hoc decisions. They recommended distinguishing between Imperial and Colonial positions. The former, Malta, Gibraltar, and Bermuda, were held for Imperial and not local commercial advantage. The latter, prosperous and self-governing, should be encouraged to contribute to the cost of local defence, under the overall defence provided by 'naval superiority'.<sup>[84]</sup> The Report was published in March 1860, by a new Liberal Government, prompting further discussion. Twelve months later Arthur Mills, a liberal MP interested in colonial questions, moved for a Select Committee of the House of Commons to consider colonial military defence and costs. Despite his personal opposition Prime Minister Palmerston allowed the Committee to proceed, recognising the interest of Gladstone, as Chancellor of the Exchequer. The cross-party Committee included three cabinet ministers, several colonial and financial experts and some promising young MPs.

The most important evidence came from Gladstone. He was already engaged in a long running, and ultimately unsuccessful battle with Palmerston and the First Lord of the Admiralty, the Duke of Somerset, to reign in the unprecedented level of peace-time naval expenditure required to defeat the French naval challenge. With support, and ideas from Paget, Childers and the radical wing of the party Gladstone



wanted economies on distant stations to counter-balance increased expenditure at home.<sup>[85]</sup> He told the Committee that the Colonies did not pay anything approaching the cost of their defence, and to make matters worse, failed to send their contribution on time.<sup>[86]</sup> He called for a radical change in the concept of Imperial Strategy:

I think the change is enormous, and that, in point of fact, our present system is one founded upon a state of things and a condition of this Empire relatively to other powers which has entirely passed away. In former times, our communications with our colonies were rare, slow and uncertain, and it would have been very dangerous indeed to trust to the principle of supporting them from the centre; but now, on the contrary, the communications with the world in general are constant, rapid and certain and England is the very centre of those communications. We have enormous advantages for supporting them upon the principle of keeping our great mass of force at home, and supplying them as they may require.<sup>[87]</sup>

The report of the Mills Committee recognised that the strategy of Imperial Defence had been profoundly affected by coastal offensive warfare with ironclads, and the development of reliable global communications. Despite the best efforts of General Burgoyne, the Inspector General of Fortifications, it condemned the construction of forts that could not be manned in wartime as inefficient, 'for places, the defence of which mainly depends on superiority at sea'. This point was applied to the West Indies and the distant possessions of the Crown.<sup>[88]</sup> As Gladstone stressed: 'Our supremacy at sea is absolutely vital to our existence, I mean to our present place in the world. England would no longer be England if she lost it.' Therefore he urged

the reduction of all overseas garrisons, apart from Malta and Gibraltar  
[\[89\]](#)

The Committee's conclusions may appear somewhat ambiguous:

the tendency of modern warfare is to strike blows at the heart of a hostile power; and that it is therefore desirable to concentrate the troops required for the defence of the United Kingdom as much as possible, and to trust mainly to naval supremacy for securing against foreign aggression the distant dependencies of the Empire.[\[90\]](#)

However, the 'defensive' cast of this summation was misleading. The Imperial government was thinking of applying British maritime power from the centre against the 'heart of any hostile power', either to deter aggression, or to force an aggressor to disgorge captured territory. Any maritime force acting from the centre would necessarily include the concentrated military force. However, such a strategy could not be openly promulgated, for the Liberal majority in the House of Commons included a significant, and vociferous radical element that wished to dispose of all colonies, and opposed any military spending that was not purely 'defensive'. One consequence was an excessive reliance on coast defence vessels, which the radicals were promoting as economic substitutes for forts.[\[91\]](#) Before this Report could be acted upon the issues it had considered were thrown into sharp focus by the '*Trent* Crisis' of December 1861.

The successful resolution of the '*Trent*' Crisis by deterrence, based on the movement of existing forces from the centre to the threatened periphery, controlled by cable, or mail steam communications, provided a powerful endorsement for the work of the Mills Committee.[\[92\]](#) Just as the '*Trent* Crisis' subsided the Admiralty responded to another Australian plea for naval defence by requesting

that the Colonial Office draft Act of Parliament to establish colonial navies. The Admiralty wanted to mobilise the resources of the colonies in the event of war with 'a Great Naval Power' rather than allowing them simply to rely on the Imperial Government. The key task for colonial forces would be to protect ports and coastal cities from attack. These defences ought to be provided locally, in Australia and Canada. Colonial naval forces would 'materially save on our expenditure', and would be sustained by self interest and national pride. They would not replace the Imperial role in protecting commerce, but should prevent alarm at every rumour of war. Ultimately:

It would seem to be sound policy to let them learn gradually how to protect themselves and also the cost of doing it. It would not probably hasten the time when they would desire the whole burden to rest on their shoulders.<sup>[93]</sup>

The Colonial Office accepted that an individual hostile cruiser might appear off Australian harbours, but against these local measures believed to be in hand should be adequate. London was pressing the local authorities to provide their own defence.<sup>[94]</sup>

For the next four years occasional alarms kept the issue of Australian defence alive,<sup>[95]</sup> while the Imperial and Colonial authorities tried to balance the demands of responsible government, local defence and Imperial security.<sup>[96]</sup> The 1865 Colonial Naval Defence Act allowed the colonies to create their own navies, but fearful that these local naval forces might cause an international incident they were restricted to colonial waters.<sup>[97]</sup> This met the objects of the Admiralty, which required secure and well equipped ports from which to operate Imperial squadrons. At this time the maritime trade of Australia was growing rapidly, so that facilities capable of supporting the Royal Navy developed without Imperial interference. After 1861

harbour defences at Melbourne , Sydney , Newcastle , Hobart , Adelaide and Fremantle made them secure bases. The former soon had a graving dock and a powerful coast defence ironclad, making Port Philip Bay a secure haven.<sup>[98]</sup> These developments made the Imperial squadron on station vastly more powerful than any possible threat, not from increased numbers or strength of ships, but because the British ships could rely on secure harbours, coal and other naval stores, potential recruits, vital graving docks, engineering back up and the best communications in the region. The arrival of the telegraph cable in 1872 merely reinforced the long standing superiority of British communications.

After 1861 British strategy shifted away from the stationed forces, both land and sea, of the previous sixty years toward the mobile, centrally controlled units advocated by the Mills Committee. With suitable local facilities and good communications stationed forces could be reduced to colonial policing types. When Gladstone became Prime Minister in 1868 the detached squadron strategy was adopted. The original idea, and much of the detail had been provided by his long time ally the quasi-radical First Secretary to the Admiralty, Paget. Alone among the radicals Paget had the professional standing to propose such a strategic shift, and used his position at the Board to develop this policy after 1859.<sup>[99]</sup> In late 1864, after it had been endorsed by the Docks Committee, Gladstone renewed his call for a 'Flying Squadron' strategy. Paget and Civil Lord Childers provided financial detail.<sup>[100]</sup> Palmerston remained resolutely opposed, and when Paget conceded it depended on future improvements, the Cabinet rejected Gladstone 's proposal.<sup>[101]</sup> Yet within months Paget and Childers's Colonial Dock (Loan) Act had laid the foundations for the new strategy, while the death of Palmerston in October removed the last serious obstacle. During Lord Russell's brief tenure as Prime Minister, 1865-66, Somerset remained at the Admiralty to frustrate

Gladstone's plans. However, there was no place for him in Gladstone's 1868 ministry.

The 'Flying Squadron' strategy was declared as Liberal party policy by Childers, Gladstone's loyal lieutenant and one time Australian politician in the House of Commons in 1867. When Gladstone formed his government in December 1868 Childers became First Lord of the Admiralty. Within weeks the Admiralty had settled the reduction of overseas squadrons with the Foreign Secretary.<sup>[102]</sup> Station force levels reflected local tasks, rather than strategic threat. Childers summed up his work:

The diminution of the force permanently maintained in distant seas will enable my Lords to send a cruising squadron of frigates and corvettes to visit the stations from time to time, and my Lords anticipate that much benefit to the naval service will be derived from this policy.<sup>[103]</sup>

The first 'Flying Squadron' of four frigates and two corvettes arrived at Melbourne in November 1869, going on to Sydney and Hobart before crossing the Tasman Sea.<sup>[104]</sup> This was the most powerful naval force yet seen in the region. In 1878 and 1885 the possibility of war with Russia was deterred by the assembly of a power projection fleet at Spithead, not the local defences of the British Empire.<sup>[105]</sup> While the Russians feared for St. Petersburg Sydney and Melbourne were safe.

The 'Trent Crisis' demonstrated that Britain could not station forces in Canada to meet the United States Army. She had to rely on deterrence. Her global empire could not be secured against serious attack by local defences. This was a matter of basic economics and political expediency. Britain would not pay for a high level of local defence, nor would her colonies. The only strategy that combined real power, global reach and relative economy was one based on the

offensive strength of the Royal Navy. Throughout the 19<sup>th</sup> century the Royal Navy had the power to destroy any rival navy, securing British interests, and releasing the fleet for further offensive operations, including economic blockades, seizure of overseas or isolated territories as diplomatic assets, and attacks on major cities. British thinking envisaged a war of limited commitment of manpower and money, husbanding resources and strength for another twenty year conflict. While this strategy could not destroy a major power, it would exhaust their military and economic resources and ultimately break their political will. Sea power gave Britain the ability to attack an enemy at their weakest, or most sensitive point, rather than simply countering an attack at the point it crossed the Imperial frontier. Mastery of global communications and the development of suitable base facilities, especially dry docks, ensured that a maritime striking force could be dispatched from the centre of the Empire, staging through the global chain of bases, to project power against any rival, in any theatre. That this did not have to be done between 1861 and 1914 reflects the success of centrally directed deterrence in reducing the threat to the empire.

### **Conclusion:**

Because the British never wrote down their core strategic doctrine in the period 1815-1914 many historians have argued that there was no strategy. This is not correct. In pursuing their economic agendas the British developed a maritime strategy, in which naval power was intimately linked to the economic activity it served. The system was constantly upgraded to exploit new technologies and meet changing political realities. Between 1856 and 1868 the strategy shifted from stationed forces to a centrally controlled 'expeditionary' strategy. The combination of British cables, British coal and British dry-docks locked up the globe, and enabled a relatively small country, with low

levels of defence spending to control the world, despite the spread of imperial and informal commercial interests. When the level of tension in Europe began to rise, in part linked to rivalries over the non-European world, the British responded, increasing defence spending, improving their cable network, building new docks, and re-deploying their forces. The fundamental strategic mobility of naval power makes the tendency of many historians to draw important, negative conclusions from the movement of ships and squadrons from periphery to the centre is unwise. The key indicators of imperial strategy were the fixed assets: communications, docks and fortifications.

The main threat to Britain's unique, and highly advantageous situation came from the one area that she could not control, the continent of Europe. However, Britain was able to exert significant influence even here, because her aims were essentially negative, the maintenance of an approximate equilibrium, in which no one power dominated the western continent, and the key invasion staging posts of the Rhine and the Scheldt remained in the hands of a minor power, Holland, and neutral Belgium. Any threat to this situation, notably that posed by the Franco-Prussian war of 1870, saw the British act quickly and effectively. It is essential to stress that British policy in Europe was carefully calculated.

By 1890 Britain's twenty-five year epoch of unchallenged imperial dominance was over. The growing economies of the USA and Germany, and the imperial expansion of France and Russia were inexorably raising the stakes and forcing Britain to increase defence spending, reconsider the basis of her strategy, and within little more than a decade, to accept alliances and Ententes with other major powers. However, all that was in the future, in 1890 Britain could look back on 25 years of cheap security, effective Imperial defence and

global power based on sound strategy, cheap government and maximising technological opportunity.

**APPENDIX ONE:**

**BRITISH STATE AND DEFENCE SPENDING: 1860 - 1890.**

In £ million.

Total Income [under year]

I. Total Expenditure

II. Defence Expenditure Navy

III. as % of Budget.

<b>1860</b>	<b>I.</b>	<b>II.</b>	<b>III.</b>
70.1	69.6	24.9	15.5%
<b>1870</b>			
73.7	67.1	21.5	13.9%
<b>1880</b>			
73.3	81.5	25.2	12.3%
<b>1890</b>			
94.6	90.6	26.3 <sup>[106]</sup>	16.8% <sup>[107]</sup>

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<sup>[1]</sup> This paper forms part of a wide ranging re-assessment of British strategy between 1815 and 1914. It first appeared only in German as, “Wirtschaftliche Macht, technologischer Vorsprung und Imperiale Stärke: Grossbritannien als einzigartige globale



Macht: 1860 bis 1890,” in M. Epkenhans and G.P. Gross, *Das Militär und der Aufbruch die Moderne 1860 bis 1890* (Munich 2003).

[12] The standard account of this process is: Cain, P.J. & Hopkins, A.G. *British Imperialism: Innovation and Expansion 1688-1914*. London 1993 see esp. pp. 125-177.

[13] Cain, P. J. ‘Economics and Empire: The Metropolitan Context’ in Porter, A. ed. *The Oxford History of the British Empire : vol. III The Nineteenth Century*. Oxford 1999. esp. pp. 42-50.

[14] Wood Memorandum August 1857: Royal Archives E 49 f.30.

[15] Imlah, A. H. *Economic Aspects of the Pax Britannica*. Harvard 1958 pp.186-8.

[16] Lynn . M. ‘British Policy, Trade, and Informal Empire in the Mid-Nineteenth Century’ in Porter ed. pp.101-121. Wong, J. Y. *Deadly Dreams: Opium and the Arrow War (1856-1860) in China* . Cambridge 1998. Pp.470-78 argues that British imperialism was complex, and included key economic elements, in which Palmerston took a leading role.

[17] Cain & Hopkins pp.204-5.

[18] Ferguson , N. *The World’s Banker: The History o the House of Rothschild*. London 1998 p.819.

[19] Kynaston, D. *The City of London : Vol I. A World of its Own 1815-1890*. London 1994 pp.335-40. Ferguson pp.817-26 For links between Government and finance, and the City’s bellicose attitude to securing investments see: Cain & Hopkins pp.206-8.

[10] Ferguson p.853.

[11] Clapham, J. H. *The Bank of England . Vol. II*. Cambridge 1944 p.318. Ferguson p.863.

[12] Porter, A. ed. *The Oxford History of the British Empire : vol. III The Nineteenth Century*. The importance of non-empire areas, capital export and global trade in sustaining British power are debated in this volume. There are chapters on areas that were never part of the formal Empire.

[13] Notably Joseph Chamberlain’s Tariff Reform and Imperial Preference movement of 1904-06.

[14] Ferguson p.680.

[15] Wong pp.350-55.

[16] Cain & Hopkins p.239.

[17] Ferguson p.812.

[18] Kynaston pp.377-8.

[19] Cain & Hopkins p.315.

[20] Kynaston pp. 175, 226, 258, 260, 306, 348-9.

[21] *ibid* p.400 quote, and see pp.430-6 for the 1890 Baring Crisis.

[22] Lambert, A.D. ed. *Steam, Steel and Shellfire: The Steam Warship 1815-1890*.

London 1991 provides a comprehensive analysis of these developments.

[23] The Crimean War (1854-1856) and the American Civil War (1861-1865) were the key demonstrations of this enhanced power. see Lambert, A D. 'The British response to the construction of Cherbourg , 1840-1850. A study in strategy, technology and infrastructure.' 7th Anglo-French Naval History Conference, Greenwich April 2001.

[24] Lambert, A D *The Crimean War: British Grand Strategy against Russia 1853-1856*. Manchester 1990 pp.73-4.

[25] Lambert, A D 'Under the Heel of Britannia: The Bombardment of Sweaborg, August 1855.' In Hore, P. ed. *Seapower Ashore*. (Chatham 2001).

[26] Editorial 24th April 1856, in Lambert & Badsey, *The War Correspondents: The Crimean War*. Gloucester 1994 pp.304-5.

[27] Lambert, A.D. 'Winning without fighting; British Grand Strategy and its application to the United State, 1815-1865.' Michael Handel Memorial Conference, US Naval War College Nov. 2001.

[28] For a discussion of this thesis see: Lambert, A. D. 'The Royal Navy, 1856-1914: Deterrence and the Strategy of World Power.' in Neilson, K. & Errington, E. J., eds. *Navies and Global Defence: Theories and Strategies*. Westport , Conn. 1995 pp. 69-92 esp. pp. 71-4.

[29] The key indicator here would be the tons carried per mile per annum, not the size of the shipping pool. Steam ships make more voyages than sailing ships, and fast ships more than slow ones.

[30] Griffiths , D. *Steam at Sea: Two Centuries of Steam-Powered Ships*. London 1997.

[31] Mullins, R. 'Sharpening the Trident' 1889 Unpub. Univ. of London Ph.D. 2000

[32] A three quarter power crossing of the Atlantic by a cruiser with triple expansion engines would end with a visit to the dockyard, and weeks of maintenance.

[33] For the legal and strategic issues see: Lambert, A.D. 'Great Britain and Maritime Law from the Declaration of Paris to the era of Total War.' Conference Paper, delivered in Oslo , August 2001. The failure of German oceanic cruiser warfare in 1914 is instructive.

[34] Mahan, A. T. *The Influence of Sea Power upon the French Revolution and Empire*. Boston 1892 is the key text.

[35] For an example of smaller imperial works see: Earle, S. J. *A Question of Defence: The Story of Green Hill Fort, Thursday Island* . Thursday Island 1993. This fort covered the key shipping route and coal depot in the Torres Straits. It was built by Queensland , the Imperial government providing guns.

[36] Headrick, D. R. *The Invisible Weapon: Telecommunications and International Politics, 1851-1945*. New York 1991. Kennedy, P. M. 'Imperial Cable Communications and Strategy, 1870-1914' *English Historical Review* LXXXVI (1971) pp.728-52.

[37] For links between Lord Stanley, later 15th Earl of Derby and Easter Chairman Sir John Pender see: Vincent, J. ed. *Disraeli, Derby and the Conservative Party: The Political Journal of Lord Stanley, 1849-1869*. Hassocks 1978 p.222. & Vincent ed. *The Derby Diaries, 1869-1878*. London 1995 p.117.

[38] Barty-King, H. *Girdle Round the Earth: The Story of Cable and Wireless*. London 1979 pp.73-4. Eastern Telegraph was one of the constituent parts of the modern Company.

[39] Ibid pp.69-70.& Kennedy 'Cable' p.741.

[40] Barty-King p.126.

[41] Kennedy 'Cable' p.748.

[42] Dietz, B. 'Dikes, Dockheads and Gates: English Docks and Sea power in the Sixteenth and Seventeenth Centuries'. *Mariner's Mirror*. Vol.88 May 2002 pp.144-54.

[43] Duffy, M. 'Devon and the Naval Strategy of the French Wars, 1689-1815' in *The New Maritime History of Devon* . Vol. I London 1992 pp. 182-4. Lambert, A.D. 'Strategy, Policy and Ship-building: The Bombay Dockyard , the Indian Navy and

Imperial Security in Eastern Seas , 1784-1869.’ In Bowen, H. Lincoln, M. & Rigby, N. *The Worlds of the East India Company*. Woodbridge 2002 pp. 137-152, esp. pp. 150-1.

[44] Colson, C. *Notes on Docks and Dock Construction*. London 1894. Colson was Assistant Director of Works at the Admiralty.

[45] Graham, G. S. *Great Britain and the Indian Ocean 1810 - 1850*. Oxford 1967 pp.305-28.

[46] Bonnini, J. & Casser, M. *The Malta Grand Harbour and its Dockyard*. Malta 1994 pp.38-122.

[47] Brassey, Lord *The Naval Annual 1886*. Portsmouth 1886 p.100.

[48] Bach, J. *A Maritime History of Australia* . Sydney 1976 esp. ch.II & XII for dock, support facilities and local coal supplies.

[49] Bach, J. *The Australia Station: A History of the Royal Navy in the South-West Pacific 1821-1913*. Kensington NSW 1986 p.199

[50] Jeremy, J. *Cockatoo Island : Sydney 's Historic Dockyard*. Sydney 1998 pp. 7-10

[51] Report of a Select Committee on the Dock and Basin Accommodation available for the Repair of Her Majesty's Ships. *House of Commons 1864 vol. VIII* p.45.

[52] Coates, A. *Whampoa: Ships on the Shore*. Hong Kong 1980 pp.7-85.

[53] *Singapore : Portrait of a Port: 1819-1984*. Singapore 1984.

[54] *Journals of the House of Commons 1864* pp.87, 91, 94, 161, 203, 222, 324, 428.

[55] 1864 Select Committee 2nd Report, Evidence p.43.

[56] *ibid.* p.45.

[57] *ibid.* p.163.

[58] *ibid.* p.164.

[59] *ibid.* 1st Report p.57.

[60] *ibid.* 2nd report p.14.

[61] *ibid.* p.vii.

[62] An Act to authorise Loans in aid of the construction of Docks in *British Possessions*. 5<sup>th</sup> July 1865. 28 & 29 *Vict. 1865 cap. CVI*

[63] Havergal, A. *Dock Book, containing dimensions of the Wet and Dry Docks, Patent Slips &c. the world etc.* London Hydrographic Dept. 1886, with annual corrections to 1890.

[64] Admiral Sir G. Seymour (C-in-C North America ) to The Duke of Northumberland (First Lord of the Admiralty) 3.11.1852: Northumberland MSS. Alnwick Castle E4 f.407

[65] Captain J. C. D. Hay 1864 Report p.167. Hay had been Flag Captain on the Station 1856058.

[66] Smith, M. G. *The King's Yard: An Illustrated History of the Halifax Dockyard*. Halifax 1985 p.12

[67] See <http://Bermuda-online.org.rnd.htm#5> for a brief survey of earlier dock projects.

[68] See John Ericsson's contemporary opinion, cited in Sandler, S. *The Emergence of the Modern Capital Ship*. Newark , Delaware , 1979 p.243.

[69] Newall, P. *Cape Town Harbour : 1652 to the Present*. Cape Town 1993 pp.8-15.

[70] McGibbon, I. *The Path to Gallipoli: Defending New Zealand 184-1915*. Auckland 1991 pp.66-67. Ross, J. *The White Ensign in early New Zealand* . Wellington 1967 pp.96-7.

[71] Gough, B. M. *The Royal Navy on the Northwest Coast of North America , 1810-1914*. Vancouver 1971 pp.224-7.

[72] Kennedy, P. M. *The Rise and Fall of British Naval Mastery*. London 1976 p.206

[73] Tunstall, W.C.B. 'Imperial Defence 1815-1870 in *The Cambridge History of the British Empire : Volume II 1783-1870*. Cambridge 1940 pp.806-12

[74] For the case of Australia see: Peacock, R.K. *Early Coast Defences in Australia , 1787-1901*. Dept. of Defence MS. Australian War Memorial, Canberra . Austin . M. *The Army in Australia , 1840-50*. Canberra 1979 pp. 150-173.

[75] *Bach Royal Navy* p.177

[76] Lambert *Crimean War* 1990

[77] Milne memo. April 1858, MLN 142/2: Milne MSS National Maritime Museum

[78] Drummond Memo. April 1858: MLN 142/2

[79] Gordon , D.C. *The Dominion Partnership in Imperial Defence, 1870-1914*. Baltimore 1965 pp. 7-9

[80] Colonial Office - Admiralty 25.4.1859: Milne minute 28.4.1859 & reply 30.6.1859 ADM 1/5721

[81] Milne Memo. of 20.6.1859 on *ibid*: Macandie, G.L. *The Genesis of the Royal Australian Navy*. Sydney 1949 pp.14-15

- [82] Macandie p.14
- [83] Admiralty to Colonial Office 26.12.1861: ADM 13/47 draft by Captain Paget.
- [84] Tunstall p.828
- [85] Gladstone - Somerset 18.12.1860: Somerset MSS Buckinghamshire Record Office 2A/14/13
- [86] Shannon, R. *Gladstone: Volume One 1809-1865*. London 1982 p.433.
- [87] Gladstone evidence 6.6.1861: PP 1861 vol. XIII Select Committee on Colonial Military Expenditure (Mills) p.263
- [88] Mills Final Report: *ibid.* p. vii
- [89] Gladstone : *ibid* p.260.
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