Journal of Military and Strategic Studies

VOLUME 16, ISSUE 2, 2015

The Cost of Admiralty: The development and condition of Britain's modern naval shipbuilding programme, 1832-2015

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> *The object of this Bill was to bring the different offices for the management of the business of the navy, which were at present partly at the Admiralty, and partly at Somerset House, under one roof, and place them under one Board. The advantage of this arrangement would be increased despatch in the business, and a considerable saving of expense.*
>
> -Lord Auckland, House of Lords 23 May, 1832.[1]

Reform of government institutions is no new affair; indeed, government reform is like a chameleon that changes colours. Today's colour is military procurement contracting. BAE systems just recently announced a major project with the United States Army worth $1.2 billion USD, while also announcing the loss of over 440 managerial level positions in Lancashire, United Kingdom (UK) due to reduced activity.[2] These announcements occurred only shortly after the passing of the Defence Reform Act in May, 2014. The act is the direct reaction to issues concerning the practices of defence

[1] United Kingdom, *Hansard Parliamentary Debates,* Lords, vol. 12, 23 May 1832 cc1369-75 (Hereafter referred to as *HL Deb* with the date, volume, and columns following).

[2] "BBC News: BAE wins $1.2bn US combat vehicles contract," *BBC,* accessed December 24, 2014, http://www.bbc.com/news/business-30597521, accessed December 24, 2014.

ISSN : 1488-559X

procurement contracting in the U.K. for the Armed forces – a direct stab at overrun costs incurred in building HMS *Queen Elizabeth* and *Prince of Wales,* Great Britain's latest additions to the Royal Navy and her future flagships. This bill and news of a collapsing domestic shipbuilding industry illustrate the dire state that military contracting has experienced in the U.K. The professionalization and colour of British naval policy during the nineteenth century can shed light on the current situation in naval procurement occurring today.

The Royal Navy evolved to its present state during the nineteenth century through progressive reforms to its organisational and operational structure. The Admiralty became a responsible and professional organization during this period. An examination of the Royal Navy's administrative evolution in its creation of a shipbuilding programme during the nineteenth century sheds light on the state of the navy's current shipbuilding programme and its construction of HMS *Queen Elizabeth* and HMS *Prince of Wales.* Naval policy was not simply directed from the Admiralty, there were other pressures at play: navy policy was aligned with domestic pressures; promoted industrial development; and had to ensure that Britain remained the hegemon of the seven seas.[3] These factors can be demonstrated by outlining the major changes that occurred during the nineteenth century that affected naval policy. Reform within the Admiralty and the professionalization of the Royal Navy's officer corps, the introduction and adoption of steam power as the principle means of propulsion in commercial and naval fleets, changes to shipbuilding methods due to the introduction of steam power, and changes to naval policy from parliament all affected how the navy conducted itself. By considering the effects of the above changes on the Admiralty's shipbuilding programme, the divergences and similarities that have occurred in naval shipbuilding and British naval policy over the course of the mid-twentieth century that led to the United Kingdom's current ship building program becomes clear. Many of the methods of construction that had been dispensed with once Britain had established a proper shipbuilding programme in the nineteenth century - the use of private firms for the construction of entire ships or specific pieces of equipment – was resumed before

[3] Although the Two-Power Standard was not put in effect until 1889, the power of the Royal Navy was set based off the number of ships that they possessed. The Admiralty ensured that the number of sailing and steam vessels out-numbered major competitors to ensure victory, even in an attritional war. Michael P. Findlay, "Full Steam Ahead: Analysis of Parliamentary debate concerning the adoption of steam in the Royal Navy, 1805-1855," *Sitrep* (RCMI) 75, no. 2 (March-April 2015): pp. 6-10.

the contract for Britain's new carriers was awarded. Also, the role of private firms compared to public expenditure and control has become just as important as it once was before. The role of private firms has taken a greater role during the last twenty years with the privatization of several services for the Royal Navy and Britain's armed forces, contrary to the professionalization and nationalization of most assets required for the Admiralty's shipbuilding programme during the nineteenth century. The result of the 1998 Strategic Defence Review's decision to build a new fleet of aircraft carriers for British power projection and the subsequent blunders in design and construction demonstrate that the erosion of assets available to the Royal Navy has affected their shipbuilding programme producing strategic aftershocks.

Today's major western democratic nations' militaries were built over the last few hundred years. However, these institutions were not immune to change over the years. The rate of technical change that currently affects the military and industry is mirrored in the changes that occurred during the nineteenth century with the Royal Navy and the merchant navy's adoption of steam power for the manufacturing and propulsion of ships. The navy's adoption of steam power is similar to the introduction of flight or the use of cyber-technologies today, their adoption rendered old methods of transport and communication obsolescent – these technical innovations also brought forth greater complexity and different potential weaknesses than their predecessors. All of these changes required long-term planning by the Admiralty, private firms, and the government, much like they do today. Because of the complexity of change during the nineteenth century, this period requires further study to examine how it compares to current procurement projects like the *Queen Elizabeth* class of aircraft carriers.

Early Reform in the Admiralty

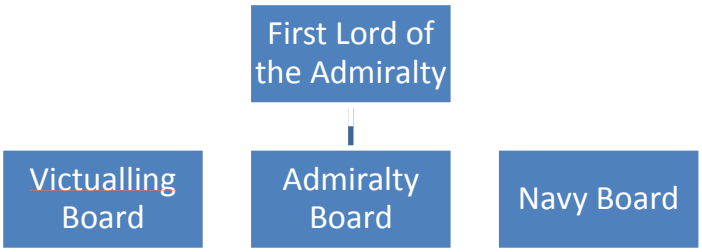
The Admiralty underwent immense administrative reform during the nineteenth century to keep up with both political control and accountability while also ensuring that the fleet was capable of defending the Empire. Beginning in 1806, reform occurred early and often throughout the century beginning in 1806. The Naval Academy at Portsmouth, the home of the Royal Navy, was renamed the Royal Naval College and

became the centre for the professional naval officer.[4] Boys who volunteered for the Royal Navy were trained at the college before sailing with the fleet. By 1811, the college also provided a professional curriculum for the training of naval architects, who began as apprentices with seven years' service at the college. This allowed the training of shipwrights (tradesmen trained in the art of shipbuilding) and naval architects to become standardized for the royal dockyards. The Royal Naval College remained at Portsmouth, being transformed in 1838 as an adult training centre for naval officers until 1873, when the college moved to Greenwich.[5] The establishment of the college meant the beginning of a professional officer corps for the Royal Navy that would aid in the transformation of the Royal Navy's civil administration. The Admiralty created a standardized curriculum for the operation and construction of ships, the most important foundation in establishing continuity. This was followed up with the creation of a formal bureaucracy to maintain and further develop that continuity.

Established in 1545, the Admiralty's administration of the Royal Navy was executed through a disparate command structure.[6] Until 1832 the business of the Admiralty, and subsequently the Royal Navy, was administered through three independent Boards: the Navy Board, the Victualling Board, and the Board of Admiralty – as described in figure 1.[7] Each Board had specific responsibilities, namely long-term planning for the navy, feeding and transportation for naval personnel and soldiers under the care of the navy, and the overall command and control of naval operations, respectively. The Board of the Admiralty was the only board subordinated to the First Lord and responsible to the government. This structure was finally upended with the passage of the Navy Civil Departments Bill of 1832.

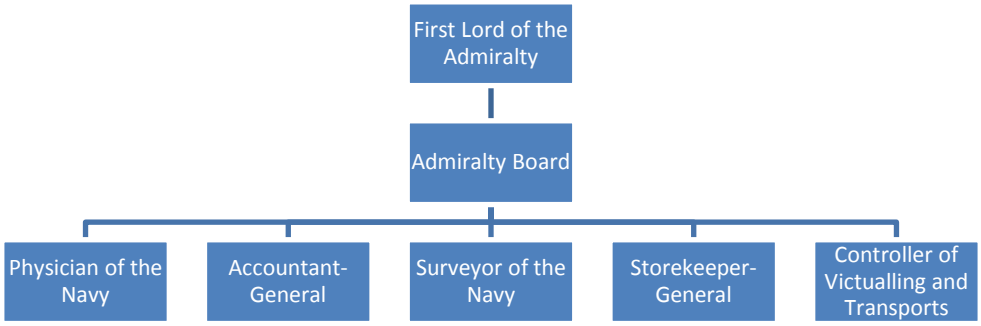
[4] Basil Greenhill and Ann Giffard, *Steam, Politics and Patronage: The Transformation of the Royal Navy, 1815-54* (London: Conway Maritime Press, 1994), p. 62.
[5] "*Records of the Royal Naval College, Greenwich,*" accessed February 6, 2015, http://discovery.nationalarchives.gov.uk/details/r/C726.
[6] Bernard Pool, *Navy Board Contracts, 1660-1832: Contract Administration under the Navy Board* (London: Longmans, 1966), pp. Vii-Viii.
[7] United Kingdom, *Hansard Parliamentary Debates,* Commons, vol. 10, 14 February 1832 cc349-76 (Hereafter referred to as *HC Deb* with the date, volume, and columns following). Wm. Laird Clowes, *The Royal Navy: A History, From the Earliest Times to the Present,* volume VI of seven volumes (London: Sampson Low, Marston And Company, 1901), p. 189.

Figure 1 Organization of the Admiralty and its three separate boards until 1832



The Royal Navy's diffused responsibility was brought under the control of the First Lord of the Admiralty in 1832. The new Admiralty Board, the sole board for the Admiralty, would control the navy through five superintendents in charge of departments replacing the previous boards. These departments were each headed by a superintendent responsible to the First Lord (see figure 2). These superintendents were responsible for the support of the Royal Navy during day-to-day operations. The most important superintendent for the long term sustainability of the navy was the Surveyor of the Navy. The Surveyor was responsible for the development and design of all ships for the fleet as well as the maintenance of future contracts for construction and control of the royal dockyards. The Navy Civil Departments Bill of 1832 was one of several major reforms produced during the nineteenth and early twentieth century that affected the Royal Navy's shipbuilding programmes.

Figure 2. Organization of the Admiralty after the Navy Civil Administration Bill, 1832-1964.



The Admiralty's new structure meant that the responsibility for the navy's shipbuilding program fell squarely within the purview of the Surveyor of the Navy. Prior to this, the planning of the Royal Navy's current and future fleet was conducted by the Navy Board. Then-Commander Sir William Symonds was named the Surveyor of the Navy in June 1832.[8] Under Symonds' close supervision, the sailing fleet of the Royal Navy reached its peak of efficiency, while he concurrently oversaw the construction of the first steam vessels to augment and support the fighting fleet.[9] His focus was primarily on sailing ships, nearly to the exclusion of steam vessels. Symonds has been simultaneously complimented from some quarters for the design of several steam vessels, including the *Dido*, while also being lambasted by Parliament for dragging his feet on the construction of steam vessels, especially during the 1840s.[10] He developed sailing vessels with superior lines for sailing but could not be rigged with steam engines, considering steam to be a fad. Despite his leadership, the Royal Navy maintained its dominance and possessed the world's most powerful fleet. It required a greater administrative talent than Symonds, who was an excellent architect of sailing vessels, but was not adept at establishing the successful bureaucracy that the new Surveyor's office needed.

[8] Andrew Lambert, "Symonds, Sir William (1782–1856)," *Oxford Dictionary of National Biography* (Oxford University Press), 2004.

[9] For more on the development of steam vessels during the early nineteenth Century, see Findlay, "Full Steam Ahead," pp. 6-10.

[10] *HC Deb 29 April 1847 vol 92 cc152-200.*

A New Administrator, A New Surveyor's Office

In 1848, Symonds was replaced by then-Commander Sir Baldwin Wake Walker. Walker arrived in 1848 with the impetus to produce major reforms; his tenure as Surveyor was marked by the complete transition of the Royal Navy from sail to steam.[11] Walker was not a naval architect like his predecessors, but a capable naval officer who had reformed the Turkish Navy only a few years prior to being appointed to the post of Surveyor. The Admiralty wanted to have an administrator at the helm of the Surveyor's office, not a designer – a fact that was realized when Walker's title was changed in 1860 from Surveyor of the Navy to Controller of the Navy, which denoted his unique position in setting the direction of the Royal Navy. It was under Walker's guidance that the retrofitting of old sailing vessels to screw-steamers was performed. Walker also set a precedent that avoided the debacles of Symonds' tenure: The Commander was never the sole architect of naval vessels. The Surveyor was a manager of the fleet and the dockyards. Walker's professionalization of the Surveyor's office meant that he created standards of construction, organized the royal dockyards, and published annual reports on the state of the fleet based on the Surveyor's shipbuilding programme.[12] It is a testament to Walker's service that the fleet was able to remain effective throughout the Crimean War even while in the midst of complete transition.

To facilitate the transition from sail to steam, Walker performed trials of several variants of steam and sailing vessels off the Lisbon, Spain coast in 1850.[13] Known as the Lisbon Trials, they demonstrated various iterations and models of steam vessels of the period. The trials convinced more conservative members of the Admiralty to transition completely to steam and provided three sound lessons for the future shipbuilding programme. First, the trials highlighted the vulnerability of steam machinery when all of the engines were rendered defunct after five full days of steaming. Second, the trials showed that ships with auxiliary steam machinery could still sail as well as standard sailing vessels. Third and perhaps most importantly, the questionable reliability of the

[11] C.I. Hamilton, "Walker, Sir Baldwin Wake, first baronet (1802-1876)," *Oxford Dictionary of National Biography* (Oxford University Press), 2004.
[12] Andrew Lambert, *Battleships In Transition: The Creation of the Steam Battlefleet, 1815-1860* (London: Conway Maritime Press, 1984), 27 *et. seq*.
[13] Lambert, *Battleships In Transition*, pp. 31-37.

steam propulsion seen during the trials convinced Sir Francis Baring, the First Lord of the Admiralty, and Walker that the Royal Navy should only seek to match the steam capability the French until the technology stabilised and became more self-sufficient. These three lessons set the tone for future British shipbuilding during the period: all open water steam ships would have a sailing rig to be able to operate under sail alone when needed; excessive money would not be wasted on experimental methods of design, but instead tested and then built *en masse* when approved. Finally, the trials exposed the utility of the screw in open waters which enabled further confidence in the technology.[14] These conclusions shaped the decisions made during the next twenty years of shipbuilding.

Just prior to the launch of the French ship *Gloire*, the world's first iron steamship, designs were laid out by the Admiralty to produce an ironclad corvette of 26 guns; the scheme was abandoned out of fear of an arms race and based on the conclusions made from the Lisbon Trials.[15] The *Gloire's* launch in 1859 occurred just after the Admiralty began a review on the state of the Royal Navy.[16] The review focussed on the capability of the Royal Navy to defend the Empire against other seafaring nations through numerical power. Also, there were worries that wooden ships had become obsolete with the introduction of heated shot. The Admiralty decided to perform tests in Portsmouth on various materials against launched shot: wood, wood and iron laminate, steel plate, and rolled or hammered iron.[17] The successful material, iron, was used on the *Warrior*, Britain's first iron warship. Walker is attributed with advocating for *Warrior's* size, number of guns, and her construction; the *Warrior*, along with her sister ship the *Black Prince*, paved the way for the modern Royal Navy, free from the confines of wood and sail.

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[14] In 1845, tests were run between the *Alecto* and *Rattler* to determine whether paddle-wheel steam ships or screw steam ships were more efficient. The *Rattler* which was the ship outfitted with a screw won the trials, but questions had still remained over which was more effective in open water, the Lisbon trials concluded decisively that the screw steamer was the better method for the steam warship. Ibid., pp. 31-32.

[15] Oscar Parkes, *British Battleships, "Warrior" 1860 to "Vanguard" 1950: A History of Design, Construction and Armament* (London: Seeley Service & Co. Limited, 1966), pp. 5-7.

[16] For more concerning the State of the Navy in 1858, see John Beeler, edit., *The Milne Papers: The papers of Admiral of the Fleet Sir Alexander Milne, Bt., K.C.B. (1806-1896),* Volume. I: 1820-1859 of 2 volumes (Ashgate, 2004), *passim*.

[17] Parkes, *British Battleships, p.* 5.

The Role of Naval Construction

The Royal Navy was maintained through the Royal Navy dockyards. A nationalised asset, the royal dockyards were established to build, fit, retrofit, and maintain the fleet of the Royal Navy.[18] The royal dockyards possessed an essential monopoly on the building of war ships. Only in exceptional circumstances did the Admiralty contract out the building or maintenance of war ships to private firms and dockyards. When contracted out, the Royal Navy sent an architect to the yard to supervise the building of naval vessels.[19] Her Majesty's Government also provided the materials to ensure their quality. The adoption of steam ended the drought of contracts to private firms since steam engines had been widely used for commercial shipping since the early 1820s. Prior to the employment of steam engines on war ships, the last contract issued to a private firm was prior to the Battle of Waterloo in 1815.[20] The contract and maintenance of steam engines, however, was done by private firms.

The firms Penn, Maudslay, Miller, and Ravenhill all became well-known firms for the construction and contracting of steam engines during the 1850s.[21] The reliability of the steam engines they constructed dictated whether they would be given tender for a future contract, which did not always occur. It was apparent through experience and material failure that steam engines only possessed a particular shelf-life that had to be managed; the British government commissioned steam based on the estimated life of a steam engine, around four to five years in the late 1850s – which had a direct impact on the navy's shipbuilding programme.[22] The relationship that existed during the transition from sail to steam between the Admiralty and private firms was symbiotic: firms needed government contracts, while the government needed private firms' expertise to build steam machinery. The royal dockyards had not been fitted to build the latest steam iron warships. The *Black Prince* and the *Warrior* were contracted out and built by private firms. Until the royal dockyards had been fitted with the needed plant

[18] Philip Banbury, *Shipbuilders of the Thames and Medway* (Devon: David & Charles: Newton Abbot, 1971), 73. D.K. Brown, *Before the Ironclad: Development of Ship Design, Propulsion and Armament in the Royal Navy, 1815-60* (London: Conway Maritime Press, 1990), p. 28.
[19] Pool, *Navy Board Contracts*, pp. 1-70.
[20] Banbury, *Shipbuilders of the Thames and Medway*, p. 73.
[21] Lambert, *Battleships In Transition,* pp. 57-58.
[22] Greenhill and Giffard, *Steam, Politics and Patronage*, pp. 195-196.

to build and fit iron and steel, the warships of the Royal Navy were built by private firms. The commercial yards had already been constructing ships of iron and were able to build on the scale required. Despite their experience, the size of both vessels caused cost overruns and a loss for both the Thames Ironworks and Napiers — both of which received government grants to prevent them from becoming bankrupt. The shipbuilding industry could not fail when the royal dockyards could not replicate the work, which necessitated government assistance for the firms to remain solvent.[23]

Major Reforms at the Close of the Century

During the nineteenth century when the Royal Navy and Britain's Merchant Marine were the largest in the world, there were still episodic gluts and lulls in the shipbuilding industry based on simple supply and demand. As was mentioned earlier in the paper, there had not been a contract for a warship by a private firm since the Battle of Waterloo when the *Warrior* and *Black Prince* were constructed. This lack of demand resulted in the loss of some shipbuilding firms during the period. The industry as a whole, however, was able to endure and even thrive later in the century. The 1880s proved to be the defining decade of the nineteenth century in terms of developing the Royal Navy's shipbuilding programme and prowess. Several different factors influenced the decade giving it greater importance. First, there was a greater stabilisation in the technology used for steam warships. The HMS *Devastation*, the first blue water battleship constructed by the Royal Navy without sailing rigging was completed in 1875.[24] This pointed to the creation of a truly modern battle fleet that was beginning with the reforms of Sir John Fisher, then Second Sea Lord.

Second, Sir John Fisher's educational reforms of naval officers were just being implemented and the naval war course was being discussed during this period.[25]

[23] Parkes, *British Battleships*, pp. 22-30.
[24] Findlay,"Full Steam Ahead," p. 8.
[25] D.M. Schurman, *The Education of a Navy: The development of British naval strategic thought, 1867-1914* (London: Cassell, 1965), *passim*. For more on reform and interest in the navy during the late nineteenth and early twentieth Centuries, see previous note. Andrew Lambert, "The Naval War Course, Some Principles of Maritime Strategy and the Origins of 'The British Way in Warfare'," chapter 10 in *The British Way in Warfare: Power and the International System, 1856-1956*, ed. Keith Neilson and Greg Kennedy, pp. 219-255 (Farnham: Ashgate Publishing, 2010), *passim*.

Fisher's reforms meant that all officers had to pass standardised tests and be competent in order to be qualified for promotion. There was also increased interest in naval affairs in general as a result of the release of A.T. Mahan's *The Influence of Sea Power upon History*. The premise of Mahan's book was that sea power dictated the strength of a nation; it presumed that a nation was only as strong as its navy, which sparked an arms race in the late nineteenth century and renewed interest in the navy profession. [26]

Third, changes to the Royal Navy's shipbuilding programme and policy adversely affected the direction that the Royal Navy followed. The career of the naval architect was rife with poverty and destitution. Many naval architects trained at the Royal Naval College, then stationed at Greenwich, were not provided a stable career with a viable income. At the urging of the future Director of Naval Construction, Sir William Henry White,[27] the Royal Corps of Naval Constructors (RCNC) was established in 1883 as "the civilians responsible for the design of British warships and supervision of their construction in Royal Dockyards."[28] The RCNC established a profession solely focussed on naval construction, much needed with the advanced technical understanding required to construct a ship – tradesmen, like the shipwrights of old, were no longer suitable. These RCNC were also to be used to supervise any contracted builds at private yards to ensure the warships were built to specifications and could advise the Admiralty on all matters of naval construction and long term shipbuilding. The establishment of the RCNC was vital because of the Navy Defence Act of 1889.

Finally, to maintain the Royal Navy's dominance against the growing power of the French and Russian navies, the British government passed the Navy Defence Act in 1889.[29] This act provided more funds for the construction of warships and allowed them to be built in private yards. The act called for the Royal Navy to establish a two-power

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[26] A.T. Mahan, *The Influence of Sea Power Upon History, 1660-1783,* fifth edition (Boston: Little, Brown and Company, 1890), *passim*.

[27] "William Henry White," *The Dreadnought Project,* last modified August 9, 2014, http://www.dreadnoughtproject.org/tfs/index.php/William_Henry_White.

[28] "Royal Corps of Naval Constructors," *The Dreadnought Project,* last modified April 18, 2014, http://www.dreadnoughtproject.org/tfs/index.php/Royal_Corps_of_Naval_Constructors.

[29] Hugh B. Peebles, *Warshipbuilding on the Clyde: Naval Orders and teh Prosperity of the Clyde Shipbuilding Industry, 1889-1939* (Edinburgh: John Donald Publishers Ltd., 1987), pp. 1-30. For more on the effect of the Navy Defence Act of 1889, see the above reference.

standard which meant that the Royal Navy had to possess the strength and size of the next two largest navies. The act called for "four battleships, five protected cruisers, seventeen second-class cruisers and six torpedo gunboats" to be built in private yards over the next four years. The legislation laid out a concrete shipbuilding policy. The two-power standard would slowly erode over the next several decades through financial retrenchment, the ravages of two world wars, the loss of domestic industry, and no requirement for a larger fleet.

The Transition from Naval Hegemon to Alliance Partner

The First and Second World wars and their effect on British naval policy have been covered extensively by other authors and need not be covered in detail here.[30] What must be emphasized is that the already established, private-public relationship in the shipbuilding industry continued through the two world wars. The government and private firms needed the existence of the other in order to remain viable. The government wanted a private shipbuilding industry for its expertise and an industrial base, whereas the firms needed assistance and public orders to remain afloat when private orders were scarce. This also meant that when it came time to cut costs and maintain less overhead, privatization of military contracting began to take over. [31] The Second World War had an even greater effect than the First World War. The establishment of a war economy, alongside the strains of financing a war that at times saw Britain as the sole European nation opposing Nazi Germany, took its toll on the nation.[32] The results of the Second World War exacted a tremendous toll on a nation that did what was necessary to achieve victory; decisions made during this conflict would continue to affect defence policy up to the present day.

[30] For more on these aspects, see Anthony Burton, *The Rise and Fall of British Shipbuilding* (Stroud: The History Press, 2013), *passim*. Also see, Paul M. Kennedy, *The Rise and Fall of British Naval Mastery* (Basingstoke: Macmillan Press, 1983), *passim*.

[31] William Hornby, *Factories and Plant* (London: Her Majesty's Stationary Office, 1958), pp. 64-72.

[32] For more on the effect that the Second World War had on the British Economy, see, W. K. Hancock and M. M. Gowing, *British War Economy,* edit. W. K. Hancock, (London: Her Majesty's Stationary Office, 1949), *passim*.

The peace dividend expected by the West as a by-product of victory in the Second World War never truly materialized because of the Cold and Korean Wars. There were seven major reviews and studies conducted by the British government to determine Britain's appropriate defence posture up until the Strategic Defense Review of 1998.[33] These reviews, demonstrated some key themes British defence planning and spending to include a general retraction in defence expenditure such that spending was kept within the means of the economy, and an increased reliance on military alliances such as NATO to ward off the Soviet threat. Rapid mobilization for the Korean War and Britain's further decolonisation dealt severe blows to the armed forces and a majority of these budget cuts were aimed at the Royal Navy. Following the Korean War, one of these defence reviews stated in 1957 that "Britain's influence in the world depends first and foremost on the health of her internal economy and the success of her export trade." The report emphasized that rearmament plans beyond the economic means of the nation should not be adopted, which only succeeded in further curtailing defence expenditure, especially since Britain was now part of NATO and could lean on the premise of collective defence. To cut the budget even deeper, the Healey reviews of 1965-1968 reduced defence expenditure by cancelling capital projects such as a proposed carrier fleet. The Falklands War put an abrupt halt on scrapping Britain's last carriers, which were again to be scrapped according to another review in 1990. The navy was reduced, but the largest reduction was to the army.

These reviews focussed on defence matters in general and not one service specifically. With the passage of the Defence (Transfer of Functions) Act of 1964, the three ministries of the Admiralty, War, and Air were merged.[34] Each service – the Royal Air Force, British Army, and the Royal Navy – would report to their respective council that, in turn, would report to the Defence Council. This measure consolidated the use of military force under one minister, allowing a more concerted defence policy to be formed, which would also reduce expenditure. It also marked a future for the Royal

[33] Claire Taylor, *A Brief Guide to Previous British Defence Reviews,* Note for the Parliamentary Library, International Affiars and Defence Section (London: Library of the House of Commons, 2010), pp. 2-3. Any further discussion of British defence reviews prior to the 1998 Strategic Defence Review shall be referred to this work, *passim*.

[34] "Defence (Transfer of Functions) Act 1964," *legislation.gov.uk,* 2014, accessed November 7, 2014, http://www.legislation.gov.uk/ukpga/1964/15/contents.

Navy that focused more on cost-savings (like the Navy Civil Administration Bill of 1832) and closer cooperation with the other branches of the military. This change allowed it to work more in conjunction with the rest of the United Kingdom's armed forces. These measures ensured that the Royal Navy possessed a stake in national defence through concerted defence policy and requirements. The Ministry of Defence determined these requirements with the approval of Cabinet, when before the Admiralty would have had its own representative in the process. The Royal Navy of 1889 is a faint memory and its hegemony over the high seas has long since passed to the United States Navy. The 1990 review and the *Defence Costs Study* of 1994 further cut the armed forces of capability and amalgamated any effort that seemed redundant; these documents also introduced contracting for services used by the armed forces that were not used directly for combat, such as medical services. These were brought to heel in some respects in 1998 due to the recognised utility of having assets completely owned by the Ministry of Defence.

New Carriers and a New Role for the Royal Navy

The British government published the *Strategic Defence Review* in 1998. The report placed emphasis on the role that the British Armed Forces have in foreign policy by claiming that the Royal Navy's role will "change its bias from open-ocean warfare, as formally envisaged in the North Atlantic, to force protection and near coast (littoral) operations. Shallow water operations in UK waters will also be given less importance."[35] This change in policy is not necessarily new, since earlier defence reports had emphasized the Royal Navy's focus on specific areas of defence and not simple force-on-force warfare. Instead, the report continues with the statement that the Royal Navy plans to acquire two 40,000 ton aircraft carriers to replace *Invincible*-class carriers by 2014. A large-carrier fleet was recognized as vital equipment to maintain a rapid response capability for expeditionary purposes. There was also scope in the review to purchase four container ships and centralise the logistics branches into one tri-service organization. These measures were all intended to save costs and maintain capability.

[35] Tom Dodd and Mark Oakes, "The Strategic Defence Review White Paper," *www.parliament.uk,* accessed February 9, 2015, http://www.parliament.uk/business/publications/research/briefing-papers/RP98-91/the-strategic-defence-review-white-paper.

The programme to build the two carriers has proved to be more tumultuous than anticipated.

The construction of these large carriers meant upending the shipbuilding industry in Britain. The UK's shipbuilding industry for capital ships had been contracting at a horrible rate during the late twentieth century and was only a shadow of its nineteenth and early twentieth century-self by the early twenty-first century.[36] In order to fulfill the requirements for the contract build, an alliance between the government and private industry was created by incorporating the Ministry of Defence, BAE systems, and Thales UK into a public-private partnership: the Aircraft Carrier Alliance.[37] The partnership marks a different variant in the public-private relationship in the Royal Navy's shipbuilding programmes – now known as capital ship procurement. The construction of HMS *Queen Elizabeth* is to be built by private firms at six different dockyards, enabling the creation of more jobs in Britain – a vital piece of political currency in a weak economy following the financial crisis of 2008. The government also created pseudo-crown corporations by having private firms subsidized or propped up by government funding, such as was done in the case of QinetiQ.[38] The subsidization of firms like Qinetiq and the creation of the Aircraft Carrier Alliance are not very different from the subsidies produced during the introduction of the ironclads by Thames Ironworks and Napiers. These pseudo-crown corporations are vital to reduce costs and provide increased serviceability during a time of fiscal austerity. The Admiralty no longer has the luxury of operating six or more royal dockyards at home. Of the venerable yards of old, only Portsmouth, Devonport (Plymouth), and Clyde remain in service.[39] The royal dockyards on the Thames have all

[36] Burton, *The Rise and Fall of British Shipbuilding,* p. 280- *et. seq*.
[37] *Aircraft Carrier Alliance,* last modified 2014, http://www.aircraftcarrieralliance.co.uk/the-ships/the-queen-elizabeth-class.aspx.
[38] QinetiQ was a government subsidized firm established to maintain naval shipbuilding within the United Kingdom, which is a strategic asset for British government. "Ministry of Defence Director, Ships, Tony Graham formally opens QinetiQ Signatures, Structures and Survivability centre in Rosyth," *QinetiQ,* May 4, 2012, http://www.qinetiq.com/media/news/releases/Pages/mod-director-opens-qinetiq-maritime-centre-in-rosyth.aspx.
[39] "Naval Bases," *Royal Navy,* accessed February 2, 2015, http://www.royalnavy.mod.uk/our-organisation/where-we-are/naval-base.

closed down and, therefore, the need for large contracts to be privately led has increased.

The project to construct the carriers was agreed to by the British government in 2007. Due to the financial crisis of 2008, construction on the two carriers was postponed in an attempt to curb the rising cost of the overall project.[40] Postponing the project failed to achieve the desired result of freezing costs with the cost of the two carriers now over £6 billion, over twice the original cost.[41] The *Major Projects Report* mentioned the decision to postpone construction with a simple and chilling statement: "The Department failed to understand fully the financial consequences of the decision taken in December 2008 to delay the *Queen Elizabeth* Class aircraft carriers."[42] To add further insult to injury, a Strategic Defense and Security Review published in 2010 that claimed that the aircraft carriers would be completed but their current design was not compatible with the needs of the government.[43] There were still fears that one of the aircraft carriers for which the government had paid would be eliminated.[44] The decision to man the second carrier, *Prince of Wales,* was only agreed to in late 2014.[45] The only saving grace for *Prince of Wales* was that the cost for cancelling the project was estimated to be as high as continuing with the project.[46] The two carriers will be completed but demonstrate the recent legacy of rapid change in British defence policy through future reform.

The construction of the *Queen Elizabeth* class has brought further reform for the British government and its national defence apparatus. The proposed Defence Reform Act of 2014 is in direct reaction to the aircraft carrier project and the overrun costs and

[40] National Audit Office, *The Major Projects Report 2010,* Report by the Comptroller and Auditor General, (London: The Stationery Office, 2010), p. 5.
[41] "Queen Elizabeth class Future Aircraft Carrier CVF (002)," *GlobalSecurity.org,* July 5, 2014, http://www.globalsecurity.org/military/world/europe/cvf.htm.
[42] National Audit Office, *The Major Projects Report 2010*, p. 5.
[43] *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (London: HM Government, 2010), p. 5.
[44] Ibid.
[45] Alan Tovey, "Boost for defence industry as Navy gets second aircraft carrier," *The Telegraph,* September 5, 2014, http://www.telegraph.co.uk/finance/newsbysector/industry/defence/11078025/Britains-largest-warship-nears-completion.html.
[46] *HC Deb 06 November 2013 cc251.*

capability changes.[47] Future procurements will use only single source contracts in direct reaction to the overrun costs of the Aircraft Carrier Alliance. The use of single-source contracting is aimed to provide savings for both the government as well as private firms by preventing open competition for tender of the contract. Instead, the government may choose a contractor to forego scaling costs. Single source contracts are similar to the contracting methods used during the mid-nineteenth century to use firms to provide steam engines. The methods of contracting have advanced, but have also come full circle – all of the lessons learned in the early twenty-first century are reminiscent of the debacles of the past centuries of Royal Navy contracts. The *Queen Elizabeth* class reminds the reader how easy it is to forget hard-earned lessons.

Tobias Ellwood, M.P., published a paper with the *Royal United Service Institute* discussing the use of the *Elizabeth* class carriers and how to best maximize their utility.[48] He suggested that the Strategic Defence and Security Review of 2010 was short-sighted and would cripple Britain's future capabilities. According to Ellwood, these new carriers could have profoundly and positively shaped some of the recent conflicts in which Britain has engaged and will certainly fill a central role in any future operations. The major issue brought forth in both Ellwood's piece and the debate in Parliament has been the lack of prescience in defence planning that must not only be recognized, but accounted for. For an institution that has existed since 1545 and been at the pinnacle of fighting prowess and strength for much of that time, the lack of long-term planning is unforgiveable. These issues were previously the territory of the now defunct Controller of the Navy, much to the chagrin of everyone involved.

Several aspects of the Royal Navy's shipbuilding programme development during the nineteenth century can be compared to the political climate and issues that brought about the construction of *Queen Elizabeth* class today. To be sure, the role of the Royal Navy during the age of sail was naval supremacy. The Admiralty had both the capability as well as the requirement to maintain that supremacy, since maritime commerce was the nation's lifeblood. The role of the Royal Navy today is to serve a

[47] "Defence Reform Act 2014," *legislation.gov.uk*, accessed November 2, 2014, http://www.legislation.gov.uk/en/ukpga/2014/20/notes/contents.

[48] Tobias Ellwood, "Leveraging UK Carrier Capability: A Study into the Preparation for and Use of the Queen Elizabeth-Class Carriers," (*Royal United Service Institute*, September 2013), *passim*.

political capability as an arm of foreign policy, not to defend the very essence of the nation. The difference in the political climate is essential to understanding the contrast between the Royal Navy of the nineteenth century and the Royal Navy of the twenty-first century. Despite the differences in size and role, the Royal Navy today, in comparison to its nineteenth century ancestor, possesses several similarities between the two periods that facilitate understanding of contemporary issues and some glaring discrepancies that explain the navy's issues today. When regarded in today's current light, the decentralized boards of Victualling, Admiralty, and Navy were a mechanism that prevented the navy from evolving and keeping pace with technological innovation and the onward march of progress. Centralized control and authority for all naval matters can be a blessing, but also a curse, when the powers that control the outcome are not well-versed in sea power and its effects. The nineteenth century saw the creation of a professional bureaucracy to provide for and protect the Royal Navy. The creation of the Royal Corps of Naval Constructors and the Royal Naval College were all signs of a standardized and professional corps of naval architects and officers that possessed the corporate knowledge of shipbuilding, technical expertise, grounded through eventual education programs on strategy to forge naval policy into the future. The RCNC still exists today, but is much smaller with the reduced size of the Royal Navy and royal dockyards.

The Royal Navy of the nineteenth century was able to transition from a standard of propulsion that had lasted centuries in only fifty years. The transition that the Royal Navy made from sail to steam required a methodical thought process and empirical trials to ensure and prove its progress. Nevertheless, the Admiralty had pushed forward with implementing the new technology even when fearing either the outbreak of an arms race or having the Royal Navy fail to meet its mandate of numerical dominance to ensure its hegemony. The Admiralty had decided when the conditions became appropriate for the transition to steam. These conditions occurred once steam technology had stabilized to a level that could produce standardized fleets of naval and merchant vessels for service in a blue-water navy. The construction of the *Queen Elizabeth* class could have provided some firsts for aircraft carrier technology. The decision to switch to a catapult-driven launch capability on the flight deck during mid-build demonstrated the Admiralty and Ministry of Defence's myopia with the planning of their new flag ships. If it was not the right time to create a supercarrier that relied

completely on a vertical, or short, take-off and landing platform, then the ships should not have been built that way in the first place. The long-term shipbuilding strategy does not appear to be present for that reason alone. When decisions over the utility of these carriers, and the further decision to possibly shelve the projects, is put into question then it becomes evident that the Admiralty, the Ministry of Defence, and Parliament are not in agreement over how the Royal Navy should be employed and deployed.

The other major issue between the Royal Navy of the nineteenth and twenty-first centuries' shipbuilding programmes is the effect that they produce on private industry. A similar cyclical pattern of glut and poverty existed during the nineteenth century for private shipbuilding yards as it continues to exist today. The difference today is that Britain neither possesses the largest merchant navy nor the largest navy in the world. These two institutions helped maintain the industry and ensured that there would always be a market for shipbuilding within the U.K. The modern Royal Navy has recognized that it is no longer the hegemon of the high seas; its role must now be decided by committee instead of as a stand-alone institution– one aspect of a three-pronged arm of foreign policy and national defence. The cost-overruns of the *Queen Elizabeth* class are great, but in retrospect they constitute a lesser evil than a non-competitive shipbuilding industry and a poorly thought out national defence policy. The Royal Navy still has a role to play that can allow Britain to pursue its own foreign policy and that can be achieved by *Queen Elizabeth* class. The true cost of the Admiralty is not monetary, but is realized when the nation fails to deliver sound defence policy to its people.

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