

THE ARMS RACE BEGINS: THE PROBLEM OF NATIONAL
DEFENSE AND TECHNOLOGICAL CHANGE IN GREAT BRITAIN, 1859-1866
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Today the arms race is taken as a given condition of international politics, and we accept rapid obsolescence of weapon systems as an expensive, but unavoidable, feature of military competition among the major powers. But such assumptions were quite foreign to European political leaders until the mid-19th century, when the technological advances of weaponry during the 1850s and 1860s necessitated new decisions and demanded rapid accommodation to the realities of a new age. In this article an attempt is to be made to examine briefly the shock of technological change in weaponry as it occurred in Great Britain during the 1860s.

The Liberal party under Lord Palmerston was in office from 1859-1866. This period witnessed the first efforts to deal with the problems of the new era, but national defense rapidly became a bipartisan issue, as it largely remains today. The British Conservatives and Liberals of the mid-19th century would debate how best to provide for national defense and how best to meet the perceived threat of the perfidious Napoleon III. Only a few independent M.P.'s would seriously question the reality of the French threat in the 1860s, and they never held Cabinet office or were able to vote down any major new program of military expenditure. Great Britain is also an interesting case study of the political effects of technological change due to its overwhelming sense of security and superiority prior to the mid-19th century. Unlike her continental neighbors, England had not suffered any form of foreign invasion since the forlorn incursion of Bonnie Prince Charles in 1745. Pamphlets, books, or periodical articles dealing with the possibility and probable effects of foreign attack were practically non-existent before the mid-1850s, but from the end of the Crimean War (1856) until the outbreak of World War I, there was a steady supply of and ready market for invasion literature. Until the downfall of Napoleon III in 1870, the anticipated foe was always France. By the mid-1870s the new German Empire would be increasingly viewed as a probable threat to British security. The anticipated enemy might change, but the problem of providing a secure defense in light of rapidly changing armaments would not go away.¹

England's security prior to the mid-1850s was based squarely on her naval supremacy. Her fleet of wooden hulled sailing ships, armed with smooth-bore cannon firing solid-shot weighing up to thirty-two pounds was the largest in the world. Coastal defense was considered largely superfluous in light of the clear numerical supremacy and qualitative edge of England's "wooden walls," and during the long peace of 1815-1854 what few coastal defense positions existed were barely maintained by the parsimonious governments of the period.²

The technology and fundamental assumptions underlying national defense were well-understood and had not changed in any major way since the mid-18th century. It was assumed that any well-constructed fort would be more than a match for any ship, for masonry obviously offered better protection against solid shot than oak planking. With an effective range of less than a mile, ship bombardment of forts was considered effective only if time and space allowed for a massive concentration. Even then, most military leaders felt that land assault was the

only practical means to take a fortified position. Since England's fleet was expected to be able to deny a potential enemy the opportunity to land any sizable force, clearly there was little to fear.

The introduction of steam navigation did little to alter these assumptions. Essentially steam power simply offered a more dependable, more expensive, and occasionally more rapid, method of moving a ship from place to place. It was considered an alternative, not a replacement, for sail, chiefly valuable for navigating close to shore, and certainly too expensive for long-distance navigation. It would not be until the 1880s that ocean-going warships relying solely on engine power would become practical. The Royal Navy adapted rather quickly and in the 1840s and 1850s steam engines became standard in England's fleet. But steam did little to alter the basic assumptions or technology of attack and defense. England still had the largest fleet of wooden-hulled warships in the world, and they were now even more effective, for they were not constantly at the mercy of wind and tide.³

The technological advances that were to cause real concern and foster significant changes in England's attitude toward national defense were the introduction of rifled shell-firing cannon and armor-plating on warships. The French introduced these during the Crimean War, first using this new technology during the assault on the Russian fortress of Kinburn on October 17, 1855. Here, while a fleet of British wooden steamships stayed safely out of range, three French iron-plated, floating batteries, equipped with small steam engines for maneuvering, anchored 800 yards offshore and began shelling the fort. According to standard naval doctrine, such a practice should have meant a quick and violent end for the crews of the batteries for the Russian 24 and 32 pound cannon were accurate up to about 1000 yards. The Russian gunners scored some 200 solid hits on the 3 batteries within the next four hours, but the 4 inches of iron-plating was only dented by the solid shot. The Russian fort, in contrast, had been reduced to rubble, with heavy casualties among the defenders.⁴

The French government then began to conduct further tests to determine what type of armor-plating offered the best resistance to the ordinance of the day. In 1858 Napoleon III ordered the construction of La Gloire, the first rifled cannon, shell-firing, ironclad warship in the world.⁵

British suspicions of French aggressiveness were confirmed in 1859 when Napoleon III annexed Nice and Savoy as his price for helping the Italians win their independence from Austria. The French were also continuing their iron-clad program, and by the summer of 1859 there was a full-blown "invasion-panic" underway in Great Britain. The clearest symptom of the degree of public concern was the sprouting of the Volunteer movement in the spring of 1859. By June, 1860, over 139,000 otherwise peaceful middle-class Englishmen were members of this so-called "rifle-corps" and the English countryside resounded with the sound of musketry as clerks and accountants prepared to defend home and hearth against the legions of Napoleon III. Even Alfred, Lord Tennyson joined in the effort, contributing a poem entitled, "Form, Riflemen, Form", encouraging recruitment in this new citizen army.⁶

The technical problems presented by the French advances were real, although the public outcry was probably exaggerated. The rifled-cannon had increased the range and

destructive power of ship guns enormously. For the first time, existing forts would be in serious peril from ship bombardment, as well as assault or siege. The ship's gun had also become a much greater threat because it would now be protected by armor. England's huge inventory of wooden ships now appeared to be easy prey for a French iron-clad raid from their harbor at Cherbourg, only fifty miles from the Royal Navy base at Portsmouth. The 19th century version of a "first-strike capability" now appeared to be a real and imminent possibility.

Palmerston's government was forced to act in some decisive way to blunt Parliamentary and public criticism. Palmerston was personally inclined to act forcefully, for he had always been a champion of a strong national defense and an assertive foreign policy. The method he and Sidney Herbert, the Secretary for War, chose was the appointment of a Royal Commission to study the problems and alternatives presented by the new technology. The commission was to direct its primary efforts into an investigation of how best to protect the dockyards and harbors of the Royal Navy. In addition, Palmerston's Cabinet authorized the completion of four iron-clads and authorized the War Office to conduct an extensive series of trials of guns against armor plate in order to find the best combination of ordinance and projectile with which to arm the new vessels.⁷

The commission's report was to determine the direction of coastal defense for the next thirty years. Appointing Royal Commissions was a favorite tactic for any 19th century British government that wished to avoid direct action on a troublesome issue, but this commission was clearly different. Six of its seven members were career officers, with only one civilian M.P. included. Commissions were normally composed largely of members of Parliament from the governing party. Also, this commission was assigned a special Technical Assistant, Major W. F. Drummond Jervois, a career officer of the Royal Engineers. Jervois was regarded as the leading fortifications expert in the British army and two of the commission members, Captain Cooper Key, Royal Navy, and Colonel John Lefroy, Royal Artillery, were considered the leading gunnery authorities in their respective services.⁸

The commission issued its voluminous report on February 7, 1860. Its members reported that the danger to England's harbors and dockyards was real and that at present there was no adequate means of protection from iron-clad assault. They recommended a massive four year program of fortification construction, at a total cost of £11,850,000. As the situation was urgent, they recommended that the Government borrow the money, an unprecedented step, for the British government had financed all fortification work since 1815 from annual revenues. They recommended casemated works of brick with iron-facing. To man such extensive works, the Volunteers were to be used, along with a core of professional troops in each fort. The Government dropped the sum to £5,000,000 but pushed through a bill to borrow the sums required, and work began in 1860.⁹

From a late 20th century perspective, the most interesting aspect of the subsequent history of the fortification scheme is how the government quickly began encountering all of the problems we are now familiar with concerning rapid obsolescence of weapons systems.

The first problem was money. Even in an age of stable

prices, cost overruns quickly became apparent, and by 1866, the anticipated cost of £5,000,000 had become the actual expenditure of £7,000,000.¹⁰

The second problem was armament. In 1860, the commission assumed most of the works would be armed with the 68 pound smoothbore, the standard heavy gun of the Royal Artillery. These weapons were plentiful, reliable, and cheap, and could pierce an inch or so of armor at several hundred yards. They averaged about £200 each. But such predictions proved hopelessly in error as new and more powerful rifled guns were quickly required for newer and more improved versions of armor plating. By 1874 the cost of fortress artillery was up to £8,000 per gun.

Another major problem was the composition of the fortress walls. Gunnery tests soon proved the original design inadequate, and there were continual delays as new combinations were tried. By 1864, when the works to protect against imminent danger were to have been completed, not a single installation was ready for its armament. The heart of the matter was the constant leap-frogging between the development of armor protection and the development of a projectile capable of defeating it.¹¹

The American Civil War also provided lessons and problems. When masonry forts, such as Ft. Pulaski, at Savannah, Georgia, proved unable to withstand even limited bombardment, while earthworks held out for months and years, a major debate arose over the advisability of having any type of masonry and armor combination. Eventually, in 1864 the Government decided to stay with a masonry and armor construction, not because it was superior to earthworks, but because it would be too expensive to dismantle existing works already under construction.¹² By 1873 most of the works were finally completed, and a reporter quickly tagged them with the name that has stuck, "Palmerston's follies."

Criticism of the works is easy today. They were obsolete when completed and never tested in battle. But the problems faced by Palmerston's Cabinet were unprecedented and modern governments have not proven themselves much better at dealing with the continuing question of how to provide an effective national defense at a reasonable cost in an age of rapid technological advance.

NOTES

¹For a discussion of the invasion "panics" of the late 1850s and early 1860s see Hugh Cunningham, The Volunteer Force—A Social and Political History, 1815-1908 (Hamden, Conn.: Anchor Books, 1975), pp. 4-7.

²Richard L. Blanco, "Reform and Wellington's Post Waterloo Army, 1815-1854," Military Affairs, 29 (Fall, 1965): 124-125.

³For a good discussion of these assumptions and their effect on military questions see W.C.B. Turnstall, "Imperial Defence, 1815-1870," Cambridge History of the British Empire, 2: 818-825.

⁴Ian V. Hogg, Fortress: A History of Military Defence (New York: St. Martin's Press, 1977), pp. 81-82. See also James Phinney Baxter, III, The Introduction of the Ironclad Warship (Cambridge: Harvard Univ. Press, 1933).

⁵Hogg, p. 83.

⁶An excellent article on the Volunteer phenomena is Barrie Rose, "The Volunteers of 1859," Journal of the Society for Army Historical Research, 37 (Sept. 1969): pp. 97-110.

⁷For Palmerston's announcement and defense of the Commission plan, see Hansard's Parliamentary Debates, 3rd Series, 155: 399-413.

⁸For information on how Sidney Herbert selected the members of this commission see Charles Duffy, Fire and Stone: The Science of Fortress Warfare, 1660-1860 (London: David and Charles, Ltd., 1975), pp. 19-21.

⁹For the full text of the report see Sessional Papers, 1860, "Report of the Commissioners on the Defences of the United Kingdom," 23: 431-487.

¹⁰For a complete listing of anticipated and actual expenditures on each of the works see Sessional Papers, 1868-69 "Report on the State of Construction of Fortifications," 12: 433-446.

¹¹See Duffy, pp. 35-37 for a discussion of the gunnery problem and pp. 29-35 for the problem of wall construction.

¹²For the Parliamentary debates on these points see Hansard's Parliamentary Debates, 3rd Series, 166: 263-268, 430-444, and 172: 689-720.