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(eds.)

**LES MARINES  
DE GUERRE EUROPÉENNES  
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**THE BUILDING AND MAINTENANCE OF THE BRITISH  
FLEET DURING THE ANGLO-FRENCH WARS  
1688 - 1815**

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England, the first naval power in the universe, and equal to all the rest united, is most deficient in proper accommodations for its navy. Her dockyards have risen from small beginnings to their present state, by a succession of expedients and makeshifts.

*Quarterly Review*, September 1812, p.38.

During the period of the Anglo-French wars the greatest and most costly administrative burden charged to the British government was the provision of an effective fleet. But at variance with the strongly-held belief that the fleet was the last line of defence against French absolutism was an ingrained conviction that an efficient and costly bureaucracy was inimicable to liberty ; the average eighteenth-century Englishman, particularly the independent country gentlemen who made up the majority of the backbenchers in Parliament, saw the establishment of a large and efficient administration as itself an absolutist threat (1). For these reasons, perhaps, while, unlike the French situation, after the 1690s naval credit was never a problem (2), the planning and rational growth of large government establishments, including dockyards, victualling yards and the other facilities necessary for the base of naval power was never smooth and, particularly in peacetime, did not attract consistent political support (3). Eighteenth-century politicians wanted, like politicians of any age, a cast iron defence, but they wanted it cheaply and without the expense of large establishments. Yet, as one historian, writing of this period, has recently pointed out :

Naval supremacy does not simply exist. It has to be created and maintained. The effort to do so profoundly altered the extent of British government, the national finances and foreign policy. It influenced the national economy and inevitably affected society as well... The expansion of private shipbuilding and the growth of the naval dockyards meant that there was no question as before of Britain having the

necessary facilities to build and maintain as many warships as it needed provided it could obtain the materials to build them (4).

Lord Sandwich, First Lord of the Admiralty from 1771 to 1782, would have reacted to this confidence with pained disbelief ; although he could be over pessimistic, he wrote with realism in 1774 :

We set out in the year 1756 with 69 ships of the line, we ended in the year 1762 with 81, 12 were taken from the enemy and employed during the war in the King's service, & 'tho we built as fast as possible in the King's Yard, and employed all the Merchant Yards that could build a ship for us, it is to be observed that we finished with exactly the same number with which we set out (5).

How can these opinions be reconciled ? After all, soon after Sandwich's gloomy analysis, Britain steadily and successfully increased her fleet during twenty-two years of warfare. British shipbuilding capacity was superior to her rivals, yet to develop it to its full potential was not an easy task. Lack of materials was not a problem, although shortages sometimes led to building with unseasoned timber (6). At the root of the problem was a lack of skilled labour, insufficient dockyard facilities to maintain the fleet, administrative shortcomings and a failure of political will. Once these essentials had been improved, the potential of England to produce a more powerful fleet than its rivals was realised.

A dockyard in the era of wooden shipbuilding was an establishment capable of repairing or refitting a substantial warship in time of war, of building others, usually in peacetime, and had an organisation and facilities capable of concentrating and redistributing a large mass of naval stores. In England during this period there were six. Deptford and Woolwich had been established in the early sixteenth century under Henry VIII, and were used now only as building yards, although they served a useful function as important distribution and ropemaking centres as they were near the London markets. Chatham on the Medway had been developed to fight the seventeenth-century Dutch wars ; although it survived as a major industrial centre until early this year (1984), it was strategically outdated by the beginning of the eighteenth century (7). It served as a building and repair yard only. Sheerness had been founded at the mouth of the Medway in 1666 as a forward base for Chatham, but was never able to expand until well into the nineteenth century because it had an unsuitable site (8). The principal bases were thus on the south coast at Portsmouth, which was the biggest yard for most of the period of the French wars. Plymouth, the only major yard to be founded and developed rationally (in 1691), grew steadily in facilities and in the size of its workforce until towards the end of the French wars it rivalled Portsmouth.

These yards, growing up, in the words of the writer in the **Quarterly Review**, as 'expedient and makeshift', had to cope with the task of creating and maintaining an ever increasing fleet as British success and imperial ambition prospered (9). For just over half of the 126 years in which England and France fought each other the fleet grew from 173 ships totalling 100,000 tons in 1688 to a peak in 1809 of 755 ships in sea service, totalling more than half a million tons -

at least a fivefold tonnage increase (10). It is unrealistic to think of consistent planning in eighteenth century England, but even for the time the dockyards grew haphazardly. There was a period of investment in the 1690s and more frequently from the 1760s, particularly at Portsmouth and Plymouth, but usually the improvements which this investment provided had been much needed for some time. There was a considerable shortfall in capacity ; indeed, without the capitalism and free market economy which England sought to defend, there could have been no effective fleet ; and by the end of the period the private sector was producing most of it.

This was not so at the start of the French wars, for apart from the rapid expansion of William III's navy, when merchant yards played a full part, during the long period of peace after the Treaty of Utrecht no ships of any size were put out to contract. It was not until 1740, when the river yards swung rapidly into action with very quickly built frigates, did their contribution begin to be felt, and they soon were building ships of the line (11). Taken over the whole period, a remarkable number of ships of the line were contract built. Of the total of 636 ships, (843,045 tons) built between 1688 and 1815, 244 (321,910 tons, 38%) came from merchant yards (12). It was from the Seven Years war that the significant changes took place. Between 1688 and 1756 merchant yards built only 25% of ships of the line ; from then on this proportion was doubled.

Yet no naval administrator liked contract-built ships, feeling that they were costly and less well built. One estimate was that they lasted two thirds as long as those built in the yards, and although it is not easy to assess, this was probably a reasonable estimate (13). Since a merchant builder's profit depended mostly upon the pace at which the ship could be built, there was good reason to think that corners could be cut. After many years of murmurs, Lord St Vincent, First Lord of the Admiralty from 1801 to 1804, took this argument to its logical conclusion. He prosecuted the builder of the Ajax (74), which, only four years after launching had to receive a substantial repair to replace many of her knees ; but this achieved little except an exoneration clause in all future contracts, at the insistence of the contractors. He then let contract building run down to a dangerous degree. Yet he was, as in so many of his reforms, flying in the face of some obvious facts. Between 1793 and 1815 71% of all naval tonnage was launched from merchant yards ; this total included sixty ships of the line, while the dockyards completed only 41 (14). The dockyards had long lost control of the task of building the fleet ; now the problem was rather whether they could maintain its ever-increasing numbers.

At the root of St Vincent's thinking, and that of Sandwich's before him, was that not only was contract building too costly and of low quality, but that the dockyards should manage to produce much more. Sandwich tried to introduce piece-rate (or task) working, but, although it eventually came about, it is doubtful whether it made any great difference to output once it became established. St Vincent, like a bull in a china shop, took on the whole of the civil administration, until he antagonised everyone from the Navy Board downwards. His eventual fate, before he could see his reforms through to any sort of result, was to become a political liability in a politically weak administration (15). Fundamental reform, which was being sought by every First Lord from Sandwich onwards, was not

possible without the press and urgency of war ; even much needed reforms which had been proposed in the early 1780s were not carried into effect until more than ten years of war had taken place (16). The misunderstanding by politicians in London of the very large industrial organisations with the dockyards had now become meant that change for more efficiency was very difficult ; only after 1810 did patient standardisation and rationalisation begin to have much effect.

The situation, as was illustrated by the St Vincent period, had become confused by the conflict between the public and private sections ; on the one hand there was a pattern of periodical intense demand, stimulating the private sector, while at the same time there was competition between the state and the private sector for limited resources. Over no part of the economy had this pattern more effect than on the skilled labour market. Private yards competed very successfully with the dockyards, yet even they were bettered in the first half of the century. The Thames private shipwrights petitioned in 1724 :

By the great number of ships and other vessels lately built ... in New England ... great numbers of those able shipwrights, brought up and employed by Petitioners, for want of work to maintain their families, have been necessitated to withdraw themselves from their native country into America and other foreign parts.

The Council of Trade agreed. 'We have good reason to believe the number of shipwrights in Great Britain is diminished one half since 1710. This diminution is chiefly owing to the great numbers of ships built annually in Your Majesty's plantations, but particularly in New England' (17). The Council could have added that the Thames had suffered considerably from the lack of naval contract since 1710. Even so, merchant yards held the whiphand when it came to attracting labour, for the navy never came near matching private shipwright wages. Although there were large variations, everywhere in the south of the country, except possibly in the West, compared very favourably with the 2/1d a day which was set in 1699 for the royal yards and not changed until 1801 (18). Yet by the time of the American war shipwrights in private yards on the Thames were earning 3/6d a day.

It thus seems surprising that the royal yards attracted any labour at all, but, with the rise of the eighteenth-century permanent state establishment, it was able to offer an unusual commodity - that of security. The merchant builders hired vigorous and young shipwrights on a piece-rate basis ; once the ship had been completed, he had to look for other employment. A royal dockyard worker expected more than that. In spite of early seasonal fluctuations, the administration in London, contrary to eighteenth-century political instincts, found increasingly that it had to maintain a continuous workforce, winter and summer, as the task of maintaining naval superiority became more complex and demanding (19). From the 1,200 workmen of all classes of 1687 there were 5,000 in 1703. At the peak of the war of 1739-48 the figure stood at 8,500, by the American war 9,500 in 1813 at nearly 16,000 (20).

Unlike the French, the British did not press shipwrights after the war of Spanish succession. It seems to have been used to its greatest extent in the 1690s

and on at least five occasions between 1704 and 1706 (21). Yet on the outbreak of war in 1739 it was never revived. By this time the navy was beginning to rely on the private sector and there was not much point in taking labour away from merchant yards which were busy with naval ships. As at any time, drafting labour into jobs in large numbers does not solve every problem, as the French experience showed. In 1793 the labour force of Toulon was swelled to 6,000 by drafting, but, according to a carpenter from Bayonne : 'It makes me sick to see so many workers idle here... Once the roll call has been taken they either have a nap or leave the Arsenal to seek jobs in the town. The Provencaux are very unkind towards the Bayonnais and claim that we work too hard'(22). However, while Britain did not resort to forced labour, the royal dockyards never had enough shipwrights, nor did any administration identify this problem and improve either the quality, numbers or administration of its apprentices until the last years of the Napoleonic wars (23). Crucially, the proportion of shipwrights to the total labour force drops steadily through the century. In the war of 1739-48 it was about half, by the American war a third and by the peak of the Napoleonic wars about a quarter.

To make matters worse, this shortage of skilled labour led directly to a succession of all-out strikes and continual labour problems in the dockyards from 1739 onwards. Over the long period of peace after Utrecht prices had dropped slightly so that it was possible that the workmen had gained from the fixed rate of 2/1d a day. In the 1730s prices steadied. But the Navy Board was vulnerable, the workforce confident and more permanent. It was unfortunate, therefore, that, in 1739, just at the time that the outbreak of hostilities were having their impact on prices, the Board should chose this moment to suppress the collection of 'chips', a privilege and important supplement to the mens' wages which they were very eager to defend. In effect, the Navy Board gave way (24). Further strikes took place in 1742, 1743 and 1744 and during the next war in 1756 and 1757. However, the most damaging and dangerous was in 1775 at the beginning of the American war. Again the theme was 'lost privileges' in protest against Sandwich's attempts to introduce task work for the shipwrights. Within ten days every yard except Deptford was at a standstill and Sandwich's attempts at introducing increased efficiency were frustrated (25). In the context of the present paper, the significance of these strikes, intense and bitter as they were, involving troops and imprisonment, was that it showed that there was a limit to how much the dockyards could be made more effective. If Parliament and the politicians would not change their regard for economy and underwrite changes in wages and methods of payment (26), if they would not put more capital into better docks and plant, and if the fleet was so big that it took all the effort of the dockyards to maintain the fleet, then there was little any administrator could do, like it or not, than to rely on the contractors who made their way to the Navy Office in reponse to invitations to tender for warship contracts.

Yet a look at the private sector and the system by which contracts were administered and monitored shows that this too was fragile. Geographically, private shipbuilding tended to complement naval building rather than compete with it. The most dynamic of all eighteenth-century shipbuilding areas, the North East, rarely, with the exception of Hull, built a ship of war (27). The other growth area, the North American colonies, built only two and then on an experimental basis (28). The Navy Board preferred the River Thames above all other areas. Of

the 244 ships of the line built by contract between 1688 and 1815, only 84 were built elsewhere (29). The Solent area was the next preferred, but it was a long way behind the River. Only 19 ships of the line were built, out of a total of 207 of all sizes. Other areas were drawn in when demand became excessive, or on occasion in attempts to keep Thames prices down. East Anglia, which suffered from a declining shipbuilding industry in the eighteenth century, was propped up by a steady flow of contracts to Harwich and Ipswich. Bristol, Hull, Frindsbury on the Medway and even Milford in Wales built ships of the line. Over sixty places in the south of England below a line drawn between Liverpool and Hull built smaller ships (30). When demand was intense, there were even more imaginative schemes. In 1693 the possibilities of building a third rate in Lubeck and some smaller ones in Ireland were thoroughly investigated, but they came to nothing. In 1694 a fourth rate was built at Newcastle in New England and purchased in 1696 ; in 1700 a 32 gun ship was built at Kinsale ; there were the two already mentioned built in New England in the 1740s ; while in 1805 Samuel Bentham went to Russia to superintend the building of two 74s and two 36 gun frigates. The only successful overseas naval building before 1815 were the three ships of the line and a handful of smaller ones built of teak in Bombay dockyard (31).

However, over the entire period Navy Board officials never liked building a long way from London, and every piece of evidence suggests that this caution or conservatism (an attribute for which the Navy Board has ever been criticised) was more than justified, for control of quality was a real problem for ships built in outlying private yards. It could be very difficult for a newly-promoted dockyard shipwright, appointed as overseer at a distant private yard, to maintain the authority of the Board. There could be many local pressures, not least political. The Member of Parliament for Hull clearly took more than a passing interest in the building of the *Success* (24) in 1740 ; while the *Gentleman's Magazine* commented : 'To build (the 1740 frigates) strengthened the hands of the ministry. Accordingly these ships were jobb'd away to the several Ports where Votes and Interests were not wanting'. Another example is outlined in detail by Namier where the placing of a contract for a 20 gun ship at Harwich at the beginning of the next war was an important move in local politics (32).

More likely pressures were, however, financial. Most shipbuilders, except those who operated on a large scale on the Thames, were not men of substance and wholly relied on the imprests which the Board issued at the various stages in the construction of a ship. Many things could go wrong. The price of timber could rise sharply ; workmen, in the early period, could be impressed. In 1693 three Navy Board Commissioners, including Richard Haddock, the Comptroller, and Edward Dummer, the Surveyor, visited two builders, Barrett and Mundy, who were in trouble at Harwich. 'Tis a melancholy story to find these works at this time in this state, and not a stick of timber further upon the place', wrote Dummer, 'nor more than six workmen employed on both of them. We acquainted Mr. Barrett in the presence of Mr Mundy what were the sentiments of the Board on this unhappy subject...' Barrett's reply was typical of the difficulties of the small contractor ; men had been pressed, local merchants had held up supplies of timber because they were not satisfied with Barrett's credit, one landowner had defaulted on timber already paid for and so on (33). It was an industry which was susceptible to bankruptcy and even men of substance could go to the wall. In an analysis of south

coast builders over the period, A.J. Holland notes that everyone of them went bankrupt at one stage or another and that they tended to do this towards the end of the eighteenth century wars (34).

The feeling of official frustration seems to have been constant. In 1692 Richard Haddock saw one of the contract-built 80 gun ships, 'ill-built by the hanging of her deck abaft so low, beside the wrong she hath taken in launching ... I... shall not readily advise the building any more by contracty out of your own view' (35). More than sixty years later, in 1756, Sir Thomas Slade, the most distinguished eighteenth-century Surveyor of the Navy, inspected the building of the **Coventry** (28) at Henry Adam's yard at Bucklershard on the Beaulieu river. He found

plant wrought Irregular, and badly fay'd to which appear'd to be from want of care in Dubbing the Timbers Several of them being furr'd which should have been let out, and One frame in the loff of the Starboard Bow too slack ... The work displeas'd me came away very angry.

and he ordered that the young overseer should never be employed again (36).

Apart from bad workmanship, there was a constant battle against inaccurate building. Edward Dummer complained in 1692 to a Southampton shipwright named Winter, building two 80 gun ships, that 'there is not only not one individual foot of her answerable to my draught, but that you never wrought by it at all' (37). Perhaps the most bizarre cases were the **America** (44) and **Boston** (24) built in North America in the late 1740s. They were lengthened by six and five foot on the keel respectively on the whim of the commander-in-chief, Admiral Peter Warren. 'I became convinced', he wrote to the secretary of the Admiralty Board, 'by the unanimous opinion of very good judges in shipbuilding, whom I consulted upon the occasion, and from the result of my own judgement on the experience I have had, that lengthening her would make her a far better sailing vessel' (38). It was no wonder that the Navy Board did not like far off contracts. Although it failed to prevent Warren doing as he wanted, it successfully resisted extra payment to the builder for the greater tonnage built, which was often the motive for this inaccurate building. The most succinct statement of the official dilemma was put by Lord Sandwich in his defence of his administration in 1781 :

Ships built at a great distance from the Dockyards occasion vast delays and expense in getting their stores to them, which must be sent from one of the established yards... Engaging persons to build, who are not equal to the undertaking, gains no ground, and is liable to every kind of abuse. When a warship is contracted for, a considerable Imprest is made to the Builder, to the amount of the value of the ninth of the ship ; if he is not a man of credit and integrity he will delay your business, and employ your money to other purposes, being secure of your work, which you cannot take out of his hands on account of the Imprest advanced... (39).

In such circumstances, it was not surprising that merchant yards were not entrusted with repairs except in extreme circumstances, for this was a task which



was even more difficult to regulate. Nevertheless, it was forced on the administration in the American and Napoleonic wars. According to Sir Charles Middleton, it was resorted to 'in cases of absolute necessity, and confined to frigates only ; the navy board are ignorant of the evils attending it ; and although I always reprobated it in my own mind, yet necessity forced it upon us in the American war, and it was put a stop to as soon as we could procure a sufficiency from our own yards' (40).

Yet the yards could not readily cope with this task. An eighteenth-century warship needed constant attention. For example, in the five years of the American war, of the thirty-four 74 gun ships which served for all five years, only twelve went through the period without being taken out of commission (41). Charles Derrick, a Navy Board clerk, analysed the problem later and commented :

It was not forgotten, on the return of peace, what powerful fleets had on several occasions been opposed to ours ; nor what little opportunity there had been in the course of the war to give ships a permanent repair (42).

In fact there was a great difference in the 1783 to 1793 peacetime period, largely based on William Pitt's determination, through Middleton's lobbying, to maintain the fleet at a much higher level of efficiency. Derrick assumed that the country would need to have a hundred line of battleships -very considerable increase on what had been achieved before. He concluded that each ship would therefore require a repair at least every ten years, an argument which he supported by a list of twenty-three ships built in the last ten years, all of which needed repair. He thus considered that ten ships had to be built or repaired annually to maintain the total of one hundred seaworthy ships. He pointed out that in the period 1766-72, 3,112 shipwrights had managed to build or repair only seven ships a year for seven years ; from 1783 to 1789, and by working extra time, they had managed to build or repair 68 ships in seven years, or just under the necessary ten.

Thus with political and financial support the civil administration made a significant improvement in the condition of the fleet ; yet even then they had a considerable advantage for the navy had to hand the biggest batch of contract-built ships since the previous century. Thirty-six ships of the line had been laid down but not launched by 1783, only six of them in the dockyards, and at the end of hostilities they were ordered to stand in frame (43). They were launched gradually over the next ten years, the average contract building time extended to over five years : while of the ships in the dockyards, the *Glory* (98), for instance, stood in frame at Plymouth for thirteen years, having been laid down in 1775 and launched in 1788. During these post-war years, the admiralty needed to order only three ships of the line. The results of the hasty building of the Seven years war and, perhaps, more important, the results of the harsh post-war economies of Grenville, were avoided (44). Now the timbers were well seasoned, while much firmer management and new regulations in the dockyards under Middleton resulted in better discipline in maintaining the ships in the Ordinary. The result of this distinguished period of naval administration was an adequate fleet in good condition, rapidly mobilised in 1793.

The constant need to build and repair the wooden ships of the eighteenth-century navy could not have been lessened unless a technological breakthrough, or a sweeping change in administrative attitudes to maintenance, could have stopped the pace of the ships rotting. Sandwich set great store by his provision of a three year supply of timber, stored in seasoning sheds ; 'if the ships hereafter last thirty years instead of ten, the nation in the end will be much benefitted' (45). It was an elusive goal. British naval administration found it easier to create new ships rather than to maintain those already built ; the only way numbers could be kept at a sufficient level was for an expensive replacement programme, and these new ships had to come from private contractors. There was thus a large amount of waste and shoddy workmanship. In other words, the navy was forced to create something which it was never able to maintain adequately. But the strength and flexibility of the financial and industrial private sector were able to compensate for these shortcomings.

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**Appendix I : Ships of the Line, 1688-1815**

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<b>1688-1755</b>	<b>Number of Ships Tonnages</b>		<b>Average tonnage per ship</b>
Merchant yards	108 (29%)	99590 (25%)	922 tons
Royal dockyards	267 (71%)	296080 (75%)	1109 tons
(Total)	(375)	(395670)	(1056 tons)
<b>1756-1815</b>			
Merchant yards	136 (52%)	222420 (50%)	1635 tons
Royal dockyards	125 (48%)	225055 (50%)	1800 tons
(Total)	(261)	(447375)	(1714 tons)
<b>Grand Totals</b>	<b>636</b>	<b>843045</b>	<b>1325 tons</b>

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Source : Lavery, pp.163-190.

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**Appendix II : Location of shipbuilders  
in South and West of England with naval contracts, 1688-1815**

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Only those places asterisked once built ships of the line and smaller ships. Double asterisks indicate building ships of the line only ; no asterisks indicate only small ships.

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<b>River Thames</b>	Deptford* Limehouse* Wapping* Cuckold's Point* Rotherhithe* Blackwall* Woolwich** Gravesend* Northfleet	<b>South Coast</b>	Shoreham Horsleydown Arundel Sandgate Hastings Dover Deal Littlehampton Sandwich Folkestone
<b>Solent area</b>	Southampton* Northam* Bucklershard* Lepe* East Cowes* Rebridge West Quay Hythe Eling Chapel Portsmouth Gosport Yarmouth Poole Chichester Itchenor Fishbourne	<b>River Medway</b>	Chatham Rochester Frindsbury* Upnor Gillingham Faversham
		<b>East Anglia</b>	Ipswich* Harwich* Aldborough Woodbridge Maldon Wivenhoe Mistley
<b>West Country</b>	Bridport Teignmouth Plymouth Lyme Regis Saltash Lympstone Turnchapel* Dartmouth Topsham* Bideford	<b>Other</b>	Hull* Bristol* Milford** Milford Haven* Kings Lynn Liverpool  See Appendix III

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**Appendix III**  
**Naval ships built in the North of England, 1688-1815**

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		Total tons
1691	Scarborough, 2 ten gun ketches	190
1745	Chester, sloop	280
1779	Leith, sloop	306
1779	Howdenpans, 44 and 24 gun ship	1,396
1804	Wearmouth, 2 gun brigs	358
1804	Chester, 2 gun brigs	357
1805	Leith, 2 gun brigs	364
1806	Howdenpans, brig sloop	383
1808	Newcastle, 1 gun brig	237
1813	Chester, 2 x 20 guns	928
1814	Chester, 2 x 24 guns	902
		<b>5,701 tons</b>

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**Sources for Appendices II and III.**

Lavery, pp.163-190 ; Ehrman, p.629 ; Baugh (1), pp.515-529 ; Banbury, pp.111-155 ; Holland, p.174 ; Oppenheim, pp.131-151 ; R.C. Anderson, **Lists of men of war, 1650-1700** (Society for Nautical research. Occasional publication no.5, reprinted 1966) ; Pool, *passim*. Comparison with the list compiled by Joseph A Goldenberg in 'An analysis of shipbuilding sites in **Lloyd's Register** of 1776', **The Mariner's Mirror**, 1973, pp.424-435, demonstrates how large shipbuilding areas of the country were never used by the Navy Board. I am grateful to Mr. David Lyon for providing me with additional information to these printed sources.

**NOTES**

1. See the remarks in Brian Lavery, **The Ship of the line**, vol.I (London, 1983), p.9. The reliance of this paper on his findings and statistical appendices will be obvious ; his analysis of the quality of the design of the British, which he finds to be far from the haphazard craftsmanship which is its reputation, makes further comment unnecessary here.
2. P.G.M. Dickson's work, **The financial revolution in England : A study in the development of public credit, 1688-1714** (London, 1967) and more particularly his essay 'War finance 1688-1714' in the **New Cambridge Modern History**, VI, pp.284-315 have well established the story of the early development of British financial strength. See also Daniel A. Baugh's chapter 'naval finance' in **British naval administration in the age of Walpole** (Princeton, 1965,

hereafter Baugh (1) and J.E.D. Binney, **British public finance and administration, 1774-92** (Oxford, 1958). The contrast with the French situation is best made by the questions asked by James Pritchard in 'The French navy, 1748-1762 : problems and perspectives' in R.W. Love (ed), **Changing interpretations in modern naval history** (Annapolis 1980), p.150.

3. Baugh (1), p.504 ; Norman Baker, 'Changing attitudes towards government in eighteenth century England', in Anne Whiteman, J.S. Bromley and P.G.M. Dickson (ed.) **Statesmen, scholars and merchants** (Oxford, 1973), pp.203-219.
4. Michael Duffy, 'The foundations of British naval power' in Duffy (ed.) **The Military Revolution and the State 1500-1800** (Exeter, 1980), pp.56, 60.
5. Public Record Office, ADM 7/661, Sandwich's notes on the dockyard visitations.
6. Space considerations rule out a discussion of the supply of naval stores. Generally a success story, underpinned by a highly aggressive foreign policy in the Baltic and a dynamic merchant fleet, there were threats of intense shortages in the last years of the period. Canada, India, South Africa and even Australia were being scoured to add to Baltic supplies. It led directly to the increased use of iron in wooden ships. R.G. Albion's pioneer work **Forests and seapower** (Cambridge, Mass., 1926) is in need of revision, over emphasising as it does the problem of supply rather than of administration.
7. For background on the history of the dockyards see Roger Morriss, **The royal dockyards during the Revolutionary and Napoleonic wars** (Leicester, 1983), pp.1-3 ; Philip MacDougall, **Royal dockyards** (Newton Abbott, 1982). Harwich, Deal, Kinsale and Leith were also minor bases, but usually contained only naval stores rather than refitting facilities.
8. The only serious attempt to resite the yards in this period came from John Rennie, who proposed a site at Northfleet in 1807 and land was in fact purchased by the Admiralty. Morriss, p.53.
9. For reasons of space it is not possible to comment further on the overseas bases of Jamaica, Antigua, port Mahon, Gibraltar and Halifax, developed from the 1720s when the British turned towards the Atlantic, although their role in maintaining the fleet in wartime was considerable. The best account is in Daniel Baugh, **Naval administration, 1715-1759** (Navy Records Society, 1977) hereafter Baugh (2), pp.325-332.
10. Figures from J. Charnock, **History of maritime architecture** (London, 1800-1802) vol.II, pp.426-431 ; John Ehrman, **The navy in the war of William III, 1689-1697 ; its state and direction** (Cambridge, 1953), p.625 ; Morriss, pp.16-17. The estimate of half a million tons is approximate and is from W. James, **The naval history of Great Britain** (London, 1902 edn), vol.IV, appendices 14-16. Tonnage figures for smaller naval ships are not available, unlike those for all merchant ships from 1788. For instance, in 1809 there were 19,882 registered merchant ships, totalling 2,167,000 tons ; see B.R. Mitchell and

Phyllis Deane, **Abstract of British historical statistics** (Cambridge, 1971), p.220.

11. No naval ships were built by merchant yards between 1710 and 1740. A useful analysis of the 1740 building appears in Baugh (1), appendix II ; Baugh (2), p.193, 217-218. The frigates were in fact rather late owing to the very hard winter of 1740 and difficulties with shipwright wages.
12. Only the dockyards built 1st and 2nd rates ; no ship larger than a 74 was built by contract. Detailed figures appear in Appendix I of this paper.
13. This was the estimate of the anonymous writer in the **Quarterly Review** of 1812, p.32. For instance, complaint was made of most of 20 gun ships built in 1740, 'that they have wholly wanted new Caulking before they have been fit to proceed on service' Baugh (2) p.219 ; see Bernard Pool, **Navy Board Contracts, 1660-1832** (London, 1966), p.13-16, 48-5, 64-67 and *passim*.
14. Morriss, pp.28-29. Of the 683 frigates and smaller vessels in the navy in June 1805, 63% were contract-built (p.29). Also his article 'St Vincent and reform, 1801-1804', **The Mariner's Mirror**, August 1983, pp.281-283.
15. Morriss, pp.197-198 ; John R. Breihan, 'The Addington party and the navy in British politics, 1801-1806', in Craig L. Symonds (ed.), **New aspects of naval history** (Annapolis, 1981), pp.171-176.
16. John R. Breihan, 'William Pitt and the Commission on Fees, 1785-1801', **The Historical Journal**, vol.27, 1984, pp.65-9, 74, 80.
17. Ralph Davis, **The rise of the English shipping industry in the seventeenth and eighteenth centuries** (2nd ed., Newton Abbot, 1972), p.67.
18. Davis, pp.374-5. See also the remarks in relation to Plymouth dockyard by Michael Oppenheim in **The maritime history of Devon** (University of Exeter, 1968), p.124.
19. Detailed quarterly labour statistics are available for the entire period. Graphs drawn by Dr. Trevor Harris (to whom I am grateful for their use) show that after 1700 seasonal fluctuations decrease as an increased fleet has to be maintained. See also Ehrman pp.636-8.
20. See D.C. Coleman, 'Naval dockyards under the later Stuarts' **Economic History Review**, vol.VI, 1954, pp.139-140 ; Baugh (1), p.264 ; National Maritime Museum, ADM BP/3, 25 Apr. 1782 ; Morriss, p.106. These figures are far less than French yards. By 1781 the totals varied between 6,100 and 7,750 and at Toulon between 3,280 and 3,860. The highest totals for the four French yards comes to 17,610, nearly double the English overall figure ; see Jonathan R. Dull, **The French navy and American Independence ; a study of arms and diplomacy** (Princeton, 1975), p.256. However, these figures probably include men employed by private contractors inside the French dockyards.

21. Ehrman, p.96 ; R.D. Merriman, **Queen Anne's navy** (Navy Records Society, 1961), p.105.
22. Quoted in M.H. Crook, 'Federalism and the French Revolution : the revolt of Toulon in 1793', **History**, 1980, vo.65, p.388. Although British impressment was abandoned early, there was an attempt in 1752 to obtain convict labour, as proved by a Parliamentary bill of 1752 'to change the Punishment of Felony... to Confinement and hard Labour in His Majesty's dockyards'. They were to be 'kept separate, and distinguished by Habit, Chains and other Marks of Servitude from the Artificers and Labourers' (B.L. Add.MSS 35591, fos.275-7, enclosure in letter from Barrington to Hardwicke, 19 Jan. 1752). Convict labour was not used until 1803 ; see Morriss, p.109.
23. See Morriss, 'St Vincent', p.275-7. Both the method of selection and numbers of shipwright apprentices were neglected by the central administration until 1811 (see Morriss, pp.112-114). There were complex reasons for this outlined in R.J.B. Knight, 'Sandwich, Middleton and dockyard appointments', **The Mariner's Mirror**, 1971, vol.57, pp.179-182.
24. See B. McL. Ranft, 'Labour relations in the royal dockyards in 1739', **The Mariner's Mirror**, 1961, vol.47, pp.281-291. These strikes were very different from those in England in the seventeenth century, or those at Brest and Toulon in 1706, which stemmed from lack of cash. See J.S. Bromley and A.N. Ryan, 'Navies' **New Cambridge Modern History**, VI, p.280.
25. See J.M.Haas, 'The introduction of task work into the royal dockyards, 1775', **Journal of British Studies**, 1969, vol.8, pp.44-68.
26. For instance, when the shipwrights petitioned the Sovereign in 1765 for an end to chips in return for an increase in pay, they received Navy Board support, but the change did not come about until 1801. See W(illiam) S(hrubsole), **A plan in favour of the shipwrights belonging to the royal dockyards** (Rochester, 1770) p.22 ; Morriss, p.93.
27. See Appendix III.
28. Davis, pp.62-68.
29. Lavery, pp.163-190 ; also Philip Banbury, **Shipbuilders of the Thames and Medway** (Newton Abbott, 1971) ; Helen Simms, 'Mr Batson's yard', **The Mariner's Mirror**, 1971, vol.57, pp.371-377.
30. See Appendix II ; Pool, pp.48, 62, 91 ; A.J. Holland, **Ships of British oak : the rise and decline of wooden shipbuilding in Hampshire** (London, 1971), p.174 ; A.G.E. Jones, 'Shipbuilding in Ipswich, 1700-1750', **The Mariner's Mirror**, 1957, vol.43, pp.294-305 ; 'Shipbuilding in Ipswich, 1750-1800', **The Mariner's Mirror**, 1972, vol.58, pp.183-193.
31. Ehrman, p.73 ; Morriss, 'Samuel Bentham and the management of the royal dockyards, 1796-1807', **Bulletin of the Institute of Historical Research**, 1981,

- LIV, p.237 ; R.A. Wadia, **The Bombay dockyard and the Wadia master builders** (Bombay, 1954), pp.181-210. Very small ships for local use were built at Halifax, Newfoundland and Bermuda late in the period.
32. John Marsh, 'The building of the 24 gun ship Success at Hull' (unpublished paper), p.4. This is based on a series of letters from John Rosewell, the overseer, to the Navy Board, and particularly concerns the difficulties of getting the more specialised naval stores to Hugh Blaydes' yard at Hull (Public Record Office, ADM 106/2553). I am grateful to Mr. Marsh for permission to use this material and also for the above reference from the **Gentlemen's Magazine** (11 September, no.846, 1742, 'The Craftsman') ; L.B. Namier, **The structure of politics at the accession of George III** (London, 1957), p.366.
  33. Quoted in Pool, pp.54-57.
  34. Holland, pp.111-113 ; for other East Coast examples see Jones, p.186.
  35. R.D.Merriman, (ed.) **The Sergison papers** (Navy Record Society, 1950), p.42, Haddock to the navy Board, 28 June 1692. The ship was the **Devonshire**, built at Bursledon.
  36. **Notes and Queries**, Series III, 1917, p.224, for which reference I am grateful to Dr. N.A.M. Rodger. Nor was the 1756 overseer promoted. He was still a quaterman in Portsmouth dockyard in the 1770s.
  37. Lavery, p.58 ; Ehrman, p.70.
  38. Julian Gwyn (ed.), **The Royal Navy and North America : the Warren papers 1736-1752** (Navy Records Society, 1973), pp.219-220, 283, 328, 359, 371, 385, 406 ; Pool, p.86. Launched in 1749, the **America** was reported as unfit for service in 1755 and sold in 1757.
  39. G.R. Barnes and J.H. Owen (ed.), **The private papers of John, Fourth Earl of Sandwich, 1771-1782** (Navy Records Society, 1932-8), vol.IV, p.293. For the system of shipbuilding contracts, penalties etc, see the explanation by Pool, pp.94-7.
  40. J.K. Laughton (ed.), **Letters and papers of Charles, Lord Barham** (Navy Records Society, 1909), vol.II, p.68, Middleton to Melville, 17 March 1805.
  41. For an analysis of repairing and refitting during this period see R.J.B. Knight, 'The performance of the Royal Dockyards in England during the American War of Independence', **Proceedings of the 14th Conference of the International Commission for Maritime History** (London, 1974) pp.140-141. See also Morriss, pp.16-22. Refitting in or out of dock has not been considered in this paper ; this was, of course, the major task of the Western yards and Sheerness, and a very high priority at the other yards, once war had been declared. For instance, Portsmouth docked 277 ships, 109 of them ships of the line, between March 1778 and March 1783 (NMM POR/F/15-18, H/9-12, Portsmouth dockyard records).



42. C. Derrick, **Memoirs of the rise and progress of the Royal Navy** (London, 1806), pp.180-181 ; quoted in P.L.C. Webb, 'The rebuilding and repair of the fleet, 1783-93', **Bulletin of the Institute of Historical Research**, 1977, L, pp.194-209 ; Webb describes the very considerable political and financial improvement in these ten years.
43. PRO, ADM 106/2509, Standing orders to the dockyards, no.47, 4 March 1783. In each contract, the contractor was allowed a **pro-rata** extension of delivery time if the navy Board should order ships to stand to season, but without any financial compensation (Pool, p.96).
44. Perhaps the worst example was the **Ardent** (64), built by Blaydes at Hull in 1764 for £ 23,000 ; only seven years later she needed a repair estimated at £ 17,000. The ship had never been commissioned. See Sandwich's comments (PRO, ADM 7/659, Visitation minutes, 1771). A large proportion of ships of the line were completed in peacetime.
45. PRO, ADM 7/661, Visitation minutes, 1774.