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# New England Forests and British Seapower: Albion Revised

R. J. B. KNIGHT

*From the days when Cromwell ruled England till the battle of the Hampton Roads sounded the knell of wooden ships of war, the heads of the English Navy worried over its timber shortage.*

WITH this sentence, sixty years ago, Robert Greenhalgh Albion began his book *Forests and Seapower* and since that time it has greatly influenced naval and economic historians.<sup>1</sup> The book was very much a pioneering work, bringing a fresh angle to naval history which more than needed it at that time. By stressing the importance of timber as the basis of seapower and examining the problems which the British government faced in securing it, he went deeper into the subject than battles and personalities.<sup>2</sup> His general conclusions were critical, particularly of the administration of Royal Forests, while he saw the colonial woods policy as ineffectual; he took the politicians, the Navy Board and the dockyards to task for conservatism and corruption; and he traced a direct causal link between inadequate supply and inadequate administration and failure in war. The first criticism is sound; recent research has made the second less tenable; and the third looks distinctly fragile.

As with many pioneering works, many of Professor Albion's detailed judgments now look dated. His attitude to the standards of morality and efficiency of naval

administrators, such as Pepys and Sandwich, was highly critical and it is notable that his criticisms of the latter, whom he labelled as 'that Lord of Misrule' in his book, are absent in the article that he wrote in 1952.<sup>3</sup> Albion, in fact, was one of the last of a long tradition of historians whose *mores* were firmly set in the Victorian age and none of them could find anything good to say of eighteenth-century administrators. He thus sided with Lord St. Vincent in his measures to reform the civil administration; cast the state of nation's naval credit in a poor light; highlighted, yet failed to prove, a consistently high level of dockyard corruption; and castigated the design of British ships.<sup>4</sup> Historical opinion has been revised since the 1920s and it would be unrealistic, in turn, to be over-critical; Albion was, in such a wide survey, making use of the scholarship which he had to hand. These points did, however, fit snugly into his central thesis and the phrase 'two centuries of anxiety' to which he referred has made its mark. Book after book stresses that shortage of timber supplies was one of the main reasons for delays and shortcomings of the eighteenth-century British navy. Many have jumped to the conclusion that the problem of supply was continually worsening, from the time of

An earlier version of this paper was read at the thirteenth Annual Symposium on American Maritime History held at the Maine Maritime Museum, Bath, Maine in May 1985.

1. R. G. Albion, *Forests and Seapower: the timber problem of the Royal Navy 1652-1862* (Cambridge, Mass., 1926); also 'The timber problem of the Royal Navy, 1652-1852,' *The Mariner's Mirror*, vol. 38 (1952), 4-22. A recent example of Albion's wide interpretative influence can be seen in Russell Meiggs, *Trees and timber in the Ancient World* (Oxford, 1982), esp. p. 116.

2. Professor Albion's principal successors were P. W. Bamford, *Forests and French Seapower* (Toronto, 1956) and J. J. Malone, *Pine Trees and Politics: the naval stores policy in Colonial New England, 1691-1775* (London, 1964).

3. *Forests and Seapower*, p. 282. Four volumes of the papers of Lord Sandwich, who was First Lord of the Admiralty, 1771-1782, were published in the 1930s and had gone some way to re-establishing his reputation.

4. For the modern views on these problems see D. Baugh, *Naval Administration in the age of Walpole* (Princeton, 1965); Roger Morriss, *The Royal dockyards during the Revolutionary and Napoleonic Wars* (Leicester, 1983); 'St. Vincent and reform, 1801-1804,' *Mariner's Mirror*, vol. 69 (1983), 269-90; Brian Lavery, *The Ship of the Line: the development of the Battle Fleet, 1650-1850* (London, 1983-1984).

TABLE I  
WHAT DIAMETERS IN THE ROUGH STATE WILL MAKE MASTS, YARDS  
AND BOWSPREETS FOR A SHIP OF EACH CLASS

n.b. mizen masts and below 64 guns are made with one stick

SINGLE STICKS	100	90	80	74	64	50	44
Main mast	39 $\frac{1}{8}$	38	37	37	34 $\frac{1}{2}$	30	28
Foremast	35	34 $\frac{1}{2}$	33 $\frac{3}{4}$	32 $\frac{3}{4}$	30 $\frac{3}{4}$	27 $\frac{3}{8}$	25 $\frac{3}{8}$
Mizen mast	23 $\frac{3}{8}$	23 $\frac{3}{8}$	22 $\frac{1}{2}$	22 $\frac{3}{8}$	20 $\frac{3}{4}$	19 $\frac{3}{8}$	17 $\frac{1}{2}$
MADE MASTS							
Main mast	29	29	28 $\frac{1}{2}$	28 $\frac{1}{2}$	27		
	28	28	28	28	26		
	27 $\frac{1}{2}$	27	26 $\frac{1}{2}$	26 $\frac{1}{2}$	25		
	$\frac{1}{2}$ of 24	$\frac{1}{2}$ of 24	$\frac{1}{2}$ of 23 $\frac{1}{2}$	$\frac{1}{2}$ of 23 $\frac{1}{2}$	$\frac{1}{2}$ of 21		

Source: National Maritime Museum, Middleton Collection, MID/8/1 (6), ca. 1778.

the elegant pleadings of John Evelyn in *Sylva* in the late seventeenth century to Admiral Collingwood anxiously planting acorns at every possible moment at the time of Trafalgar.<sup>5</sup> A careful reading of the book reveals that he acknowledged that, in the long run, the supply of timber to the navy was successful and that there were few difficulties in the first part of the century. Indeed, Albion himself saw 1775 as the beginning of the problem.<sup>6</sup>

In no other aspect was Albion more emphatic than when he stressed the critical dependence of the British navy on the very large mast sticks, which were only available from New England forests. He argued that when the mast supply was cut off at the beginning of the American Revolution, the navy staggered from

delay to delay; this inefficiency influenced the course of the war, and, by implication, this war rather than any other. The delay was caused because British shipwrights had to relearn the art of making 'made masts' (i.e. a mast made of more than one stick), which they had abandoned in the previous century when New England large sticks became available.<sup>7</sup> Albion, however, was simply not correct in this assertion. There are constant references to the making of made masts from the 1690s;<sup>8</sup> in 1746, for instance, the Master Shipwright at Plymouth dockyard wrote to the Navy Board:

And as these stores have not a sufficient number of large

7. See *Forests and Seapower*, pp. 282-88.

8. For instance, John Smith, *The Seaman's Grammar and Dictionary* (London, 1692), pp. 15-16; William Sutherland, *Britain's Glory, or Shipbuilding Unveiled* (London, 1726), pp. 55-62; National Maritime Museum, SPB/37a, manuscript notebook by John Williams, shipwright at Woolwich yard, ca. 1720. 'A Made Mast. The spindle to be in two pieces, thats two masts of 22 hands. . . .'

5. Daniel A. Baugh makes some shrewd comments on Albion's influence in his *Naval Administration, 1715-1750* (London, Navy Records Society, 1977), pp. 237-39.

6. *Forests and Seapower*, pp. vii-ix, 133, 412.

masts to make one out of a single tree, we shall in that case be obliged to make made-masts for all above 30 inches, several of our largest New England masts having been reduced for defects. We have but one in store of 32 inches; all the rest are from 29 inches downwards . . . we humbly propose the mast-makers and boatbuilders, and such other workmen as may be necessary to forward the making such masts, may be employed thereon two tides each day (Extra), till we have provided a sufficiency of them to answer all events.<sup>9</sup>

Twenty years later, William Falconer stated simply in his dictionary:

. . . the lower masts of the largest ships are composed of several pieces united into one body . . . as . . . a mast, formed by this assemblage, is justly esteemed much stronger than one consisting of any single trunk, whose internal solidity may be very uncertain.<sup>10</sup>

Albion also failed to realize that there was a steady increase in size of ships of the line through the century. Those built between 1755 and 1815 were 40 percent bigger than those built between 1689 and 1755; no single sticks were going to provide the material for the lower masts of these ships.<sup>11</sup>

Indeed, few really large masts actually came across the Atlantic. Even at the height of the Seven Years War the dockyards were using no more than a dozen sticks a year of over thirty-two inches.<sup>12</sup> Very large trees were undoubtedly there for the cutting, yet, quite apart from the ineffectiveness of the Colonial Stores policy, there was a powerful economic motive for dealing only in the smaller sticks. It was well stated in a slightly later context, at a time when the British were attempting to exploit the Canadian forests; Commissioner Henry Duncan of Halifax yard wrote in 1788:

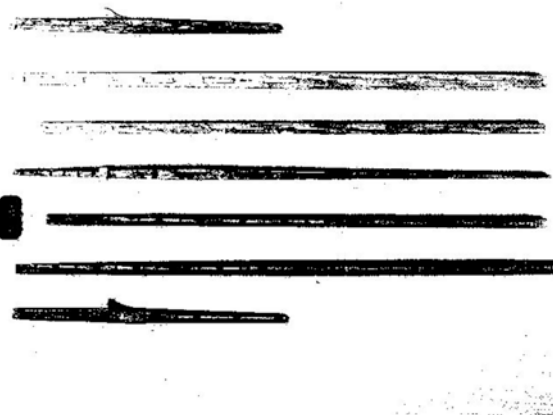
Altho' there is a very great disproportion between the price of a large and small Mast in all Contracts that I have seen; yet from my observations in my different tours even that difference does not seem enough; for almost in any of the rivers Masts may be found up to 24 inches growing on the banks, which may be fell'd, trim'd & loaded at very little expense indeed; in this size & all under very few of them turns out bad

9. Quoted in Baugh, *Naval administration* (1977), p. 259.

10. William Falconer, *An Universal Dictionary of the Marine* (London, 1769), entry under 'Mast.'

11. See Table 1. This increase in size is discussed in R. J. B. Knight, 'The building and maintenance of the British Fleet during the Anglo-French wars, 1688-1815,' in Martine Acerra, Jose Merino and Jean Meyer, ed., *Les Marines de Guerre Europeenes XVII-XVIIIe siecles* (Paris, 1985), pp. 42-45.

12. See Table 2. An unpublished thesis by M. J. Williams, 'The naval administration of the Fourth Earl of Sandwich, 1771-82' (Oxford, 1962), pp. 315-27 contains a useful general critique of Albion's mast argument.



The seven pieces of a lower mast: central spindle, fore, after and side fishes, and (top and bottom of the picture) the two cheeks with the bib. The system of interlocking coaks, to maintain internal solidity, can be clearly seen. (Reproduced with the permission of the Trustees of the National Maritime Museum, Greenwich.)

after an expense has been incurred upon them; whereas the very large sticks are generally farther from the water, are seldom found together, roads through the woods must be made for each of them, & where one of the smaller size prove defective, 15 or perhaps 20 of the larger are unsound. It appears to be very much the interest of a Contractor to procure large Masts, the difference in the prices being so great, yet I am certain a man would sooner make a fortune if he never looks for a stick above 22 or 24 inches.<sup>13</sup>

It must, however, be said that there were delays in fitting out fleets during the American War because of masting problems. The battle of Ushant, in the fall of 1778, when two lines of ships sailed slowly past each other firing into the rigging, caused enormous problems and subsequently delayed ships getting to America. But this delay was not caused by a shortage of large masts; there were plenty in the yards.<sup>14</sup> The real cause was a lack of space and of labor. By the end of the century, a first rate had up to twenty-three masts, yards and

13. N. M. M., Middleton collection, MID/1/53, 30 Sept. 1788, Duncan to Charles Middleton, at that time Comptroller of the Navy Board. See Malone, *Pine Trees and Politics*, pp. 52-53, and Samuel F. Manning, *New England masts and the King's Broad Arrow* (Kennebunk, Maine, 1979).

14. N. M. M., Portsmouth Dockyard records, POR/D/21, Yard officers returns to the Navy Board, 13 Jan. 1778. There were 149 rough masts in the mast ponds between 27 and 34 inches at this date.

spars, with the main mast up to a hundred and twenty feet long, nearly forty inches in diameter and weighing up to eighteen tons. The smallest spar would be the fore-topgallant yard, thirty-one feet long, weighing perhaps seventy-five pounds. To make them was a considerable burden on the dockyards. Thus to build a lower made mast for a ship of the line was a long and expensive business; it took twelve shipwrights sixty-one days for the mast of a 100-gun ship and only slightly less for a 74.<sup>15</sup> At Portsmouth, for instance, as early as February 1778 there were six extra shipwright gangs in the yard masthouse and the Master Shipwright wanted them to work 'nights' (five hours overtime per day). In April the yard still could not keep pace, long before Ushant, and he had to resist Navy Board directions to put more gangs into the masthouse on the grounds that it was impractical. After the battle shipwrights were taken off other projects to help with the masting problem.<sup>16</sup> The navy, in short, did not lack timber; it lacked skilled shipwrights.

What happened, therefore, when the New England sticks were no longer in the mast ponds, which they certainly were not between 1778 and 1780? Albion is contradictory here. At one point he acknowledges that pines from Riga in the Baltic were considered superior, but 250 pages later he asserts that 'the Baltic forests at their best could not provide adequate substitutes for the largest New England pines.'<sup>17</sup> The opinion of the Portsmouth shipwright officers was, by contrast, quite clear. In 1780 they were asked how savings could be made in timber consumption. Since masts were now made of Riga fir, they replied, they could be made one inch less in diameter, 'as they will be superior in strength, much cheaper and of less weight aloft.'<sup>18</sup> Quality was, therefore, not a problem.

A glance at Table 2 and at the graph will show that masts from the Baltic forests, mostly shipped out from Riga, had supplied the British navy from well before

the American War. Not only that, it demonstrates clearly that there had been many more Russian masts than American from the time of the Seven Years War. At the time of the Falkland Islands Crisis of 1770 and 1771, American masts remained at under a thousand, while Riga, much more flexible to British demand, supplied over three thousand. When it came to the American War, Riga was well able to supply the British dockyards. By 1779, Baltic masts imported were slightly under five thousand, while there were no American masts at all. The missing American masts caused some inconvenience, for even with made masts the central spindle was a very large piece of timber. The biggest ships of the line, requiring a main mast of 39 inches diameter, required a spindle of 29 inches, which itself was a very large stick.<sup>19</sup> It is clear that the smaller Riga sticks of 22 to 19 inches took up the brunt of the shortage, their consumption rising to three times what was used in the Seven Years War, while there was a corresponding decrease in consumption of the large American sticks. The dockyards adapted to the new circumstances remarkably smoothly. Models were made and modifications agreed. Adam Hayes, the oldest Master Shipwright, by now in the post at Deptford yard, wrote to Charles Middleton in 1779: 'I am (of the) humble opinion the best way for making made Main Mast etc if drove to necessity for want of Large Masts to form them the Common way will be . . . the Spindle in three trees.'<sup>20</sup> It was a more expensive method, for only 5½ New England trees for a main mast, while the two methods using Riga sticks used 7½ or 6¼ trees respectively.<sup>21</sup>

It is perhaps difficult to set such evidence against Albion's evocative and persuasive style:

Time and again throughout the war came the tale of squadrons scattered and great ships rendered useless as spars crashed to the deck while worn out masts split open and tumbled into the sea. . . . With the exception of one wicked hurricane in 1780, the winds of the Revolution probably blew no

15. N. M. M., Middleton collection, MID/8/1/5/, 'An Estimate of the Charge of the Materials and Workmanship used in completing Made Masts for 100 and 74 gun ships, exclusive of the trees which form the Mast,' ca. 1778. The very high price of large masts (see Malone, *Pine Trees and Politics*, Appendix B), as opposed to masts of 24 inches and below, should be set against the costs of this long process.

16. N. M. M., POR/D/21, 15 Feb., 21 Apr., 21 Aug. 1778; POR/D/22, 6 Sept. 1779, 21 Mar. 1780. A good number of smaller spars were contracted out. For the shortage of labor see Knight, 'Building and maintenance,' pp. 38-39.

17. *Forests and Seapower*, pp. 31, 285.

18. N. M. M., POR/D/22, 24 Apr. 1780.

19. One estimate gave the spindle dimensions of a 74-gun ship, which because of their numbers was a vital dimension, as 29 inches, which differs slightly from Table 2, N. M. M. MID/8/1/2/, 'An Account of the Particulars of making the Main, Fore and Mizzen masts and bowsprits of H.M. Ship the Alexander of 74 guns, with the value of materials and workmanship,' Deptford Yard, 26 Sept. 1778.

20. N. M. M., Middleton collection, MID/1/89, Hayes to Middleton, 5 Mar. 1779.

21. See N. M. M., MID/8/1/9/, 'An Account of Riga Trees, the Number and Parts required to form Made Mast for Ships of 100 guns, and 74 guns.'



TABLE 2 (i)  
MASTS: AVERAGE ANNUAL CONSUMPTION, 1756-1782

	New England												Riga												Norway	
	36"-32"	31"	30"	29"	28"	27"	26"	25"	24"	23"	22"	21"	20" and below	26"	25"	24"	23"	22"	21"	20"	19"	18"	17" + 16" and below	16" - 6"		
1756-1762 Seven Years' War	12.5	6.9	18.4	31.1	32.7	38.3	30.1	20.9	9.4	8.1	4.1	1.4	3.9	4.1	18.1	34.1	33.4	43.0	51.7	62.9	78.0	90.6	173.4	2766.9		
1763-1769 Peace	2.0	3.0	6.8	5.7	6.5	9.9	11.0	8.1	4.9	3.1	2.4	1.3	8.4	1.9	4.9	7.0	12.3	13.3	22.1	22.6	23.6	25.4	44.2	728.7		
1770-1771 Falkland Islands Mobilisation	2.5	3.5	12.5	21.0	17.0	17.0	19.0	18.5	7.5	4.5	3.5	2.5	5.5	2.0	5.5	13.5	21.0	24.5	30.0	25.5	33.0	30.0	88.5	1500.5		
1772-1774 Peace	3.3	3.6	9.3	11.3	9.6	11.3	18.0	9.7	4.3	4.0	1.0	2.0	11.0	1.7	3.7	8.3	17.5	11.7	19.0	15.3	31.0	24.7	58.7	966.0		
1775-1777 War in America	2.0	2.0	4.3	10.0	14.7	13.3	21.0	7.3	2.7	1.3	1.0	2.0	9.0	1.0	6.0	20.0	28.7	40.3	53.0	50.7	42.7	58.3	135.7	2397.7		
1778-1782 European War	1.6	1.4	6.8	14.4	17.4	18.2	17.6	8.4	4.2	1.8	0.4	1.8	48.0	1.4	12.0	19.4	69.2	157.2	216.0	172.2	215.2	184.2	221.2	3668.8		

ADM 106/3182 'Expence of several species of stores at the several yards from 1750 to 1783 inclusive.' A year by year analysis of all stores consumed by each dockyard, here totalled and averaged.

Source: Public Record Office, ADM 106/3182

TABLE 2 (ii)  
YARDS AND BOWSPRITS: AVERAGE ANNUAL CONSUMPTION, 1756-1782

	New England: Yards		Bowsprits											Riga	
	21" and above	20" and below	36"-32"	31"	30"	29"	28"	27"	26"	25"	24"	23"	22"	Yards of all sizes	Bowsprits of all sizes
1756-1762 Seven Years' War	41.6	39.3	25.1	9.0	10.6	7.4	6.3	11.4	3.7	4.6	3.4	1.4	0.9	2.7	7.8
1763-1769 Peace	14.1	11.9	5.7	3.0	4.8	4.1	5.1	1.6	2.1	1.7	1.0	0.1	1.4	1.4	8.6
1770-1771 Falkland Islands Mobilisation	29.0	16.5	11.0	4.5	11.5	8.5	10.0	9.5	3.5	5.0	—	—	—	2.0	5.5
1772-1774 Peace	13.7	15.0	7.3	2.3	2.0	5.0	3.0	4.3	3.3	2.0	0.3	0.6	1.0	5.0	2.0
1775-1777 War in America	22.3	11.3	6.3	3.3	7.0	9.0	10.7	4.3	6.3	0.3	0.6	0.3	1.0	not recorded	24.0
1778-1782 European War	13.0	9.0	8.4	6.4	3.8	4.4	8.6	7.0	4.6	0.4	—	—	0.4	not recorded	61.8

Source: Public Record Office, ADM 106/3182

harder than at any time. . . . Yet British fleets in other wars had met similar winds with only the occasional loss of minor spars.<sup>22</sup>

Setting apart the American Revolution as different, with, it must be said, very little evidence, Professor Albion went on to construct an implicit interpretation that the loss of the colonies was ultimately due to the mast shortages. Yet was the American War any different from any other eighteenth-century wars? Professor Baugh notes of the war of 1739-1748 'the wholesale destruction of masts and rigging' and he feels that overmasting and the 'reckless crowding of sail' were the most important factors.<sup>23</sup> Many factors could lead to the loss of a mast. Standards of seamanship and of shipboard maintenance should be considered, as well as insufficient time for preparation for a commission. A Navy Board order of 1780 points to a completely different defect. 'There have been many instances dur-

ing the present war of ships losing and springing their masts and topmasts, from a want of time to enable them to stretch their standing rigging before they . . . proceed on service.'<sup>24</sup> Consumption of masts was undoubtedly high during the period, but there is no evidence to suggest that their quality was any different from any other war and it is wrong to look at the American War in isolation from the rest of the century.

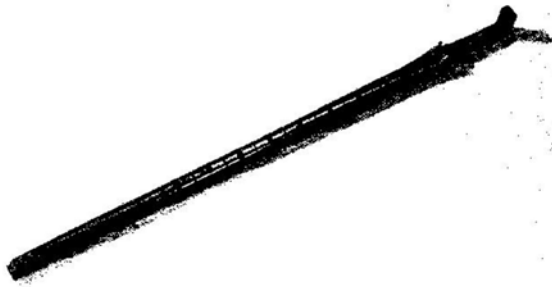
This raises a larger question. If the Baltic could supply cheaper, better quality and adequately-sized masts, why was there any New England trade at all? Firstly, it was an insurance policy, brought about by the fear of disruption by unstable conditions in the Baltic, caused by the rise of Russia, until the end of the Great Northern War in 1721. Between 1715 and 1727 eight naval squadrons sailed under Sir John Norris to the Baltic to protect British interests, the chief of which was the supply of naval stores.<sup>25</sup> At the same time, there were

22. *Forests and Seapower*, pp. 281-82.

23. Baugh, *Naval administration* (1966), pp. 278-79.

24. Public Record Office, ADM 106/2508, Navy Board Standing Orders to the Dockyards, no. 1018, 24 Aug. 1780.

25. This is treated in general by D. D. Aldridge, 'Admiral Sir John

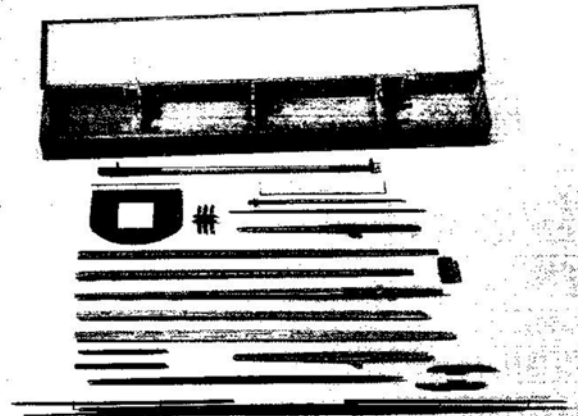


The assembled lower mast. The painted black bands represent alternating iron hoops and rope woodings which kept the mast together. Note the position of the (black) cap and bib which supported and retained the topmast. (Reproduced with the permission of the Trustees of the National Maritime Museum, Greenwich.)

the mercantilist fears. The Commissioners of Trade and Plantations tried to replace the Baltic region as the chief supplier of naval stores by encouraging the trade with British North America, thus improving the balance of trade with Northern Europe. The result was a series of Bounty Acts, the chief of which was in 1704, which resulted in a subsidy (funded from the Naval Estimates) being paid for stores coming across the Atlantic. Ironically, of course, the region which first became unstable was the British colonies in 1775, for no British fleet went near the Baltic for seventy-five years from the last of Norris's expeditions. British difficulties diminished because Sweden and Russia managed to reach a diplomatic balance, which was to last until the very last years of the eighteenth century, and also because Holland's domination and therefore control of the trade was slowly broken.<sup>26</sup> Trade with Russia increased dramatically in the mid-century, not only in naval stores, but

Norris and the British naval expeditions to the Baltic Sea, 1715-1727' (London University Ph.D. thesis, 1971).

26. See J. J. Malone, 'England and the Baltic Naval Stores trade in the seventeenth and eighteenth centuries,' *The Mariner's Mirror*, 58 (1972), pp. 375-95. Though an excellent survey of the early part of the century, he overrates the North American contribution by the 1770s.



Boxed Admiralty model of a main mast and yards, ca. 1750. In addition to the mast pieces, there are the yards, the main top, with trestle and cross trees and the cap to support the topmast. (Reproduced with the permission of the Trustees of the National Maritime Museum, Greenwich.)

also in wheat, iron, flax and hemp.<sup>27</sup> The importance of these trades to both parties was strong enough for it to withstand easily the diplomatic isolation which Britain went through in the American Revolutionary War. Even at the height of anti-British feeling during the period of the League of Armed Neutrality, it was in no one's interest, least of all France's, to stop trade in the Baltic. The naval stores contest began only when the stores had left the Kattegat.<sup>28</sup>

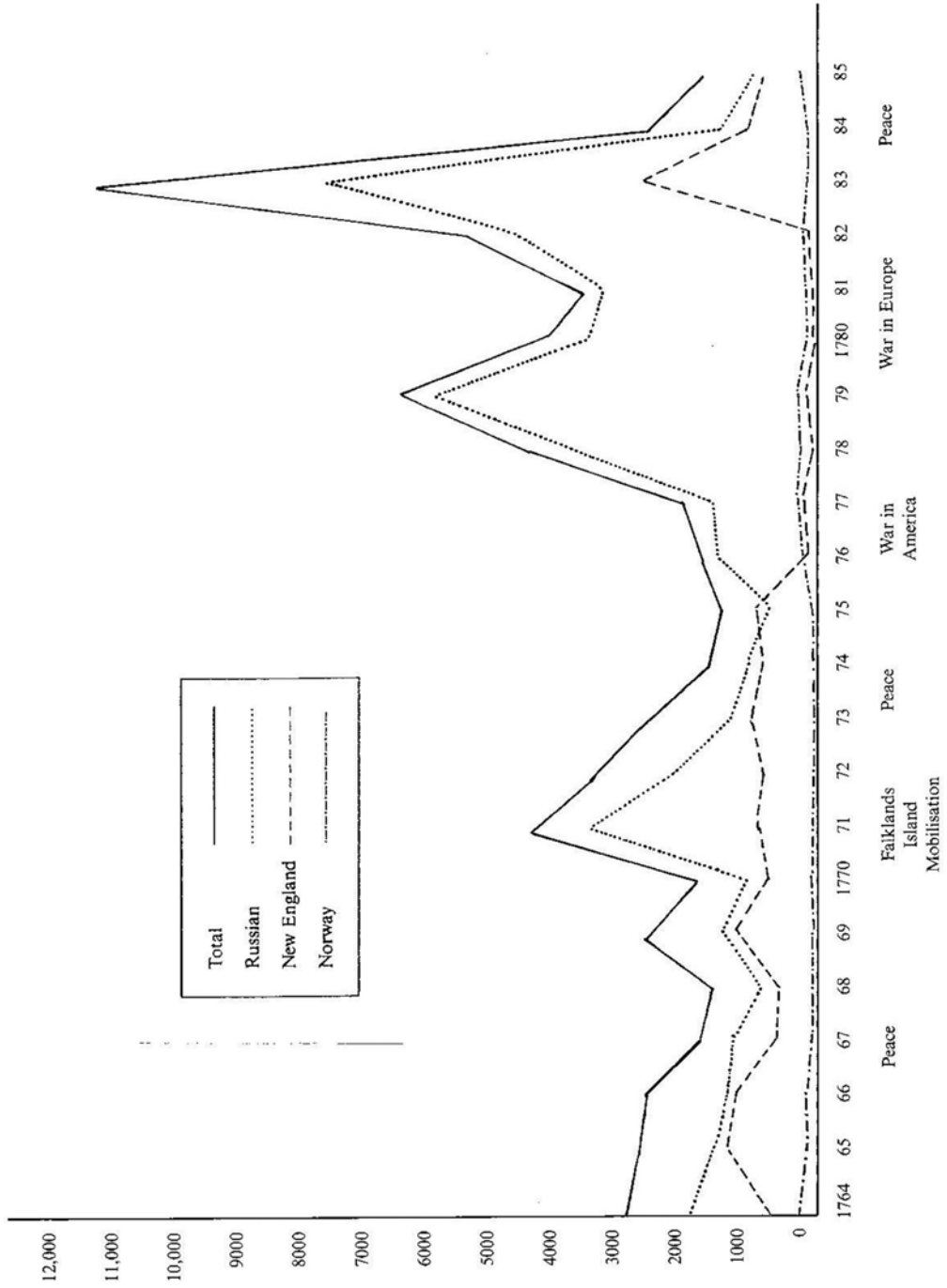
Early mercantilist and strategic pressures, therefore, brought about an orthodoxy which was to last the century. The Colonial Stores policy was expensive and as an insurance policy it became less and less important. When the supply was cut off in 1775, the Baltic filled the gap effortlessly. The Baltic trade continued to grow powerfully until the imposition of the Continental Decrees by Napoleon in 1808. The industrial expansion of England from the 1780s led to an enormous growth in demand from the Baltic for sawn softwoods, particu-

27. For instance, Jennifer Newman, 'The Russian grain trade, 1700-1779,' *The Baltic grain trade; five essays*, ed. Walter Minchington (Exeter, 1985), pp. 47-59; 'The English contribution to the economic revolution in Russia in the eighteenth century,' paper presented to the Association for the History of the Northern Seas, Dartington, Devon, September 1985.

28. David Syrett, *Neutral rights and the War in the Narrow Seas, 1778-82* (Fort Leavenworth, Kansas, 1985).



BRITISH IMPORTS OF GREAT MASTS, 1764-1785



Source: Public Record Office, BT/6/240. 'Account of Bowsprits, Mast and Yards imported,' 5 Jan. 1764 - 5 Jan. 1786.

larly for the building industry. The mast trade continued to flourish and by 1805 70 percent of imported masts came from Riga.<sup>29</sup> However, when Europe turned protectionist as a result of the Continental Decrees, British Customs dues from 1810 came to a massive 30/- a load and it allowed the preferred Canadian timber trade its boom years until the Free Trade days of the 1840s.<sup>30</sup> The British government was finally able to call in its insurance policy over a hundred years after it took it out, though it was the Canadians who benefited rather than original New England colonies.

It was at this time also that the other timber resource, hardwoods for the hulls, also became scarce. British oak had had to be supplemented on a large scale by Sandwich in the 1770s, principally from the southern Baltic ports such as Stettin. Prejudice against American live oak, some of it justified in the condition in which it reached the dockyards, was never overcome. Alternative sources had to be found from the turn of the century, when the hugely increased scale of war caused a real shortage. This was exacerbated by the difficulties which the British navy put itself through during the first years of the nineteenth century, particularly in its timber contracting.<sup>31</sup> The Adriatic and even the Black Sea were being combed for oak. A Portsmouth shipwright was despatched to South Africa to investigate the quality of stinkwood. Two cut-down ships of the line were despatched around the world to call at Botany Bay to pick up cargoes of Australian wood. Most important, the teak of India, and its shipbuilding resources, were called into play. Another consequence was that iron

came to be used extensively in the construction of knees and standards.<sup>32</sup>

There was unquestionably both a softwoods and a hardwoods crisis from the early nineteenth century, but the timber shortage of the Royal Navy before 1800 is largely illusory. This is not to say that the procurement of naval stores should not have been perceived as a central problem, or that, in the Baltic region, it was never less than a cornerstone of British foreign policy. But the fleet delays that can be traced before that time had little to do with the shortage of timber; they were much more due to administrative weaknesses and shortages of manpower. In Albion's crucial period during the American War, 1775 to March 1783, Britain produced 181 naval ships (132,928 tons), of which 36 were ships of the line (54,685 tons). Moreover, by the end of the war there were 30 ships of the line on the stocks. The capacity of British shipbuilders was rising rapidly and for both ships of the line and frigates, Britain was to outstrip both France and Spain together.<sup>33</sup> One can point to many reasons for the loss of the American colonies; it was not, however, a shortage of mast timber and further, the great masts from New England were very far from crucial.

32. B.L. Add.MSS.34922, fos. 339-42, report from Fiume about oak from Ragusa; J. J. Packard, 'Sir Robert Seppings and the timber problem,' *The Mariner's Mirror*, vol. 64 (1978), 148-49; R. J. B. Knight and Alan Frost, *The journal of Daniel Paine, 1794-1797* (Greenwich and Sydney, 1983), pp. 77-96; R. A. Wadia, *The Bombay dockyard and the Wadia Master Builders* (Bombay, 1954), pp. 191-254.

33. See the dramatic graphs in Jose P. Merino Navarro, *La Armada Española en el siglo XVIII* (Madrid, 1981), pp. 357-58.



*R. J. B. Knight completed a thesis on the British dockyards in the American Revolutionary period. He then joined the National Maritime Museum, Greenwich, in 1974, becoming Custodian of Manuscripts in 1977. From 1983 he headed the Museum's computer group and is now Head of the Documentation and Research Division.*

29. See Sven-Erik Aström, 'British timber imports from the Baltic, 1775-1825,' Diagram 1; Jorma Ahrenainen, 'Britain as a buyer of Finnish sawn timber, 1760-1860': papers presented to the Association for the History of the Northern Seas Conference, Dartington, Devon, September 1985.

30. Sven-Erik Aström, 'North European timber exports to Great Britain, 1760-1810,' in *Shipping, Commerce and Trade: essays in memory of Ralph Davis* ed. P. L. Cottrell and D. H. Aldenroft (Leicester, 1981), 8; Gerald Graham, *Sea power and British North America, 1783-1820* (1941; reprinted New York, 1968), pp. 142-44.

31. See Roger Morriss, *The Royal dockyards during the Revolutionary and Napoleonic Wars*, pp. 74-89, for some parallel criticisms concerning Albion's interpretation of the hardwood shortage during the St. Vincent period of naval administration.