

Atlantic Canada and the Age of Sail Revisited

Eric W. Sager and Lewis R. Fischer

L'explication traditionnelle de l'essor et du déclin de l'industrie maritime sur la côte atlantique du Canada au 19ème siècle est que l'industrie était étroitement liée au commerce du bois. Selon cette thèse, les navires ont été grossièrement construits, mal gérés, et n'ont servi qu'au transport du bois régional vers le marché. Sur une base de recherche statistique sur des données marchandes et économiques, les auteurs arguent du fait que les navires ont été bien construits et employés compétitivement dans une variété de commerces. Le déclin était le résultat de la confédération canadienne en 1867, dont les meneurs ont préféré l'encouragement provincial au développement continental. En conséquence, les propriétaires de navires de la région atlantique ont remanié leur capital vers des entreprises sur terre ferme moins risquées.

This article is reprinted by kind permission of University of Toronto Press Incorporated www.utpjournals.com/chr © University of Toronto Press 1982. All rights reserved.

This paper is based on research undertaken by members of the Atlantic Canada Shipping Project at Memorial University of Newfoundland. The paper is therefore the result of a collective effort by many friends and colleagues. We are particularly indebted to David Alexander, Gerald Panting, Keith Matthews, and Rosemary Ommer. The Atlantic Canada Shipping Project is funded by the Social Sciences and Humanities Research Council of Canada and by Memorial University of Newfoundland.

THE WOODEN SHIPS which once sailed from the builders' yards of Atlantic Canada have little place in the collective mythology of a nation which has long since forsaken its role as a maritime power. As we developed our western frontier and determined to serve as the hinterland of a continental economy, our growth centres shifted from our eastern shores and the Canadian Confederation lost touch with the trade and culture of its thalassic peoples. Today the great ocean fleets of the nineteenth century are present only in the mythology and folklore of provinces eager to revive what few sources of dignity and pride remain from their past. In the 1920s Frederick William Wallace sought to awaken Maritimers' memories of their 'past glories' and it is no accident that he wrote in a decade when the eastern economy entered a steep decline and Maritimers raged at the failure of Confederation.¹ Only in recent years

¹ Frederick William Wallace, *Wooden Ships and Iron Men* (London 1924); *In the Wake of the Wind Ships* (Toronto 1927); *Record of Canadian Shipping* (London 1929)

have Wallace's valuable chronicles been superseded by the works of other popular historians and by a few serious attempts to assess the economic importance of the Canadian shipbuilding and shipping industries.² Many of the older myths surrounding the age of sail have disappeared in the process and a reassessment of that age is long overdue. The new realities which are emerging come from an empirical base and a methodology which Wallace would not have recognized; but he would have acknowledged that the 'era of maritime effort and industry' remains a worthy source of pride, and a salutary reminder to an insular nation of the wider vision and the entrepreneurial acumen of our eastern Canadian forbears.

The traditional views of the history of shipping in the Maritimes, although never combined within a single interpretation, might be summarized as follows. We have been told that shipbuilding and shipping were both directly linked to the timber trade: timber was the major cargo for colonial-built vessels, and timber, together with the British demand for shipping tonnage, determined the pattern of colonial shipbuilding. 'Launched, rigged, and loaded with the ubiquitous and ever-ready cargo of timber, the ship would be sent to Great Britain consigned to brokers who made a specialty of selling such vessels.'³ Colonial timber and British demand sustained the industry until some Canadian shipowners, encouraged by mid-century gold rushes and the Crimean War, entered into ship operation themselves. But this was still mainly a shipbuilding industry, since 'net earnings by entrepreneurs came largely from taking the price risk involved in the marketing of wooden ships.'⁴ The collapse of British demand for wooden-hulled sailing vessels in the 1860s caused a crisis in the industry and left Maritimers with no option but to keep their vessels on registry in Canada and to run them for what profit they could. Thus there followed the 'palmy days' of Canadian shipowning, when the vessels of the Maritimes sailed to all four corners of the world for cargoes of cotton, guano, and tea.⁵

Concerning the vessels themselves, we have been told that the colonial-built vessel was a floating coffin of execrable quality, and that wooden sailing vessels of this

² See particularly Stanley T. Spicer, *Masters of Sail: The Era of Square-rigged Vessels in the Maritime Provinces* (Toronto 1968); Charles A. Armour and Thomas Lackey, *Sailing Ships of the Maritimes* (Toronto 1975); Richard Rice, 'The Wrights of Saint John: A Study of Shipbuilding and Shipowning in the Maritimes, 1839-1855,' in David S. Macmillan, ed., *Canadian Business History: Selected Studies, 1497-1971* (Toronto 1972); David Alexander and Gerald Panting, 'The Mercantile Fleet and its Owners: Yarmouth, Nova Scotia, 1840-1889,' *Acadiensis*, viii, 2, 1978, 3-28; Eric W. Sager and Lewis R. Fischer, 'Patterns of Investment in the Shipping Industries of Atlantic Canada, 1820-1900,' *Acadiensis*, ix, 1, 1979, 19-43. The proceedings of the conferences of the Atlantic Canada Shipping Project are mentioned below. For a review of some recent literature on the subject see David Sutherland, 'Wooden Ships and Iron Men Revisited,' *Acadiensis*, viii, 1, 1978, 101-7.

³ Wallace, *Wooden Ships and Iron Men*, 35; see also J.G.B. Hutchins, *The American Maritime Industries and Public Policy, 1789-1914* (New York 1941), 300-1, 412.

⁴ Peter D. McClelland, 'The New Brunswick Economy in the Nineteenth Century' (Ph.D. thesis, Harvard University, 1966), 186.

⁵ Wallace, *Wooden Ships and Iron Men*, ix; J.P. Parker, *Sails of the Maritimes* (Halifax 1960), 55.

period were not susceptible of significant improvements in productivity.⁶ There was in any case no great incentive to improve sailing times or labour productivity, since these ‘floating warehouses’ were often valuable as much for their stowage as for their transportation functions. Despite the clumsiness of his vessel, however, the Bluenose skipper was ‘the terror of duffers and slackers’ and the ‘reputation of the Bluenose mate is such that sailormen shudder at the mention of the name.’⁷ But inevitably the industry in which these ‘iron men’ served was destroyed by a new technology. According to Harold Innis, ‘the competition of iron and steel destroyed a magnificent achievement, an integration of capital and labour, of lumbering, fishing and agriculture, on which rested a progressive community life.’⁸ From this assumption about the splendid ‘integration’ of shipbuilding with local lumber and trade, Innis concluded that the decline of shipbuilding was the most serious single difficulty faced by the economy of the Maritimes in the half-century before 1930.

Such are the myths about eastern Canadian shipping. Almost everything in this chronicle must now be either qualified or rejected. Only one part of this account has ever been seriously questioned. In 1966 Peter McClelland sought to refute Innis’s argument that shipbuilding had been the ‘linchpin’ of the New Brunswick economy.⁹ This was not a difficult task, but in the process McClelland left many questions unanswered and he might have created a few myths of his own had his work been more widely read. For McClelland argued that both shipbuilding and shipowning were ‘of negligible significance’ in stimulating economic growth; that shipowning offered ‘a dubious earnings record after 1865’; and that shipowning meant ‘gambling’ with an obsolete technology, a drain of entrepreneurial talent from manufacturing, and hence a ‘constraint’ on the growth of local industries.¹⁰ In different ways both Innis and McClelland overestimated the importance of the industries which they studied: for shipbuilding was never so critical in its contribution to the economy as Innis thought; and shipowning was never the wasteful gamble which McClelland thought it to be.

In revising these traditional portraits of the shipping industry we have begun by examining the patterns of vessel registration in the major ports of registry in Atlantic Canada.¹¹ It is clear that the pattern of investment in both shipbuilding and shipping is a complex phenomenon which cannot be explained merely by reference to

⁶ Hutchins, *The American Maritime Industries*, 300-1.

⁷ Wallace, *Wooden Ships and Iron Men*, 165,174.

⁸ C.R. Fay and Harold Innis, ‘The Maritime Provinces,’ *Cambridge History of the British Empire*, vi: *Canada and Newfoundland* (New York 1930), 663.

⁹ McClelland, ‘The New Brunswick Economy’ (thesis); ‘The New Brunswick Economy in the Nineteenth Century,’ *Journal of Political Economy*, xxv, 4, 1965, 686-90.

¹⁰ McClelland, ‘The New Brunswick Economy’ (thesis), iii, 168-235.

¹¹ Data on major fleets are taken from the Board of Trade [BT] series 107 and 108 vessel registries in the Public Record Office, Kew, supplemented where necessary by data from port copies of registries held by Canadian registrars of shipping or by the Public Archives of Canada. Registries have been analyzed (from 1820 or from date of registry opening) to 1914 for the following ports of registry: Saint John, Miramichi, Halifax, Yarmouth, Windsor, Pictou, Charlottetown, and St John’s.

the timber trade and to British demand for shipping. This was not a monolithic industry but two industries — shipbuilding and shipowning — and the incentive to invest in either industry varied from one port to another within the region. By far the largest fleet of vessels was registered in Saint John, New Brunswick. Here the timber trade does appear to have had a considerable influence upon both shipbuilding and ship operation in the early decades of the nineteenth century. A series of correlations between New Brunswick timber exports, tonnage clearing New Brunswick ports, and investment in new tonnage in Saint John suggests that the relationship may have been very close: correlating annual changes in these series yields correlation coefficients of between +.61 and +.69 for the period from 1820 to 1850. Since we know that a large proportion of vessels in

TABLE I:
Annual growth rates of gross physical investment
and of tonnage on registry in major ports

Port	Years to peak	Tonnage on registry ¹ (%)	Gross investment (%)
Saint John	1826-77	+4.0	+2.1
Charlottetown	1826-75	+3.9	+2.9
Yarmouth	1843-79	+6.9	+4.4
Halifax ²	1826-74	+2.3	+3.0
Windsor	1853-91	+5.8	+2.0
St John's	1826-74	+2.1	+1.2
Pictou	1846-84	+1.9	+3.5
Miramichi	1833-64	+3.3	+4.1
Total ³ (8 ports)	1828-78	+4.3	+2.8
UK (all ships)	1828-78	+2.5	+3.6

¹ All growth rates are calculated from regression equations of the form $\log Y = a + bt$. In our estimates of tonnage on registry, the date when the vessel actually went out of service was used, rather than the official date of registry closure. Where the date of actual disposal is unknown, the vessel was given an estimated service life based on the mean service life of vessels with known dates of disposal. The result is a much more accurate estimate of capital stock than that given in official figures.

² Halifax growth rates are calculated for vessels with at least one owner resident in Halifax County, in order to reduce the impact of fluctuations caused by the opening of new ports of registry in Nova Scotia, particularly Yarmouth (1840), Pictou (1840), and Windsor (1849).

³ All vessels registered in Halifax are included here, since this was the major port of registry in Nova Scotia before the opening of Yarmouth, Pictou, and Windsor.

SOURCE: BT5 107/108 vessel registries; B.R. Mitchell and Phyllis Deane, Abstract of British Historical Statistics (Cambridge 1962), Transport 1 and 2, 218-22

this fleet were owned initially by timber merchants or shippers of timber and sawn lumber, it seems likely that returns from the shipping of timber were the most important single incentive toward investment in shipping.¹²

While timber provided the major stimulus to the growth of shipping in Saint John, this was not true of shipowning throughout the region. Large as it was, the fleet of Saint John accounted for less than a third of all shipping registered in the Atlantic region in the nineteenth century. And a significant proportion of new shipping in the region was coastal shipping, built for use in the fisheries, in coastal trading, or in runs to the West Indies. This was true even in the centres of oceangoing shipping. In the four largest oceangoing fleets — those registered in Saint John, Charlottetown, Yarmouth, and Halifax — vessels designed primarily for coastal trading accounted for 30 per cent of all new tonnage between 1820 and 1860 (included among these vessels are schooners, which averaged fifty-six tons in these ports, and brigantines, which averaged 150 tons).¹³ If all ports of registry were included coastal and fishing vessels likely would account for over 40 per cent of the entire industry in the nineteenth century. The sixth largest fleet in the region, that of St John's, Newfoundland, consisted almost entirely of coastal vessels; here the pattern of investment was determined by the demand for vessels as a factor of production in the cod and seal fisheries and by the need to supply out-port communities and the Labrador summer fishery. In the fourth largest fleet, that of Halifax, vessels under 150 tons accounted for 45 per cent of all investments in the nineteenth century, and in the first half of the century there was a close correlation between investment in shipping and patterns of West Indian trading. The timber trade was a major stimulus to the shipping industry in the Bay of Fundy and on the Saint John and Miramichi Rivers in the early decades of the century. In eastern Nova Scotia and ports of the Gulf of St Lawrence, timber was less important than the growing demand from coastal and West Indian trades and the fisheries; in Newfoundland the timber trade was of no significance at all.¹⁴

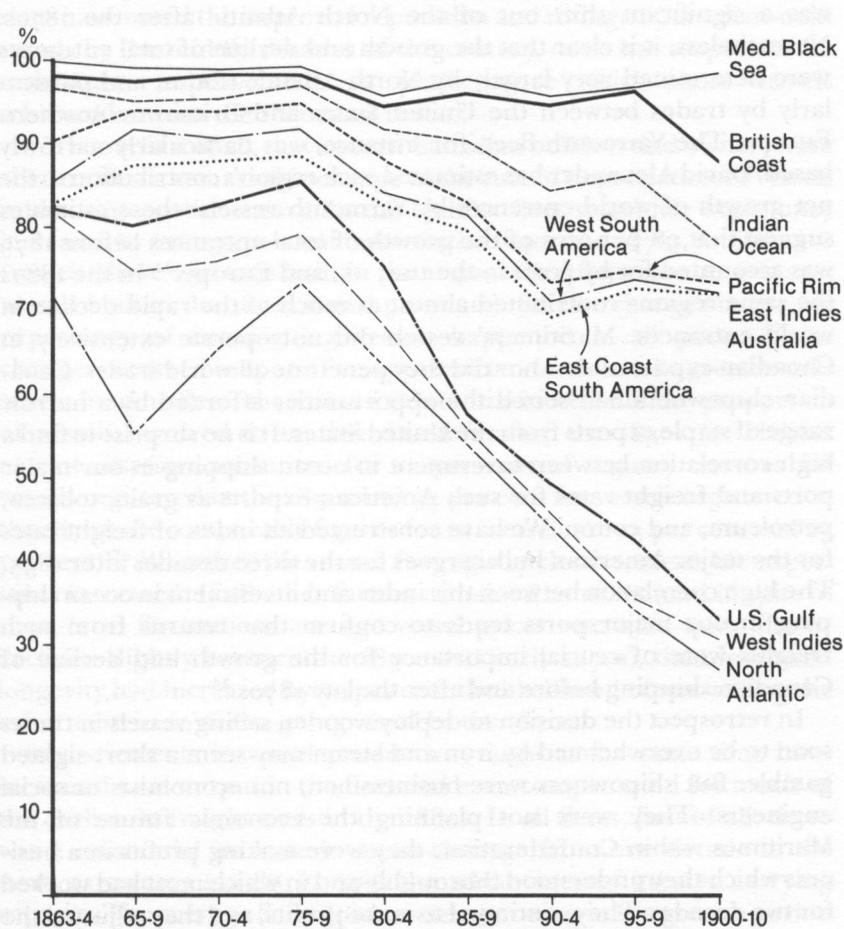
Impressed by the importance of shipbuilding for Quebec and New Brunswick, Richard Rice and others have proposed an even more direct link between shipbuilding and the timber trade. For many places in these provinces shipbuilding was a forward linkage from the timber industry, inspired not only by the need to carry timber but by the opportunity to sell the finished product in the British market. From this quite acceptable assumption stemmed others which, however true for some shipbuilding centres, were less valid for the Maritimes as a whole: it was assumed that the pattern of

¹² On Saint John shipping see Esther Clark Wright, *Saint John Ships and their Builders* (Wolfville 1975); Lewis R. Fischer, 'The Great Mudhole Fleet: the Voyages and Productivity of the Sailing Vessels of Saint John, 1863-1912,' in David Alexander and Rosemary Ommer, eds., *Volumes Not Values: Canadian Sailing Ships and World Trades* (St John's 1979), 117-55.

¹³ By coastal vessels we mean those rigged as schooners, brigantines, sloops, shallops, and ketches. There was a high correlation between rig and tonnage, and almost all vessels having these types of rigging were under 150 tons.

¹⁴ On the Newfoundland fleet see Eric W. Sager, 'The Merchants of Water Street and Capital Investment in Newfoundland's Traditional Economy,' in Lewis R. Fischer and Eric W. Sager, eds., *The Enterprising Canadians: Entrepreneurs and Economic Development in Eastern Canada, 1820-1914* (St John's 1979), 75-95.

FIGURE I: Voyage distribution of vessels on registry in Saint John, Yarmouth, Halifax, and Windsor



SOURCE: Crew Lists and Agreements for vessels registered in Saint John, Yarmouth, Halifax, and Windsor.

investment in shipbuilding was determined primarily by British demand and that the shipowning industry in eastern Canada was confined mainly to the 1860s and 1870s.¹⁵ Of the importance of British North America as a supplier of vessels for Britain there can be no doubt. But those who argue the primacy of British demand for Maritime Canadian shipbuilding run the risk of underestimating the substantial local demand for coastal and fishing vessels, vessels which were least likely to be transferred to Britain. Even in the major shipbuilding centres the importance of British demand has been exaggerated. Of all tonnage built in Saint John and its immediate out-ports between 1820

¹⁵ Richard Rice, 'Measuring British Dominance of Shipbuilding in the Maritimes, 1787-1890,' in Keith Matthews and Gerald Panting, eds., *Ships and Shipbuilding in the North Atlantic Region* (St John's 1977), 109-55.

and 1850, only half was transferred ultimately to Britain, and much of this transferred tonnage had first been retained for use by Saint John's shipowners.¹⁶ The fleet of vessels retained on registry in Saint John grew particularly rapidly in the 1830s (an annual rate of 12.5 per cent), and in the three decades after 1826 our estimates of the fleet actually on registry in Saint John show that this fleet grew almost as rapidly as did gross physical investment (4.4 per cent compared with 4.7 per cent per annum). This suggests that the sale of vessels to Britain did not limit the sustained long-term growth of the local shipowning industry.

The second largest fleet in the Atlantic region was registered in Charlottetown, the only port of registry on Prince Edward Island. Of all tonnage registered in PEI between 1787 and 1914 (and this includes almost all vessels built on the island), 69.3 per cent was transferred to ports elsewhere. Of these transfers 72 per cent of the tonnage went to Britain. But in the peak decades of vessel construction in PEI, from 1840 to 1889, only 57 per cent of all transferred tonnage went to Britain. British North America (and particularly Newfoundland) was always an important market for vessels built in PEI, as well as for vessels built around Miramichi and Pictou. And there was a substantial shipowning industry in PEI itself. After the 1840s island shipowners retained their vessels on registry for longer periods of time: the mean registry life of all vessels rose from 2.2 to nine years between the 1840s and 1880s, and the mean life of transferred vessels rose from 1.9 years to four years over the same period. Our estimate of the size of the fleet on registry suggests an impressive long-term growth rate of 3.9 per cent per annum between 1826 and 1875.¹⁷ Clearly PEI was more than a shipbuilding factory for Great Britain. Thus even in the major shipbuilding centres of New Brunswick and PEI there was substantial capital accumulation in shipping. For the industry outside New Brunswick and PEI, and for the entire region after the 1840s, it is no longer possible to argue that 'few of these (Canadian) vessels were operated under Canadian register' or that 'net earnings by entrepreneurs came largely from taking the price risk involved in the marketing of wooden ships.'¹⁸

The great boom in Canadian shipowning in the 1860s and 1870s was not a novel 'gamble' forced upon shipbuilders and owners by the decline in British demand for wooden sailing ships. The scenario in which 'the would-be short-term owner became a fulltime shipowner by default' does not explain what happened in the 1860s and 1870s. The boom in Canadian shipping in these decades was merely the accelerated growth of an industry already well established in the North Atlantic. Table I suggests that there was a

¹⁶ BT 107/108 vessel registries.

¹⁷ Ibid. On PEI shipping see R.S. Craig, 'British Shipping and British North American Shipbuilding in the Early Nineteenth Century, with special reference to Prince Edward Island', in H.E.S. Fisher, ed., *The Southwest and the Sea* (Exeter 1968); Lewis R. Fischer, 'The Port of Prince Edward Island, 1840-1889,' in Matthews and Panting, *Ships and Shipbuilding*, 41-70. In the 1840s 41.5 per cent of all vessels transferred from the Pictou registry went to other ports in British North America; see Rosemary E. Ommer, 'Anticipating the Trend: the Pictou Ship Register, 1840-1889,' *Acadiensis*, x, 1, 1980, 756.

¹⁸ Hutchins, *The American Maritime Industries*, 301; McClelland, 'The New Brunswick Economy' (thesis), 186

sustained high growth in the fleets of the major ports from the 1830s to the 1870s. The industry grew more quickly than did the fleet of the United Kingdom in every decade before the 1880s. The pattern of investment in all ports (except St John's, Newfoundland) was very closely correlated with the pattern of investment in shipping in Britain. This coincidence in trends results only in part from shipbuilders' responsiveness to British demand; of greater importance is the fact that British and Canadian shipowners were responding to the same demand for ocean shipping during a period of sustained growth in the volume of international trade.¹⁹ No single model of growth will apply to the shipbuilding and shipping industries of Atlantic Canada. But it is clear that there was a gradual extension of trading activities from an early dependence on timber or coastal trades to a wider involvement in many North Atlantic trades by the 1850s, and from there to varying degrees of involvement in certain world trades.²⁰ Virtually nothing has been known until very recently about the voyages of Canadian vessels. On the one hand Innis's argument about the 'integration' of the industry with the local economy assumes that vessels on Canadian registry must have operated from Canadian ports. On the other hand Wallace leaves us with the impression that Canadian vessels never saw their home ports after launching but traded in every part of the world.²¹ Our analysis of the 'Agreements and Accounts of Crew' for our major fleets allows some greater precision about the deployment of oceangoing vessels, at least after 1863.²² It is likely that a substantial proportion of voyages earlier in the century began from ports in Canada; by the 1860s this was no longer true. But it is no more true that Canadian vessels were operating extensively in all world trades. As Figure 1 indicates, Canadian oceangoing vessels operated mainly in the North Atlantic after 1863. In spite of this concentration on North Atlantic trades, they operated infrequently from Canadian ports. The United Kingdom, United States, and Europe accounted for 63 per cent of all entrances into port by Saint John vessels, 76 per cent of all entrances by Yarmouth vessels, and 70 per cent of all

¹⁹ There was a fairly close correlation between annual changes in new tonnage added to the registry in our ports and annual changes in sailing tonnage built and first registered in the United Kingdom, particularly in the early registration cycles (1820-30, 1830-43, 1843-53) and from 1858 to 1869; this applies not only to PEI but also to the non-transfer-trade ports (Yarmouth and Halifax).

²⁰ A non-computerized analysis of early Crew Agreements in the BT 98 series for vessels registered in Halifax and Saint John confirms that an overwhelming majority of voyages were in the North Atlantic in the 1840s and 1850s; see Lewis R. Fischer and Gerald Panting, 'Harbour and Metropolis: the Shipping Industry of Saint John and the Urban Economy, 1820-1914,' in Lewis R. Fischer and Eric W. Sager, eds., *Merchant Shipping and Economic Development in Atlantic Canada* (St John's 1982).

²¹ Wallace, *Wooden Ships and Iron Men*, 193.

²² Most of these 'Crew Lists' for vessels registered in the British empire between 1863 and 1939 are contained in the archive of the Maritime History Group, Memorial University of Newfoundland. We have analyzed 4172 voyages for Yarmouth vessels, 8829 voyages for Saint John vessels, 3577 voyages for Windsor vessels, and 1844 voyages for Halifax vessels. The Crew List computer files for these four ports also contain entries for 170,000 seamen. See Lewis R. Fischer and Eric W. Sager, 'An Approach to the Quantitative Analysis of British Shipping Records,' *Business History*, XXII, 2, 1980, 135-51.

entrances by Halifax vessels. Vessels in the Saint John fleet traded more often outside the North Atlantic throughout the period, but in all ports there was a significant shift out of the North Atlantic after the 1870s. Nevertheless, it is clear that the growth and decline of total entrances were determined very largely by North Atlantic trades, and particularly by trades between the United States and Britain or northern Europe. The Yarmouth fleet, for instance, was particularly narrowly based. David Alexander has estimated each region's contribution to the net growth of world entrances by Yarmouth vessels: these estimates suggest that 98 per cent of the growth of total entrances before 1879 was accounted for by ports in the USA, UK, and Europe.²³ In the 1880s the same regions contributed almost as much to the rapid decline in world entrances. Maritimers' vessels did not operate extensively in Canadian export trades; nor did they penetrate all world trades. Canadian shipowners had seized the opportunities afforded by a narrow range of staple exports from the United States. It is no surprise to find a high correlation between investment in ocean shipping in our major ports and freight rates for such American exports as grain, tobacco, petroleum, and cotton. We have constructed an index of freight rates for the major American bulk cargoes for the three decades after 1855. The high correlation between this index and investment in ocean shipping in our major ports tends to confirm that returns from such freights were of crucial importance for the growth and decline of Canadian shipping before and after the late 1870s.²⁴

In retrospect the decision to deploy wooden sailing vessels in trades soon to be overwhelmed by iron and steam may seem a shortsighted gamble. But shipowners were businessmen, not economists or social engineers. They were not planning the economic future of the Maritimes within Confederation; they were making profits in a business which they understood thoroughly and in which most had worked for two decades. They continued to make profits, and they adjusted the supply of vessels to meet a dwindling demand. They did this not by disposing of vessels recently purchased, but by drastically reducing all new investment in response to the declining freight rates of the late 1870s and 1880s. At the same time they guaranteed the returns from vessel operation by wresting improvements in performance and productivity from the vessels which they retained. Although some historians have noted the improved reputation and rating of Canadian-built vessels by the middle decades of the century, none has suspected the remarkable improvements in performance which these vessels achieved between the 1860s and 1880s.²⁵

²³ David Alexander, 'Output and Productivity in the Yarmouth Ocean Fleet, 1863-1901,' in Alexander and Ommer, eds., *Volumes Not Values*, 845.

²⁴ Sager and Fischer, 'Patterns of Investment,' 412. Correlating 'annual changes in Keith Matthews' sailing-ship freight index and annual changes in newly-registered oceangoing tonnage for four ports yielded $r^2 = +.61$ for 1869/70-1879/80 and $r^2 = +.67$ for 1879/80-1885/6. See Keith Matthews, 'The Canadian Deep Sea Merchant Marine and the American Export Trade, 1850-1890,' in Alexander and Ommer, eds., *Volumes Not Values*, 195-243.

²⁵ It is worth noting that Douglass North found no significant improvement in sailing speeds between 1820 and 1860, and doubted that the fall in real shipping costs in this period was influenced by increased speed. Our data suggest that, for Canadian vessels at least, there may have been some productivity improvements as a result of increased sailing speeds. North,

We know, first of all, that eastern Canadian builders and owners were able to effect a remarkable change in the rate of depreciation of vessels in the nineteenth century. In the Halifax fleet vessel life expectancy increased by over 50 per cent between the 1840s and 1870s, for instance (vessels above 250 tons built in the 1840s lasted 6.3 years on average; vessels built in the 1870s lasted 9.6 years). Similar changes in the life expectancy of oceangoing vessels happened in all ports. These changes occurred in spite of an apparent tendency to take greater risks at sea: in some fleets there was a substantial increase in the proportion of vessels involved in marine disasters after the 1850s (in Halifax marine disasters accounted for 12 per cent of registry closures for vessels registered in the 1850s and 34 per cent for vessels registered in the 1870s; the comparable figures for PEI vessels are 13 per cent and 25 per cent).²⁶ Whatever the reason for registry closure, mean life expectancy increased. If all other factors remained constant (and in spite of short-term fluctuations average vessel prices remained quite flat or declined slightly between the 1850s and early 1870s), then increased longevity had increased by 50 per cent the likelihood of amortizing the investment in an oceangoing vessel by the 1870s.

Improvements in vessel productivity must at the same time have increased total output in the fleet and even compensated for much of the decline in freight rates in the 1880s. In all fleets, first of all, there was a substantial increase in mean tonnage from one decade to the next, as owners sought to reap the advantages of greater carrying capacity. The average Saint John vessel operating in the growth period from 1863 to 1877 was 801 tons; there was a 36 per cent increase (to 1093 tons) in the period from 1878 to 1890, and a 37 per cent increase in the next period, from 1891 to 1912 (to 1497 tons).²⁷ Of equal importance was the fact that Canadian shipowners did not sacrifice speed to carrying capacity: the advantage of operating these vessels as 'cheap warehouses' does not seem to apply. Data on passage times leads inescapably to the conclusions, not only that passage times were shortening, but also that actual sailing speeds were increasing over time. On westward passages from Liverpool to nine major ports, and on four eastward passages, passage times improved on eleven of thirteen routes between the 1863-77 period and the 1878-90 period (improvements ranged from 1.3 per cent on the Liverpool-New Orleans route to 26.1 per cent on the Liverpool-Philadelphia run; the mean percentage change was 5.3 per cent).²⁸ A similar analysis was undertaken for

'Sources of Productivity Change in Ocean Shipping, 1600-1850,' *Journal of Political Economy*, LXXVI, 5, 1968, 1953-70.

²⁶ BT 107/108 vessel registries. For Yarmouth, however, marine disasters as a proportion of tonnage on registry did not increase significantly. Loss rates were never so high that they might have threatened the financial basis of the industry. Alexander and Panting, 'The Mercantile Fleet and its Owners,' 15-16.

²⁷ There were disadvantages, however, to larger vessels: the range of ports was restricted, and so was the range of cargoes that could be carried profitably. See Robin Craig, 'Conference Summary,' in Alexander and Ommer, eds., *Volumes Not Values*, 364.

²⁸ The routes selected were Liverpool to New York, Boston, Philadelphia, New Orleans, Saint John, Callao, Quebec City, Havana, and Rio de Janeiro; New York to Liverpool, London, and Havana; and Saint John to Liverpool. Fischer, 'The Great Mudhole Fleet,' *Volumes*

passages by Halifax vessels from eastern American ports (between New York and Baltimore) to ports in the UK or northern European ports (between Amsterdam and Havre). These passages were chosen to allow a sufficient number of cases and to reduce the possibility that shorter distance might account for reduced passage times. Sailing eastwards, over six days were saved between the 1860s and 1880s, representing a 15 per cent improvement; in the other direction eleven days were saved, which means that sailing times improved by 20 per cent. At the same time significant improvements were recorded in turnaround times between the end of one voyage and the beginning of the next, and in port times during a voyage. In the Saint John fleet there was a 7 per cent decrease in all turnaround times between the periods 1863-77 and 1878-90, with the biggest decreases recorded by the largest classes of vessel and by European and American ports. Port of call times declined by 10 per cent between the same two periods. Taking into account the changes in sailing times and port times, the typical voyage from an eastern American port to the UK and back, with stops on both sides of the Atlantic, took fourteen fewer days between the periods 1863-77 and 1878-90. This represented a potential gain in gross output of over 10 per cent between the two periods. These changes apply to sailing vessels only, since steamers were excluded. After 1890 all port times increased, and they increased most rapidly in British and American ports. These improvements suggest that great efforts were made to maintain the profitability of vessels by forcing masters to make more voyages within the same period of time.

Improvements in vessel productivity were accompanied by improvements in labour productivity. Labour productivity can be measured either by the ratio of labour to capital (the man-ton ratio), or in terms of output per unit of labour employed. In the fleets of Halifax and Yarmouth the man-ton ratio fell by over 2 per cent a year between 1863 and 1899; in the large Saint John fleet there was a comparable saving in labour to 1890, and then a much steeper decline, at an annual rate of 5 per cent between 1891 and 1912. A major reason for this improvement was that capital inputs increased faster than did labour inputs, even in this 'traditional' industry. As vessel size increased there was not a proportionate increase in labour requirements, because in these fleets the number of masts and sails to be handled did not increase as hull size expanded. But increases in vessel size are not the only reason for declining man-ton ratios. It has been possible by various methods to hold tonnage constant and to observe changes in labour requirements owing to factors other than changes in tonnage. A significant proportion (probably about a third) of the decline in man-ton ratios was due to factors other than increasing vessel size. For instance, between the 1860s and the 1880s masters of 1000-ton vessels reduced their crews by 20 per cent, and shipowners benefited from a substantial saving in their wage bill.²⁹

It is difficult to determine what caused these improvements in the performance of vessels and crew. There appears to have been no major change in the structure of vessels, apart from their increasing size, although students of naval architecture might well pursue

Not Values, 136

²⁹ On man-ton ratios see David Williams, 'Crew Size in Trans-Atlantic Trades in the Mid-Nineteenth Century,' and Eric W. Sager, 'Labour Productivity in the Shipping Fleets of Halifax and Yarmouth, Nova Scotia, 1863-1900,' in Rosemary Ommer and Gerald Panting, eds., *Working Men Who Got Wet* (St John's 1980), 105-53, 155-84.

the question further. So far no satisfactory explanation for increasing vessel life has emerged, although the desire of shipowners to extend the revenue-earning life of their assets was likely to be an important factor, particularly when freight rates were declining. The improved Lloyds rating of Canadian vessels after mid-century, and the prices received for Canadian vessels in Britain, suggests that improvements in construction had occurred.³⁰ Some technological innovations did help to save labour and improve performance: these included the use of double rather than single topsails, wire rigging, patented reefing gear, canvas windmill pumps, and donkey engines.³¹ 'Masters and officers were also more experienced in handling larger crews as time passed and as vessel size increased, and as G.S. Graham noted long ago masters were becoming more familiar with prevailing winds and currents in this period.'³² It is likely that when freight rates declined after the mid-1870s shipowners pressured masters to cut costs and improve performance. If the correspondence published in the *Novascotian* is representative, shipowners scrupulously trimmed expenditures wherever they could. N.B. Lewis and B.F. Gullison repeat the credo of parsimony on almost every page: 'Hold things up as cheaply as possible and make all you can of it.'³³ It is also possible, as Robin Craig has suggested, that improvements in performance reflect the 'different time horizon' of owners of short-lived softwood vessels: 'Canadian shipowners did not sacrifice speed to carrying capacity because they were operating softwood vessels in which the capital had to be written down fairly rapidly.'³⁴ Certainly Lewis preferred not to leave his vessel waiting for an uncertain advance in freights: 'Were glad to get her fixed even at this low rate. Never found any money in waiting. Any advances is lost in time and expence with the best of softwood ships.'³⁵

There may also be some substance to the old image of the brutal Bluenose masters, 'those crude bully-boys that bang their way around the world with belaying pins and pistols, taking potshots at people on the royal yards when they feel a little disturbed or unhappy.'³⁶ Certainly Canadian shipowners preferred to hire local masters: in the fleets of Yarmouth, Windsor, and Halifax, Maritimers were a majority among masters and officers

³⁰ The firm prices for Canadian vessels are reflected in the papers of the shipbrokers Messrs Kellock and Co of Liverpool, contained in the National Maritime Museum, Greenwich; the improved Lloyds' rating is noted by R.S. Craig, 'British Shipping and British North American Shipbuilding in the Early Nineteenth Century,' in Fisher, ed., *The Southwest and the Sea*.

³¹ On the purchase of a windmill pump see Clement W. Crowell, *Novascotian* (Halifax 1979), 123. We are indebted to Neils Jannasch for pointing out many of these improvements.

³² G.S. Graham, 'The Ascendancy of the Sailing Ship, 1850-85,' *Economic History Review*, IX, 1, 1956-7, 75-81; R.O. Goss, 'Economics and Canadian Atlantic Shipping,' in Fischer and Sager, eds., *Merchant Shipping and Economic Development*.

³³ Crowell, *Novascotian*, 153.

³⁴ Craig, 'Conference Summary,' 364.

³⁵ Crowell, *Novascotian*, 95.

³⁶ Craig, 'Conference Summary,' 364. One of the best descriptions of a pistol-carrying Bluenose master appears in Samlet au Svein Molaug, *Sjofolk forteller; therdagshistorien fra seilskutiden* (Oslo 1977), 15-16. We are indebted to Captain Lewis Parker for this reference.

(in the Yarmouth fleet 81 per cent of voyages were undertaken by Nova Scotian masters); and in the fleets of Halifax and Yarmouth the Nova Scotian master achieved more rapid savings in labour than did other masters (with other factors held constant), particularly when he was working for a Nova Scotian managing owner.³⁷ Captain B.F. Gullison of the *N.B. Lewis*, writing from New Orleans to his managing-owner in Yarmouth, suggests how far a master was prepared to go in order to secure a good first officer, preferably one 'from home': 'I telegraphed you on Saturday asking you to send me mate. I received yours today. "Can't find mate, will have to do best you can." I am very sorry as I am in want of one very much, the fact is I cannot get along with the one I have and there is none here at present that I would take and no likelihood of being any very soon. I know the cost is considerable from home here but sometimes the dearest article is the least expensive in the end.'³⁸

There is also some evidence of preference for local sailors, and in large port cities masters were able to exercise some discretion in selecting their crews. The seafaring labour pool as a whole may have been a polyglot mixture (we shall soon be able to answer this question for British shipping in the late nineteenth century); but the labour force on Canadian oceangoing vessels was not, as Wallace believed, truly international or 'composed of all nationalities.'³⁹ A majority were English-speaking, coming particularly from Canada, the United States, and Britain. The proportion of Canadian sailors decreased over time, presumably because alternative opportunities for employment on land became more attractive in the last decades of the century. The proportion of European (particularly Scandinavian) sailors increased, until by the 1890s British and western European sailors were the overwhelming majority of the crew. There existed, however, a noticeable preference for local sailors: it is necessary to take into account the relative size of the national populations from which crew might be drawn. On a per capita basis Nova Scotians and New Brunswickers were conspicuously over-represented in our fleets, even if masters and officers are excluded (in the Yarmouth fleet Nova Scotians had by far the highest participation rate on a per capita basis, at sixty-two per ten thousand population; the rate for New Brunswickers was thirty-three per ten thousand followed by Scandinavians at a mere nine per ten thousand).⁴⁰ Wherever possible masters exercised discretion in selecting their crew; furthermore there is no reason to believe that sailors were drawn from a depressed and

³⁷ In the Halifax fleet, for instance, the Nova Scotian master sailed with a smaller crew in every tonnage class under 1500 tons; his man-ton ratio was 5.3 per cent lower than that for non-Nova Scotians, when time and tonnage class are held constant (calculated from the Crew Lists for Halifax vessels).

³⁸ Crowell, *Novascotiaman*, 158.

³⁹ The portrait of crews serving on British vessels will come from our current analysis of a 1 per cent sample of the entire Crew List archive for British imperial shipping from 1863 to 1913.

⁴⁰ These ratios are merely the total appearances from 1870 to 1889 by crew born in each region relative to the average of the total population of that region in two decennial censuses (usually 1871 and 1881). For a more refined analysis see Rosemary E. Ommer, "'Composed of All Nationalities": The Crews of Windsor Vessels, 1862-1899,' in Ommer and Panting, eds., *Working Men Who Got Wet*, 191-227.

relatively ill-educated lumpen-proletariat.⁴¹ These factors, and the greater experience of crews (their average age increased over time), help to explain improvements in labour productivity between the 1860s and 1890s. Labour costs were a major component in the costs of vessel operation, and savings in labour helped to sustain profit levels for the owners of sailing vessels in these decades. Since wages in the industry increased only slightly in the 1860s and thereafter fell slightly, and since other costs (capital cost of hulls, insurance, port charges, victualling) remained constant or declined slightly in these decades, the chances of amortizing the investment in a wooden sailing vessel remained favourable even as freight rates declined in the 1880s.

The continued investment in wooden sailing vessels in the 1860s and 1870s was not an unpropitious gamble but a finely judged attempt to seize expanding opportunities, and then to maintain rates of return as the demand for sailing ship services fell. The hypothesis that investment in wooden shipping was an unfortunate diversion of resources and a constraint on the growth of other industries can be accepted only if one could prove that better investment opportunities existed in the Canadian context in the 1860s and 1870s, and that these better opportunities were rejected in favour of investment in shipping. No such proof exists. It is not yet possible to compare rates of return in shipping with rates of return on landward investments. But we have been able to estimate the growth of output in shipping, and so to compare output in shipping with output in landward enterprises. These output growth rates allow a rough comparison between the expansion of market opportunities in landward and seaward sectors. The estimates of output in shipping also help to confirm that labour productivity improved in terms of output per unit of labour employed.

In estimating the growth of output in shipping we begin by measuring the annual rate of growth of physical output in terms of the relationship:

$$\overline{GO} = \overline{EN} + \overline{SV}$$

where \overline{GO} is the rate of growth of gross output, \overline{EN} is the rate of growth of the total number of entrances into port by all vessels operating in the fleet, and \overline{SV} is the rate of growth of average vessel size. This relationship measures the growth in output in terms of both total entrances into port and cargo capacity entering port; this growth will be determined by available freights, sailing and turnaround times, time lost in repairs, total fleet size, and so on. This method of measuring output is feasible only because our sample of Crew Lists is so large.⁴² The equations are then revised to take into account the inevitable increase in the ratio of ballast to cargo on North Atlantic routes. We think it

⁴¹ Literacy rates suggest that sailors usually did not come from an illiterate substratum of the national populations from which they were drawn. In the late 1860s 69 percent of all crew were literate, and this proportion rose to 85 per cent in the 1890s. See David Alexander, 'Literacy Among Canadian and Foreign Seamen, 1863-1899,' *Working Men Who Got Wet*, 133.

⁴² The Yarmouth Crew List file probably contains data on two-thirds of all voyages ever undertaken by Yarmouth oceangoing vessels between 1863 and 1900.

TABLE II
Estimated gross output in shipping, 1869-90

Gross output				
$\overline{GO} = \overline{REV} + \overline{SV} + \overline{FRW}$				
Saint John	1869-77	+6.8%	1878-90	-0.8%
Yarmouth	1869-79	+7.4%	1879-90	-1.6%
Halifax	1866-76	+5.4%	1877-90	-4.9%

SOURCE: Crew Lists and Agreements for vessels registered in Saint John, Yarmouth, and Halifax. In each case the two periods are centred on the peak year of investment in each port.

reasonable to assume that vessels entering British or European ports carried cargo and that outward sailings to regions other than North America were mainly with cargo. But we know that an increasing number of sailings to North America were with ballast. We assume, very conservatively, that only 75 per cent of North American entries in 1863 were fully laden, and that this proportion fell at a constant rate to only 10 per cent in 1890. The trend in total entrances is then deflated to produce \overline{REV} which estimates the growth in cargo-carrying entrances. The equation allows only an estimate of physical output, however. Estimates of revenue are introduced by adjusting for trends in freight rates. For Saint John and Yarmouth the Isserlis index was used; for Halifax our own index of sailing-ship freight rates for American bulk cargoes was used (the two indices follow very similar patterns, in fact). These freight rate indices have been deflated to take into account price changes in the Atlantic economy; since Canadian owners would be likely to assess their investments in terms of prices in the Canadian economy, a Canadian import price index has been used. Real gross output in each fleet is estimated by

$$\overline{GO} = \overline{REV} + \overline{SV} + \overline{FRW}$$

where \overline{FRW} is the rate of growth of the weighted freight rate index.⁴³

The results (Table II) suggest that a very high growth in output occurred in

⁴³ It is possible that the use of vessel entrances as a basic component in this estimate may produce misleading results: as time passed more voyages were on long-distance routes having fewer entrances, even though vessels may have been profitably employed on those routes. A second estimate, replacing \overline{REV} with \overline{RVT} where \overline{RVT} represents the growth of time spent on potential revenue-earning voyages, yielded the following annual growth rates for Saint John: 1863-77: +6.4 per cent; 1878-90: 0.2 per cent. See Fischer and Panting, 'Harbour and Metropolis,' *Merchant Shipping and Economic Development*.

all three ports well into the 1870s. Market opportunities allowed an expansion of output substantially higher than output growth in other sectors of the economy. It has been estimated, for instance, that Canadian GNP grew at 2.4 per cent per annum in the 1870s and that gross output in manufacturing grew at 2.9 per cent in the same decade.⁴⁴ In Nova Scotia total industrial output in real terms grew at an annual rate of 5.7 per cent in the 1870s; output in shipping grew at a similar rate in Halifax until 1876, and somewhat faster in the Yarmouth fleet until 1879. In New Brunswick industrial growth was much more sluggish in the 1870s (growing at an annual rate of 1.9 per cent), and our estimate of output in the Saint John fleet suggests that market opportunities in shipping were growing three times as fast as were opportunities in landward industries.⁴⁵ It is difficult to argue that shipowners were collectively mistaken about potential returns in landward industries, since we know that shipowners were already involved in a range of businesses, including banking, insurance, retailing, mining, and occasionally manufacturing. If the census data on 'capital invested' have any meaning, then the value of fixed and working capital in industry grew more quickly than did real output or value added in both Nova Scotia and New Brunswick in the 1870s, which suggests that returns on capital invested may have been disappointing (a unit increase in capital was not matched by a comparable increase in real output or value added).⁴⁶ On the other hand, in those counties where local resources or the arrival of a railway expanded market opportunities, and where the growth of output was faster than the growth of capital stock, the exodus from shipping occurred as early as the 1870s (this applies particularly to Halifax, and to Northumberland and Westmorland counties in New Brunswick, which were located on the Intercolonial Railway).⁴⁷ In the 1880s shipowning was even less a constraint upon investment in industry, since tonnage in service declined in all ports except Windsor, while industrial investment and output accelerated in both Nova Scotia and New Brunswick. Where other opportunities appeared favourable the movement of capital from shipping was smooth and rapid, and it is difficult to imagine how in these circumstances one industry acted as a constraint upon others.

44 O.J. Firestone, 'Development of Canada's Economy, 1850-1900,' National Bureau of Economic Research, *Trends in the American Economy in the Nineteenth Century* (Princeton 1960), 222, 234.

45 Growth rates for Nova Scotia and New Brunswick are calculated from Canada, *Census*, 1871, 1881, and 1901. In order to approximate growth in landward industries ship construction was excluded from the totals. Values from which growth rates were calculated were constant 1935-9 dollars; census figures were deflated by the Canadian wholesale price index J34 in M.C. Urquhart and K.A.H. Buckley, *Historical Statistics of Canada* (Cambridge 1965), 294.

46 Thus in New Brunswick fixed and working capital grew by 4.6 per cent a year in real terms between 1870 and 1880, whereas gross value of industrial production grew by 1.9 per cent a year and value added by 0.8 per cent a year; the comparable figures for Nova Scotia in the 1870s are 6.5 per cent, 5.7 per cent, and 4.3 per cent, respectively. Canada, *Census*, 1871, 1881.

47 In Northumberland industrial output grew by to per cent a year in constant dollars in the 1870s; in Westmorland the growth rate was 9.8 per cent a year, and in Halifax City it was 7.7 per cent a year.

Although we cannot yet compare profits in shipping with profits in landward enterprises, it is likely that profits as well as total output were increasing rapidly in the 1860s and 1870s. The decline in freight rates in the late 1870s did not prevent an output growth rate of over 7 per cent for the Yarmouth fleet in that decade. In the same period total man-months of labour grew by only 4.1 per cent a year, and total wage costs for the fleet grew by 5.1 per cent, which suggests that output per unit labour cost was growing by more than 2 per cent a year. Even in the 1880s there were significant gains in labour productivity in the Yarmouth fleet, since estimated output fell by only 1.6 per cent a year, whereas total man-months fell by 5.8 per cent a year and the total wage bill fell by 4.6 per cent a year. Since other costs were generally steady or falling, rates of return must have increased in the 1870s. In the 1880s rates of return likely remained positive for those vessels retained in service (otherwise the vessels would have been sold or abandoned), but returns were probably lower than in the 1870s, since freight rates (and hence gross earnings) were falling more quickly than were operating costs.

Rates of return may have improved in the 1860s and early 1870s, but it is possible that profits began at a low level and remained relatively poor, as McClelland argued. Freight rates and costs fluctuated steeply in this industry. In favourable circumstances the returns from a particular voyage could be enormous; but the overall earnings record in a fleet could still be poor. McClelland's evidence is based mainly on an analysis of net earnings by Moran family vessels between 1867 and 1878.⁴⁸ Earnings per ton and net earnings after depreciation were calculated for an average of eleven vessels a year from 1867 to 1878. If they do nothing else, the results lend further weight to our argument that output and revenues were growing rapidly at least until the mid 1870s. Between 1867 and 1874 gross earnings per ton increased by 4 per cent a year, and the rate of return (net earnings as a percentage of the depreciated value of the fleet) increased by 7 per cent a year.⁴⁹ But how large were those earnings? Certainly they were greater than McClelland believed: he underestimated the rate of return on these vessels because he overestimated the capital value of the vessels when newly built, and underestimated the rate at which the average wooden vessel in this period depreciated. If we recalculate the rate of return using an initial capital valuation of seven pounds per ton rather than ten pounds, the mean annual rate of return on these vessels was close to 20 per cent before 1874, and it remained positive, although declining steeply, after 1874.⁵⁰ Such a rate of return is remarkably

⁴⁸ His calculations are from the Moran-Galloway Account Books, New Brunswick Museum.

⁴⁹ We use 'rate of return' in the same sense as McClelland did: it is net profit after depreciation as a percentage of capital employed. Loan capital and working capital are excluded from capital employed: there is little evidence that major shipowners borrowed extensively to acquire new vessels, and even if they did profits net of debt charges must still have been high; and large amounts of working capital were not required, since most operating costs were paid out of vessel earnings, often by a broker.

⁵⁰ McClelland relied heavily upon data contained in the Moran-Galloway Account Books for his cost estimates, but this superb source has led to an overestimate of building costs because by the early 1870s the firm was buying most of its new tonnage from shipyards in Saint John City, where building costs were higher. Our time series on newly-built tonnage has been compiled from a variety of sources, including the Peake Letterbooks (Public Archives of PEI) and the Hilyard, Fisher, and Ward Papers (New Brunswick Museum). For a

high; but analysis of returns for other oceangoing vessels, where detailed records exist, suggests that net earnings as a proportion of the depreciated value of a vessel were often as high as 20 per cent, and for some vessels the rate could remain above 10 per cent even in the 1880s. The *Magna Charta* of Saint John, for instance, earned gross revenues of \$8300 a year between 1868 and 1883; deducting operating costs and depreciation, the annual average return was 15 per cent of the depreciated value of the vessel.⁵¹ The *N.B. Lewis* of Yarmouth earned over \$3100 a year, net of operating costs and depreciation, between 1885 and 1892 (a rate of return of about 12 per cent).⁵² We have attempted to reconstruct the potential earnings of vessels carrying particular cargoes in the North Atlantic, using a standard formula and available data on freight rates, vessel tonnage, stowage factors, and operating costs (mainly wages, depreciation, insurance, victualling, port charges, and repairs). The results of this exercise (with grain as the standard cargo) tend to confirm that a rate of return of 20 per cent was not unexpected in the early 1870s.⁵³

It is risky to assume that entire fleets enjoyed precisely the same rates of return as did particular cases. But it is no longer possible to argue that shipping experienced a 'dubious earnings record after 1865.' Capital stock in the industry in the Maritimes was growing by almost 4 per cent a year in the 1860s and 1870s; it is difficult to believe that such a sustained growth would have occurred if profits had not been high. If rates of return were high, then shipping must have made a significant contribution to capital accumulation in Saint John, Yarmouth, Windsor, and even Halifax. It is unlikely that all such savings were lost to the community, since we know that shipowners were investing in many local enterprises in this period.⁵⁴ If the entire Saint John fleet experienced rates of return approaching 20 per cent, then shipping would have accounted for a net flow of income of over a million dollars a year in the early 1870s, or a fifth

more complete description of sources see Lewis R. Fischer, *Enterprise in a Maritime Setting: The Shipping Industry of Prince Edward Island, 1787-1914* (forthcoming, St John's 1982), chap. 5. We have estimated depreciation, very conservatively, at 7 per cent a year.

- ⁵¹ Calculated from Hilyard Papers, New Brunswick Museum. See also the examples in Spicer, *Masters of Sail*, 196-7.
- ⁵² Calculated from data contained in Crowell, *Novascotiaman*. We are indebted to Rosemary Ommer for compiling data from this source. Insurance expenditures of \$800 a year are included among costs; the vessel (purchased in 1880 for \$40,000) was depreciated at a rate of 7 per cent a year.
- ⁵³ The results appear in Lewis R. Fischer, Eric W. Sager, and Rosemary E. Ommer, 'The Shipping Industry and Regional Economic Development in Atlantic Canada, 1871-1891: Saint John as a Case Study,' in Fischer and Sager, eds., *Merchant Shipping and Economic Development*.
- ⁵⁴ See, for instance, Gerald Panting, 'Personnel and Investment in Canadian Shipping, 1820-1889,' in Ommer and Panting, *Working Men Who Got Wet*, 335-60; Panting, 'Cradle of Enterprise: Yarmouth, Nova Scotia, 1840-1889,' in Fischer and Sager, eds., *The Enterprising Canadians*, 253-71. Shipowners had always invested in a variety of landward enterprises; thus twenty-nine of T.W. Acheson's 'Great Merchants' were among the largest shipowners in Saint John. Acheson, 'The Great Merchant and Economic Development in St. John, 1820-1850,' *Acadiensis*, VIII, 2, 1979, 327.

of the declared value of New Brunswick exports in each year.

This does not confirm the argument that shipping and shipbuilding were the 'linchpin' of the economy; nor does it refute McClelland's argument that these industries were poor contributors to economic development. The shipping industry probably contributed to the accumulation of savings in shipowning centres, and to the extent that shipowners channeled these savings into a variety of landward enterprises (as we know many did), there was an important contribution to industrial growth and diversification. But in other ways these industries were weak contributors to economic development: this was McClelland's argument in 1966, and it remains substantially unquestioned.⁵⁵ Since Maritimers' vessels operated largely outside Canadian trades, the linkages between shipping and the local economy were few (except with shipbuilding). In spite of the preference for local sailors, employment opportunities offered to Maritimers were not numerous. Shipbuilding itself employed little more than 2 per cent of New Brunswick's labour force, and its demand for timber and metals was not a significant stimulus to either industry.⁵⁶ Although shipping was a capital-intensive service industry, it did not directly stimulate much local capital formation. The skills acquired in shipping and shipbuilding were highly specialized ones, and not readily transferable (except in the case of ship carpenters, who moved into construction). Even the entrepreneurial skills acquired in the shipping business were specialized, and not easily shifted into manufacturing industries serving Canadian markets. The evidence collected by Gerry Panting suggests that shipowners (although not shipbuilders) tended to move their capital and energies into banking, transportation, and other service industries, rather than into manufacturing.⁵⁷ The shipping industry was no engine of economic growth; and it is worth noting that the 1870s was a decade of slow industrial growth in most of the region's shipowning centres and a decade of massive out-migration from the major shipping centre, Saint John.⁵⁸

In one respect McClelland's argument about the direct economic benefits of shipping may be qualified. In Newfoundland and Nova Scotia particularly coastal and fishing vessels were themselves a type of backward linkage from another marine industry, the fisheries. Shipping was the linchpin of a marine-based economy, such as that of Newfoundland, since the supplying of out-port communities, the extension of the

⁵⁵ McClelland, 'The New Brunswick Economy,' (thesis); see also Peter D. McClelland, 'Commentary: On Demand and Supply in Shipping and Regional Economic Development,' in Fischer and Sager, eds., *Merchant Shipping and Economic Development*.

⁵⁶ McClelland, 'The New Brunswick Economy' (thesis), 181, 275.

⁵⁷ Gerald Panting, 'Shipping Investment in the Urban Centres of Nova Scotia,' and Fischer and Panting, 'Harbour and Metropolis,' in Fischer and Sager, eds., *Merchant Shipping and Economic Development*.

⁵⁸ In a recent study of population movement Thornton has discovered significant out-migration from both New Brunswick and Nova Scotia as early as the 1870s; Saint John lost over 20 per cent of its population in the 1870s. Patricia Thornton, 'Some Preliminary Comments on the Extent and Consequences of Out-Migration from the Atlantic Region, 1870-1920,' in Fischer and Sager, eds., *Merchant Shipping and Economic Development*; see also T.W. Acheson, 'The National Policy and the Industrialization of the Maritimes, 1880-1910,' *Acadiensis*, 1, 2, 1972, 5-7.

fishery to Labrador and the Grand Banks, and the very existence of the seal fishery depended upon capital inputs in the form of vessels of various types. It is no surprise to find a very high positive correlation between the growth of out-port populations and the building of schooners. There is also a positive correlation between the gross value of fisheries output and investment in schooner tonnage.⁵⁹ Nevertheless, McClelland's argument about linkages from shipping itself remains intact: even if the owners of oceangoing shipping made respectable profits, they were investing in a service industry having limited linkage effects, particularly of the kind which might have stimulated the development of a more diversified manufacturing industry. Until this argument is refuted, it is not possible to claim that the decline of shipping and shipbuilding was a major cause of the relative economic weakness of the Maritimes in the decades which followed.

At the same time it remains difficult to accept McClelland's more extreme claim that shipping and shipbuilding acted as serious constraints upon the growth of other industries. Capital employed and revenues earned in the industry were highly mobile; when alternative investment opportunities appeared more tempting, shipowners could shift their capital and run down their investment in shipping very quickly. It was all the more easy to do this since a majority of the major shipowners in the region were involved from the beginning of their careers in merchandising, banking, finance, and other landward activities. By the late 1870s and 1880s a declining portion of shipping revenues was being ploughed back into shipping; shipowners were probably contributing capital to the growing industrial and service sectors of the 1870s and 1880s.⁶⁰ Shipping was also an essential factor in many of the primary industries which continued to exist in the new industrial age. Coastal shipping was essential not only to the production and marketing of fish, but also to trade within the region and to trade with other parts of British North America and to the United States. As S.A. Saunders pointed out, coastal shipping in the Maritimes was briefly stimulated by railway construction, until branch

⁵⁹ Eric W. Sager, 'The Port of St. John's Newfoundland, 1840-1889: a Preliminary Analysis,' in Matthews and Panting, eds., *Ships and Shipbuilding in the North Atlantic Region*, 36. There is a consistently positive correlation between estimated returns to schooner tonnage (in terms of the dollar value of cod exports per ton in service) and new investment in schooner tonnage between 1880 and 1929. Each upward surge in revenues from the fishery and in average prices per quintal of cod was followed by a flurry of new investment in schooner tonnage, and also in such imported inputs as fishing gear, gasoline engines for boats, cordage, seines, and lines. This point is discussed in detail in Eric W. Sager, 'Sailing Ships and the Traditional Economy of Newfoundland, 1850-1934' (paper presented to the Annual Meeting of the Canadian Historical Association, Halifax, 1981).

⁶⁰ The size of investments in landward industries remains to be discovered, but the active participation of shipowners and former shipowners is known from the work of Gerald Panting, T.W. Acheson, and others. It is likely that some portion of shipping revenues were lost to the region; see J.D. Frost, 'Principles of Interest: the Bank of Nova Scotia and the Industrialization of the Maritimes, 1881-1910' (MA thesis, Queen's University, 1979); Christopher Armstrong, 'Making a Market; Selling Securities in Atlantic Canada before World War 1,' *Canadian Journal of Economics*, XIII, 1980, 438-54.

lines and steamships reduced the demand for small wooden coasters.⁶¹ The argument that traditional economic activities such as shipping and shipbuilding constrained the growth of manufacturing industry and a more diversified economic development has not been proved. It is more likely that the eager pursuit of new industries diverted capital and resources from traditional marine-related activities, and particularly from the fisheries. If these conclusions appear tentative it is because informed discussion of these issues has scarcely begun.

These conclusions have a direct bearing upon the most potent of all myths about the Canadian shipping industry. The decline of the industry has always been explained in terms of technological obsolescence: the Canadian industry was destroyed by the competition of iron and steam. The difficulty of making the transition to a new technology may help to explain the decline of the shipbuilding industry: it would have required an enormous effort and substantial subsidies to compete with British and European builders. But technological obsolescence merely begs the question: why did shipowners in Atlantic Canada not invest in iron and steam vessels? It appears that shipowners did not lack the capital to make such investments. Certainly they did not withdraw from the shipping industry because they were losing money: shipowners in Windsor appear to have been satisfied with returns in the North Atlantic even in the 1880s, and expanded their stock of vessels until 1891. There were still 110,000 tons of shipping on registry in Saint John by the mid-1890s (78 per cent of these were deep-sea vessels of 250 tons or more); it is unlikely that businessmen would retain so large a fleet if they were not making some profits. Since it is not possible to compare rates of return in shipping with rates of return in landward enterprises, we cannot estimate precisely the opportunity costs of capital invested in shipping. There can be little doubt, however, that by the 1880s (and in some ports in the 1870s) various landward enterprises appeared to offer rates of return which, if less spectacular, were at least more stable than returns in shipping. In both Nova Scotia and New Brunswick market opportunities in landward sectors appeared to be expanding very rapidly in the 1880s: in Nova Scotia industrial output grew in real terms by 6.4 per cent a year and value added grew by 7.2 per cent; in New Brunswick industrial output grew by 3.6 per cent a year and value added by 5.4 per cent a year.⁶² Growth rates were above the provincial average in the major shipowning counties of Yarmouth, Hants, Pictou, and Saint John (in Halifax they were already above average in the 1870s). By the 1880s there were sound reasons for not reinvesting in wooden sailing vessels: given the continuing decline in freight rates, a rapid amortization of the investment seemed less certain than before. There were even better reasons for not investing in iron steamers: the initial capital cost was high, amortization would require a long-term commitment, and the management of fleets of iron steamers probably required a different corporate structure from the old family firm which had dominated the wooden shipping business. Even if in some cases the returns from shipping remained high, this was an industry subject to great risk; the young Canadian Confederation, and its National Policy, appeared to be offering stable

⁶¹ S.A. Saunders, *The Economic History of the Maritime Provinces* (Ottawa 1939), 17-18.

⁶² Calculated from Canada, *Census*, 1881, 1891. See also Acheson, 'The National Policy and the Industrialization of the Maritimers, 1880-1910,' 4-5.

opportunities in a range of landward enterprises. Most shipowners were content to expand their existing assets in landward service industries, and to reap what they could from an expanding industrial economy.

The passing of the eastern Canadian shipping industry was not simply the result of businessmen's calculation of opportunity costs. The decline of this industry occurred in no textbook free market, but in a society where political decisions and national policy shaped the environment in which businessmen made their choices. The economic power of the Canadian state was used in this generation to stimulate western development and central Canadian manufacturing. There would be massive subsidies for railways but few for shipbuilding or ship operation; there would be no Canadian Navigation Acts. This is not to say that public investment in shipping would have been a better allocation of Canadian resources than was our public investment in railways. To prove such a contention would require a complicated (and probably inconclusive) exercise in counterfactual speculation. It is worth reminding ourselves, however, that a political decision was taken to subsidize certain sectors and not others; the choice necessarily involved costs and foregone opportunities. There were opportunities for profitable investment in Canadian carrying trades, both before and during the 'wheat boom.' The demand for carrying capacity in Canadian ports grew by 4.5 per cent a year in the 1880s and by 3.1 per cent a year in the 1890s; in the early 1900s tonnage clearing all Canadian ports grew by 4.2 per cent a year.⁶³ Even if we take into account the decline in freight rates there remained an expansion of gross returns from Canadian carrying trades; in the 1910s opportunities mushroomed as freight rates soared.

It is not self-evident that our economic and political interests were best served by the collective failure to sustain a shipping industry to serve Canada's export trades. There were politicians, both local and national, who wanted the National Policy to include a shipping industry and Atlantic seaports as part of a truly national economic structure. But the vision of Canada as a maritime power soon faded, even in the Maritimes.⁶⁴ It is impossible to know how far a shipping industry might have contributed to prosperity in the Maritimes in the twentieth century. We are spared that knowledge by the decisions of the late nineteenth century, when Canadians pursued a landward development strategy and left the people of the Maritimes to dream of past glories and foregone opportunities.

⁶³ Calculated from Dominion Bureau of Statistics, *The Maritime Provinces Since Confederation* (Ottawa 1927), 88.

⁶⁴ There was, however, federal support for shipbuilding in Nova Scotia during the First World War; L.D. McCann, 'The Mercantile-Industrial Transition in the Metal Towns of Pictou Country, 1857-1931,' *Acadiensis*, X, 2, 1981, 57.