MERCHANT SHIPPING AND ECONOMIC DEVELOPMENT IN ATLANTIC CANADA

Edited by

LEWIS R. FISCHER

ERIC W. SAGER

Maritime History Group

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EDITORS' NOTE

This is the fifth volume of papers from the annual workshops of the Atlantic Canada Shipping Project. In previous conferences we examined the merchant fleets of the North Atlantic, entrepreneurs and economic development in eastern Canada, the voyage patterns of Canadian shipping and the bulk trades which they served, and the labour force employed by merchant fleets in the nineteenth century. In this volume we examine both the regional and international contexts within which Atlantic Canadian shipowners operated, and we combine the skills of economists, geographers, maritime historians and regional Canadian historians. It is a measure of the complexity of our subject matter that we must now bring to bear upon a single Canadian industry such a range of expertise. This was a Canadian industry, subject to influences specific to the colonies, provinces and urban centres of British North America; and it was simultaneously an international industry, subject to economic and other influences operating within the international trading system. The distinction between "seaward" and "landward" begins to break down: this was a Canadian international industry. The papers offered by Project members attempt, more thoroughly than before, to connect this international service industry with its regional base. Gerry Panting reviews the methods employed in our study of major shipowners in their landward environment. C.K. Harley and R.O. Goss offer economists' approaches to the questions of demand for shipping and rates of return in the industry. Roy George introduces the problem of regional economic development and the crucial role of the state in that development. Patricia Thornton tells us about the human losses suffered by Atlantic Canada as the region failed to make the transition from the age of sail to the age of iron and steam. We have learned, if nothing else, that the movement of freight rates in distant trades and the movement of men and women within and from Atlantic Canada were not unrelated events. Douglass North, and our other commentators, help us to grope towards new methods of capturing such diffuse phenomena in the web of historical logic.

We wish to acknowledge the assistance of our colleagues in the Maritime History Group, Heather Wareham, Doris Pike, Janet Bartlett, Lorraine Rogers, Irene Whitfield, Ivy Dodge, Rose Slaney, Gary Penner, and Terry Bishop. Elaine Pitcher and her colleagues converted the original typescript into print. Kevin Tobin drafted the figures. The Social Sciences and Humanities Research Council of Canada has provided the support for the Project and its Conferences; Memorial University of Newfoundland provided the funds for publishing these proceedings.

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St. John's, 1981

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1. THE DATA BASE OF THE ATLANTIC CANADA SHIPPING PROJECT

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Atlantic Canada Shipping Project

THE DATA BASE OF THE ATLANTIC CANADA SHIPPING PROJECT

Rosemary E. Ommer
Lewis R. Fischer
Eric W. Sager

Over the lifetime of the Atlantic Canada Shipping Project a number of attempts have been made to explain the complex data sets created by Project members and the way in which they have been handled.[1] At this conference, whose theme is designated "Theory and Methodology in Maritime History," we have felt it appropriate to cover this material once again, although in summary form, in order to establish the context within which the computer end of the Project works. The following two papers will present some of our findings and seek your assistance on some of our problem areas.

The computer side of the Project has two basic data sources. The first is the registries of vessels for the Canadian ports which we have studied; the second is the Agreements and Account of Crew, commonly known as the "Crew Lists." The registries we have on microfilm; the Crew Lists for British Imperial Shipping from 1863 to 1939 are contained in the archive of the Maritime History Group.

We have taken as our basic unit of analysis the vessels registered in Atlantic Canada. This is a pragmatic decision, based on the most efficient way of accessing information, since the only link between the two data sets is the official number of each vessel and its port of registry. The ports selected for study were those which we considered to be of major importance in Atlantic Canada — Saint John, New Brunswick; Yarmouth, Nova Scotia; Windsor, N.S.; Halifax, N.S.; Pictou, N.S.; Miramichi, N.B.; Charlottetown, Prince Edward Island; and St. John's, Newfoundland (the latter two had one port of registry each for the whole island). These ports were then divided into two sets — major and minor ports, again a pragmatic decision based on the length of time available for analysis. Minor ports were those on which only registry analysis and limited voyage analysis was carried out: P.E.I., Newfoundland, Miramichi and Pictou. For major ports both registries and Crew Lists were analyzed in detail; major ports are Saint John, Yarmouth, Windsor and Halifax. The time periods chosen for analysis were 1820 (or whenever a registry opened) to 1914 for Crew Lists. At least two analytical flaws are inherent in this system. First, it is more difficult for us to analyze vessel deployment prior to 1863; and second, because of time constraints, we have been unable to offer detailed analysis of vessel deployment in any of the Gulf ports or in Newfoundland.

Turning to the computer methodology for handling this vast data bank, coding forms were designed to capture the maximum amount of information, but stopped short of transactions and ships' logs. Briefly, registry information was broken down into two file segments. The first contains information on vessels, the

second on their owners. General vessel information includes the port number, official number, name, whether new or *de novo,* previous registry and date (if applicable), and date and place of build. Physical information about the vessel includes the number of decks and masts, the rig, vessel length, width, depth, tonnage (gross, net and registered) and horse power, if applicable. Other details include year of closure, reason for closure, reason for *de novo* registration, to whom sold, where registry closed and when it was closed. The owner segment, linked to the vessel by port number, gives name of owner, number of shares, occupation, residence, number of partners and whether the owner was also the builder.

From this file a wide variety of analytical details can be extracted. For example, it is possible to produce graphs of tonnage newly registered, tonnage transferred to other ports, and tonnage on registry in each year (a variable which we call fleet size and use as a surrogate for capital stock in each fleet). Beyond this, the fleets can be analyzed by tonnage, tonnage class, rig, place built, place transferred, previous location, etc. Ownership files allow us to extract major owners in our ports, and to relate owners, residences and occupations to vessel characteristics such as tonnage, rig, place of build and so on.

Crew List data capture, more complex than that for the registries, was achieved by creating a master file with four segments — voyage information, port of call, master and crew. These are all linked by official number and sequence number (i.e., voyage 1 to n for any particular vessel).[2] The voyage segment of the Crew List master file allows identification (by voyage) of owner, managing owner, voyage type (passage, voyage, with or without crew information attached), tonnage of the vessel, residence of the managing owner, whether the vessel deviates from the agreed description of the voyage or not, the required number of crew, sailors and any restrictions entered in the agreement. It also gives date information which allows us to set rather precise time parameters: the date the master signs the agreement, the date the voyage is said to commence and the date of the last crew member on board, which we take as definitive of voyage start. We also capture the date of vessel arrival at the terminal port, the date the voyage is said to terminate, the date the first crew member disembarks, and the date the last crew member disembarks. Beyond this we assign a general voyage description and note probable missing ports and whether or not the log contains interesting information for possible future recall.

The port of call segment gives ports of call in chronological sequence. It captures the official dates of entry and exit as given by the official consular stamps recorded at the back of the Crew List, but also gathers more precise dates from internal evidence in the crew agreement where such exists. For example, a crew member may desert at a port before the consular date given for vessel arrival, and this is indication that the vessel was in port prior to the official date given.

The master and crew segments give a variety of information including name, certificate (where appropriate), age, sex, birthplace, capacity, whether other crew members from his last ship came with him or not, whether other family members are with him or not, last ship and place and date of discharge, date and place of joining this ship, wages, how paid and in what currency, how discharged from this

vessel, when and where discharged, and literacy. Not all vessels were coded for crew, since this would be an enormous task. A twenty-five percent sample for Saint John yielded fifty-five thousand crew members, for example. But all voyages, ports of call and master segments were coded.

From such a file a tremendous amount of information can be gleaned. Not only can detailed descriptions of voyages be provided, by start and end ports, or by "legs", but data are now available on voyage time, man-ton ratios, wage bills and turn-around times, all of which are important for an understanding of productivity in the Canadian ocean-going fleets.[3] Linkage to vessel owners (provided through official numbers) allows us to begin thinking about profitability and revenue — a topic we begin to tackle in another paper in this volume.[4] In another analytical area such matters as ethnicity and literacy among crews can now come under the microscope.[5] In much of this analysis we are now using SAS computer programmes as well as SPSS, because SAS is better equipped to handle alphabetics and to handle our large multi-segment master files.

Despite the richness of these computer files, it remains for us to reach beyond these data if we are to deal with the rise and decline of the industry and its impact on the landward economy of the region. Such landward analysis is being undertaken by another Project member whose task it is to search newspapers, probate records, business directories, censuses, parliamentary journals and other sources for data on major shipowners and their investments.[6] Beyond this, we also require comparability with non-Canadian fleets, and to this end the Project is creating a one percent sample of the non-Canadian vessel Crew Lists.

This brief review of the context within which we work is designed to do no more than give you a rough idea of the nature of our data base both in terms of its richness and in terms of its gaps. The two papers which follow in this session will present some of our findings, and also indicate some of the areas in which we have experienced difficulties. It is our hope that you will be able to come to our assistance in order that this Project may be brought to a successful completion.

NOTES

1. David Alexander, "Objectives and Methodologies of the Atlantic Canada Shipping Project," *The Great Circle: The Journal of the Australian Association for Maritime History,* I, no. 2 (October 1979), 36-43; Lewis R. Fischer and Eric W. Sager, "An Approach to the Quantitative Analysis of British Shipping Records," *Business History,* XXII, No. 2 (July 1980), 135-151.

2. For a detailed description see Fischer and Sager, "An Approach to the Quantitative Analysis of British Shipping Records," *Business History* (July, 1980).

3. First results were reported in David Alexander and Rosemary Ommer (eds.), *Volumes Not Values: Canadian Sailing Ships and World Trades* (St. John's, 1979).

4. 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," *this volume.*

5. David Alexander, "Literacy Among Canadian and Foreign Seamen, 1863-1899," in Rosemary Ommer and Gerald Panting (eds.), *Working Men Who Got Wet* (St. John's, 1980), 1-33; Rosemary Ommer, "'Composed of All Nationalities': The Crews of Windsor Vessels, 1862-1899," *Working Men Who Got Wet,* 191-227.

6. See Gerry Panting, "Personnel and Investment in Canadian Shipping, 1820-1889," in Rosemary Ommer and Gerald Panting (eds.), *Working Men Who Got Wet,* 335-360; "Shipping Investment in the Urban Centres of Nova Scotia," *this volume.*

2. LANDWARD AND SEAWARD OPPORTUNITIES IN CANADA'S AGE OF SAIL

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Atlantic Canada Shipping Project

LANDWARD AND SEAWARD OPPORTUNITIES IN CANADA'S AGE OF SAIL

Eric W. Sager
Lewis R. Fischer
Rosemary E. Ommer

Canada was once a maritime nation and an inter-continental trading power. From the beginning European peoples in northern North America lived by the staple products which they exported, and depended upon river craft and ocean-going vessels for access to local and European markets. For a long time the settlers of New France and British North America saw their goods transported in vessels from the motherland, but during the eighteenth century locally-built fleets expanded, and by the early nineteenth century British merchants were carrying staple cargoes in hulls built in the colonies. Soon the ownership of Canadian ocean fleets passed into the hands of Canadians, and in the early years of Confederation we possessed the fourth largest merchant marine in the world. For four of the five centuries of our history we traded across oceans and depended upon maritime transportation. In the course of the last century we have forsaken our role as a maritime power and as an international trader, and we have become the hinterland of a continental economy. This was a critical transition in the modern history of this northern half of North America. The transition has never been explained; still less are its consequences understood.

The Atlantic Canada Shipping Project has set out to explain part of this transition — the rise and decline of the shipping industry in the Atlantic provinces of Canada and in Newfoundland. Although other questions have arisen since our research began, this mandate remains our first priority. It seemed to all of us that the subject of the rise and decline of this industry was encrusted with dogma and myth. The rise of the shipping industry had been explained quite simply. The industry was a type of forward linkage from the timber trade: in the early 1800s a shipbuilding industry provided vessels, primarily for the timber trade; then shipbuilders began to sell tonnage to British shipowners; finally, when British demand for wooden sailing vessels declined, Maritimers were left with no option but to keep their vessels on registry in Canada and to run them for what profit they could.[2] This assumption flew in the face of evidence that substantial fleets were both built and owned in the colonies long before British demand collapsed in the 1860s. Explanations for the decline of the industry were even less satisfying. It appeared that our industry was destroyed by competition from the new technology of iron and steam.[3] The decline of the industry was therefore inevitable, just as the decline of everything else in the Maritimes was inevitable,

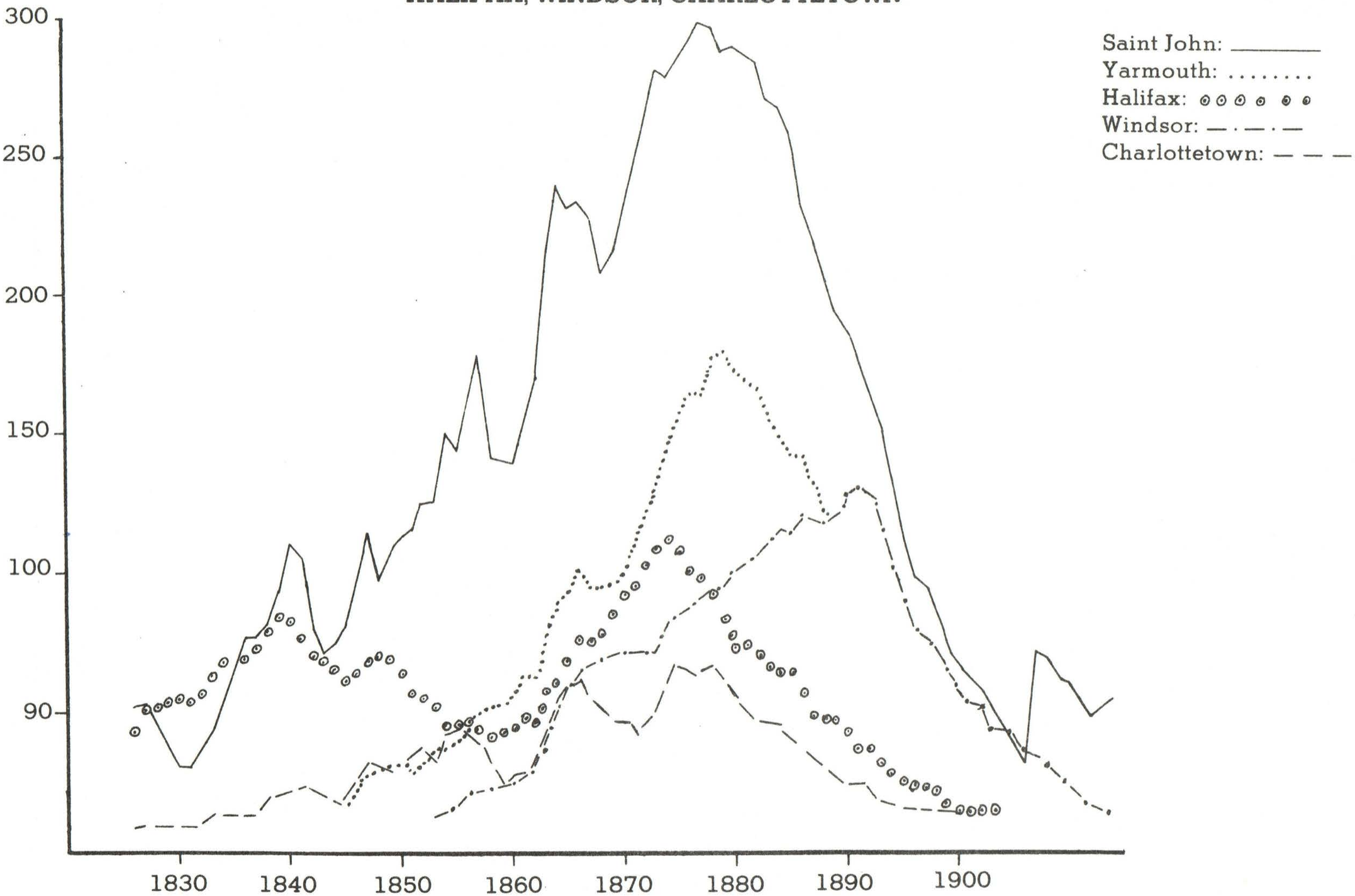
and no more sophisticated explanation was needed where the region was assumed to be so isolated and the people so backward and conservative. There is indeed a condescension implicit in this question-begging explanation, for no historian (until David Alexander) considered the possibility that Maritimers themselves might have made the transition to iron and steam, and bothered to ask why they did not do so. The question is pertinent, since other nations made the technological transition in the late nineteenth century, and because it is clear that Maritimers lacked neither the talent, the capital nor the resources to embark upon a major industrializing effort in these decades.

The rise of our shipowning industry (to distinguish it from our shipbuilding industry) occurred in particular centres in the 1820s and 1830s. While in a general sense investors in shipping were responding to opportunities afforded by the sustained growth of international trade in the first half of the nineteenth century, nevertheless it is clear that the industry in the Maritimes was not monolithic, and that to a considerable extent investors in each port were responding to different opportunities. The early expansion of fleets in Halifax and in Newfoundland, for instance, was not related to British demand for colonial-built tonnage, nor even to demand for ocean-going tonnage, but rather to local demand for coastal and fishing vessels. The sixth largest fleet in the region was that registered in St. John's, Newfoundland, and it consisted 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 demand for coastal vessels. In New Brunswick, and particularly in Saint John, which possessed the largest fleet in the region, the structure of the industry was very different. Here the early growth of shipbuilding and shipowning was undoubtedly linked to the expanding timber trade, and investment in coastal vessels was much less important than it was in Nova Scotia or Newfoundland.[4]

Despite the connections between timber and shipping in New Brunswick, shipowning was not a belated spin-off from the timber trade or the transfer trade in wooden vessels. No simple model of growth will account for the rise of our shipping industry. Even where the timber trade and shipbuilding did co-exist there appeared substantial locally-owned fleets well before the 1860s (see figures 1 and 2). In Saint John, Prince Edward Island, Pictou and Miramichi, where the rapid transfer of vessels to British ownership and registry was a common occurrence, there was a substantial accumulation of locally-owned tonnage before the middle of the century. As Table 1 suggests, most fleets grew even more quickly than did the British fleet. In five of eight fleets, and in the industry as a whole, capital stock (tonnage on registry) grew more quickly than did gross investment, in spite of the transfer trade and in spite of the rapid depreciation of softwood vessels.[5] Except in Newfoundland and in Windsor, the peaks in tonnage on registry occurred in the 1860s and 1870s, and these peaks followed from two or three decades of sustained growth. Although we lack a satisfactory explanation for the rise of our shipping industry as a whole, some of the old myths have been shattered. Shipowning was a business deeply entrenched in Atlantic Canada before the 1860s; it was not the reluctant gamble of a single generation. The rise of

FIGURE 1

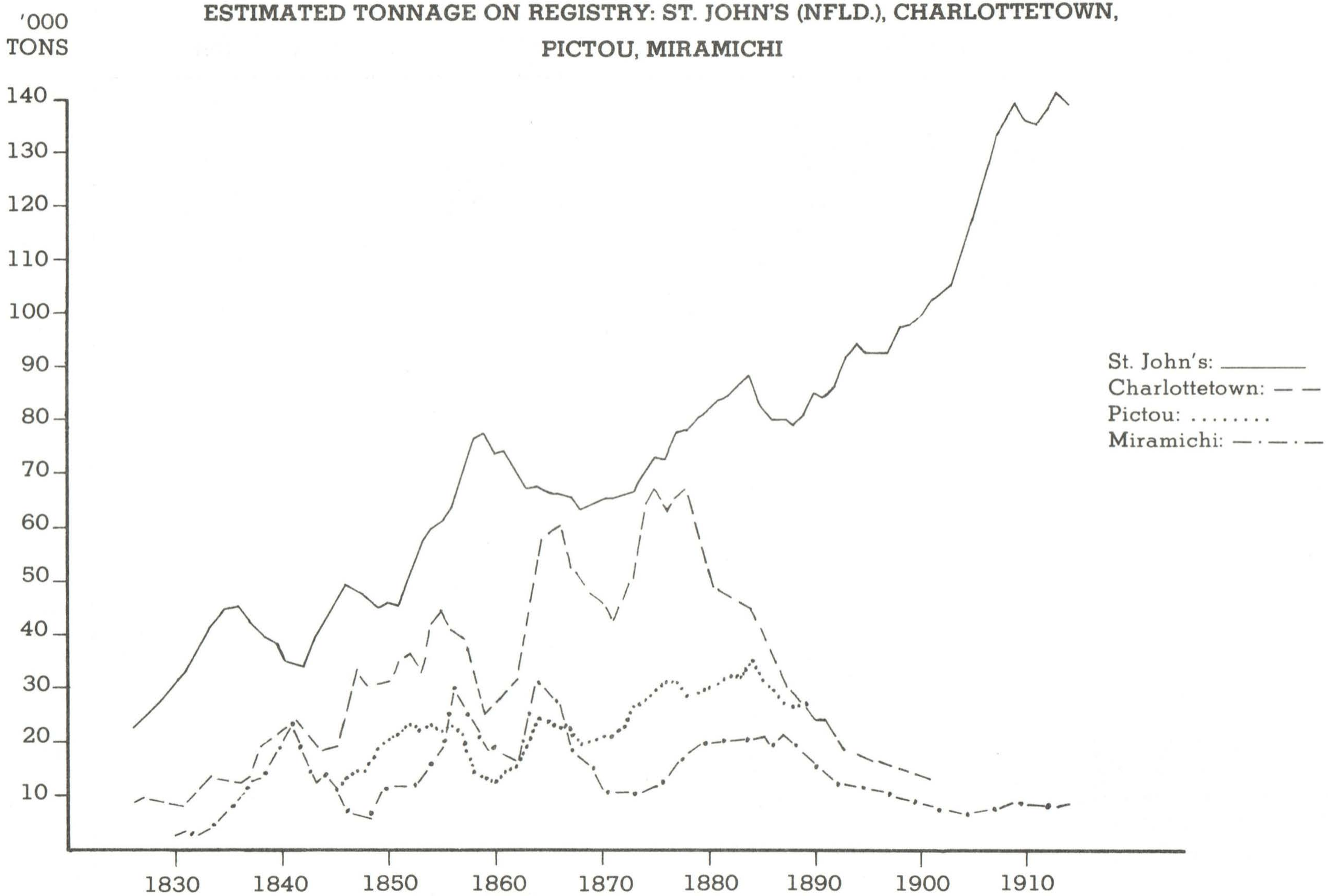
ESTIMATED TONNAGE ON REGISTRY: SAINT JOHN, YARMOUTH HALIFAX, WINDSOR, CHARLOTTETOWN



Source: B.T. 107/108 vessel registries.

FIGURE 2

ESTIMATED TONNAGE ON REGISTRY: ST. JOHN'S (NFLD.), CHARLOTTETOWN, PICTOU, MIRAMICHI



Source: B.T. 107/108 vessel registries.

the industry was linked first to demand for coastal traders to serve the growing populations of outport communities, and over a third of new tonnage before 1860 consisted of coastal traders. The rise of our industry was also linked to specific trades originating in British North America: the timber trade and the West Indies trade are the most prominent of these. From these roots in the Canadian "home trades" our shipping horizons expanded, until by the 1860s and 1870s we were fully involved in North Atlantic and world trades, and the link with our domestic trades had weakened, if not disappeared.

Neither the rise nor the decline of the Canadian shipping industry was caused by the rise and fall of British demand for Canadian-built tonnage. This is not to deny that British North America was an important supplier of vessels in the British market.[6] But if we are to understand the patterns of investment in shipping in these colonies we must look beyond the British market. Even in P.E.I. only sixty-nine percent of tonnage put on registry was transferred elsewhere, and between 1840

TABLE 1

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 (P.E.I.)	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 (Newfoundland)	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%
U.K. (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 in 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: B.T.107/108 vessel registries; B.R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), Transport 1 and 2, 218-222.

and 1889 only fifty-seven percent of transferred tonnage went to Britain.[7] In all transfer-trade ports colonial demand was of more than marginal importance. In Miramichi sixty percent went to other British North American ports.[8] The local market was particularly important for vessels built in Pictou and P.E.I. In the 1840s 41.5 percent of all transfers from Pictou went to British North America; local and particularly Newfoundland markets remained important in the 1850s.[9] In the 1840s and 1850s thirty-three percent of all transfers from P.E.I. went to British North American ports.[10] In P.E.I. and Pictou especially there was a tendency to maintain vessels on registry for longer periods before transferring them; often this resulted from the failure of new British owners to re-register their purchase immediately, but it also reflected the tendency of local owners to run the vessels on their own account. This tendency to delay the transfer of vessels helps to explain the growth of the local fleets, especially in P.E.I.

What then determined the pattern of investment in shipping in Atlantic Canada? Although this was not a monolithic industry, it is clear that shipowners were responding to common influences in the international trading system, especially where ocean-going tonnage was a large proportion of the fleet in service. A glance at Figures 1 and 2 suggests that there was a similar pattern of growth and decline, particularly in Saint John, Yarmouth, P.E.I. and Halifax (and the similar pattern is even more evident in Halifax if vessels wholly-owned outside Halifax County are excluded, in order to remove the effect of fluctuations caused by the opening of new ports of registry in Nova Scotia). Correlation analysis confirms that the overall pattern was similar in these ports (Table 2). Three fleets do not follow the general pattern so closely: those of St. John's, Miramichi, and Windsor. In St. John's local demand for coastal and fishing vessels determined the pattern; in Miramichi the decline of the transfer trade from the mid-1860s was

TABLE 2

CORRELATION COEFFICIENTS BETWEEN TONNAGE ON REGISTRY IN MAJOR PORTS, 1840-1889

	Saint John	P.E.I.	Yarmouth	Halifax	Windsor	Nfld.	Pictou	Miramichi
Saint John		+.84	+.95	+.83	+.48	+.37	+.81	+.35
P.E.I.	+.84		+.71	+.86	+.01	+.01	+.61	+.36
Yarmouth	+.95	+.71		+.75	+.67	+.53	+.86	+.24
Halifax	+.83	+.86	+.75		+.20	+.03	+.53	+.05
Windsor	+.48	+.05	+.67	+.20		+.73	+.63	-.06
Nfld.	+.37	+.01	+.53	+.03	+.73		+.52	+.05
Pictou	+.81	+.61	+.86	+.53	+.63	+.52		+.25
Miramichi	+.35	+.36	+.24	+.05	-.06	+.05	+.25	

Source: B.T. 107/108 vessel registries.

followed by only minimal investment in ocean-going vessels, and coastal and fishing vessels thereafter determined the pattern; in Windsor the decline of investment in ocean-going vessels was delayed by about thirteen years.

It is not surprising that most of the coefficients in Table 2 should be positive, since the common upward trend in the early decades easily produces such a result. The analysis of gross investment, or gross physical capital formation, confirms that there were common patterns followed by most fleets, and particularly by those with a large proportion of ocean-going tonnage. We have noted elsewhere the high correlation between gross investment in the United Kingdom in the early nineteenth century and gross investment in Saint John, Yarmouth, Halifax and P.E.I.[11] In some cases the close fit between these time series might be explained by the direct influence of British demand. But a closer analysis of the Canadian and British patterns suggests again that we must not attribute too much to the influence of the British market. Table 3 presents correlation coefficients for annual *changes* in new tonnage in B.N.A. ports and annual changes in sailing tonnage built and first registered in the United Kingdom.[12] Coefficients are given for each of the major cycles in gross investment; Newfoundland is excluded since we already know that its pattern of investment was unrelated to the British pattern. There is a close fit between the Canadian and British patterns in the first two and the fourth cycles (note particularly the coefficients for the sum of gross investment in seven fleets, given in the bottom row of Table 3). The close correlations between investment in P.E.I. and Saint John and

TABLE 3

CORRELATION COEFFICIENTS BETWEEN ANNUAL CHANGES IN GROSS PHYSICAL INVESTMENT IN SELECTED PORTS AND ANNUAL CHANGES IN SAILING TONNAGE BUILT AND FIRST REGISTERED IN THE UNITED KINGDOM

	Cycle 1	Cycle 2	Cycle 3		Cycle 4	Cycle 5 & 6
	1820-30	1830-43	1843-53	1843-58	1858-69	1869-87
Saint John	+.82	+.59	+.67	-.25	+.64	-.25
P.E.I.	+.69	+.73	+.48	-.16	+.65	+.40
Yarmouth	—	—	+.51	+.52	+.69	-.05
Halifax	+.13	+.47	+.53	+.07	+.51	-.13
Windsor	—	—	—	-.32	+.36	-.04
Pictou	—	—	+.19	-.18	+.57	-.04
Miramichi	—	+.36	+.22	+.05	+.79	+.30
Total (7 ports)	+.73	+.69	+.61	-.14	+.78	+.01

Source: B.T.107/108 vessel registries; Mitchell and Deane, *Abstract of British Historical Statistics,* Transport 2, 220-22. Compare, however, the correlations in R.O. Goss, "Economics and Canadian Atlantic Shipping," *this volume;* but note that here we are correlating annual changes or first differences.

investment in the U.K. continued into the third cycle, but broke down between 1853 and 1858. It is at first sight a surprise to find that the coefficients are relatively low for Pictou and Miramichi, and relatively high for a non-transfer trade port such as Yarmouth. But the effect of local demand, and particularly demand from Newfoundland, is to steepen both upward and downward trends in the transfer-trade ports in cycle three, and so to weaken the relationship with the international shipping cycle. Except in the mid-1850s investment in all ports was synchronized with the British pattern until 1869, and this applies to both the transfer-trade ports and to ports from which relatively few vessels were transferred. Clearly direct British demand was not the only factor determining the pattern of investment in British North America. In fleets with a large proportion of ocean-going vessels (especially Saint John, Yarmouth, P.E.I., and Halifax) investors were responding to the same demands for carrying capacity which influenced British investors. They were responding in parallel fashion to opportunities particularly in North Atlantic trades.

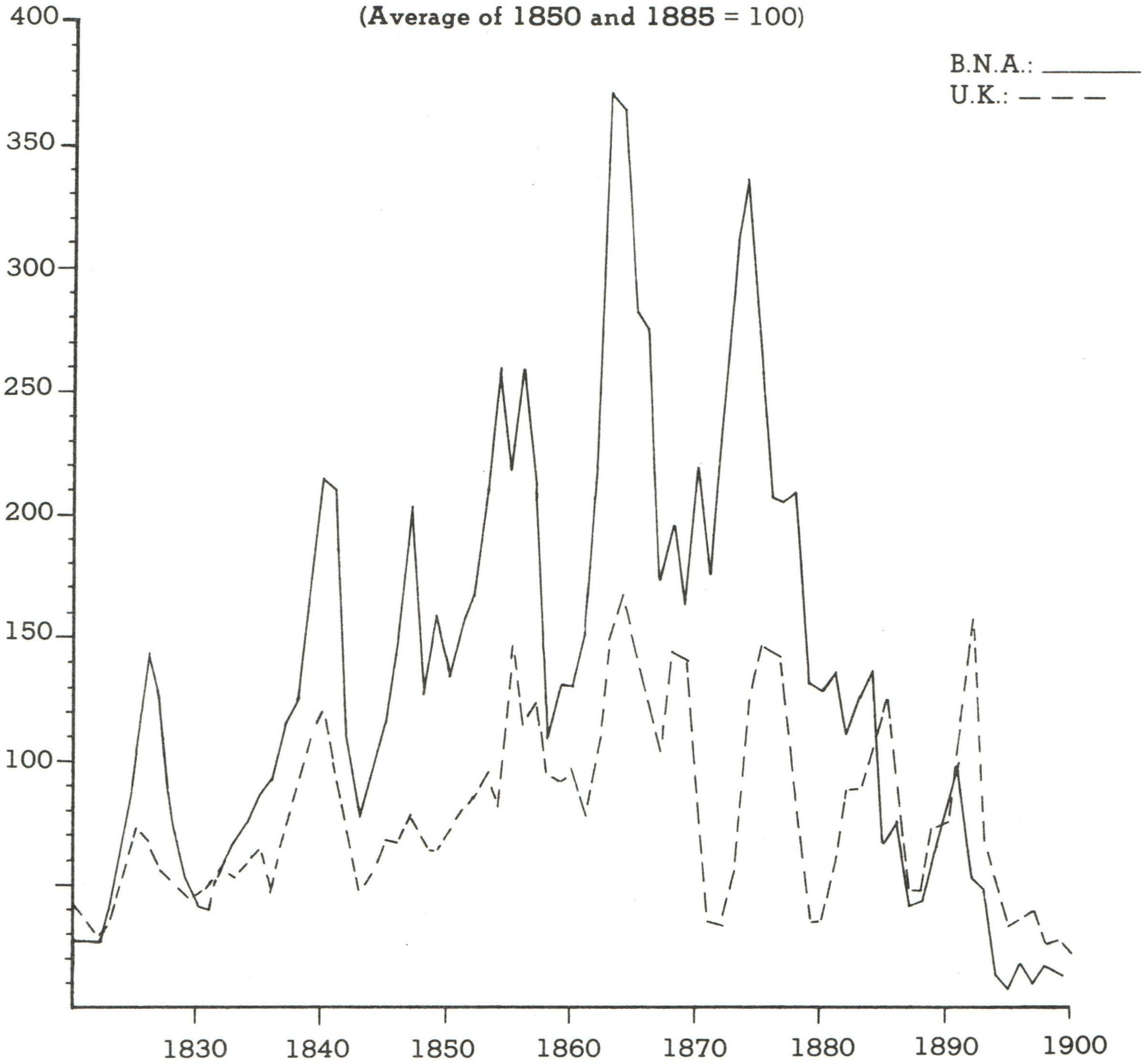
The Maritimes was therefore established as a region of shipbuilders and shipowners well before mid-century, and its shipping industry was already part of the North Atlantic trading system. To understand the pattern of investment in shipping we must still make a distinction between transfer-trade shipbuilding centres (especially those in the Gulf of St. Lawrence) and the more purely shipowning centres: in the former places the peaks of the 1870s were much flatter than they were in Saint John, Yarmouth, Halifax and Windsor. But we cannot make too much of this distinction, since shipowning occurred in all ports, and since the rise and decline of the transfer trade tells us little about the rise and decline of our shipowning industry. An equally important distinction can be made between places such as Newfoundland, where builders and owners specialized in serving the local coastal trades and fishing industries, and places such as Saint John and Windsor, where builders and owners specialized almost exclusively in providing ocean-going tonnage. Where the former specialty predominated the pattern of growth and decline was least influenced by factors in the international trading system, and the demise of the wooden sailing ship could be delayed until the twentieth century. Even this distinction should not be pressed too far, since specialization by type of vessel was not a regional phenomenon. In most ports the building and owning of coastal vessels overlapped with the building and owning of ocean-going vessels. But the concentration of some shipowning centres on investment in ocean-going vessels was critical to the rise and decline of the industry as a whole: for it was the rapid decline of investment in ocean-going tonnage in five major ports of registry which put an end to the eastern Canadian shipping industry in the 1880s and 1890s.

While noting the coincidence between Canadian and British investment patterns before 1869, it is equally important to note how far Canadian investment departed from the British pattern in the last cycles, after five decades of fairly close congruence. Figure 3 describes in broad outline what happened. In this Figure we present an index of new investment in shipping tonnage in seven fleets (excluding Newfoundland), giving equal weight to each fleet in the final index (we do this in

FIGURE 3

INDECES OF GROSS PHYSICAL INVESTMENT IN BRITISH NORTH AMERICA AND OF SAILING TONNAGE BUILT AND FIRST REGISTERED IN THE U.K.

(Average of 1850 and 1885 = 100)



Source: B.T. 107/108 vessel registries; B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), Transport 2, 220-2.

order to describe the pattern of investment across all fleets; the sum of new tonnage in all fleets might have been used here, but it would reflect mainly the pattern of investment in Saint John, because of the size of that fleet). Figure 3 also presents an index of new sailing tonnage in the United Kingdom, using the same base as for the composite Canadian index. Some of the distinguishing features of the Canadian industry are readily apparent: the cycles are more pronounced, and the variation from the mean annual investment in each cycle was larger than in the British fleet, with its slower but more steady rate of growth. The broad coincidence between the two series before 1869 is obvious; thereafter the cycles disappear from the Canadian index, and the decline was much more steep than it was in the U.K. (from 1874 to 1899 the Canadian index declines at an annual rate of 11.1 percent, compared to 3.8 percent for the U.K. index). The decline in capital stock or fleet size (5.7 percent a year to 1899) was much less steep than the decline in gross investment, since Canadian shipowners did not rush to sell off newly-purchased vessels, but ran them for whatever they could earn even in the 1880s. Further analysis suggests, however, that this failure to replace depreciating assets did not occur uniformly across all ports. Not only did the patterns of capital formation in Atlantic Canada fall out of step with the British pattern; they also fell out of step with each other. After 1869 each port's gross investment series deviates further from the seven-fleet index presented in Figure 3. If we were to correlate annual changes in new tonnage in each port with annual changes in the overall index, we should expect to find strong positive results, since we are in effect correlating the index with its seven sub-sets. The coefficients are indeed strongly positive, but only until the mid-1870s (once again Miramichi and Windsor are least synchronized with the others, confirming the impression given by Table 2). After 1877 all coefficients fall, and three fleets — those of Saint John, Halifax and Miramichi — no longer correlate significantly even with the index in which they have equal weight.[13]

These results prompt the following conclusions. First, there remained opportunities, even for sailing vessels, which British shipowners seized after the 1860s but Canadian shipowners did not. While the general demand for ocean-going tonnage in the North Atlantic exercised a common influence across all ports during the rise of our industry, after about 1870 Canadian investors were being influenced by factors quite different from those which influenced British investors. Furthermore, the rate and timing of the decline in investment was different from one port to another; and in one port, Windsor, shipowners continued to expand their stock of vessels until 1891. It was not the absence of opportunities, even for wooden sailing vessels, which prompted the disinvestment in shipping in ports other than Windsor. If investors in other ports were no longer tempted to pursue opportunities in shipping, we must conclude that other opportunities had captured their interest, or the interest of their sons. Whatever those other opportunities were, they were likely to differ between ports, since there was no single pattern of disinvestment. It is the argument of this essay that the critical factor influencing the decision to withdraw from shipping was the existence of investment opportunities in the port cities of Atlantic Canada and elsewhere. These opportunities differed in their timing and impact, but their effect was to

increase dramatically the opportunity costs of investment in shipping. It remains our task to discover what those opportunities were. At this point our analysis of an international maritime industry merges with our analysis of its landward base.

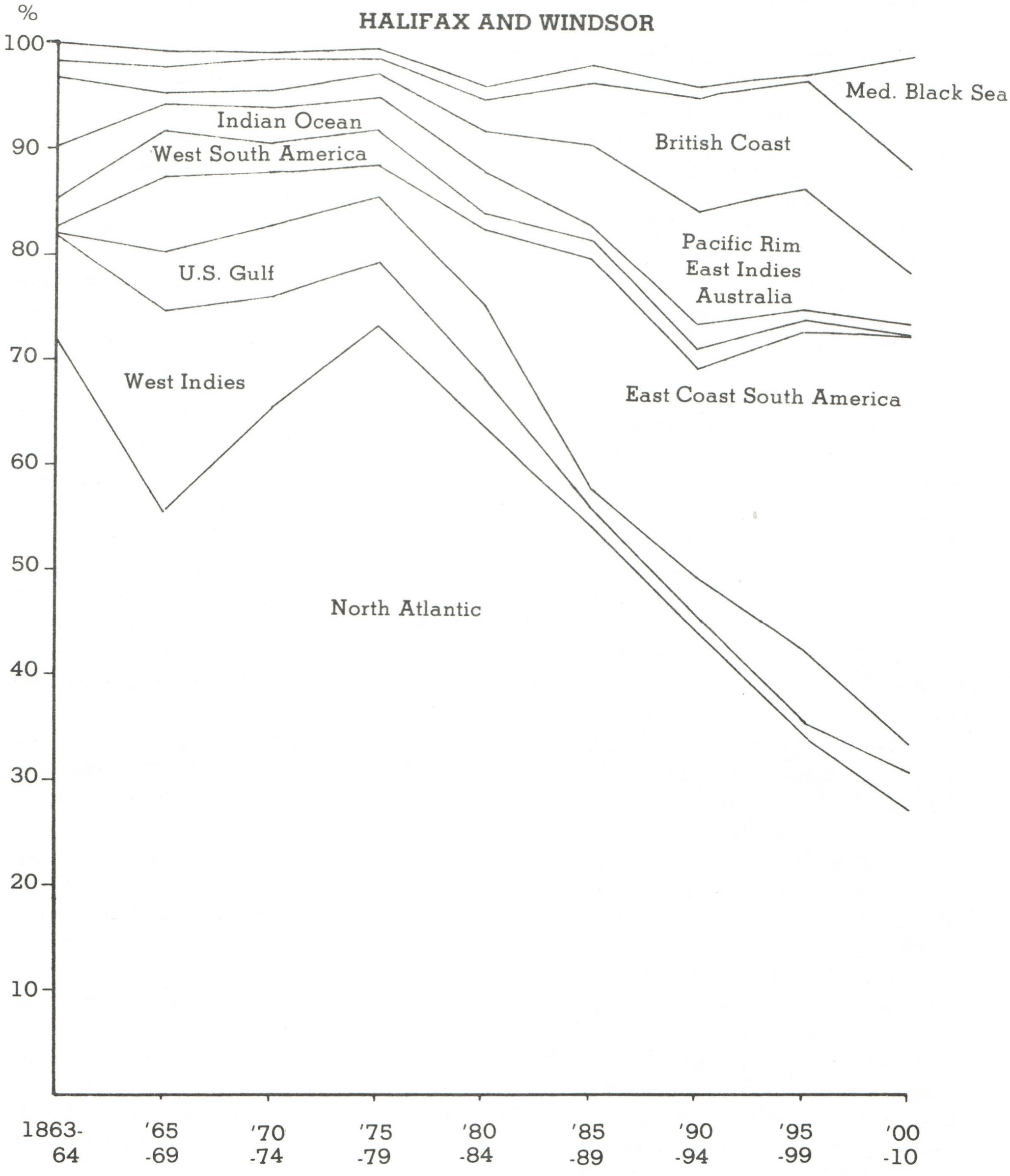
While emphasizing the effect of landward opportunities, we do not deny the role of international factors as they affected the decline of our industry. Of critical importance to the investment decisions of Canadian shipowners was the shifting demand for and supply of carrying capacity in North Atlantic trades. Canadian vessels were always heavily committed to the trade in bulk commodities between North America and Britain or Europe. The two final peaks in gross investment in shipping occurred in 1863 and 1874; both peaks followed immediately after peaks in freight rates in the North Atlantic. Analysis of the Crew Lists for our major fleets suggests how important were the North Atlantic trades for Canadian shipping by the 1860s. Figure 4 depicts the proportion of voyages in various trades by the fleets of Saint John, Yarmouth, Halifax and Windsor. There were differences in voyage patterns between these fleets, but in each fleet the majority of voyages were in the North Atlantic until the late 1880s. There was a significant shift towards the South American, East Indian and Pacific trades in the 1880s and 1890s, and also some movement of rapidly diminishing fleets into British coastal trades. This shift into long-distance trades was one means of preserving the life of the industry, but it is worth noting that the Windsor fleet, which departed furthest from the pattern of other fleets by expanding until the early 1890s, did not survive because Windsor shipowners had found a new and unique salvation in long-distance trade routes. In fact Windsor vessels were more committed to the traditional North Atlantic trades than were other fleets — even in the 1890s over fifty percent of voyages by Windsor vessels were in the North Atlantic. Windsor's shipowners, it appears, were more satisfied with the diminishing returns earned by wooden sailing vessels in the North Atlantic trades.[14]

Even within the North Atlantic Canadian fleets depended on a narrow range of staple trades. By the 1860s Canadian shipping was no longer serving Canadian staple trades. Instead our fleets carried grain, tobacco, petroleum and cotton from American ports to Britain and Europe.[15] Analysis of entrances into port by the large sample of voyages by Yarmouth vessels has suggested how far the net growth of all entrances into port depended on American-European trades: ninety-eight percent of the growth of entrances before 1879 was accounted for by ports in the U.S.A., Europe, and the U.K.; in the 1880s the same regions contributed almost as much to the net decline in world entrances.[16] Having convinced ourselves of the importance of American export trades for Canadian shipping, we constructed an index of sailing ship freights from American ports between 1855 and 1886. We took the sum of ocean-going tonnage newly-added to four major fleets (Saint John, Halifax, Yarmouth and P.E.I.) and correlated annual changes in the freight rate index with annual changes in gross investment in ocean tonnage. The high coefficients of determination (+.61 in the 1870s and +.67 in the 1880s) were no surprise, and suggested to us that the decline in freight rates might largely explain the decline of our shipping industry.[17]

This was, however, a preliminary and simplistic answer, and we cannot

FIGURE 4

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.

conclude that "over 60% of changes in investment in ocean-going rigs may be accounted for by changes in sailing ship freights from American ports...."[18] We have yet to deal with the anomaly of Windsor, where declining freight rates did not seem to deter investors to the same extent. Besides, other national fleets survived the period of depressed freight rates, and some, such as the British and the Norwegian, even expanded in the 1880s. Furthermore, the steep decline in gross investment in most Canadian ports was faster than the decline in freight rates would appear to have justified. Since this was a period of price deflation the decline in gross freights in real terms, even for sailing ships, was much less steep than the decline in investment: our sailing ship freight rate index declined by a little over four percent a year in real terms between 1873 and 1886, whereas gross investment in shipping tonnage declined by eleven percent, and investment in ocean-going tonnage declined by seventeen percent a year.[19] We know from other evidence that major costs of vessel operation — particularly the cost of vessels and the wage bill — were declining in this period.[20] The decline in freight rates was a necessary but hardly a sufficient condition for the decline of the Canadian sailing ship industry.

To some the decision to withdraw from the wooden sailing ship industry in the 1880s may appear to be simply rational calculation, given the apparent obsolescence of the wooden sailing ship and the competitive advantages of steamers. Indeed, arguing with the benefit of hindsight the decision to deploy wooden sailing vessels even in the 1870s, in trades soon to be overwhelmed by iron and steam, may seem a short-sighted gamble and a regrettable diversion of capital and entrepreneurial effort into an industry of short-term value to the Maritime provinces.[21] But these are the arguments of hindsight. We must remember that shipowners were businessmen, not economists, social engineers or romantics. They were not planning the economic future of the Maritimes in Confederation. They were making profits in a business which they understood thoroughly and in which many had worked for two or three generations. If they continued to invest in wooden sailing vessels in the 1870s, it was because they made money by doing so. If shipowners in Windsor continued to invest in shipping in the 1880s, it was because experience told them to expect a positive rate of return and a rapid amortization of the investment.

There are good reasons for believing that rates of return in this industry were high in the 1860s and 1870s, and that they remained positive even in the 1880s. In our analysis of data from Crew Lists we have discovered several indications of improved productivity in our fleets between the 1860s and the 1880s. These improvements must have helped Canadian shipowners to maintain rates of return even when freight rates were failing. Vessels depreciated less quickly over time, as the average life of all classes of vessel increased. In all fleets there was a substantial increase in mean tonnage from one decade to the next. 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 across the North Atlantic leads inescapably to the conclusion that passage times were shortening,

and that sailing speeds were increasing between the 1860s and 1880s. At the same time significant improvements were recorded in turn-around times between the end of one voyage and the beginning of the next, and in port times during a voyage.[22] Man-ton ratios declined rapidly between the 1860s and 1880s, and in the Yarmouth fleet at least there was a considerable saving in the total wage bill between the same decades.[28] There is little doubt that great efforts were being made to maintain vessel productivity. Robin Craig has suggested that these improvements may reflect the "time horizon" of owners of 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."[24] Whatever the reasons for these changes, it is clear that shipowners were making strenuous efforts to sustain vessel profitability. These improvements in productivity lend credence to David Alexander's measurement of real gross output in shipping by the formula

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

where $\overline{GO}$ is the rate of growth of gross output, $\overline{REV}$ is the rate of growth of entrances into port with an adjustment for entries in ballast, $\overline{SV}$ is the rate of growth of average vessel size, and $\overline{FRW}$ is the rate of growth of freight rates deflated by a Canadian import price index. Gross output per vessel is estimated by

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

where $\overline{FL}$ is the rate of growth of the number of vessels in the fleet.[25] The results (Table 4) suggest that a very high growth of output occurred in all three ports well into the 1870s. In the 1880s the decline in total output was steep only in Halifax, and the fleets of Saint John and Yarmouth continued to experience gains in output per vessel. It seems likely that a diminishing number of vessels could be maintained in profitable employment even in the 1880s.

Canadian shipowners did not withdraw from the shipping business because they were losing money. Technological obsolescence does not explain the decline of the shipping industry, but merely begs the question: since Canadian shipowners were making money in shipping, and since they possessed the capital to invest in iron steamships, why did they not do so? If our estimates of returns for the Saint John fleet are at all accurate, shipowners in Saint John could have replaced their sailing ships with iron steamers if they had chosen to do so.[26] They have not told us why they made the choices they did, although a more thorough search through non-quantifiable sources may bring to light some of their thoughts on the matter. We must first reconstruct as carefully as possible the economic environment in which their investment choices were made. If the decline in freight rates was a necessary condition for the decision to withdraw from shipping, the sufficient condition was the increasing range of investment opportunities available to businessmen in the Maritimes during the period of declining freight rates. In 1979 David Alexander compared growth rates to output in shipping with growth rates of output in Canada's major industries in the 1870s and 1880s. He concluded that "a reversal of investment opportunities" had occurred between the 1870s and 1880s, particularly with the policy of heavily protected

industrialization introduced in Canada at the end of the 1870s. Growing market opportunities in landward sectors meant that it was perfectly sensible for shipowners to shift their investments into various landward enterprises.[27] We are now able to refine this tentative explanation for the decline of the shipping industry.

The analysis of major shipowners in the Maritimes undertaken by Gerry Panting suggests that shipowners were attracted by particular opportunities in Nova Scotia and New Brunswick, and even by opportunities within the urban centres in which they resided.[28] The argument about the reversal of investment opportunities must be tested by comparing growth rates in shipping with the growth of market opportunities and capital investment in these provinces and even in particular counties. The results presented in Table 5 and 6 tend to confirm that a shift in investment opportunities between maritime and landward sectors did occur, and that the opportunity costs of continued investment in shipping must have increased dramatically in the 1880s. In the 1870s estimated real gross output in shipping in Halifax and Yarmouth grew as fast as, or faster than, real output in industry in Nova Scotia (compare Tables 4 and 5). In the same decade output in shipping in Saint John grew significantly faster than did output in non-marine industries in New Brunswick. In the 1880s this situation was reversed: in

TABLE 4

ESTIMATED GROSS OUTPUT AND PRODUCTIVITY IN SHIPPING

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%

Productivity (output per vessel)

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

Saint John:	1869-77:	+3.9%	1878-90:	+6.1%
Yarmouth:	1869-79:	+4.1%	1879-90:	+5.8%
Halifax:	1866-76:	+3.0%	1877-90:	-0.7

Source: B.T. 107/108 vessel registries; 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. For Saint John and Yarmouth the Isserlis freight rate index was used; for Halifax, our own sailing ship freight rate index, which correlates closely with the Isserlis index. Freight rates were deflated by the Taylor Canadian import price index. In deflating total entrances to produce $\overline{REV}$ we assume, very conservatively, that vessels entering British or European ports were fully laden, but that only seventy-five percent of North American entrances in 1863 were fully laden, and that this proportion fell at a constant rate to only ten percent in 1890. See David Alexander, "Outport and Productivity in the Yarmouth Ocean Fleet, 1863-1901," in Alexander and Ommer (eds.), *Volumes Not Values* (St. John's, 1979), 86-90.

TABLE 5

GROWTH RATES IN INDUSTRY AND IN SHIPPING, 1870-1900[1]

	Capital Invested	Value of Products	Value Added	Tonnage in Service
		A. 1870-1880		
NOVA SCOTIA	+6.5%	+5.7%	+4.3%	+2.9%[2]
Halifax City	+5.1	+7.7	+3.3	-1.6
Yarmouth Co.	+1.5	-1.0	+0.5	+5.5
Hants Co.	-4.2	+2.6	+2.4	+3.4
Pictou Co.	+2.9	+2.2	+0.4	+3.6
NEW BRUNSWICK	+4.6	+1.9	+0.8	+3.9[2]
Saint John Co.	+7.0	+0.5	-1.6	+2.4
Northumberland Co.	+8.8	+10.0	+9.1	+4.6
Charlotte Co.	-5.1	-3.9	-2.1	+1.5[2]
Westmorland Co.	+9.2	+9.8	+6.0[2]	(-2.3)[3]
		B. 1880-1890		
NOVA SCOTIA	+7.9	+6.4	+7.2	-1.7[2]
Halifax City	+9.9	+3.7	+4.0	-5.7
Yarmouth Co.	+11.3	+13.8	+10.1	-4.9
Hants Co.	+17.8	+9.0	+10.1	+2.2
Pictou Co.	+12.4	+10.8	+13.0	-1.5
NEW BRUNSWICK	+7.5	+3.6	+5.4	-4.6[2]
Saint John Co.	+4.7	+4.0	+6.5	-4.3
Northumberland Co.	+4.3	-0.9	-2.1	-2.5
Charlotte Co.	+21.2	+9.1	+9.3	+13.5[2]
Westmorland Co.	+8.4	+2.6	+5.0	-10.0[3]
		C. 1890-1900		
NOVA SCOTIA	+6.3	-1.6	-2.4	-6.9[2]
Halifax City	+3.0	+0.3	-1.1	-8.0
Yarmouth Co.	+2.4	-0.2	-7.6	-12.5
Hants Co.	-1.0	-7.7	-7.6	-7.7
Pictou Co.	+5.1	-1.9	-1.0	-4.3
NEW BRUNSWICK	+3.5	-0.4	-0.2	-9.3[2]
Saint John Co.	+3.0	-1.4	-0.6	-9.8
Northumberland	+6.5	+3.2	+6.4	-5.0
Charlotte Co.	+3.9	+1.0	+1.7	n.a.
Westmorland Co.	+1.3	-3.4	-1.7	n.a.

continued

TABLE 5 (continued)

1. All growth rates calculated from end-point ratios. In order to approximate growth rates in landward industry, ship construction has been excluded from the totals. In the 1871 and 1881 *Census* there is a single category for "Capital Invested;" in the 1891 and 1901 *Census* Capital is broken down into "Fixed" and "Working." It appears that "Capital Invested" in 1871 and 1881 included both fixed and working capital: see *Census of Canada,* 1891, Bulletin No. 8, "Manufactures", 9. O.J. Firestone assumed that the 1871 and 1881 figures included both fixed and working capital: Firestone, *Canada's Economic Development 1867-1953* (London, 1958), 321. All values from which growth rates are calculated are constant 1935-39 dollars; census figures have been deflated by the Canadian wholesale price index J34 in M.C. Urquhart and K.A.H. Buckley, *Historical Statistics of Canada* (Cambridge, 1965), 294.

2. Calculated from official figures given in Canada, *Sessional Papers.* The port of registry in Charlotte County was St. Andrews.

3. In the absence of substantial shipowning in Westmorland County growth rates here are for ship construction, as given in the Census.

Source: B.T. 107/108 vessel registries; Canada, *Census,* 1871, 1881, 1891, 1901.

both provinces the growth rates of industrial output accelerated, while estimated gross output in shipping turned negative. In the 1870s investment in wooden sailing vessels made good sense, since the demand for carrying capacity and the relatively low cost of the wooden vessel ensured a rapid amortization of the investment. At the same time there were equally sound reasons for not investing in iron steamers, since the initial capital cost was high, amortization might require a long-term commitment, and in any case the local street-car company seemed to be offering a comparable rate of return. By the 1880s the reversal of opportunities was complete. The rapid growth of total output and of value added in New Brunswick, and the sustained growth of the initially smaller industrial complex in Nova Scotia in both the 1870s and 1880s, suggests that shipowners were being presented with a plethora of attractive options in their own communities. This does not mean that shipowners always shifted capital directly into manufacturing industry. Many did invest in industry, but as Professor Panting has pointed out, shipowners tended to move into banking, financial services, transportation and other parts of the tertiary sector. They were nevertheless seizing opportunities generated within a rapidly expanding industrial economy.

Analysis of industrial growth in counties where ports of registry and major shipowners were located suggests that shipowning usually declined most rapidly where the growth of landward industries was fastest. Counties included in Tables 5 and 6 are those with major fleets on registry, as well as Westmorland, the second largest ship-building county in New Brunswick in 1870. Figures on "Capital Invested" in the Canadian *Census* must be treated cautiously, since it is not clear what was being reported to census-takers.[29] We present these figures only as indications of general trends across decades. If there was some consistency to the reporting of capital investment from one Census to the next, then most shipowning counties experienced a significant growth of industrial capital in the 1880s

TABLE 6

GROSS VALUE OF PRODUCTION PER CAPITA (Constant Dollars)[1]

	Halifax Co.		Hants. Co.		Yarmouth Co.	
	GVP/ capital	Growth rate	GVP/ capital	Growth rate	GVP/ capital	Growth rate
1871	91.0	—	49.2	—	51.6	—
1881	151.1	+5.2%	54.0	+0.9%	44.5	-1.5%
1891	204.1	+3.1%	109.2	+7.3%	119.2	+10.4%
1901	194.6	-0.5%	57.4	-6.2%	112.9	-0.5%

	Pictou Co.		Saint John Co.		Northumberland Co.	
	GVP/ capital	Growth rate	GVP/ capital	Growth rate	GVP/ capital	Growth rate
1871	49.7	—	199.0	—	58.8	—
1881	57.0	+1.4%	201.1	+0.1%	113.9	+6.8%
1891	153.2	+10.4%	307.9	+4.4%	101.7	-1.1%
1901	130.1	-1.6%	256.2	-1.8%	124.9	+2.1%

	Charlotte Co.		Westmorland Co.	
	GVP/ capital	Growth rate	GVP/ capital	Growth rate
1871	72.1	—	58.9	—
1881	47.0	-4.2%	107.1	+6.2%
1891	122.0	+10.0%	124.2	+1.5%
1901	143.3	+1.6%	86.3	-3.6%

	Nova Scotia		New Brunswick		Canada	
	GVP/ capital	Growth rate	GVP/ capital	Growth rate	GVP/ capital	Growth rate
1871	39.9	—	76.2	—	75.4	—
1881	58.7	+3.9%	80.3	+0.5%	99.9	+2.9%
1891	102.7	+5.8%	110.6	+3.3%	144.8	+3.8%
1901	82.3	-2.2%	101.5	-0.9%	174.3	+1.9%

1. All figures are for value of industrial products, including marine industries. Values are in 1935-39 dollars, census figures having been deflated with the wholesale price index J34 in Urquhart and Buckley, *Canadian Historical Statistics*.

Source: Canada *Census, 1871, 1881, 1891, 1901*.

particularly. In both provinces, and in six of eight counties, the growth of industrial output and value added accelerated rapidly between the 1870s and 1880s. The exceptions, Northumberland and Westmorland, do not disprove but rather confirm the inverse relationship between landward opportunities and maritime investment: the Inter-Colonial Railway passed through both counties, and both counties experienced unusually rapid industrial growth in the 1870s. Opportunities for investment in mining, industry and services may well have contributed to the early decline of the shipping and shipbuilding industries in these counties, as well as in Pictou.[30] In these counties the decline of shipbuilding was not followed by the growth of substantial ocean-going fleets; the positive growth rates for shipping in Pictou and Miramichi in the 1870s should not obscure the fact that businessmen in these counties shunned the international carrying trades (see Figure 2). The only other shipowning centre experiencing early decline was Halifax, and again the pattern holds: in the 1870s there was a very rapid growth in all landward sectors of the urban economy. These results tend to confirm the argument about shifting opportunities, but they also suggest that the introduction of the National Policy tariffs may not have been the critical watershed, since in some counties landward opportunities were growing well before the late 1870s.

By the 1880s all shipowning centres were experiencing a rapid shift of capital and output away from the maritime sector. Only in Windsor did investment in shipping continue, and this phenomenon remains unexplained. Hants County was, however, relatively less developed industrially, as Table 6 suggests, and its population was declining in the 1880s. In these circumstances the rate of return in shipping may not have seemed derisory; and the local gypsum trade, which expanded in the 1870s and 1880s, may have created its own demand for carrying capacity. By the 1880s shipowning counties (except Northumberland) were industrializing rapidly, and as Table 6 suggests their gross output per capita was above the provincial average by 1890, if not before. Shipowners were well situated to lead or to follow this movement of capital and resources, for we know that they began to diversify their investments well before the 1880s. Already they were involved in banking, insurance, wholesaling and retailing, mining, utilities and transportation. They did not suddenly exchange seaward for landward portfolios in the 1880s; instead they allowed their landward assets to increase relative to their maritime assets, and it was easy for them to do so. The sailing ship industry, with its high rates of depreciation, was a perishable asset, and in two decades the failure to replace depreciating vessels reduced the industry to insignificance.

The Maritime provinces failed to become the industrial workshop of Canada, and the failure began in the 1890s. Tables 5 and 6 suggest that the process of industrialization was almost arrested (although there was a modest recovery in the early 1900s), and that returns on investment must have disappeared in many industries.[31] This does not mean that industrialization was a mistake. It suggests, however, that the policy of heavily protected industrialization, designed as it was to guarantee industrial growth in Central Canada, encouraged Maritimers to

divert capital and resources into more than a few unproductive sectors, and to ignore the maritime industries which they knew best. The National Policy, in spite of early promises, did not apply to Canada's maritime industries. There would be massive subsidies for more than one transcontinental railway, and massive industrial protection; there would be no support for shipbuilding and no Canadian Navigation Acts. Canada would export bulk commodities across two oceans, but not in Canadian hulls. The National Policy is remarkable, not least for its omissions. But as we have seen, the old link between Canadian external trades and Canadian shipping had long since been severed. By the 1870s few Canadians thought it unnatural to load Canadian cargoes into British or Norwegian hulls. Two decades later the great wheat boom began. But even before then the demand for carrying capacity in Canadian ports was growing rapidly — by 4.5 percent a year in the 1880s and by 3.1 percent a year in the 1890s. In the early 1900s tonnage clearing Canadian ports grew by 4.2 percent a year.[32] Even if we take into account the decline in freight rates, there was still a considerable expansion of gross returns from Canadian carrying trades in these decades; in the next decade (the 1910s) opportunities mushroomed as freight rates soared. It is possible that some degree of public investment in these carrying trades might have been a better allocation of resources than investment in three trans-continental railways.

This is not a lament for the passing of the Canadian shipping industry, but a reminder that its passing was the result of choices made by businessmen and politicians. The choices were not simple ones, and it is not self-evident that our economic interests were best served by the decision to withdraw from this industry. The decline of the industry occurred in no text-book free market, but in a society where political decisions and National Policy weighed heavily in the calculation of opportunity costs. Seduced by the prospect of selling coal and cement to each other, Canadians never perceived the costs of opportunities foregone in their own carrying trades. Encouraged by an increasingly myopic national leadership, eastern Canadians starved even their fishing fleets and eventually bequeathed their fisheries to foreigners. The costs of continued investment in the maritime sector were high, and for this reason businessmen withdrew; but there were costs to their withdrawal from the maritime sector, and these costs, however difficult to estimate, should not be ignored. The greatest opportunity cost of our landward National Policy was an economic and political vision dimly realized and rapidly foregone: it was the loss of a national economic structure in which the resources and skills of the Maritimers were integrated with those of the western settlers, each serving the other in the common pursuit of international markets; it was the loss of those vital links with our European heritage which our trade and our fleets once sustained; it was the loss of the skills of those maritime entrepreneurs who did not live to see our descent into economic dependence; it was the loss of the indigenous culture of a people who lived by the sea.

NOTES

1 This paper is based on research undetaken for the Atlantic Canada Shipping Project, which is funded by the Social Sciences and Humanities Research Council of Canada and Memorial University. We gratefully acknowledge the assistance of Keith Matthews and Gerry Panting, and of the research and clerical staff of the Project. Fischer has worked on the fleets of Saint John and P.E.I.; Sager on the fleets of Halifax and Newfoundland; Ommer on the fleets of Miramichi, Pictou and Windsor. Fleet size (tonnage on registry) data for Pictou and Windsor may be subject to minor changes after further research.

2 Frederick William Wallace, *Wooden Ships and Iron Men* (London, 1924), 35; J.G.B. Hutchins, *The American Maritime Industries and Public Policy, 1789-1914* (New York, 1941), 300-1, 412; Peter D. McClelland, "The New Brunswick Economy in the Nineteenth Century" (Ph.D. thesis, Harvard University, 1966), 186.

3 C.R. Fay and Harold Innis, "The Maritime Provinces," *The Cambridge History of the British Empire* (New York, 1930), VI, 663.

4 All data on vessel registrations are taken from the Board of Trade series 107/108 vessel registries for colonial ports, contained on microfilm in the Maritime History Group, Memorial University of Newfoundland; supplemented in later years by registries contained in the Public Archives of Canada. On Newfoundland see Eric W Sager, "The Port of St. John's Newfoundland, 1840-89; A Preliminary Analysis," in Keith Matthews and Gerald Panting (eds.), *Ships and Shipbuilding in the North Atlantic Region* (St. John's, 1978), 19-39; "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), 77-95. On Saint John see Lewis R. Fischer, "The Great Mudhole Fleet: The Voyages and Productvity 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) 117-155; 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* (Toronto, 1972), 317-337.

5 Average life expectancy improved over time, however, and this was one reason for the impressive growth of capital stock. On this point and others relating to investment patterns see Eric W. Sager and Lewis R. Fischer, "Patterns of Investment in the Shipping Industries of Atlantic Canada, 1820-1900," *Acadiensis,* IX (Autumn 1979), 19-43.

6 See Richard Rice, "Measuring British Dominance of Ship-building in the 'Maritimes,' 1787-1890," in Matthews and Panting (eds.), *Ships and Shipbuilding, 109-155.*

7 Lewis R. Fischer, *Enterprise in a Maritime Setting: The Shipping Industry of Prince Edward Island, 1787-1914* (Memorial University, St. John's, forthcoming).

28 Rosemary E. Ommer, "Miramichi: A Staple Interface, 1828-1914" (unpublished paper presented to the Atlantic Conference on "Land, Sea and Livelihood", Sackville, N.B., 1979).

9 Rosemary E. Ommer, "Anticipating the Trend: the Pictou Ship Register, 1840-1889," *Acadiensis,* X (Autumn, 1980), 75-6.

10 Fischer, *Enterprise in a Maritime Setting.*

11 Correlations between sailing tonnage built and first registered in the U.K. and new tonnage registered in three major ports yields the following coefficients between 1820 and 1849: Saint John, +.82; Halifax, +.81; P.E.I., +.67. Sager and Fischer, 34.

12 New tonnage in B.N.A. ports means newly built tonnage, and tonnage transferred in from other ports.

13 Correlation of each fleet's annual changes in new tonnage with annual changes in the seven-fleet composite index yields the following correlation coefficients from registry opening to 1877: Saint John: +.74; P.E.I.: +.67; Yarmouth: +.81; Halifax: +.67; Windsor: +.63; Pictou: +.67; Miramichi: +.53. From 1878 to 1889 (Yarmouth and Pictou) or 1899 (the others) the coefficients are: Saint John: +.20; P.E.I.: +.67; Yarmouth: +.78; Halifax: +.23; Windsor: +.62; Pictou: +.52; Miramichi: -.12.

14 Rosemary E. Ommer, "'Composed of All Nationalities': The Crews of Windsor Vessels, 1862-1899," in Rosemary Ommer and Gerald Panting (eds.), *Working Men Who Got Wet* (St. John's, 1980), 193-6.

15 Keith Matthews, "The Canadian Deep Sea Merchant Marine and the American Export Trade, 1850-1890," in Alexander and Ommer (eds.), 197-243.

16 David Alexander, "Output and Productivity in the Yarmouth Ocean Fleet," in Alexander and Ommer (eds.), 75.

17 Our freight rate index was constructed from data compiled by Keith Matthews, and includes such commodities as cotton, grains, petroleum, and tobacco. The index correlates strongly with Isserlis' index: see L. Isserlis, "Tramp Shipping Cargoes and Freights," *Journal of the Royal Statistical Society* (1938), cited in B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), 224; Sager and Fischer, "Patterns of Investment," 40-2.

18 Sager and Fischer, "Patterns of Investment," 41.

19 The seventeen percent annual decline is calculated from the sum of ocean-going tonnage (brigs, barques, barquentines and ships) newly registered in Saint John, P.E.I., Yarmouth and Halifax. As mentioned earlier, total capital stock in all fleets, including Windsor, declined by 5.7 percent a year to 1899.

20 See Sager, "Labour Productivity in the Shipping Fleets of Halifax and Yarmouth, Nova Scotia, 1863-1900," in Ommer and Panting (eds.), 155-184; see also Fischer, Sager and Ommer, "The Shipping Industry and Regional Economic Development in Atlantic Canada, 1871-1891: Saint John As a Case Study," *this volume.*

21 This is one of Peter McClelland's arguments in "The New Brunswick Economy in the Nineteenth Century," 168-235.

22 Fischer, "The Great Mudhole Fleet" and Sager, "Sources of Productivity Change in the Halifax Ocean Fleet," in Alexander and Ommer (eds.), 93-155.

23 Sager, "Labour Productivity," in Alexander and Ommer (eds.), 178-82.

24 "Conference Summary," in Alexander and Ommer (eds.), 364.

25 See the note to Table 4 and Alexander, "Output and Productivity in the Yarmouth Ocean Fleet," *Volumes Not Values,* 86-90.

26 See Fischer, *this volume;* working independently Sager estimated that the Saint John fleet might have accounted for a net flow of income into Saint John of $1.3 millions a year in the early 1870s; the mean annual rate of return (earnings as a percentage of the depreciated value of the fleet) was about 20% between 1867 and 1874 (calculated from the Moran-Galloway Ledger, New Brunswick Museum).

27 Alexander, "Output and Productivity in the Yarmouth Ocean Fleet," 86-90.

28 Gerry Panting, "Cradle of Enterprise: Yarmouth, Nova Scotia, 1840-1889," in Fischer and Sager (eds.), 255-71; "Personnel and Investment in Canadian Shipping, 1820-1889," in Ommer and Panting (eds.), 335-60.

29 See Table 5, note 1.

30 Ommer, "Anticipating the Trend," 67-89; see also L.D. McCann, "The Mercantile-Industrial Transition in the Metal Towns of Pictou County, 1857-1931," *Acadiensis,* X (Spring 1981), 29-64.

31 On economic growth after 1880 see David Alexander, "Economic Growth in the Atlantic Region, 1880 to 1940," *Acadiensis,* VIII (Autumn 1978), 47-76.

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

3. THE SHIPPING INDUSTRY AND REGIONAL ECONOMIC DEVELOPMENT IN ATLANTIC CANADA, 1871-1891: SAINT JOHN AS A CASE STUDY

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Atlantic Canada Shipping Project

THE SHIPPING INDUSTRY AND REGIONAL ECONOMIC DEVELOPMENT IN ATLANTIC CANADA, 1871-1891: SAINT JOHN AS A CASE STUDY[1]

Lewis R. Fischer
Eric W. Sager
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When Howard Douglas Troop passed to his final reward in 1912, it marked the end of an era for Saint John, and indeed for the Maritimes. Along with his father, Jacob Valentine Troop, he had been a principal in developing the Troop fleet, the largest locally-owned fleet in the region in the 1870s and one of the largest ever owned in Atlantic Canada. Beginning as a grocer on the old North Market Wharf in the early 1840s, the elder Troop soon became interested in the West Indian trade. To pursue that interest, he purchased the 60-ton schooner *Kate* in 1847; this craft was the first of sixty-six vessels totalling almost twenty thousand tons in which Jacob Valentine Troop had an interest over the next quarter century. Howard Douglas entered the family business in the 1860s, and prior to his death owned 12,501 tons spread over fifty-nine vessels. Among the large vessel owners in nineteenth century Saint John, the father and son ranked seventh and fourteenth, respectively.

But Howard D. Troop was more than just another shipowner; he clearly was an innovator and an entrepreneur as well. He was one of the first owners in the region to invest substantially in steamers and steel barques. In 1881 he attempted to initiate a regular steamship service between Saint John and Liverpool. That the two steamers employed in that experiment, the *Cedar Grove* and the *Kentigern,* both were lost shortly after launching does not diminish his effort. He also used his shipping profits to invest in a variety of other activities, ranging from banking and insurance to textile mills.[2]

Troop was certainly a substantial man, well-placed in the Saint John business community in the days of "wooden ships and iron men." Yet by the time of his death, he doubtless was viewed by many as a reminder of a vanished era. The days when talk of magnificent ships and exotic-sounding ports dominated many business discussions in the city had passed; as Beth McGahan has argued, the vision which had motivated development in Saint John had switched from being "Atlantic" in orientation to "continental."[3] Even Howard Troop recognized this shift: his will revealed an interest in only one sailing vessel.

Yet he and his fellow vessel owners had once been part of a vast regional industry. Saint John alone had been the home to almost two million tons of shipping between 1820 and 1914, and over three million tons of shipping were registered elsewhere in the region over a similar period, in ports ranging from Yarmouth to Sydney and from Miramichi to Lunenburg. The men (and the occasional woman) who invested in shipping in the nineteenth century doubtless

believed that they were engaged in an important and dynamic industry. But were they?

The earliest chroniclers of the shipping industry in the region obviously thought so. Frederick William Wallace — that prodigious compiler of material relating to ships and the sea — was so certain that the contribution of the shipping industry to the economic development of the region was crucial that he merely asserted the fact as self-evident, not even bothering to take the time to offer any evidence.[4] Another analysis in 1930 by Harold Innis seemed to offer support for Wallace's optimism. Innis sifted the evidence and concluded that there was a "splendid integration" between the industry, including shipbuilding, and the local economy. The decline of the region, according to Innis, could be traced to the demise of shipping.[5]

But in recent years this conclusion has been challenged, especially by the work of Peter D. McClelland of Cornell University. In an important Harvard thesis completed in 1966, McClelland effectively refuted Innis' argument that *shipbuilding* had been a "linchpin" of New Brunswick's economy in the nineteenth century, demonstrating that there were relatively few strong linkages between that sector of the shipping industry and the developing economic system.[6] With some minor caveats, our work on the eastern Canadian shipbuilding industry would seem to confirm McClelland's argument.[7] But what about shipowning? McClelland concluded that this branch of the industry was of "negligible significance" in fostering capital accumulation and economic growth. He also argued that shipowning offered a "dubious earnings record after 1865." Finally, he suggested that shipowning was in fact akin to "gambling" with an increasingly obsolete technology, a process which led to a drain of entrepreneurial talent and investment capital away from more productive sectors, such as manufacturing. In other words, it was McClelland's contention that the shipowning industry acted as a constraint upon the growth of other local industries.[8]

In this paper we wish to focus upon McClelland's arguments concerning the profitability of the industry and its impact on the local economy. We shall also suggest in our conclusion some of the evidence available which casts doubts upon the notion that the industry was a constraint on local growth, although our research in that area has only just begun. The focus in this paper will be on shipowning, which is the primary interest of the Atlantic Canada Shipping Project. Based upon our analysis thus far — which admittedly is still preliminary and tentative — we shall argue that shipowning was a dynamic and profitable industry long after McClelland claimed its demise.[9] While the paper undoubtedly raises at least as many questions as it answers, we hope that the arguments presented here will have a positive impact upon the debate over the significance of the maritime sector to the regional economy in the nineteenth century.

In what ways did the shipping industry have an impact on the regional economy of the nineteenth century? Perhaps the most obvious contribution — and the one which we would like to focus on in this paper — was the generation of capital in the form of profits. Simple logic suggests that an industry into which

entrepreneurs invested almost $200 million in the nineteenth century must have been profitable. But how much capital was created by the industry? At present the best available estimate is McClelland's conclusion that shipping (exclusive of shipbuilding) contributed about 2.3 percent to New Brunswick's Gross Provincial Product in 1870/71 based on profits on the order of $820,000.[10]

At present, our data collection with the Project is not yet complete; thus it is impossible to estimate returns from the industry for the entire region or even to generate figures comparable to McClelland's for the province of New Brunswick. However, it is feasible to estimate the contribution made by the shipowning sector of the industry to one city, Saint John. Although the results are still far from firm, our estimates suggest that the industry was far more important to the economy than McClelland believed.

When we began our work, we had reason to believe that the industry might be of more importance than McClelland implied. From some estimates of gross output and productivity calculated for Saint John, Yarmouth and Halifax, we knew that all three ports experienced very high rates of growth of gross output in the 1870s: Saint John's growth rate was estimated at 6.8 percent, Yarmouth's at 7.4 percent and Halifax's at 5.4 percent per annum.[11] These compared favourably to Firestone's estimates of growth in Canadian GNP and gross output in manufacturing (2.4 percent and 2.9 percent per annum, respectively).[12] We also knew that gross output per vessel continued to grow in the 1880s (3.9 percent per year for Saint John, 4.1 percent for Yarmouth and 3 percent for Halifax), largely because shipowners lowered staffing requirements, increased speed, and moved to larger vessels.[13] Unfortunately, such evidence told us little about the precise impact on the economy. A new method had to be found. This is what we have attempted to accomplish in this paper.

To begin, we can examine the size of the fleet registered in Saint John (see Table 1). The fleet comprised 245,574 tons in 1871, rising to 286,690 tons in 1881 before falling to 179,165 tons in 1891. These figures differ slightly from published figures, a point which requires some elucidation. The official figures include all vessels whose registries are "officially" open in a given year. However, with large fleets, the registrar always loses track of some vessels, closing their registries years after they have actually gone out of service. Through a procedure described elsewhere,[14] we have estimated the date that such vessels actually went out of service. Hence, we believe that our estimates more accurately reflect reality than do the published statistics.

Attaching dollar figures to these investments is a procedure fraught with risks. Both McClelland and A. Gregg Finley[15] have used a figure of ten pounds sterling per ton to estimate the new value of New Brunswick shipping; both relied heavily upon a single source for their data.[16] We have compiled a time series on the value of new tonnage using a variety of sources, and this suggests that both have over-valued the cost of new shipping.[17] A more reasonable estimate would be seven pounds sterling per ton. While this may be slightly lower than the cost of vessels built in urban shipyards, over half the tonnage on registry in any given year at Saint John was built outside the city in rural areas, where building costs were

TABLE 1

PHYSICAL CAPITAL REPRESENTED BY THE SAINT JOHN FLEET, 1871-1891

(A)
ENTIRE FLEET REGISTERED AT SAINT JOHN

Year	Tons on registry at Saint John[1]	New value ($Cdn.)[2]	Depreciated value ($Cdn.)[3]
1871	245,574	8,354,427	4,898,201
1881	286,690	9,754,194	4,503,050
1891	179,165	6,095,193	2,477,879

(B)
TONS OWNED BY RESIDENTS OF SAINT JOHN CITY[4]

Year	Tons owned by Saint John residents	New value ($Cdn.)	Depreciated value ($Cdn.)
1871	219,088	7,453,373	4,501,837
1881	217,632	7,408,841	3,456,113
1891	142,744	4,856,151	1,995,392

(C)
OCEAN-GOING TONNAGE ON REGISTRY[5]

Year	Ton on registry	Tons owned by Saint John residents	New value ($Cdn.)	Depreciated value ($Cdn.)
1871	204,166	193,104	6,569,398	3,879,230
1881	256,946	207,076	7,044,726	3,356,812
1891	149,363	128,514	4,372,046	1,808,715

[1]Tons registered at registry port.

[2]New value calculated at seven pounds sterling per ton. Exchange rate calculated as one pound sterling = $4.86 Canadian.

[3]Depreciated value calculated by assuming constant rate of depreciation based upon mean registry life expectancy for all vessels except those transferred in each tonnage class for a particular decade. The values are calculated as of 1 January for each year. See the text for a further explanation.

[4]Residents of Saint John City based upon residence given on vessel registry.

[5]Ocean-going tons assumed to be the total of all vessels of 250 tons burthen and above.

Source: B.T. 107/108 vessel registries; see notes 16 and 17 and text.

lower than seven pounds. Hence, our estimate provides a more reasonable blend of actual prices than does the ten pound figure.

Sailing vessels depreciated over time, but little is known of their "real" depreciation rates. McClelland applied a depreciation rate of seven percent a year for the first five years, four percent a year for the next quinquennia, and 2.5 percent a year thereafter.[18] The few sales contracts that we have seen, however, suggest that vessels, particularly of the softwood variety, depreciated far more rapidly. But a far more important reason for feeling discomfort with McClelland's rates is that applying his formula would require twenty-eight years for vessels to depreciate to no value. Canadian softwood vessels seldom lasted that long; indeed, in the entire nineteenth century no single tonnage class of vessel ever averaged that life expectancy for even a single decade, and this is true even if we exclude those vessels which were transferred to other ports.[19] Thus it seemed more reasonable to opt for a different set of depreciations. The method chosen for this analysis, although crude and perhaps somewhat arbitrary, was to assume a constant yearly rate of depreciation based upon the calculated registry life expectancies for each tonnage class in each decade. This may result in a slight overestimation of depreciation, but since depreciation is a major cost of vessel operation, it seemed to us preferable to be conservative.[20] To see how this method works, a few illustrations may be in order. For vessels first registered in the 1870s of over 1500 tons burthen (with those transferred removed) the registry life expectancy was about fourteen years. Thus, for these vessels we have applied a constant depreciation rate of 7.14 percent a year. Similarly, vessels of between 1000 and 1499 tons survived on average for twelve years if first registered in the same decade. The depreciation thus applied is 8.3 percent. The resulting calculations demonstrate that the fleet's depreciated value declined from almost $4.9 million in 1871 to just under $2.5 million in 1891. This phenomenon is accounted for by a decline in the rate of new investment after the mid-1870s. Owners instead chose to operate vessels for longer periods and to provide fewer replacement vessels in the 1880s.[21]

Since we are not at present able to estimate tonnage on registry for the other three ports of registry in New Brunswick (St. Andrews, Miramichi and Moncton), we want to limit our analysis only to owners resident in Saint John. But not all of the owners of vessels registered in Saint John were residents of the city. Therefore, Panel B of Table 1 recalculates the value of investments made by residents of the city. As the figures demonstrate, residents of Saint John city clearly predominated; the effect of this operation is to lower the estimated depreciated value of the fleet by eight percent in 1871, twenty-three percent in 1881, and nineteen percent in 1891.

Ideally, one would like to be able to calculate the impact of the entire locally-owned fleet upon the metropolitan economy. However, some crucial information in subsequent estimates comes from the "Agreements and Accounts of Crew." These documents are invaluable sources for the study of shipping, since they give us crew information (including wages), and they allow us to chart voyages with a precision heretofore impossible.[22] Unfortunately, these documents have survived

for the deep-sea trading fleet only; hence, for our purposes it is necessary to separate ocean-going from coastal tonnage. Of the 8829 voyages contained in the Saint John voyage file,[23] less than three percent were for vessels of under 250 tons burthen. This suggests the functional differentiation applied here: all vessels over that tonnage figure were classed as ocean-going. Estimates of the new and depreciated values of this segment of the fleet are presented in Panel C of Table 1.

These data form a crucial component for the estimation of the gross revenue of the fleet (see Table 2). In our gross revenue equation we need first to know the tonnage of the ocean-going fleet (T). Tonnage is a measure of carrying capacity; we

TABLE 2

ESTIMATE OF GROSS REVENUE FOR SAINT JOHN-OWNED OCEAN-GOING FLEET, 1871-1891

$$GR = \sum_{i=1}^{n} L\,(T \times S \times V \times FR)$$

where GR = Gross Revenue
L = Lading Factor[1]
T = Vessel Tonnage
S = Stowage Factor[2]
V = No. of Utilized Voyage Months Per Year[3]
FR = Freight Rate Value[4]

[1]Lading factors are vessel utilization parameters, which have been established at different levels per year. It is well-known that increasing investment in steam tonnage gradually led to increased difficulties in obtaining cargoes for sailing vessels. However, this was counter-balanced somewhat by increasing exports from the United States. Hence, David Alexander has estimated that vessels leaving U.S. ports were virtually always fully laden, but vessels leaving ports in the United Kingdom were seventy-five percent laden in 1863, declining relatively constantly to ten percent in 1890. See Alexander, "Output and Productivity," 86-87. For 1871, this would suggest a utilization rate (lading factor) of .75; for purposes of estimation an upper limit has been set at .85, a middle range at .75, and a lower limit at .65. For 1881, the parameters selected were seventy-five percent, sixty-five percent, and fifty-five percent, while in 1891 the parameters were sixty-five percent, fifty-five percent, and forty-five percent.

[2]Stowage Factor measures the potential number of tons of a commodity which could be carried in a given volume of cargo capacity. For the commodity chosen for this index (grain), the stowage factor was calculated at 1.15.

[3]The number of voyage months per year was calculated for each estimated year. For 1871, the mean value was 9.8, for 1881 9.4, and for 1891 8.3.

[4]FR was calculated based upon the mean annual value of rates for grain from New York to Cork for orders. See Keith Matthews, "The Canadian Deep Sea Merchant Marine," 236. These rates were chosen both for their completeness and because of the continuing availability of grain cargoes for sailing vessels throughout the period. The series constructed by Matthews unfortunately terminates in 1884; the 1891 rate was calculated by adjusting the 1884 rate using the Isserlis Freight Rate Index. Monthly rates were established by dividing the freight rate by the mean number of days from New York to Cork and multiplying by thirty.

know it to be an imperfect measure, but at least it is an actual figure rather than a derived estimate, unlike the remaining components of the gross revenue equation. Since the tonnage listed on the registry does not correspond to the actual carrying capacity of a vessel, however, a way had to be found to correct for this. The result of our search is the stowage factor (S). Almost anyone who has ever studied seaborne commerce has encountered the seeming anomaly of a fifty-ton vessel laden with sixty-five tons of grain. This is a result of the problem of tonnage measurement discussed above. Unfortunately, the amount of carrying capacity depends very much on the construction of the vessel and the type of cargo to be carried. The former is a problem which can best be dealt with by naval architects, but the latter is controllable if one assumes that a vessel is carrying only one type of cargo.

Obviously such an assumption distorts reality, but since the Crew Agreements do not list cargoes, such an assumption was also necessary if an arduous reconstruction of vessel cargoes was to be avoided. For reasons to be amplified upon shortly, we chose grain as the cargo. A study of vessels carrying only grain was drawn from the *New York Maritime Register,* and the results indicated that a sailing vessel *could* carry approximately 1.15 tons of grain for every ton of ship. In other words a 1000-ton vessel was capable of carrying 1150 tons of grain if stowed competently.[24] Hence, in our equation S is a constant, established at a value of 1.15.

The next term in the equation, V, measures the number of voyage months in each year that a vessel could actually be engaged in carrying cargo. This value was calculated from the Crew Agreements, and includes all time that a vessel spent either at sea or in an intermediate port of call. In other words, if a vessel sailed from Liverpool to New York and back to London, V would equal the time between the date of departure in Liverpool and the date of arrival in London. This is roughly equivalent to the time that a vessel could actually have been earning revenue. However, it is not precise: most charter agreements called for payment for "berthing days" during which a ship would be loaded for sea. The exact amount of time provided for this activity varied widely in the nineteenth century; without access to large runs of charter agreements it is impossible to calculate a mean time. On the other hand, many nineteenth century charter parties were only one-way agreements: that is, a vessel might be chartered only from Liverpool to New York, but would then have to wait in New York in hopes of obtaining another charter. In such cases, the vessel would be earning no revenue while awaiting a cargo in New York.[25] On balance, it seems to us likely that those two practices counteracted each other. Thus, our method of calculating V should provide a fairly accurate measure of the revenue-producing period.

The most difficult value to calculate was FR, which is the value of freights. The first difficulty encountered concerned cargoes. As we indicated earlier, the Crew Agreements do not tell us the cargo carried by a vessel. Such information could be gleaned from other sources, but not without an enormous amount of work. Since a majority of vessels carried mixed cargoes, one would have a calculate a whole series of freight rates to account for each. At this point, such a process is impossible. To solve the problem we needed to choose one cargo and to make the assumption that all vessels carried it.

For this paper we have assumed that all vessels carried grain. This cargo was selected for several reasons. First of all, grain was not only the most common cargo carried from ports in the United States but also a commodity which was available to sailing vessels throughout the period. As well, the price charged for the carriage of grain was "intermediate"; that is, it was about an average freight rate.[26] Finally, grain freights from New York to Cork for orders correlated extremely well with the Isserlis Freight Rate Index.[27] This latter point was itself important for two reasons. First of all, Keith Matthews' freight rate indices to be employed in this paper terminate in 1884. To calculate 1891 rates requires the adjustment of the 1884 rates using the Isserlis index. Therefore, a strong relationship between the two rates is extremely important. Second, we know that Saint John vessels ranged all over the world.[28] The Isserlis index incorporates samples of world-wide freight rates; again, a good fit with the Isserlis rate was deemed important to measure adequately freights in the Pacific, South Atlantic, or Indian Oceans.[29] Matthews' time series was converted into a monthly rate and then applied to all vessels.

This type of manipulation seems to us unlikely to introduce drastic distortions into the estimates for several reasons. First, most Saint John vessels (over eighty percent) never left the North Atlantic; for these vessels a North Atlantic freight rate is likely to reflect reality fairly closely. But what about those vessels which sailed the other trade routes of the world? Since no one has yet calculated a time series for the carriage of rice from Bassein to London or guano from Callao to Antwerp, we really had little choice except to apply North Atlantic rates. But given the ready availability of cargoes, especially grain and petroleum, in U.S. ports through most of the period, one could argue that few vessels would be employed elsewhere unless the freight rates prevailing were at least as high. Therefore, it seems to us that our freight rate estimates are likely to err slightly on the side of conservatism, which at this point would be preferable to being too high.

Only one component of the gross revenue equation remains to be explained: the lading factor (L). The portion of the equation within the parentheses estimates potential revenue at full utilization. However, we know that with increasing competition from steel and steam after the mid-1860s, sailing vessels seldom if ever were fully utilized all of the time. This problem was particularly acute on westbound legs of trans-Atlantic voyages. David Alexander has estimated elsewhere that in the last third of the nineteenth century sailing vessels were likely operating at close to full capacity on outward voyages from North American ports. Given the explosion in U.S. export trades following the Civil War, this conclusion seems reasonable enough. However, it is doubtful that sailing vessels were so fortunate on westbound legs. Alexander estimated that vessels heading for North America operated at about seventy-five percent capacity in 1863, declining at a relatively constant rate to ten percent in 1890.[30] A slight adjustment of the resulting trend line has been used to estimate the lading factor in this paper. Thus, we would estimate that combining the two legs vessels were operating at seventy-five percent utilization in 1871, sixty-five percent in 1881, and fifty-five percent in 1891. To be safe, we also estimated upper and lower parameters set at ten percent intervals around the estimation. Thus, in 1871 we have also calculated estimates

for eighty-five percent and sixty-five percent utilization, with similar bounds established for 1881 and 1891.

Our estimates of the gross revenue in current dollars earned by the Saint John-owned ocean-going fleet are presented in Table 3. For 1871 our middle-range estimate suggests that the fleet earned on the order of $2.75 million with upper and lower estimates of $3.1 million and $2.4 million, respectively. The 1881 estimates are a mid-range of $1.8 million flanked by upper and lower bounds of $2.1 million and $1.5 million. Even for 1891, when the fleet was well in decline,[31] we estimate gross revenues of between $1.1 million and $.75 million, with a middle-range of about $.95 million.

Our first response to these results was one of shock: we had not expected gross revenues to be nearly so high. However, an analysis of the Moran Ledgers, which are relatively complete for the 1870s, provides some support for these results. Gross revenues could be extremely high. Several perfectly ordinary runs carrying deals from Saint John generated gross revenues of $80,000 or more for vessels in the 1000-1499 ton class. Several runs from southeast Asia and Australia generated even higher gross revenues.[32] Further, it must be recognized that most of our estimates in calculating gross revenue were extremely conservative; hence, we feel confident in assuming that the results are of roughly the correct magnitude.

But knowing gross revenues without understanding costs means little. To calculate costs (see Table 4), we began with depreciation, which was calculated by the method described previously. In calculating depreciation we assumed that all new vessels on the 1871 registry were registered as of 1 January; thus depreciation costs for a full year were applied to each vessel. The wage bill is precise, based upon the stated rate of pay for each sailor as listed in the Crew Agreements.[33] The figure for "other costs," on the other hand, is very much an estimate. From various shipping ledgers and account books, we were able to determine that "other costs" generally were about three times the size of the wage bill, a ratio which remained fairly constant throughout the period.[34] The only potential problem with this method appeared to us to concern repair costs. We hypothesized that as owners retained vessels longer toward the end of the period, repair costs were likely to rise. However, the shipping ledgers and the crew lists

TABLE 3

ESTIMATED GROSS REVENUES OF SAINT JOHN-OWNED OCEAN-GOING VESSELS, 1871-1891

Year	Upper Limit	Middle Range	Lower Limit
1871	3,113,595	2,747,290	2,380,984
1881	2,079,324	1,802,081	1,524,838
1891	1,114,974	943,439	771,905

Source: B.T. 107/108 vessel registries; see Table 2 and text.

provide little evidence to support this notion. Instead, it appears that owners simply ran the vessels with routine maintenance until the craft met with a marine disaster or literally fell apart.

The results presented in Table 4 demonstrate that although gross revenues were high, so too were costs. We estimate that total costs for operating the ocean-going fleet of Saint John approximated $1.5 million in 1871, $1.3 million in 1881, and about $550,000 in 1891. The total includes not only depreciation and wages

TABLE 4

ESTIMATED COSTS FOR SAINT JOHN-OWNED OCEAN-GOING VESSELS, 1871-1891

Year	Depreciation	Wages	Other Costs[1]	Total Costs
1871	351,087	297,540	892,620	1,541,247
1881	379,208	236,501	709,503	1,325,212
1891	200,562	86,881	260,643	548,086

[1]Other costs calculated as three times wage bill. This would include repairs, insurance, brokerage charges, victualling, port dues, and the like. The ratio appears to be relatively constant. Calculated from Moran Ledger Book, Aylward Papers, Ward Papers and Peake Account Books.

Source: B.T. 107/108 vessel registries; Moran Ledgers, New Brunswick Museum; Aylward Papers, Public Archives of Nova Scotia; Ward Papers, New Brunswick Museum; Peake Papers, Public Archives of P.E.I.; see Table 2 and text.

TABLE 5

ESTIMATED POTENTIAL PROFITABILITY FOR SAINT JOHN-OWNED OCEAN-GOING VESSELS, 1871-1891

Year	Revenue		Less Costs	Potential profits	% of undepreciated assets	% of depreciated assets
1871	Upper Limit	3,113,595	1,541,247	1,572,348	23.9	40.5
	Middle Range	2,747,290	1,541,247	1,206,043	17.1	31.1
	Lower Limit	2,380,984	1,541,247	839,737	12.8	21.7
1881	Upper Limit	2,079,324	1,325,212	754,112	10.7	22.5
	Middle Range	1,802,081	1,325,212	476,869	6.8	14.2
	Lower Limit	1,524,838	1,325,212	199,626	2.8	6.0
1891	Upper Limit	1,114,974	548,086	566,888	13.0	31.3
	Middle Range	943,439	548,086	395,353	9.0	21.9
	Lower Limit	771,905	548,086	223,819	5.1	12.4

Source: B.T. 107/108 vessel registries; see Tables 2, 3, and 4.

but also repairs, insurance, port charges, victualling and a whole host of expenses related to the operation of a sailing vessel.

Having estimated both revenues and expenses, we can now estimate what we have chosen to call "potential profits" (see Table 5). We prefer to use the term "potential" not only because the figures are estimates but also because there is no foolproof method of learning whether profits garnered in the world's cross-trades were necesarily repatriated to Saint John. However, as we shall suggest later, there is good reason to believe that most if not all of the profits so earned were eventually absorbed into the local economy. Still, without an impossibly exhaustive survey we cannot know this for certain.

Nevertheless, "potential profits" appear to have been substantial. Our middle-range estimate for 1871 suggests profits on the order of $1.2 million, with upper range estimates of almost $1.6 million and a lower range of $800,000. The mid-range estimates for 1881 and 1891 are $477,000 and $395,000 respectively. As a percentage of the depreciated value of the hulls, this suggests a return on capital of 31.1 percent, 14.2 percent and 21.9 percent respectively. Even the lower limit estimates, which represent types of "worst case scenarios" suggest not only that McClelland was wrong in assuming that profits turned negative after the late 1870s, but also that the profits earned were extremely respectable.[35] The lower rates of return for 1881 are likely explained by the necessity of adjustment to new conditions, a process which was necessitated both by the challenge of steam and a declining freight market.

There is reason, we think, to place some confidence in these estimates. Indeed, if we use McClelland's cost estimate of new tonnage (ten pounds per ton) and his depreciation schedule for the entire fleet, net earnings as a percentage of the depreciated value of assets would be 24.3 percent in 1871, 5.1 percent in 1881, and 14.3 percent in 1891, using our mid-range profitability estimates. And using his depreciation rate but retaining our lower estimate of new value (seven pounds per ton) yields a rate of return of over forty percent in 1871. As well, numerous other sources place the rate of return in excess of twenty percent in the 1870s.[36]

But recall that these estimates are only for ocean-going vessels. What about the coasters? Though large in number, such vessels only account for a small fraction of tonnage. Still, any estimate of the contribution of the industry should take these craft into account. Unfortunately, we have little evidence about their profitability. For purposes of argument, however, let us assume that they were perhaps half as profitable on a per ton basis as the ocean-going fleet. Given what we know about the lower productivity of these vessels, this would seem to be a reasonable, although conservative, estimate.[37] If we calculate the profit per ton (using the middle-range estimates) for the ocean-going fleet for each year and then halve the results, we derive the estimates for the coastal fleet presented in Table 6.

But without some context into which to place these estimates they mean little. Perhaps the best way to see the significance of our estimates is to compare them with Gross Provincial Product (GPP). McClelland estimated that in 1871 all vessels registered in New Brunswick, regardless of the residence of the owners, contributed about 2.3 percent to estimated Gross Provincial Product. How do our estimates compare?

The first step in answering this question is to estimate GPP. Here we have followed the methodology employed by McClelland. A.G. Green has estimated that New Brunswick GPP in 1890/91 was $49.05 million.[38] McClelland then estimated 1870/71 GPP by the following formula:

$$GPP = 49.05 \left(\frac{TV^1}{TV^2} \right)$$

where TV^1 = value of total sales by all industrial establishments in 1870;
TV^2 = value of total sales by all industrial establishments in 1890.

McClelland used this formula to estimate 1870/71 GPP as $35.7 million; a similar calculation estimates 1880/81 GPP as $38.07 million. This might be slightly low, but it is possible that the 1877 fire in Saint John contributed to a lower rate of increase in the 1870s. At any rate, given the problems inherent in the 1881 industrial census,[39] we must accept this estimate for the time being. Since we have so far been estimating earnings for residents of Saint John city, we have also estimated the city's contribution to GPP using the same formula. The results are presented in Table 7.

Even excluding the coasters, the shipping industry contributed 11.5 percent of Saint John's Gross Domestic Product in 1871, declining to 5.7 percent in 1881 and 4.2 percent in 1891 (see Panel B). With the inclusion of our estimates for the coasters, these estimates are revised upward to 12.3 percent, 5.9 percent and 4.4 percent (see Panel C). There can be little question about the importance of the industry to the city of Saint John. But of equal importance, we estimate that in 1871 the industry contributed 3.4 percent (3.6 percent with the coasters included) to the New Brunswick economy, almost fifty percent higher than McClelland's estimates. If we were able to calculate the contributions of fleets registered in St. Andrews, Miramichi, and Moncton, the other provincial ports of registry, the impact would doubtless be significantly greater.

So far we have been comparing profits to Gross Provincial Product, primarily to provide data which are roughly comparable with McClelland's results.

TABLE 6

ESTIMATED PROFITABILITY OF THE SAINT JOHN-OWNED COASTAL FLEET, 1871-1891

Year	Coastal Tons on Registry	Estimated Profit Per Ton	Potential Profit ($Cdn.)
1871	25,984	3.12	81,070
1881	10,556	1.15	12,139
1891	14,230	1.54	21,914

Source: B.T. 107/108 vessel registries; see text.

However, a more accepted way of comparing an industry with its economy is to compare the value added in that industry (that is, gross revenue less purchased intermediate products) with the output of the economy. This is a fairly simple exercise, since "other costs" ought to measure the value of purchased intermediate products. The results are presented in Table 8. Using our mid-range profit estimates for ocean shipping and calculating value added for coasters, we

TABLE 7

PROFITS AND GROSS PROVINCIAL PRODUCT

(A)

Year	N.B. G.P.P. ($ million)	Saint John City Contribution	% Saint John
1871	35.70	10.47	29.3%
1881	38.07	8.30	21.8%
1891	49.05	9.39	19.1%

(B)

Year	Middle Range Ocean-Going Profits	% N.B. G.P.P.	% Saint John Contribution
1871	1,206,043	3.4%	11.5%
1881	476,869	1.3%	5.7%
1891	395,353	0.8%	4.2%

(C)

Year	Ocean-Going Plus Coastal Estimates	% N.B. G.P.P.	% Saint John Contribution
1871	1,287,113	3.6%	12.3%
1881	489,008	1.3%	5.9%
1891	417,267	0.9%	4.4%

(D)

Year	Panel C Plus Wages for Residents of Saint John	% N.B. G.P.P.	% Saint John Contribution
1871	1,374,230	3.8%	13.1%
1881	559,128	1.5%	6.7%
1891	465,193	0.9%	5.0%

Source: B.T. 107/108 vessel registries; Tables 1 to 6.

find that Saint John shipping produced 5.6 percent of provincial output in 1871, 2.9 percent in 1881, and 1.9 percent in 1891. As a percentage of Saint John's total output, however, the shipping contribution is particularly large: 18.9 percent in 1871, 13.5 percent in 1881, and 8.9 percent in 1891.

TABLE 8

VALUE ADDED AND PROFITABILITY

	1871	1881	1891	
Estimated Ocean Revenues (Mid-range)	2,747,290	1,802,081	943,439	
Less: Other Costs	892,620	709,503	260,643	
Value Added Ocean (Mid-range)	1,854,670	1,092,578	782,796	
Value Added Coastal[1]	123,947	27,920	43,828	
Total Value Added	1,978,617	1,120,498	826,624	(1)
Gross Provincial Product	35,700,000	38,070,000	49,050,000	(2)
Saint John Contribution	10,470,000	8,300,000	9,390,000	(3)
Total Value Added as a % of Gross Provincial Product	5.6%	2.9%	1.9%	(4) = (1)/(2)
Total Value Added as a % of Saint John Contribution	18.9%	13.5%	8.9%	(5) = (1)/(3)
Profits in New Brunswick[2]	3,570,000	3,807,000	4,905,000	(6)
Shipping Profits as % of N.B. Profits	33.0%	12.8%	8.5%	(7) = Profit/(6)

[1]Figures calculated by "grossing up" profit estimates.

[2]Profits assumed to be ten percent of G.P.P.

Source: Tables 1 to 7; see text.

Another significant comparison which might be made is to compare profits generated by the shipping industry with total profits in the New Brunswick economy. Not surprisingly, total provincial profits are virtually impossible to determine for the late nineteenth century. However, we do know that even in the 1970s, when profits soared, corporate profits in Canada have always been less than ten percent of Gross National Product, and unincorporated profits are not thought to have added much to that figure. If we assume, rather liberally, that profits were ten percent of New Brunswick's Gross Provincial Product in the last third of the nineteenth century, then the Saint John-owned fleet alone produced a third of provincial profits in 1871, almost thirteen percent in 1881, and 8.5 percent in 1891.

One final contribution made by the industry is also possible to estimate. We know from the census data that mariners were relatively numerous in Saint John; indeed, in each census year mariners were the fourth most populous occupational category, numbering 527 in 1871, 421 in 1881, and 342 in 1891. We do not know how many of these individuals were in the various ranks aboard ship, nor do we know on what ships they sailed. However, for our purposes we can assume that they were all able-bodied seamen working the same number of months as those about whom we have data from the Crew Lists. Operating under those assumptions, the per capita wages pumped back into the local economy would have been $165.30 in 1871, $166.55 in 1881 and $140.13 in 1891.[40] Panel D of Table 7 recalculates the industry's contribution with seamen's wages included, and once again revises upwards our estimates to 13.1 percent of the Saint John total in 1871, 6.7 percent in 1881, and 5.0 percent in 1891. This analysis strongly suggests the importance of the industry to the economy. If our estimates are of relatively the correct magnitude, it will no longer be possible to accept McClelland's contention that the impact was "negligible." Instead, those who strive to understand the regional economy in the future will have to place greater stress upon the shipping industry.

But what about McClelland's contention that the industry constrained the growth of other local industries? We are not yet in a position to analyze this issue in any detail, but we do feel able at least to offer the suggestion that he might not be entirely correct. First of all, we have good reason to believe that shipowners who continued to invest in the industry were not engaged in a "wasteful gamble"; they were instead investing in an industry which offered the prospect of continued high rates of return. On the other hand, the *opportunity* for continued profits in the industry was clearly declining as the century drew to a close. This was reflected in Saint John in an annual growth rate of -12.2 percent in gross investment between 1872 and 1890, and a -2.1 percent per year growth rate of tonnage on registry in the 1880s.[41] Clearly, shipowners were not re-investing in shipping, regardless of whether such investments would have been poor risks or not.

What then were they doing with their profits? An analysis, not yet complete, of all Saint John owners of over five thousands tons in the nineteenth century (n = 58) suggests that profits earned in shipping served as capital for investment in other sectors of the economy. Take, for example, the case of James L. Dunn, who owned

9426 tons in forty-eight ships between 1852 and 1880. He began as a hardware merchant with John McMorran, and later branched out into shipbuilding as well. Among his other investments subsequent to shipping, he invested after 1877 in the Springhill Coal Mining Company, the Saint John Gaslight Company, the Maritime Bank and the Maritime Warehousing Company. Edward D. Jewitt, who began investing substantially in tonnage in 1856, later constructed a saw and planning mill and became a director of the European and North American Railway. George Carvill, who owned almost six thousand tons of shipping between 1846 and his death in 1885, invested in the Saint John Gaslight Company, the Commercial Bank of New Brunswick, the Bank of New Brunswick, and other similar enterprises.[42] Such accounts could be repeated endlessly.

But what is conspicuously absent from these examples is investment in secondary industry. We do know that some owners resident elsewhere did invest in textile mills, metallurgy and other operations symbolic of the industrial revolution. Indeed, when our research is complete we may find evidence of this practice in Saint John as well. At present, though, the most prudent conclusion would be to offer only a partial revision to McClelland's contention. It is clear that major shipowners did diversify their holdings, most likely using funds generated by their involvement in the shipping industry. At this point, however, it is impossible either to support or refute McClelland's contention that they failed to invest in the industrial sector.

If our preliminary indications of failure to invest in secondary industry are correct, it suggests a number of significant conclusions. Perhaps most important would be the suggestion that by failing to invest in the secondary sector while concentrating investments in services, shipowners helped to foster the unhealthy reliance in the region on service sector employment for both jobs and wages. If this conclusion is borne out, it will require yet further research to discover whether the shipowners simply missed an opportunity or were exercising finely-tuned judgement. Such research would obviously add much to our understanding of the economic development of Atlantic Canada.

NOTES

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2 Data on Troop and other owners discussed in this paper is derived from owner files created by Gerry Panting. For a full description of sources, see Lewis R. Fischer and Gerry Panting, "Harbour and Metropolis: The Shipping Industry of Saint John and the Urban

Economy, 1820-1914," *this volume;* Panting, "Personnel and Investment in Canadian Shipping, 1820-1899," in Rosemary Ommer and Gerald Panting (eds.), *Working Men Who Got Wet* (St. John's, 1981), 337-360. On the Troops see also Esther Clark Wright, *Saint John Ships and Their Builders* (Wolfville, N.S., 1976), 26-27.

3 Elizabeth McGahan, "The Port of Saint John, New Brunswick, 1867-1911: Exploration of an Ecological Complex," *Urban History Review,* III (1976), 3-13.

4 Frederick William Wallace, *Wooden Ships and Iron Men* (London, 1924); Wallace, *In the Wake of the Windships* (New York, 1927); Wallace, *Record of Canadian Shipping* (London, 1929). For a review of recent literature in the field, see David Sutherland, "Wooden Ships and Iron Men Revisited," *Acadiensis,* VIII (Autumn 1978), 101-107.

5 C.R. Fay and Harold Innis, "The Maritime Provinces," *Cambridge History of the British Empire,* VI (New York, 1930), 663.

6 Peter D. McClelland, "The New Brunswick Economy in the Nineteenth Century" (unpublished Ph.D. thesis, Harvard University, 1966). For a summary of this argument see McClelland, "The New Brunswick Economy in the Nineteenth Century," *Journal of Political Economy,* XXV (1965), 686-690.

7 Support for this argument can be found in Fischer and Panting, "Harbour and Metropolis," *this volume.* But for some important corrections, see Lewis R. Fischer, *Enterprise in a Maritime Setting: The Shipping Industry of Prince Edward Island, 1787-1914* (forthcoming, St. John's, 1981), chapter V. In Prince Edward Island at least, the shipbuilding sector alone was crucial enough to turn a normally negative visible balance of trade positive in most years.

8 McClelland, "The New Brunswick Economy" (Ph.D. thesis), iii.

9 McClelland's contentions have been accepted by T.W. Acheson, "The Great Merchant and Economic Development in Saint John, 1820-1850," *Acadiensis,* VIII, No. 2 (Spring 1979), 3-27. For partial rebuttals from different perspectives, see Eric W. Sager and Lewis R. Fischer, "Patterns of Investment in the Shipping Industry of Atlantic Canada, 1820-1900," *Acadiensis,* IX, No. 1 (Autumn 1979), 19-43; Sager and Fischer, "Wooden Ships and Iron Men Revisited: The Canadian Shipping Industry in the Nineteenth Century" (paper presented to the Economic History Society, University of Liverpool, April 1980). See also note 6.

10 McClelland, "The New Brunswick Economy" (Ph.D. thesis), 272-278.

11 David Alexander, "Output and Productivity Change in the Yarmouth Ocean Fleet, 1863-1901," in David Alexander and Rosemary Ommer (eds.), *Volumes Not Values: Canadian Sailing Ships and World Trades* (St. John's, 1979), 63-91; Fischer and Panting, 7-11; Sager and Fischer, "Wooden Ships and Iron Men Revisited," 20-23.

12 O.J. Firestone, *Canada's Economic Development, 1867-1953* (London, 1958), 65, 178.

13 These points are discussed at greater length in Lewis R. Fischer, "The Great Mudhole Fleet: The Voyages and Productivity of the Sailing Vessels of Saint John, 1863-1912," in Alexander and Ommer (eds.), *Volumes Not Values,* 117-155; Alexander, "Output and Productivity Change," *Volumes Not Values,* 63-91; Eric W. Sager, "Sources of Productivity Change in the Halifax Ocean Fleet, 1863-1900," *Volumes Not Values,* 93-115; Sager, "Labour Productivity in the Shipping Fleets of Halifax and Yarmouth, Nova Scotia, 1863-1900," in Ommer and Panting (eds.), *Working Men Who Got Wet,* 155-184.

14 See David Alexander, "The Port of Yarmouth, Nova Scotia, 1840-1889," in Keith Matthews and Gerald Panting (eds.), *Ships and Shipbuilding in the North Atlantic Region* (St. John's, 1977), 92-94.

15 A. Gregg Finley, "Shipbuilding in St. Martins, 1840-1880: A Case Study of Family Enterprise on the Fundy Shore" (unpublished MA thesis, University of New Brunswick, 1980). This thesis will appear shortly in a revised form under the imprint of the New Brunswick Museum.

16 Both relied heavily on the data contained in New Brunswick Museum, Moran-Galloway Company Account Book, 1867-1878. While this is a superb source, it has led to an over-estimate 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.

17 This time series is presented in Fischer, *Enterprise in a Maritime Setting,* Chapter V.

18 McClelland, "The New Brunswick Economy" (Ph.D. Thesis), 210.

19 See Lewis R. Fischer, "'From Barques to Barges:' The Shipping Industry of Saint John, New Brunswick, 1820-1914" (paper presented to the Atlantic Studies Conference, University of New Brunswick, April 1978), 25.

20 This procedure increased depreciation costs in the early years of a vessel's life compared to McClelland's formula. On the other hand, once a vessel surpassed the mean life expectancy for its tonnage class, no depreciation was charged. We would defend this methodology by arguing that it is likely that vessel owners had at least a general idea of the length of time a vessel would likely remain in service and probably assessed costs on that basis.

21 This phenomenon is described in Fischer, "The Great Mudhole Fleet," 133-150.

22 For a description of data available from the Crew Agreements, see Lewis R. Fischer and Eric W. Sager, "An Approach to the Quantitative Analysis of British Shipping Records," *Business History,* XXII, No. 2 (July 1980), 135-151.

23 This file is described in Fischer, "The Great Mudhole Fleet," 119-120.

24 These estimates were confirmed using data found in Robert White Stevens, *On the Stowage of Ships and Their Cargoes, Freights, Charter-Parties, Etc.* (Third Edition, London, 1863); Roy S. MacElwee and Thomas R. Taylor, *Wharf Management, Stevedoring and Stowage* (New York, 1921).

25 Chartering is a complex operation and one which requires further research. Our knowledge of the practice is derived chiefly from J. Bes, *Chartering and Shipping Terms* (Seventh Edition, The Hague, 1970); Henry B. Cooley, *Chartering and Charter Parties* (New York, 1947); C.F.H. Cufley, *Ocean Freights and Chartering* (London, 1964); Carleen O'Loughlin, *The Economics of Sea Transport* (Oxford, 1967); Alan E. Branch, *The Elements of Shipping* (London, 1964).

26 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. In some earlier calculations we deflated freight rates (and other figures) using the Taylor Canadian Import Price Index. However, upon reflection, it seems to us doubtful that nineteenth century shipowners were sophisticated calculators of such economic variables. Therefore, freight rates and all other calculations are in current dollars.

27 L. Isserlis, "Tramp Shipping Cargoes and Freights," *Journal of the Royal Statistical Society* (1938), 304-417.

28 Voyage patterns of Saint John vessels are described in Fischer, "The Great Mudhole Fleet," 119-132.

29 A simple Pearson Product-Moment Correlation Coefficient between annual changes in Matthews' grain freight rates and annual changes in the Isserlis index yielded a value of +.89 between 1870 and 1884.

30 Alexander, "Output and Productivity in the Yarmouth Ocean Fleet," 86-87.

31 The decline is described and compared with other fleets in Sager and Fischer, "Patterns of Investment," especially 25.

32 These figures were drawn from the Moran-Galloway Account Books for the vessels *Beau Monde, Tribune* and *King Ceoloric.*

33 Fischer and Sager, "An Approach to the Quantitative Analysis," 136-138. Wages were calculated only for those paid in dollars (either Canadian or U.S.) and sterling. Because of the difficulty in establishing exchange rates for many other currencies, those paid in other than dollar or sterling currencies were assumed to be paid at the mean wage rate for that particular voyage.

34 This ratio was drawn from the Moran-Galloway Account Books, the Peake Letterbooks, the Ward papers, the Fisher Account Books and the Aylward Ledgers. We have some confidence that this estimate is of the right magnitude. Robin Craig has estimated that wages accounted for approximately twenty percent of the cost of ship operation, exclusive of depreciation [Craig, "Discussion," in Alexander and Ommer (eds.), *Volumes Not Values,* 370]; our estimate is that wages accounted for twenty-five percent of costs.

35 McClelland, "The New Brunswick Economy" (Ph.D. Thesis), 210.

36 See, for example, the Peake Letterbooks (Public Archives of P.E.I.) and the Ward Papers (New Brunswick Museum). See also Clement W. Crowell, *Novascotiaman* (Halifax, 1979). A full description of other soruces is contained in Fischer, *Enterprise in a Maritime Setting,* Chapter V.

37 See Fischer, "The Great Mudhole Fleet," 144-149; Sager, "Labour Productivity," 157-184.

38 A.G. Green, "Regional Aspects of Canada's Economic Growth" (unpublished Ph.D. thesis, Harvard University, 1965), 160-162.

39 These problems are discussed in Rosemary E. Ommer, "Anticipating the Trend: the Pictou Ship Register, 1840-1889," *Acadiensis,* X, No. 1 (Autumn 1980), 67-89.

40 These wages compared unfavourably to per capita wages in industry, which were $263.28 in 1871, $283.01 in 1881, and $352.91 in 1891. It should also be recognized that a large proportion of the mariners resident in the town likely were officers; thus, this is an extremely conservative estimate of total wages added by the industry.

41 Sager and Fischer, "Patterns of Investment," 25-26. Growth rates were calculated by the formula Log $Y = a + bt$.

42 See note 1.

4. COMMENTARY: ON THE METHODOLOGY AND RESULTS OF THE ATLANTIC CANADA SHIPPING PROJECT

Peter N. Davies

On my original visit to Newfoundland to take part in the first of these "workshops" I found great difficulty in relating many of the smaller pieces of research to the project as a whole. This was, perhaps, quite understandable, for the members of the team were obviously quite dedicated to their collective and respective tasks. Thus they could be forgiven for forgetting that many of us had significant misunderstandings of an undertaking in which we had hitherto played no part. In the event, therefore, we found that we could not appreciate the branches of particular trees as we did not have an overall view of the forest!

On a subsequent occasion when representatives of the Group lectured at the Economic History Conference when it was held in Liverpool I found that the general picture was much clearer. In fact I am bound to say to Messrs. Fischer and Sager that numerous complimentary remarks were made to the organisers about their papers. Nevertheless I still had the feeling that, although they recognised the problem, they experienced some difficulty in presenting their research in a balanced format. Today, however, I am quite sure that these criticisms are no longer valid and all three papers under discussion do not pre-suppose an unwarranted amount of prior knowledge on the part of their audience.

Paper One is particularly clear in this respect. It begins with an outline of the two basic data sources and then explains how, if this information were available in a palatable form, it could be used to provide a statistical base for the study of both the major and minor ports of Atlantic Canada. The difficulty, of course, lies in the enormous scale of the source material and thus it became essential to evolve a system utilising computer methodology. After initial difficulties a successful technique was developed so that it became possible to extract and analyse details of owners and their vessels. This newly manageable information could then be used as a basis for an examination of various aspects of the project. Paper One is necessarily a simple introduction to the methodology which underpins the entire enterprise. It fulfills this task in such an eminently satisfactory manner that we can readily follow the theses and arguments put forward in the later papers.

Paper Two is equally clear in its aims and aspirations: "How can we explain the rise and decline of the shipping industry in the Atlantic Provinces of Canada and in Newfoundland?" It indicates the traditional theories based on the premise that British demand first encouraged the shipbuilding industry and then killed it when wooden vessels were no longer required. This explanation, we are informed, ignores the existence of large locally owned fleets so British demand was only one, albeit important, factor in this picture. However this modification does not alter the broad generalisation that by the 1880s the wooden — though not necessarily the metal-hulled — sailing ship was becoming less and less competitive in many trades and that the future lay with the iron, or steel, steamship. Assuming that this

hypothesis is true the question asked by David Alexander becomes particularly relevant: "Why did the local ship operators not adopt the new technology?"

In order to clear the field the paper emphasises that local shipbuilding is a separate issue and it would be fair to argue that with the changes which were taking place the comparative advantage of constructing ships had shifted from Canada to other areas, mainly in Britain. Hence as the overall demand for the type of ship best produced in Atlantic Canada declined, it could be anticipated that shipbuilding facilities and output would also decline on a pro-rata basis. This is not to suggest that the actual rate of decline was not faster than it might or ought to have been but is rather an acceptance of the economic reality of the changed situation.

To return to the main point at issue: the paper seeks to explain or discover why the long-established and highly experienced operators of Canadian shipping did not purchase the latest technology from the cheapest source and then continue in their traditional or new trades. The current situation of British owners directly parallels the Canadian dilemma of the late nineteenth century. British shipbuilding has declined drastically as it can no longer compete effectively with many other producers. On the other hand British ship operators have maintained a position of some importance although their percentage share of world carrying has been gradually eroded by the "flags of convenience," the Third World carriers and the non-economic activities of the Eastern Block nations. But this share has only been secured by purchasing tonnage from Japan and South Korea at rock bottom prices and by ensuring that the vessels are technically of the very best. And it could be argued that British shipowners were using this tactic to remain in existing trades rather than break into new ones with different technologies.

When the attitude of the potential Canadian investor of the late nineteenth century is examined, a number of considerations become relevant. His expectation of profit and his avoidance of loss were bound up with his experience in sail. To some extent a decision to enter into steam involved an element of the "unknown" and this was compounded by the fact that the new investment would tend to be in larger "lumps" and would need longer periods of profitable trading to achieve viability. While contemplating such a decision the potential investor would also be aware of the opportunities available in other local or distant industries. This, traditional theories suggest, is the reason for the relative decline of the American mercantile marine after the Civil War — opportunities for investment within the United States providing higher returns as well as a greater degree of security.

Thus if the Canadian entrepreneur found that the rate of return from "the local street car company" was not significantly different from the acquisition of a new ship, the fringe benefits might well play a decisive role. If the alternative investment offered more security and less aggravation the temptation to change the direction of at least some of one's capital would seem to be irresistible to many hard-headed Canadians. Indeed the evidence in the paper does indicate that shipowning did decrease most rapidly in areas where the growth of landward industries was fastest. That many shipowners should have taken the

decision to diversify their interests and ultimately concentrate on their non-maritime investments is not, therefore, altogether surprising. This becomes especially clear when it is remembered that the softwood sailing vessel had a very limited life and that it required a positive decision to replace an elderly vessel. This, of course, is in contrast with the case of (say) an outmoded iron works where a decision to continue might not require the provision of any new capital.

The authors of this paper may not be fully aware of the enormous controversy and inevitable literature that has been generated by attempts to analyse the decision-making process of the entrepreneur. Here I would refer to the works of Professor G.L.S. Shackle as an introduction to this debate.[1] The conclusion one reaches is that motivation is extremely complex and that entrepreneurs seldom act purely to maximise their profits. In the present context, therefore, we would be on doubtful ground if we thought that Canadian investors were any less sophisticated than their compatriots elsewhere. Their decisions would have been influenced by a whole range of factors including the fear of the unknown, the desire for a quiet life or because of parental feelings that their children should aspire to better things. Life at sea was always hard: could a father be blamed for seeking safer investments and job opportunities, especially if these carried no financial penalties?

In some cases, of course, the desire for a son to maintain a family tradition would push the other way and investment in shipping might have continued for longer than would otherwise have been the case. This may also have been true where there existed a family or financial link between a shipbuilder and a ship operator — the authors should indicate the scale of such linkages in future publications.

The paper also gives some consideration to the lack of government support for shipping. Yet the decision of the state to subsidise its railways may have had some consequences for shipping as is witnessed by the diversification of the Canadian Pacific into the transatlantic trade when it acquired the Beaver Line in 1901. On balance, however, it is certain that the priorities of the government did not include either shipbuilding or ship operating. Whether or not this was the correct policy is beyond my competence but, no doubt, the state acted in what — at that time — appeared to be the best interests of Canada as a whole.

The final paper this morning looked at the impact of the shipping industry in Saint John, New Brunswick. It examined the thesis put forward by Professor McClelland and agreed with him that shipbuilding had little significance for the growing economic system of the area. However his further assertion that shipowning was also of negligible importance is challenged with the aid of the new information that is now available. It appears that rates of depreciation were the subject of some misunderstandings and that the amounts of cargo, particularly grain, which could be carried were higher than had been previously considered.

The result of this new interpretation is that profitability may have been much more substantial than had been anticipated. This was far in excess of the five or

six percent normal for British liner companies in this period. In turn this meant that the contribution of shipping to the Gross Provincial Product may have been fifty percent more than that originally suggested.

A second point put forward by Professor McClelland was that the investment in shipping constrained the growth of other local industries. As yet this appears to be unproved and unchallenged. There is little evidence to show that the profits from ship operating were invested in secondary industry; equally no evidence is provided to suggest that these industries failed to develop because of a lack of capital.

It appears likely that only extensive investigations into the activities of local investors will ever clarify this situation. But the paper leads us to suppose that, so far, only a few entrepreneurs have had their investment decisions examined. Whether this is from choice or from a lack of time or a paucity of material I am not sure but would enter a plea for the place of the individual in economic analysis. In my view it is insufficient to merely establish the bare statistics of a trade or event. This is only a first (though vital) step and a full understanding can only be achieved by taking into account the impact of many other aspects including that of the entrepreneur, both as a class and as an individual.

In the present context one significant aspect in the failure of the Canadian mercantile marine to continue in business was the lack of suitable leaders at the appropriate time. If Samuel Cunard had been operating in the 1880s instead of the 1840s and had centred his activities in Halifax instead of Liverpool a different situation may have evolved. It seems, however, that even when substantial entrepreneurs did emerge their enterprise tended to die with them or with their sons. The basis of their business was a personal one and does not appear to have been formalised into distinct limited companies. Thus a personal decision to move into a different area of investment meant automatically that the shipping aspect came to an end. If formal structures had existed, shares may have been sold but the company would have continued its activities on whatever basis economic circumstances dictated.

Perhaps if Alfred Holt or Alfred Jones had been based here they would have been able to overcome the disadvantages of an Atlantic Canadian base by building on the very real advantages which the region possessed as a major source of bulk cargoes. It should also be noted that these shipowners were, in fact, satisfied with (on balance) a lower rate of return on their employed capital than if they had invested in manufacturing industry in Britain. Would Canadian entrepreneurs have been prepared to have accepted this situation?

My own research into shipping and business history has convinced me that we attach too little importance to the role of chance which frequently, it appears, guides the decisions of many entrepreneurs. I have, in fact, published an article, currently appearing in the July issue of *Business History,* which puts forward this view in some detail and may lead you to the conclusion that not everything is quantifiable and that it is not possible to explain entrepreneurial decisions solely in terms of economic analysis.

For the past four years I have acted as Supervisor of a project to make

available to a wider public the four volumes of the Liverpool Plantation Registers. These cover the period from 1744 to 1784 and are the only extant volumes of a major port. These records comprise a mere four thousand entries so it would have been quite possible to have produced a printed version. The decision to put the information on magnetic tape was, therefore, a marginal one and I am still not sure if we made the right choice.

When looking at the decision to adopt the new methodology for the Crew Lists held in Memorial University there can be no such hesitation. The overriding impression that remains after reading and hearing these three papers is that the plethora of fresh material being produced via the computer is extending our horizons simultaneously in many directions. In this respect I am sure that we all accept that the "computerisation" of these records was a basic necessity and not some kind of optional extra.

However, I would still wish to repeat my contention that the compilation of the relevant facts and trends are only a first step towards a full understanding of the decline of the Atlantic Canada shipping industry. My feeling is that once the basic foundations have been laid the further analysis should include a much greater emphasis on the entrepreneur and on the social, as well as economic pressures, which caused him to act as he did.

Finally, a word on the underlying assumptions of the project. Implicit in many arguments is the unspoken assumption that the loss of her mercantile marine was an unmitigated disaster for Canada. This may be so, but I would suggest that the absence of a service that can be more efficiently and cheaply provided by others is not necessarily always a bad thing!

NOTES

1. *Expectations, Investment and Income,* 1938 (2nd Edition 1968); *Expectation in Economics,* 1949 (2nd Edition 1952); *Uncertainty in Economics and Other Reflections,* 1955; *Undertainty and Business Decisions* (Ed.), 1957; *On the Nature of Business Success,* 1968; *Expectation, Enterprise and Profit,* 1970.

5. DISCUSSION FOLLOWING THE PAPERS OF OMMER, SAGER AND FISCHER

MCCLELLAND praised the Project members for being so diligent in the task of data collection. This is an important task, one which is making an important contribution to Canadian economic history. But the profitability calculations presented are not convincing. There are at least two competing hypotheses concerning the importance of the industry to the New Brunswick economy. Project members have argued that the industry had a great importance to the regional economy. Canadians, in their view, moved into shipowning early and stayed with the industry because of high rates of return. Implicit in their argument is that Canadians made the correct decision and that they performed the task of ship management well. A competing hypothesis would suggest that the Canadian owners were "trapped" into ship ownership. They had always been shipbuilders; when the prices to be found on the international market failed to meet their expectations in the 1860s and 1870s they were forced to retain their assets rather than quickly disposing of them. The first hypothesis might be defensible if profit rates were as substantial as Project members suggest. However, the rates are not convincing because the methodology is suspect. In particular, it does not seem logical that a sector of the economy which accounts for only 3.4% of Gross Provincial Product would produce a third of all provincial profits in 1871.

HARLEY argued that the reason that the profit rates presented were inflated was because the authors had over-estimated the amount of time that a ship could be earning revenue. Vessels did not earn revenue while in an intermediate port of call, at least not on the level that they would be earning while at sea. From data presented by Project members in the past, this would probably lead to an over-estimation of gross revenue by about a third and profits by slightly more than that.

FISCHER replied that he was aware of both of the problems raised by the previous speakers. The authors had in fact calculated gross revenue and profit rates excluding days in intermediate ports, but felt that the estimates should include port days for reasons outlined in the paper. However, if days in port were excluded from the calculations, profit rates did not decline as dramatically as was suggested. They would have been 28.7% in 1871, 10.3% in 1881, and 18.6% in 1891. To understand why the shipowning sector could account for a third of all provincial profits in 1871 will require further research into the profitability of competing sectors within the provincial economy, a topic which is beyond the scope of the Project.

As for the McClelland hypothesis about the impact of the industry, it does not appear that the evidence supports the concept that owners were "trapped" into shipowning. Research into the BT 98 series, for example, suggests that regional owners were actually operating substantial numbers of vessels in the 1840s, a quarter-century prior to the date that the hypothesis would predict to be the point of entrance.

MCCLELLAND pointed out that even if the 1871 profit levels are accepted, the Project's hypothesis is still suspect. If shipowners were making twenty-two percent profits in 1891, why were people streaming out of the industry? If it was because of a shift in the profitability of other sectors there should have been a lot of evidence to suggest this.

FISCHER responded that the Project had quite a bit of evidence to support the idea of a shift in investment opportunities by 1890. But it is a mistake to assume that there was a headlong rush out of shipowning. Instead, owners simply did not replace their depreciating assets. This suggests not only that there were still opportunities to make the kinds of profits suggested in the paper but also leads to the conclusion that opportunities for realizing that level of return were constricting.

GOSS suggested that the Project might consider calculating profits in a number of different ways in order to either support or refute their estimates of profitability.

FISCHER concurred and suggested that the Project was particularly concerned about being able to calculate an equivalent of daily rate of hire as perhaps a better measure of earning potential than aggregate profitability rates.

DAVIES asked whether the cost estimates presented by the Project included repair costs.

FISCHER stated that they did, but that the evidence suggested that repair costs were much lower than initially expected.

DAVIES responded that it was his experience that sailing vessels would be totally refitted every three or four years, at a cost of between forty and fifty percent of the initial capital cost of the vessel. If these types of costs are not included in the calculations then perhaps this might explain the high rates of profitability being estimated.

FISCHER suggested that repair costs might not have been as major for Canadian softwood sailing vessels as people assume. The evidence for this is perhaps not as solid as one would like; however, it is fairly persuasive. First of all, if vessels were undergoing major refits, there should be regular gaps in the Crew Lists reflecting the time that a vessel was undergoing repairs. These gaps do not exist. Second, when McClelland analyzed the Moran-Galloway Ledgers, he found only two vessels in a decade which appeared to undergo major repairs. This evidence may suggest that Canadian owners approached the maintenance of their vessels from a different perspective than did British owners.

GOSS pointed out that it is conceivable that even major repairs were being done while the vessel was at sea, either by the ship carpenter or by able-bodied seamen.

BUCKNER suggested that the Project might be making a mistake by assuming, whether explicitly or implicitly, that shipowning was the major concern of regional entrepreneurs. As T.W. Acheson has shown, it was not the shipping industry which served as an engine of development but rather the timber trade.

SAGER agreed that the regional towns and cities were not simply communities of

shipowners, but pointed out that a large proportion of activity in these places was in fact oriented toward the sea and international trade.

DAVIES praised the Project for shifting the discussion of nineteenth century shipowning away from subjective appraisals and into more sophisticated analysis. But not all of the variables are quantifiable and an analysis which fails to incorporate non-quantifiable sources runs the risk of being less comprehensive than it ought to be.

GOSS echoed these views, and extended the argument by suggesting that man is more than merely "economic man" and that economic man does not solely live on profit. For these reasons an understanding of the impact of the shipping industry requires more than simply the calculation of profit rates.

NORTH pointed out that the shipping industry can be viewed as a series of transactions costs, many of which do not appear in official records. These costs, such as primage and the sale of ships' stores, need to be calculated. When this is done, they may well lower significantly the real rates of return.

6. ISSUES ON THE DEMAND FOR SHIPPING SERVICES, 1870-1913: DERIVED DEMAND AND PROBLEMS OF JOINT PRODUCTION

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ISSUES ON THE DEMAND FOR SHIPPING SERVICES, 1870-1913: DERIVED DEMAND AND PROBLEMS OF JOINT PRODUCTION

C. Knick Harley

The late nineteenth century shipping industry can usefully be analyzed as a number of very closely related markets. Under this conference's rubric of theory and methodology in maritime history, I wish to consider certain aspects of modelling the demand for shipping services. Most ships could be used in various trades to carry various commodities and a significant portion of the world's merchant fleet regularly traded on alternative routes as demand conditions altered their relative advantages. This implies that we must analyze shipping in terms of an aggregate of various trades — as what we might call an aggregate shipping market. Appropriate aggregation of various trades and the demands they generated, however, raises a number of important complications. This paper presents some preliminary aggregation attempts and discusses in some detail one of the most important problems. This problem arises from the joint production of inward and outward capacity on any trade route.

I. DERIVED DEMAND FOR SHIPPING CAPACITY IN TON-MILES FROM PRINCIPAL COMMODITY FLOWS: 1909-1913

Analysis of the economics of late nineteenth century shipping requires detailed information on the demand and employment of shipping on various trades over a period of several decades. The construction of such time series is a time-consuming and difficult task. It is currently underway. As a first step in that task I have constructed a benchmark for the immediate pre-war years. This has served to quantify the relative importance of various trade flows and will help to direct attention in the construction of the time series. The construction of this benchmark has involved a search that has often been tedious, and occasionally frustrating. At times assumptions, based on varying amounts of information, have had to be made. The compilation is not yet complete. In particular manufactured exports have not yet been covered. The details of the calculations do not belong here, but they are available upon request from the author. Certain main aspects of the calculation do need to be mentioned. Most of these commodities were exported from a relatively restricted number of areas. Generally export statistics have been used to estimate the flow. These have been checked in a general way by the import statistics of the principal importers. These import statistics have also been used to ensure that no major sources of supply have been overlooked.

Shipping ton-miles have formed the basis of aggregation for this benchmark. A shipping ton-mile has been defined as a ton of 2240 lbs. or fifty cubic feet (the volume of a ton of wheat), whichever is greater. For most commodities density can quite easily be ascertained from standard sources.[1] Cattle and passengers pose

special problems but cattle are reckoned at two tons per head and passengers at 2.5 tons per head.[2] The results of these calculations are presented in Table 1. These figures quantify relative importance of various trades and do not require additional comment here.

There are two serious drawbacks to this aggregation on the basis of ton-miles. First, it makes no allowance for time a vessel spends in port. Second, it does not make any allowance for the possibility of excess demand on one leg of an in and out trade route. Each of these omissions is of considerable weight. On long voyages port costs including the opportunity cost of the vessel's delay were about half the total costs of the voyage; on short voyages the proportion was much higher. In voyages with excess capacity in one direction the earnings on the "ballast leg" which had excess capacity were only about half the earnings on the other leg.[3] Both these problems can be overcome by using freight earnings rather than ton-miles as an aggregator since both these aspects of shipping earnings are incorporated into the supply conditions that help to determine freight rates.

II. AGGREGATION BY FREIGHT EARNINGS: EUROPE'S GRAIN IMPORTS AND BRITAIN'S COAL EXPORTS

The data for using freight rates to aggregate rather than ton-mileage are much more difficult to obtain. It is relatively easy, however, to proceed with the two largest volume trades listed in Table 1: Europe's grain imports and Britain's coal exports. Most of the freight rates have been collected from the Angier circulars[4] and are the mean of the high and low for each year from 1909 to 1913. North Atlantic berth rates were collected from other sources.

Table 2 presents aggregations for Europe's grain imports and Britain's coal exports on the basis of ton-mileage (column 2) and freight revenue (column 4). In order to facilitate comparison of the two aggregations they have both been standardized on the basis of wheat and flour ton-miles or earnings equalling one hundred (columns 3 and 5). These figures are relative weights under the two aggregations. Inspection reveals considerable differences between the two aggregations. In grain, Black Sea and Indian exports gain weight relative to North American. Even more striking are the changes that occur in coal. Much of the literature on late nineteenth century shipping has emphasized the advantage Britain gained in shipping because of the presence of coal as an outward ballast cargo. That feature of the coal trade would lead to an expectation of low freight rates on coal relative to grain and thus to figures in column 5 being smaller than the corresponding figures in column 3. Generally this is not true. Instead Part B of Table 2 draws attention to the importance of the short trades to the Baltic, North Sea and Atlantic Coast of Europe in Britain's coal exports and the relatively high freight rates per ton-mile that prevailed on these routes (see Table 3). This reflects the much higher proportion of total costs on these voyages that consisted of port costs including the opportunity cost of time in port. The expected lower figure in column 5 as a result of excess capacity outward can be found. Notice particularly the case of Southern Russia, Argentina and the Orient. These, however, were relatively unimportant in the coal trade as a whole.

TABLE 1

SHIPPING TON-MILES: PRINCIPAL TRADED COMMODITIES 1909/1913

		Millions of ton-miles
1.	**Grain**	
	Wheat and Wheat/Flour	76.7
	Maize	26.7
	Barley	17.3
	Oats	6.7
	Rice	22.2
2.	**Animals and Animal Products**	
	Live Animals	1.4
	Meat	11.8
	Butter and Cheese	1.7
3.	**Oil Seeds and Oils**	23.9
4.	**Beverages**	
	Coffee	5.3
	Tea	4.5
	Cocoa	0.9
5.	**Sugar**	8.8
6.	**Tobacco**	2.6
7.	**Textile Fibres**	
	Cotton	33.8
	Wool	18.9
	Jute	5.2
8.	**Wood Products**	
	Timber	33.3
	Wood Pulp	1.5
	Rubber	0.4
9.	**Coal and Coke**	161.5
10.	**Petroleum**	18.1
11.	**Nitrate of Sodas**	19.4
12.	**Metal Ores and Concentrates**	
	Iron Ore	17.6
	Copper Ore	0.9
	Copper Metal	1.9
	Lead Ore	1.6
	Lead Metal	1.3
	Zinc Ore and Metal	2.7
	Tin Ore	0.5
	Tin Metal	1.1
13.	**Passengers**	25.0

Source: Trade statistics of various nations; see text.

TABLE 2

COMPARISON OF TON-MILEAGE AND FREIGHT EARNINGS, VARIOUS TRADES 1909/1913

A. GRAIN EXPORTS TO EUROPE

	(1)	(2)	(3)	(4)	(5)
	long tons x 10^6	shipping ton-miles x 10^9	ton miles / ton-miles wh. and wh fl. x 100	freight revenue	£ / £ wh. and wh. fl. x 100
Wheat and Wheat Flour					
South Russia	3.81	13.18	17.60	2.24	21.29
Danube	1.82	6.93	9.26	1.03	9.79
USA — Atlantic	0.83	2.71	3.62	0.29	2.76
USA — Gulf	0.34	1.62	2.16	0.22	2.09
USA — Pacific	0.24	3.26	4.35	0.39	3.71
Canada	2.00	6.48	8.66	1.03	9.79
India — Bombay	1.46	9.43	12.60	1.45	13.78
Australia	1.41	15.64	20.89	1.89	17.96
Argentina	2.50	15.62	20.86	1.98	18.82
Total		74.87	100.00	10.52	100.00
Maize					
Argentina	2.73	17.06	22.79	2.16	20.53
USA — Atlantic	0.67	2.19	2.92	0.24	2.28
USA — Gulf	0.26	1.24	1.66	0.17	1.62
Canada	0.09	0.29	0.39	0.05	0.48
Black Sea	1.70	5.88	7.85	0.96	9.12
Total			35.61		34.03
Barley					
South Russia	3.82	13.23	17.67	2.47	23.48
Argentina	0.01	0.09	0.12	0.01	0.10
USA — Atlantic	0.02	0.07	0.01	0.01	0.10
USA — Pacific	0.14	1.93	2.58	0.25	2.38
Canada	0.07	0.22	0.29	0.04	0.38
Total			20.67		26.44
Oats					
Argentina	0.64	4.03	5.38	0.66	6.27
Canada	0.12	0.39	0.52	0.08	0.76
USA — Atlantic	0.12	0.38	0.51	0.06	0.57
USA — Gulf	0.01	0.04	0.01	0.01	0.10
USA — Pacific	0.01	0.15	0.20	0.02	0.19
Total			6.62		7.89

TABLE 2

B. COAL AND COKE EXPORTS FROM UK

	(1) long tons x 10^3	(2) shipping ton miles x 10^9	(3) $\frac{\text{ton miles}}{\text{ton miles wh. and wh. fl.}} \times 100$	(4) £ Freight revenue x 10^6	(5) £/£ wh. and wh. fl. x 100
Northern Europe					
North Russia	2531.9	3.27	4.37	0.62	5.89
Sweden	4295.5	4.21	5.62	1.02	9.70
Norway	2215.5	1.28	1.71	0.55	5.23
Denmark	3035.0	1.18	1.58	0.72	6.84
Netherlands	2176.6	0.63	0.84	0.40	3.80
Belgium	1718.6	0.57	0.76	0.31	2.95
North France	3548.8	1.46	1.95	0.64	6.08
Germany	9021.8	3.88	5.18	1.64	15.59
Total		16.48	22.01		56.08
Atlantic Europe					
Spain	2305.8	2.88	3.85	0.76	7.22
Portugal	1053.3	1.67	2.23	0.40	3.80
Atlantic France	3548.8	3.16	4.22	0.92	8.74
Gibraltar	306.6	0.49	0.65	0.11	1.04
Total		8.2	10.95		20.80
Mediterranean					
Algeria	1054.9	2.04	2.72	0.36	3.42
South France	3548.8	6.81	9.10	1.40	13.31
Italy	9238.0	23.07	30.81	3.98	37.83
Aust. — Hung.	968.2	2.79	3.73	0.47	4.47
Egypt	2897.7	9.56	12.77	1.20	11.41
Malta	491.5	1.22	1.63	0.16	1.52
Greece	624.6	1.82	2.43	0.26	2.47
South Russia	2531.9	9.27	12.38	1.03	9.79
Total		56.58	75.57		84.22
South America					
Argentina	3171.8	20.62	27.54	2.51	23.86
Uruguay	918.7	5.86	7.83	0.73	6.94
Chile	706.4	6.36	8.49	0.64	6.08
Brazil	1619.7	8.76	11.70	1.38	13.12
Total		41.60	55.56		50.00
Orient					
India	210.4	1.36	1.82	0.11	1.04
Ceylon	253.5	1.75	2.34	0.14	1.33
Total		3.11	4.16		2.37
Grand Total			168.25		213.47

Source: Table 1; "Fifty Years Freights", *Fairplay,* 1920 *et seq.*

TABLE 3

FREIGHT EARNINGS PER 100 TON-MILES, 1909/1913

	(1)	(2)	(3)
	Distance (naut. miles)	Freight Rate (pence)	Earnings per 100 ton-miles (pence)
A. **Grain (Wheat)**			
South Russia	3600	141.2	3.9
Danube	3660	135.8	3.7
USA — Atlantic	3270	85.0	2.6
USA — Gulf	4780	156.2	3.3
USA — Pacific	13580	390.4	2.9
Canada	3240	123.8	3.2
India — Bombay	6460	238.6	3.7
Australia	11090	321.7	2.9
Argentina	6250	190.0	3.0
B. **Coal and Coke**			
Northern Europe			
North Russia (Cronstadt)	1290	58.7	4.6
Denmark (Copenhagen)	390	57.0	14.6
Germany (Hamburg)	430	43.5	10.1
Atlantic Europe			
Spain (Bilbao)	950	67.1	7.1
Portugal (Lisbon)	1590	90.3	5.7
Atlantic France (Bordeaux)	890	62.4	7.0
Mediterranean			
Algeria (Algiers)	1930	83.2	4.3
South France (Marseilles)	1920	95.0	4.9
Italy (Venice)	2880	115.6	4.0
(Genoa)	2370	99.4	4.2
South Russia (Odessa)	3660	98.1	2.7
Egypt (Alexandria)	3300	99.6	3.0
South America			
Argentina (Buenos Aires)	6500	190.0	2.9
Brazil (Rio de Janerio)	5410	204.5	3.8
Chile (Valparaiso)	9010	217.5	2.4
Far East			
India (Bombay)	6460	126.9	2.0
Ceylon (Colombo)	6910	128.0	1.9

Source: Angier, "Fifty Years Freights"; American and Canadian freight rates from *Canada Yearbook,* 1916, Tables 28 and 29.

The differing freight rates per ton-mile that resulted from different voyage lengths and capacity are more easily seen in Table 3, where they are tabulated directly. The distance and back haul aspects of coal freights are apparent. In addition this table brings out the quite strikingly low rate on grain from the Atlantic ports of the United States. This too reflects a cargo imbalance. Passenger traffic created excess capacity eastbound on the Atlantic[5] in quite striking contrast to the case of the Black Sea and Indian grain trades where the volume cargoes to Europe exceeded the reverse flow. The imbalance of cargo and its influence on freight rates seems important enough to warrant additional discussion.

III. THE ECONOMICS OF JOINT PRODUCTION OF SHIPPING CAPACITY

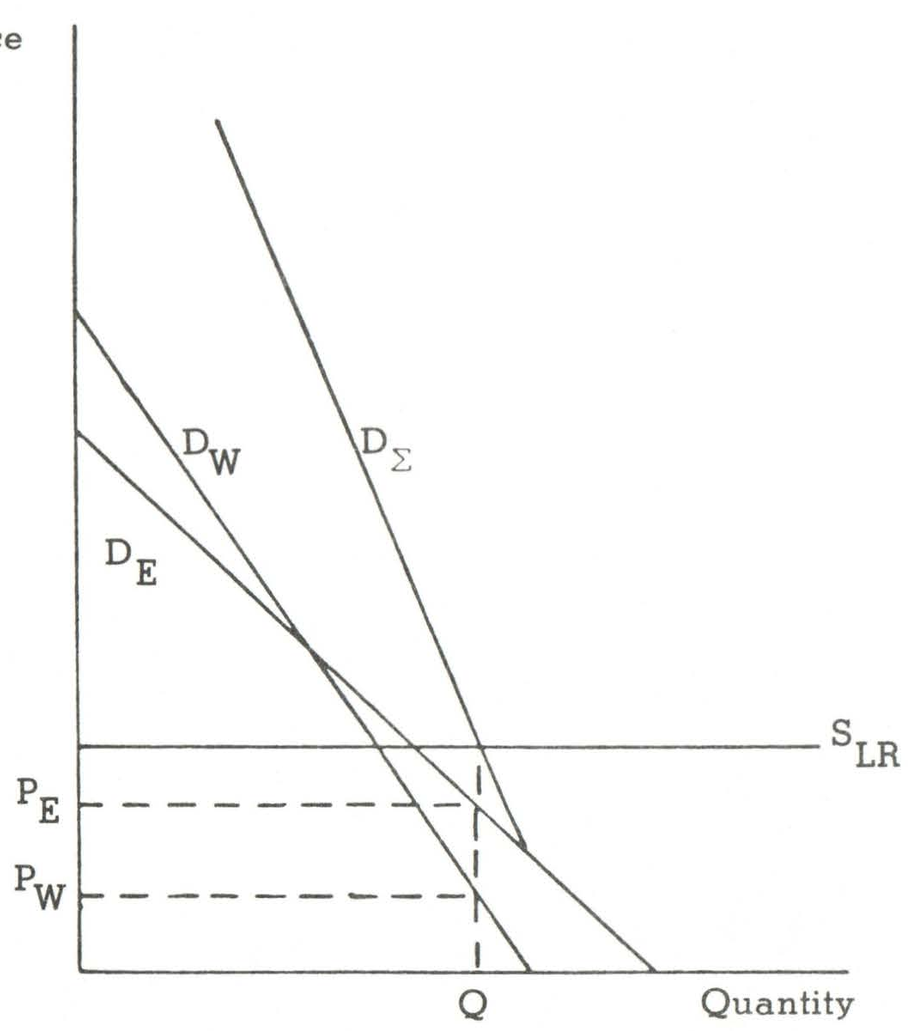
A ship trading regularly between, say, Liverpool and New York will, in a round trip, provide shipping capacity in both an eastward and westward direction. In examining the economics of this joint production, it is initially convenient, although historically oversimplified, to assume that round trip costs are not altered by utilization of capacity and to analyze the process of freight rate determination. In Figure 1 below the determination of east and westbound freights is analyzed in a context of a horizontal long-run supply curve[6] for tonnage capacity on a round trip. That is to say it costs P_{SLR} per round trip per ton of carrying capacity whether cargo is carried either way, both ways, or even not at all. Illustrative demand curves for cargo capacity eastbound (D_E larger) and westbound (D_W smaller) have also been drawn. The competitive market equilibrium may be found by realizing that the demand price for any round trip capacity is the sum of the freight earned eastbound and that earned westbound (D_E). Equilibrium quantity (Q_E) occurs where these vertically summed demand curves cut the supply curve. The freight rates on each leg are determined by the demand price for that quantity in each direction (P_E and P_W respectively). It is certainly possible (and empirically verifiable) that there could be actual excess capacity in one direction. This would occur if the quantity of cargo offered in one direction even at a freight rate of zero were small enough that the demand price of that quantity of cargo in the other direction would equal or exceed the full round trip charges. This is illustrated in panel B. Equilibrium has eastbound traffic paying the full round trip costs and westbound cargo being carried free.

Since cargoes were often larger in one direction than the other and not carried free, the above analysis must be extended. The assumption that generated the prediciton of zero price in the trade with excess capacity was the clearly inappropriate simplification that there were no marginal costs involved in carrying cargo in both directions rather than only in one. The nature of these costs will be explored below, but first it is appropriate to modify Figure 1 as Figure 2. The total round trip voyage costs with only eastbound cargo is S_E, the extra costs of carrying a westbound cargo are MC_W, the demand curves are unchanged. The total *net* demand price can be found by adding the vertical distance between the westbound demand price and the westbound marginal cost vertically to the eastbound demand. In panel A the equilibrium is as in A in Figure 1. In panel B,

FIGURE 1

FREIGHT RATE DETERMINATION, ALL COSTS JOINT

A



B

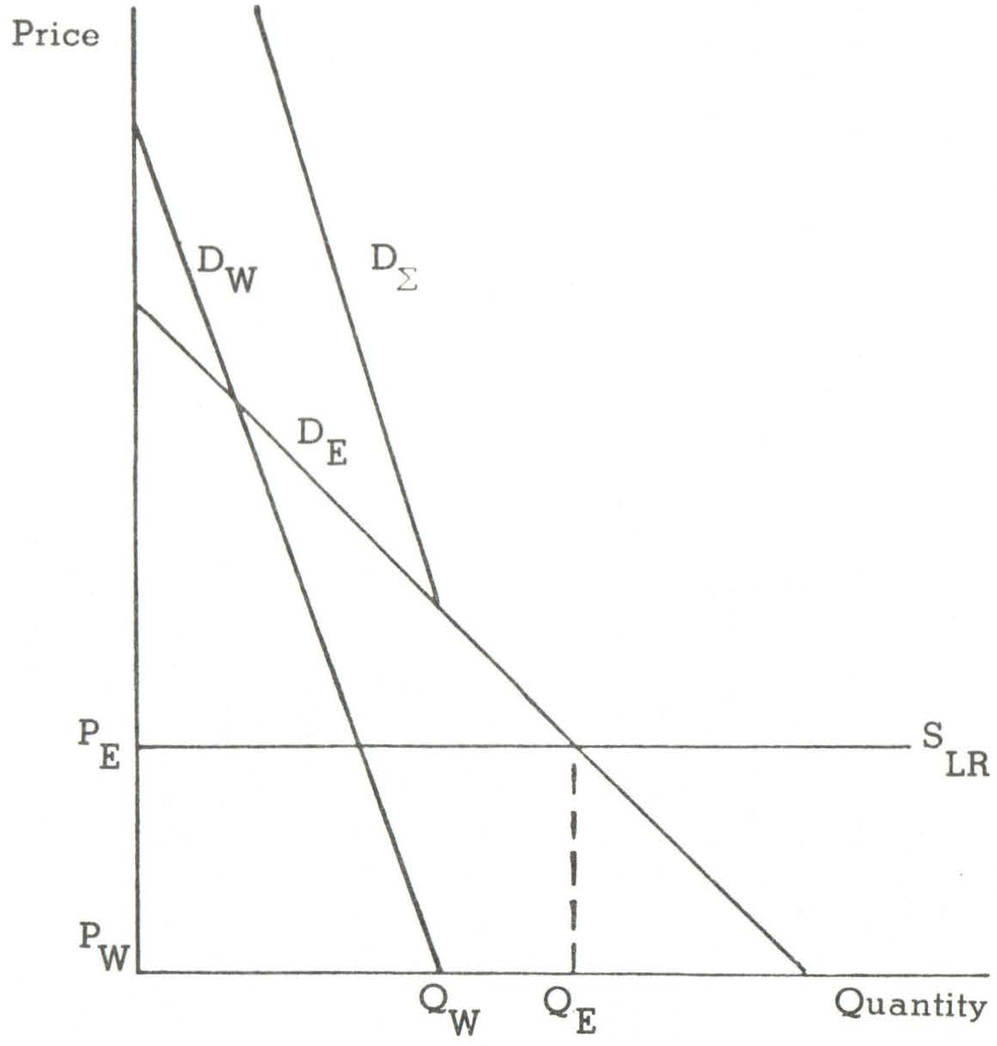
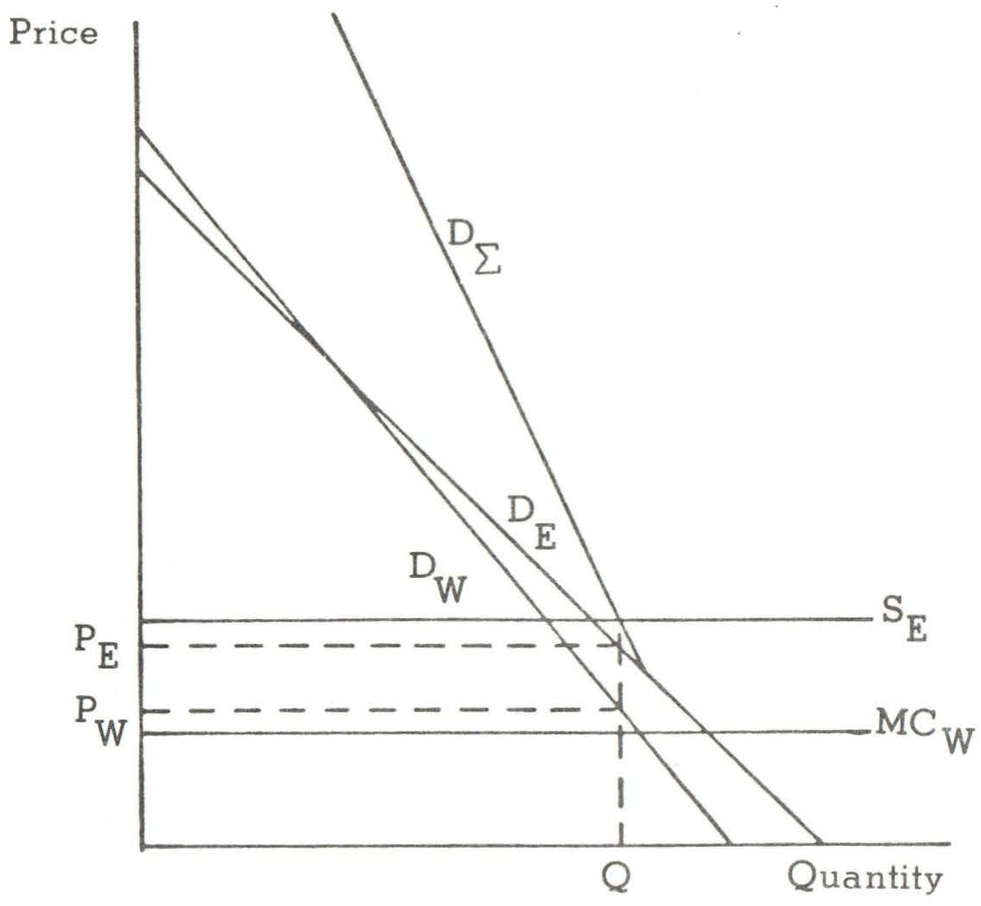


FIGURE 2

FREIGHT RATE DETERMINATION, SOME MARGINAL COST TO WESTBOUND CARGO

A



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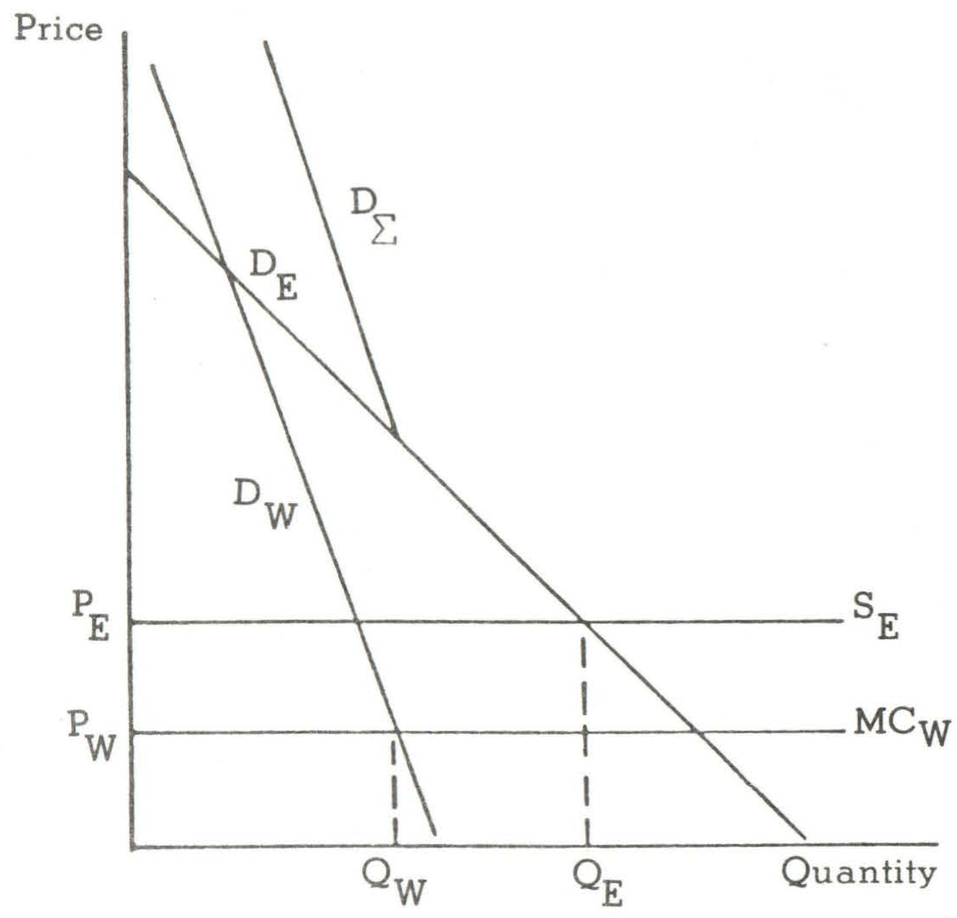


the total quantity of shipping on the route and the eastbound traffic is Q_E and the eastbound freight is at S_E. Westbound freight will be charged a freight that equals MC_W and the corresponding quantity demanded will be Q_W. The capacity $Q_E - Q_W$ will travel east in ballast. The westbound cargo in these cases where the eastbound cargo creates excess capacity may be termed "ballast cargoes". It is necessary now to investigate the costs associated with these cargoes.

IV. VOYAGE COSTS AND FREIGHTS: SOME EMPIRICAL INFORMATION

Analysis of freight rates requires some quantitative impression of the various costs involved in representative ocean voyages and the allocation of these costs to a round trip with outward ballast and homeward cargo on one hand and to the extra costs of a "ballast cargo" on the other. The costs of a steamer voyage may be summarized under four headings: 1. port and loading charges; 2. crew and provisions; 3. coal; and 4. the costs of capital and management.[7] Extra costs of carrying a cargo on an outward trip rather than proceeding in ballast occur in all four categories. Proceeding with cargo rather than in ballast increases a vessel's displacement and thus its coal consumption. Carriage of the extra cargo involves loading and unloading costs and, generally, other extra port charges — often involving visiting additional ports. The largest cost of carrying a cargo rather than proceeding in ballast arises from the time spent loading and unloading. Some of this is extra crew costs; most is the opportunity cost of the vessel.

The best way to illustrate the relative sizes of these costs is to examine a particular example. For example, the freight pages of the shipping journal *Fairplay* for January 24, 1901 (p. 136) contain the following passage:

> There is no doubt that a profit can be made running out to the Plate at 11s. 6d. to 12s. for coal, and back from San Lorenzo district to U.K. Cont. at 24s.; but what owner is going to risk fixing his boat out for so long an outward voyage, showing as it does an enormous loss, when at the same time he cannot simultaneously fix up the homeward freight? We will take a boat 4,000 tons all told: owners fix her from Cardiff at, say, 11s. 6d. per ton; 3,000 tons at this rate come to £1,725. What is left out of this? Sufficient coal must be taken to last out to the Plate and back to Las Palmas — say 1,000 tons of second-quality large at 18s. per ton, £900, disbursements both ends about £500, charter deductions roughly £90, working expenses for seven days' loading, 30 days outward passage, and 18 days discharge, about £850 — or in all an expenditure of about £2,340. It is this that makes an owner so chary, for until a boat is actually fixed home there is no calculating as to what the ultimate result of the round voyage may be.

Many of the costs are included in the quotation but for many we must go further afield. In the calculation of a trip outward in ballast and home with grain, port costs and port times are assumed to be the same as those quoted. Crew and provision costs are taken at five pounds sterling per day. The largest portion of the costs (at least at long-run equilibrium price) are those attributable to the vessel and its mangement. For both historical and theoretical reasons it seems

appropriate to consider both the long-run equilibrium price at which capital earns its opportunity cost in management fees, depreciation and profits; and to also make a calculation of the short-run shutdown point which recognizes the quasi-rent nature of these returns. The replacement cost of the vessel discussed above was about £29,000.[8] The long-run equilibrium annual return on a steamer consisted of about thirty-five percent of its capital value. This may be broken down as follows:[9]

1.	Insurance	7-8	percent
2.	Depreciation	8	percent
3.	Maintenance	4-5	percent
4.	General management	5-7	percent
5.	Profit	5-10	percent

About sixty percent of these costs, however, are quasi-rents that cannot be avoided in the short-run. The remaining forty percent — insurance, maintenance and some management costs — are variable costs that can be avoided by laying up the vessel and thus constitute part of the shutdown price. In fact, the high fixed costs in shipping and the volatility of many of the agriculturally based commodity flows resulted in considerable fluctuations in freight rates. Over the typical twenty-five year life of a vessel freights ranged from the lay-up price to levels well above long-term equilibrium. This path of earnings, of course, added to the riskiness of shipowning and undoubtedly required higher average profit rates to attract capital in competition with investments with more stable earnings.

Data are collected in Table 4 to provide an estimate of the costs of a voyage in ballast to the Plate and home with wheat. The calculation of the shutdown price is included in parentheses. Under competitive conditions in which the supply of tonnage outward at the marginal cost of carrying outward cargo exceeds the quantity demanded at that freight rate competition will drive the freight rate down to marginal cost. Only when ship owners become indifferent between a voyage with a "ballast cargo" and a voyage in ballast will competition cease to put downward pressure on the freight rate. On the other hand, none would be willing to carry freight outward if the revenue fell short of the marginal cost and thus carrying the cargo would reduce the profits from the voyage as a whole.

The marginal costs of the voyage may be classified under the headings we have already used. Part disbursements connected visiting Cardiff and Las Palmas and loading and unloading coal are an obvious marginal cost. Marginal crew costs consist of wages and provisions during the extra time — seven days loading and eighteen days discharging — the voyage entails. There will also be an additional fuel requirement for a laden vessel rather than one in ballast. It would, however, be easy to overstate this effect. Not only do the bulk of the vessel and the resistance of the machinery account for much of the coal consumption, but also the vessel must carry ballast in order to be seaworthy on the outward trip. The saving presented in Table 4 assumes that a quarter of the coal consumption is devoted to overcoming the friction in the machinery and the balance is proportional to the vessel's displacement. The ballast outward is

assumed to be one thousand tons and in addition to one thousand tons of coal for the vessel's use, the vessel's own weight is assumed to be approximately eighteen hundred tons.[10]

The opportunity cost of the vessel itself is a major cost in this calculation. The carriage of a ballast cargo extends the length of the round trip by twenty-five days (an increase of thirty-one percent) and if the cargo is to be worth carrying the vessel must earn the equivalent to its earning if that time were devoted to a portion of an additional round trip in ballast out and cargo home. When the opportunity cost of the vessel is expressed in this way, it becomes clear that it will vary directly with the freight on the principal cargo. The opportunity cost at long-run equilibrium and also at the shutdown, or lay-up, price are both calculated and presented in the table. In fact, of course, the opportunity cost varied as freight rates fluctuated from the lay-up cost to short-run peaks well above the

TABLE 4

EXAMPLE OF VOYAGE COSTS, U.K./LA PLATA 1901

A. COST OF A VOYAGE OUT IN BALLAST AND HOME WITH 3500 TONS OF GRAIN:	
1. Port Disbursements	3.4 s. per ton of cargo
2. Crew and Provisions	2.6
3. Coal	5.2
4. Cost of Vessel for 85 Days (60 at sea; 25 in port)	
a. At long-run equilibrium	13.6
b. Shutdown rate	5.4
Total, Long-run Equilibrium	25.3 shillings per ton of cargo
Total, Shutdown Point	17.1
B. MARGINAL COST OF CARRIAGE OF 3000 TONS OF COAL TO LAS PALMAS:	
1. Port Disbursements	3.9 s. per ton of cargo
2. Crew and Provisions for 25 extra days	0.8
3. Extra Coal	0.9
4. Opportunity Cost of Vessel for 25 days	
a. At long-run equilibrium	4.6
b. Shutdown rate	2.0
Total, Long-run Equilibrium	10.2 shillings per ton of cargo
Total, Shutdown Point	7.6

Source: *Fairplay,* 24 January 1901, 136; see text.

long-run equilibrium price. Thus the ballast freights were forced to move in harmony with other freights by the opportunity cost of the vessel's time consumed in loading and unloading and in any diversion from a direct route that the outward cargo required.

The marginal costs of a ballast voyage to Las Palmas are tabulated in part B of Table 4. The calculated costs at long-run equilibrium correspond quite closely to the outward and homeward rates of 11.5 shillings and twenty-four shillings respectively being quoted. *Fairplay* indicated that this voyage would show a profit, but only just, in a generally weakening market. This correspondence helps to establish some confidence in these calculations.

V. WHAT HAPPENS WHEN EXCESS CAPACITY SWITCHES FROM WESTBOUND TO EASTBOUND? THE LINERS, EMIGRANTS AND THE NORTH ATLANTIC IN THE 1880s

There is, of course, nothing in the nature of things to ensure that the excess capacity on a trade route remain in the same direction. We can use the same diagram we have used above to illustrate the effect of an expansion of demand for westbound capacity. As expansion takes place, the quantity of space demanded westbound at the marginal cost of a second cargo will come to equal the quantity demanded eastbound at the cost of a round trip with only one cargo. As westbound demand increases further the westbound freight will rise and the eastbound fall (as the market equilibrium attains positions like those shown in Figure 2A). Finally the market will reverse with eastbound freight rates at marginal cost and westbound at full round trip costs as shown in Figure 3. Of course, historically the market is unlikely to trace out positions of long-run equilibrium as this adjustment occurs. As total demand increases westbound demand grows to exceed eastbound and there will probably be a short-term increase in freight rates as the market adjusts along an inelastic short-run supply curve.

The possibility of this shift of "excess capacity" in a trade implies that care must be exercised in drawing conclusions from any single freight rate or related group of rates. Compare the course of the grain freights from Odessa and New York to Liverpool from 1875 to 1890 presented in Figure 4. The New York rate fell from an average of 7.4 pence per bushel in 1875/79 to 2.9 pence per bushel in 1885/89, a decline of sixty-one percent. The Odessa rate also declined significantly but by only forty-four percent. This relative decline in the North Atlantic rates was accompanied by a dramatic upsurge in trans-Atlantic migration that dramatically increased westbound demand.

The passenger and principal commodity movements into and out of the North Atlantic ports of the United States are relatively easily compiled. Aggregation into shipping demands in each direction is somewhat trickier since it involves some special problems. First the volume of various commodities must be calculated. For many commodities that is a straight-forward matter of consulting recognized authorities. The space requirements for passengers and live cattle require more attention.

FIGURE 3

EFFECT OF EXPANSION OF WESTBOUND DEMAND

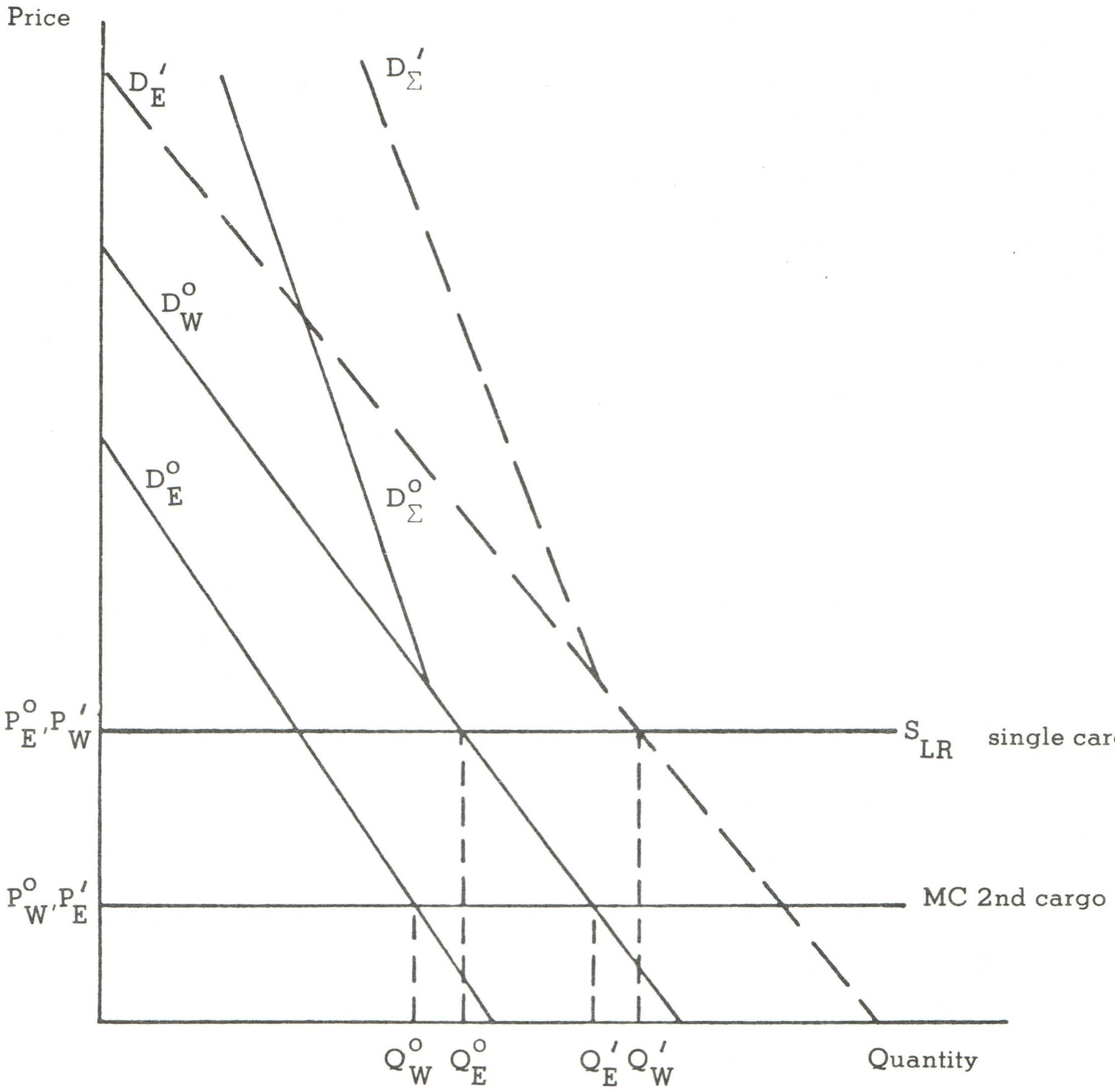
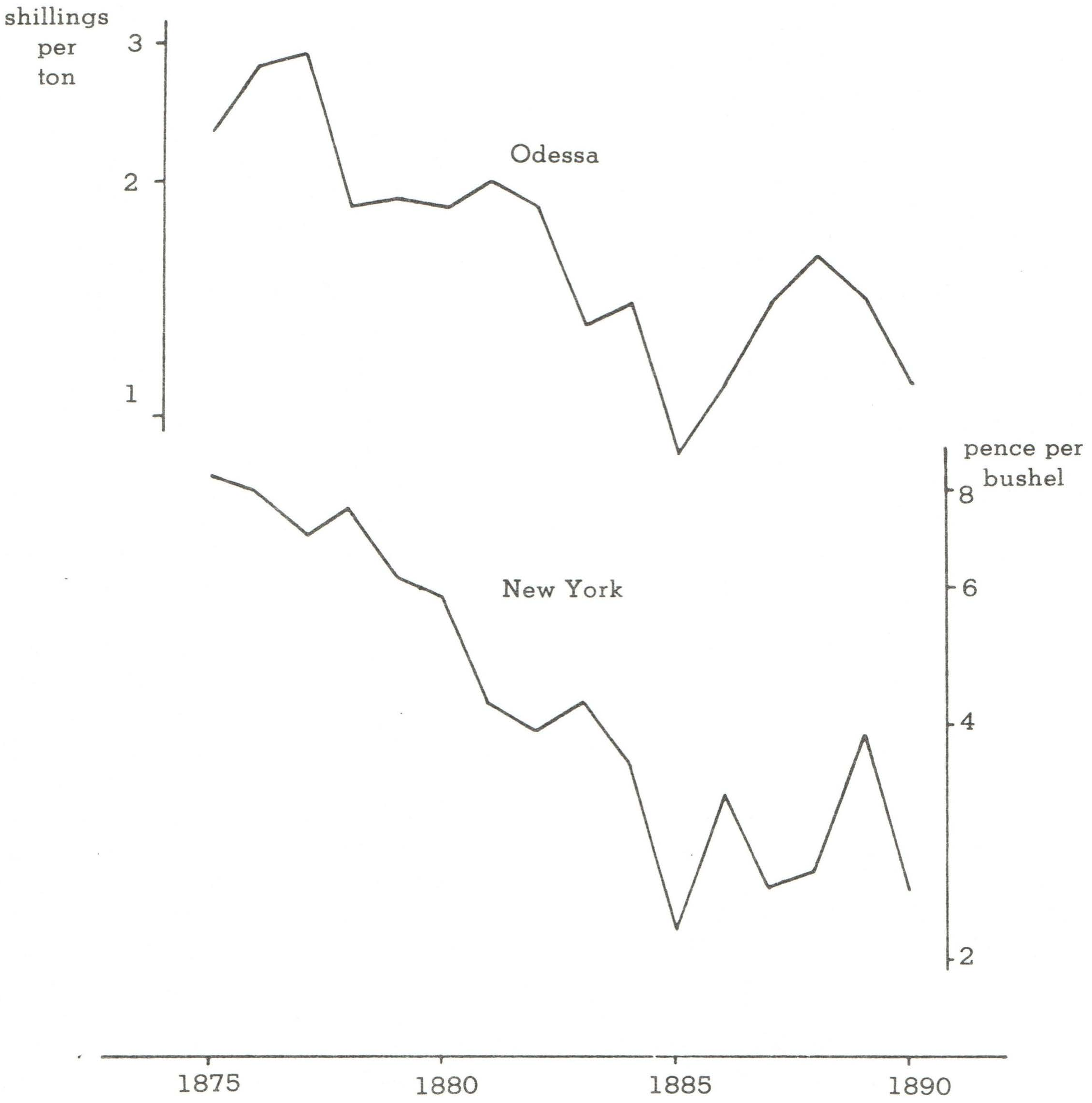


FIGURE 4

FREIGHT RATES OF GRAIN FROM ODESSA AND NEW YORK TO LIVERPOOL, 1875-1890



Source: Angier, "Fifty Years' Freights," *Fairplay*, 1920.

Cattle were carried subject to both British and American regulation. The space per animal was two feet six inches by eight feet plus a two-foot passage way to permit care of the animals.[11] If we assume a between deck height of six feet this implies each animal occupied 150 cubic feet or the space of three tons of wheat. This figure should be reduced, however, since approximately a third of the cattle appear to have been carried on deck space unavailable for the carriage of heavy cargo.[12] There fore each head of cattle have been considered equivalent to two tons of wheat.

Passengers present a similar problem. Typical immigrant accommodations occupied underdeck space that could easily be cleared for eastbound cargo. When these areas were fully occupied the ratio of immigrants to space was such that there was about 120 to 135 cubic feet per person (a bit less than each head of cattle) or the space for about two and a half tons of wheat.[13] Often, however, immigrant ships were far from full. An alternative approach to the cargo capacity generated by westward passenger traffic is to consider the total capacity on these vessels. Lists of vessel departures, ship tonnage and the numbers of passengers are available in the British Parliamentary Papers. For example, from January to June 1883 some 167,000 immigrants were carried in vessels with an aggregate net register tonnage of 854,000 tons, on average 5.1 net register tons per passenger.[14] If these data are examined on a monthly basis, the tonnage per immigrant ranges from a high of 18.3 in January to a low of 3.4 in April. If these monthly figures are extended to the rest of the year on the assumptions that July, August and September will on average equal April, May and June; October will be the mean of March and April; November will be like March and December like February, the average net tonnage per immigrant becomes 4.9. Now in three-deck cargo ships deadweight capacity was about 2.3 times net register tonnage.[15] For voyages at moderate speeds some ten percent of this capacity would be needed for bunker coal on North Atlantic voyages; higher speeds would require more bunkerage. On the basis of these calculations the shipping space of an average immigrant would provide eastbound capacity for about ten tons, deadweight, of cargo. If this approach is to be used to calculate capacity available for eastbound freight, cargo carried from Europe in the holds of immigrant vessels must be added to the count since the capacity to carry that cargo is already included in the figure of ten tons per immigrant.

These two alternative methods of calculating the east-west balance of traffic in the North Atlantic from 1876 to 1890 are presented below. In the first, Table 5 and the associated Figure 5, ten times the westbound passengers has been compared with U.S. export of grain, meat and cotton from the North Atlantic ports (Boston, New York, Philadelphia and Baltimore). Cattle exports have been omitted since cattle and immigrants were seldom carried on a single round trip. Petroleum exports are also excluded since petroleum was carried exclusively in wooden sailing ships. The results of this calculation reveal a quite striking reversal of the balance of eastbound and westbound demand occurring with the upsurge of immigration and the simultaneous decline in grain exports through the North Atlantic ports after 1880. This calculation of the change in the balance of demand is not very sensitive on the conversion of passengers into capacity. At

TABLE 5

THE NORTH ATLANTIC TRADE 1876-1880: WESTWARD PASSENGER DEMAND AND EASTBOUND BERTH CARGOES IN MILLIONS OF SHIPPING TONS

	Passengers (x 10 tons each)	Total Eastbound	Grain	of which Meat	Cotton
1876	1.51	3.66	2.67	.20	.32
1877	1.32	3.21	2.62	.24	.35
1878	1.28	5.45	4.74	.34	.37
1879	1.72	6.80	6.06	.39	.35
1880	3.81	6.77	5.79	.43	.55
1881	5.64	5.09	4.14	.39	.56
1882	6.75	3.47	2.64	.24	.59
1883	5.95	4.06	2.99	.30	.77
1884	5.14	3.38	2.52	.27	.59
1885	4.57	3.93	2.90	.32	.71
1886	4.28	4.49	3.20	.32	.97
1887	5.57	4.29	3.28	.28	.73
1888	6.11	2.96	1.86	.26	.84
1889	5.13	4.16	2.87	.37	.92
1890	5.53	3.02	1.64	.50	.88

Source: see text.

TABLE 6

NORTH ATLANTIC TRADE, ALTERNATIVE CALCULATION 1876-1890: WESTBOUND AND EASTBOUND DEMAND IN MILLIONS OF SHIPPING TONS

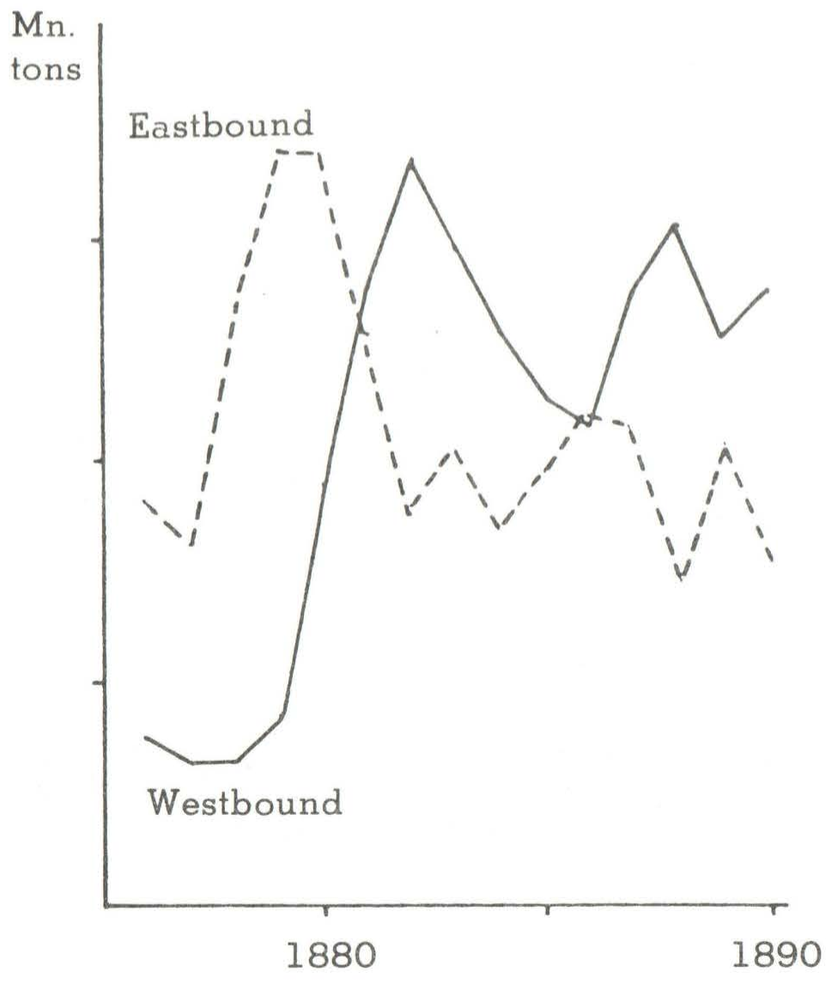
	Westbound	Eastbound	of which Petroleum
1876	2.18	4.45	.79
1877	2.21	4.33	1.10
1878	2.17	6.65	1.06
1879	3.14	8.23	1.28
1880	4.79	8.13	1.05
1881	5.22	6.85	1.56
1882	5.44	5.10	1.53
1883	4.96	5.99	1.62
1884	4.84	5.31	1.65
1885	4.44	5.91	1.70
1886	4.93	6.51	1.79
1887	6.26	6.31	1.83
1888	5.39	4.98	1.73
1889	4.96	6.82	2.07
1890	5.52	5.89	2.11

Source: see text.

FIGURE 5

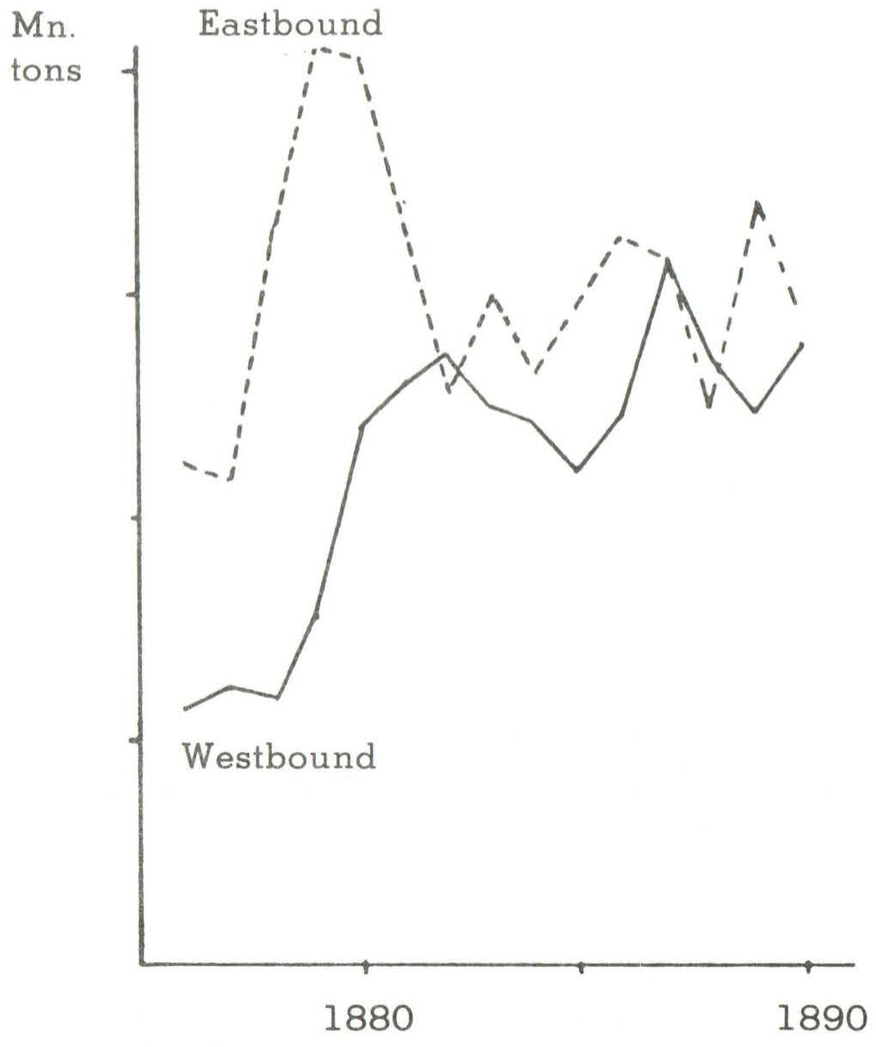
EAST AND WESTBOUND FREIGHT, NORTH ATLANTIC 1876-1890

A. Calculation based on passenger vessels.



Source: Table 5.

B. Alternative aggregation



Source: Table 6.

least in the early 1880s a tonnage capacity of only seven tons per passenger would still reveal a surplus of eastbound capacity.

An alternative calculation of eastbound and westbound demand provides a check and confirmation of the above results. Westbound demand evaluates passengers at their space requirements of two and a half tons. To this is added the tonnage of iron, salt and chemicals imported from Europe and the tonnage of iron ore, sugar, coffee and tea and jute from elsewhere. The outward demand adds cattle and petroleum to the commodities considered above. This calculation provides a similar relative time path of the two demands to the previous calculation but the excess eastbound capacity in the 1880s is less. The westbound demand approaches and in some years exceeds the eastbound cargoes. If allowance is made for the petroleum trade, where most of the sailing vessels entered U.S. ports either in ballast or carrying some of the four-fifths of the barrels in which petroleum was exported that returned as "empties", the excess eastbound space is evident.[16]

These calculations make it fairly clear that the rise in passengers to America combined with a decline in the grain exported through the northern ports created an excess supply of tonnage competing particularly for berth cargoes in these ports. This led to the preeminence of the liners in those trades since there were obvious reasons why these companies dominated the westbound passenger trade. This also led to part of the rapid decline in outward freight rates from these ports and especially from New York.

VI. CONCLUSIONS

This paper has considered some problems of aggregating various commodity flows into an aggregate measure of the quantity of shipping services employed. The first step in that exercise consists of compiling international commodity flows whose movements provide the derived demand for shipping. Aggregation of these flows on the basis of ton-miles is, however, insufficient on two grounds. First a large proportion of the cost of shipping results from the cost of having vessels spend time in port to load and unload. These costs are unrelated to distance so aggregation on the basis of ton-mileage overweights long voyages relative to short. This effect is particularly evident in Britain's coal export trade. The second problem arises because outward and homeward capacity are jointly produced. Consequently the allocation of costs and thus relative importance is determined by demand conditions. Both these complications may be overcome by the use of price weights in aggregation, but there are severe data problems with that solution. Finally the allocation of costs on particular routes may change during a period of historical analysis creating problems of interpretation. As this paper has attempted to show, none of these problems is fundamental but adequate treatment of each requires careful attention to the specifics of supply and demand and to the nature of market equilibrium.

NOTES

1 Most information from R.E. Thomas, *Stowage: the Properties and Stowage of Cargoes* (Glasgow, 1968 edition). Some supplementary information from R.W. Stevens, *On the Stowage of Ships and Their Cargoes* (London, 1871).

2 See Section V below.

3 See Section IV below.

4 E.A.V. Angier, "Fifty Years Freights, 1869-1919," *Fairplay,* 1920 *et seq.*

5 See Section V below.

6 The long-run horizontal supply curve seems empirically appropriate. It does not affect the results in any quantitative way.

7 This latter category is something of a catch-all category. It includes management expenses, insurance, maintenance, depreciation and profit.

8 This is based on the *Fairplay* price for a ready steamer.

9 These are the returns to the Ben Line Steamers from Thomas E. Milne, "A British Shipowning Company in the Late Nineteenth and Early Twentieth Century" (unpublished B. Litt. Thesis, University of Glasgow, 1965). The depreciation rate is from a decision of the Commissioners of Income Tax quoted in *Fairplay,* April 12, 1900, 614. These percentages are very similar to those collected by Robert Griffen in 1882: "On the Use of Import and Export Statistics," *Journal of the Royal Statistical Society,* XLV (1882), 259-264.

10 This figure is from the relationships between weight and capacity for various typical steamers presented in J.G. Jordan and R. Marlborough, "Types and Proportions of Mercantile Steamers in Relation to Cost, Carrying Capacity and Speed," *Transactions of the North-East Coast Institution of Engineers* (1893), 275-291.

11 Report of the Departmental Committee on the Transatlantic Cattle Trade," *Parliamentary Papers,* 1890-91 (C. 6350), LXXVIII, ix, QQ357, 234.

12 See descriptions and illustrations in Samuel Plimsoll, *Cattle Ships* (London, 1890).

13 "Emigrant Accommodations on Board Atlantic Steam Ships," *Parliamentary Papers,* 1881 (C. 2995), LXXXII.

14 "Return Relating to British Ships which Carried Emigrants. . .," *Parliamentary Papers,* 1883 (261), LXXVI.

15 Jordan and Marlborough, "Types and Proportions," 275-291.

16 See Harold F. Williamson and Arnold R. Daum, *The American Petroleum Industry: The Age of Illumination 1859-1899* (Evanston, 1959), 498. See also Keith Matthews, "The Canadian Deep Sea Merchant Marine and the American Export Trade, 1850-1890," in David Alexander and Rosemary Ommer (eds.), *Volumes Not Values: Canadian Sailing Ships and World Trades* (St. John's, 1979), 231, 233.

7. ECONOMICS AND CANADIAN ATLANTIC SHIPPING

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ECONOMICS AND CANADIAN ATLANTIC SHIPPING

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I. INTRODUCTION

My diffidence in accepting the kind invitation to read a paper to this conference came partly because I am not a historian and partly because, being based in Britain, I have not had the opportunity of familiarising myself with the nature of the original sources available to the main participants. Various people have, however, persuaded me that I could make some useful contribution. I have, moreover, read the three earlier volumes from this series of conferences. I have, therefore, necessarily written under some disadvantages; but I have, perhaps, the same advantage as some of your visitors in earlier years in that by viewing from a distance I may see the details less clearly but the general outline more so.

Much of this paper is, I hope politely, couched in the form of questions on two general subjects which are related to one another. The first concerns the changes in comparative advantages of the Atlantic Provinces and their effects; the second concerns some techniques which might possibly be useful in assessing some of these changes. What follows this introduction is, however, presented in four parts. Part II, which follows this introduction, deals in general terms with comparative advantage in the context of the present discussion and reviews some of the points which I have particularly appreciated from the papers delivered to earlier conferences. Part III looks at the quantitative evidence, of ship numbers and of tonnages, in terms of the competition facing the wooden ships (almost) exclusively produced in the Maritimes, a competition stemming from composite, iron and steel-built ships over the second half of the nineteenth century. Part IV discusses some of the sources from which further evidence might be sought and how it might be used. Finally, Part V attempts to draw some conclusions.

II. COMPARATIVE ADVANTAGE AND THE MARITIMES' SHIPBUILDING ACTIVITY

It is obvious that if person A can always produce something cheaper than B, C, etc., then given certain assumptions about knowledge, time, freedom, etc., he will compete them out of that particular business and they will have to go and do something else at which they are better than A. It is less obvious that, even if A is better at everything (a polymath genius, say), he will still tend to specialise in the more valuable activities and leave the others to be done by everybody else. For example, if A were the best lawyer in the land and also the best telephonist then he would probably be well advised to specialise full-time in law and hire someone else to answer the phone for him. The first of these is the principle of absolute advantage and the second is that of comparative advantage.

This second principle leads freely-competing nations and provinces to specialise in those activities for which they have some special ability — in their

soil, climate, people, history, location or whatever — and it seems to me that, at precisely the time that wooden sailing ships were in great demand, the Canadian Atlantic Provinces were well suited to supplying both them and their initial cargoes. Graeme Wynn has graphically described how New Brunswick, for one example, turned from "a sparsely-settled backwater of empire into a commercial colony of almost 200,000 people by 1851."[1] As he stresses, there was a rapid development of enterprise in response to these opportunities. And it was enterprise, apart from the timber needed to supply the demand, that was primarily needed, for as a later author at the same conference pointed out: "the skills represented in the St. Martins' shipyards were handicraft skills. The shipyards employed manual labour, requiring few specialised occupations. Large amounts of capital equipment were uncommon."[2] For good measure he goes on to say that, since the labour force remained non-union and the operations local and small-scale, the effects of the industrial revolution were minimal, except, of course in the supply of ironwork, cordage and canvas from the United Kingdom. We often forget today that, not so long ago, there was a widespread availability of manual skills in, for example, carpentry, leather and clothworking that are half forgotten today and were then taken for granted as readily as we assume widespread literacy and the ability to drive a car competently.

But that spirit of shipbuilding and shipowning enterprise could not flourish effectively in the Maritime Provinces without both the supply of easily accessible softwoods and the demand for wooden ships. That both were necessary can be seen in the decline and closure of the Moran's firm, despite a move to Saint John, N.B., and the forging of close links with Liverpool. As the final quotation from Gregg Finley's paper makes clear, wooden ships simply could not compete with metal ones.[3]

This is well known, and hardly surprising, although it is sometimes underestimated in relation to the overtaking of sail by steam. Given metal ships, is there any likelihood that they would be built in the Maritime Provinces of Canada, whose massive iron ore sources were yet to be discovered? Is there any reason, save that of the reservoir of expertise to which I have just alluded, why they should be owned or operated from there? Had the comparative advantage conferred by ready access to large supplies of softwood been lost? As far as the undoubted enterprise is concerned this must always have been limited to a very small proportion of the population. These were stirring times in Canadian history, for the very processes that produced steel for the metal ships of the late nineteenth century also produced it for the railways that opened up the prairie provinces and provided business opportunities there. This, indeed, is one of the limitations of conventional treatments of the theory of comparative advantage, which tend to concentrate on natural factors like climate and soil fertility. These are relevant to extractive industries and to agriculture but much modern manufacturing industry relies little upon either, but rather upon freedom of opportunity and an easily-trained and energetic labour force (this is why we see easily-transported goods like cameras and radios from East Asia). With essentially service industries like ship operations there is even less relationship with natural factors, which is why we see people like Mr. Narby operating out of Switzerland.

Paula and Lawrence Felt describe how there was a significant rate of development of manufacturing industry in late nineteenth century maritime development, and that this included iron and steel.[4] They describe how the failure of most of these to take off into sustained growth has been attributed by others to the limitations of Halifax as a business centre; to difficulties of family succession; to dumping by foreign industries in successive slumps; to continued dependency on sales via agents elsewhere, particularly in Montreal; to the decay of trade with the West Indies; and to the retaining of a narrow equity base, so that the burden of fixed-interest capital increased in a time of generally declining prices.

But, may I ask, were these sufficient or was there another reason? If businesses were scattered amongst a variety of communities outside Halifax then they must have been too small to reap significant economies of scale. Why could these not have been exploited? Difficulties of family succession can be overcome by hiring managers from outside (and there were plenty of energetic people about at that time), or by selling. Debt/equity ratios can be changed and especially in profitable firms. Rather, these reasons sound to me like symptoms of marginal industry; some of this may be seen by turning the statements around. Why did not the iron and steel firms of the Maritimes weather successive slumps by dumping *their* excess capacity on the world market? Because their scale of operation was too small? If so, why did they not exploit the undoubted economies of scale in manufacturing industry and, especially, in iron and steel-making? Because their market was too small? If so, why was this, when real transport costs were declining by almost every mode? And, if dumping from abroad took place, why was this foreign steel not imported into the Maritimes and used to build steel sailing ships? Was competition from the rapidly-growing and heavily-protected manufacturing industries of the USA just too much?

If, as is suggested in the Felts' paper, the views quoted above as being put forward by others are incorrect but that a main reason lies in the loss of local control of banks to Montreal (a point similar to that which Sturmey claims to have been relevant to the decline of locally-based British shipping companies)[5] then why was not capital sought from elsewhere? There were plenty of loans from Britain at this time.

Capital and enterprise are the most mobile of factors of production and they could have been made available in abundance if the needs had been recognised and sufficient rewards had been offered. Moreover, needs can be recognised from outside: they do not have to be recognised by those already there. The Felts themselves say: "There appears to have been no great barrier to movement of capital from commercial to industrial use, nor any great barrier to movement from merchant to industrial roles by individual entrepreneurs."[6] The Felts also note that "many merchants acquired expertise in running industrial enterprises and, when such expertise was lacking, thought nothing of bringing in relevant managers from Scotland, the United States and elsewhere." By just such expertise could funds be found, for profitable purposes, from a variety of sources, by no means all of them banks and by no means all of them located in Montreal or, indeed, in Canada. Indeed, as Sager argues: "Stagnation in the maritime economy (of Newfoundland) did not originate in a failure of capital investment."[7] Thus,

what in the Maritime Provinces (and also in some of British agriculture) might well be termed the great depression of about 1870 onwards was a period in which activities were reformulated and re-located as the great new agricultural areas of North and South America and Australia and New Zealand were opened up to the great benefit of their consumers. This benefit was enhanced by the improvements in sea transport, the regularity and reliability of steamships, the increased durability and deadweight/light ship displacement ratio of steel ships and the efficiency and safety of steel wire rigging. Whilst the safety record of ships remained appalling throughout this period, there were some improvements, though most steamers remained seriously under-powered on economy grounds and those who think romantically of the square-rigged sailing ship should remember that it was one of the most dangerous modes of transport ever invented.

Is this, from a visiting outsider, too simplistic an explanation of the "theme", or question originally stated by Matthews? "We seek to examine, describe and as far as possible, explain the rise and fall of the shipping industry in this region and. . .to do this in the wider context of Canadian development and the changes in world shipping in the period between 1830 and 1914."[8] Perhaps we might, with indulgence, extend this and ask why there was no revival of Canadian shipowning in more recent years. As far as the period since 1945 is concerned the cause lies in three factors: the extensive operating subsidy programme of the U.S.A., most of which goes simply to support the high wages of American seamen; the Canadian seamen's strike in 1946, which achieved parity so that these wage rates would be paid to Canadian seamen; and the refusal of the Canadian government to introduce a subsidy programme. A number of Canadian shipping companies sold their ships as a result of this and, except for the Great Lakes and intra-Canadian trade, a nascent Canadian industry died.

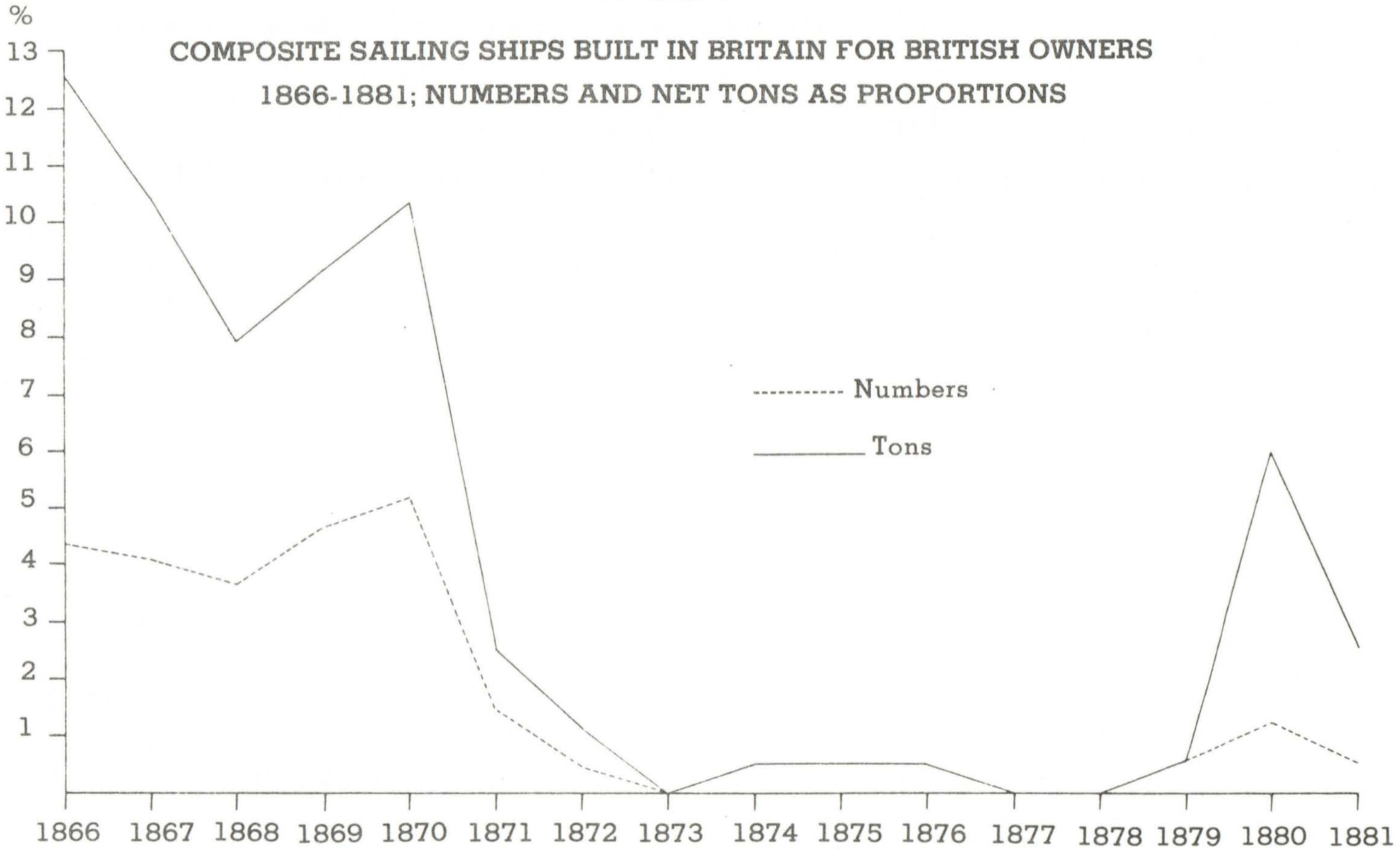
III. QUANTITATIVE EVIDENCE

If such arguments sound plausible, can they be supported by statistical evidence? Appendix I shows some of the raw data, extending from 1850 to 1900 which might be useful in this context. As Richard Rice so reasonably stresses, we are dealing with the operation of a market economy which can be measured from available evidence. He goes on to say, with supporting evidence that "the tunes of maritime shipbuilding. . .were mainly British."[9] Accepting this, let us examine the levels of shipbuilding in the Maritimes over the period of decline from 1850 to 1900. Appendix I (extracted from Rice's work) shows the numbers and tonnages of ships built in each of the main shipbuilding provinces of New Brunswick, Nova Scotia and Prince Edward Island, and their totals.

Knowing, as we do, the broad lines of technological development in shipping for that period, let us look at what was happening in Britain at that time. Appendix II shows the output of ships (by number and tonnage) built and first registered by British citizens (people, groups or companies) over the same period, broken down by method of construction — wood, composite, iron and steel. Figures 1, 2 and 3 display the same material more readily and I take these data as indicating the relevant, if not the dominant, market to which the Canadian Maritime Provinces had, perforce, to respond.

FIGURE I

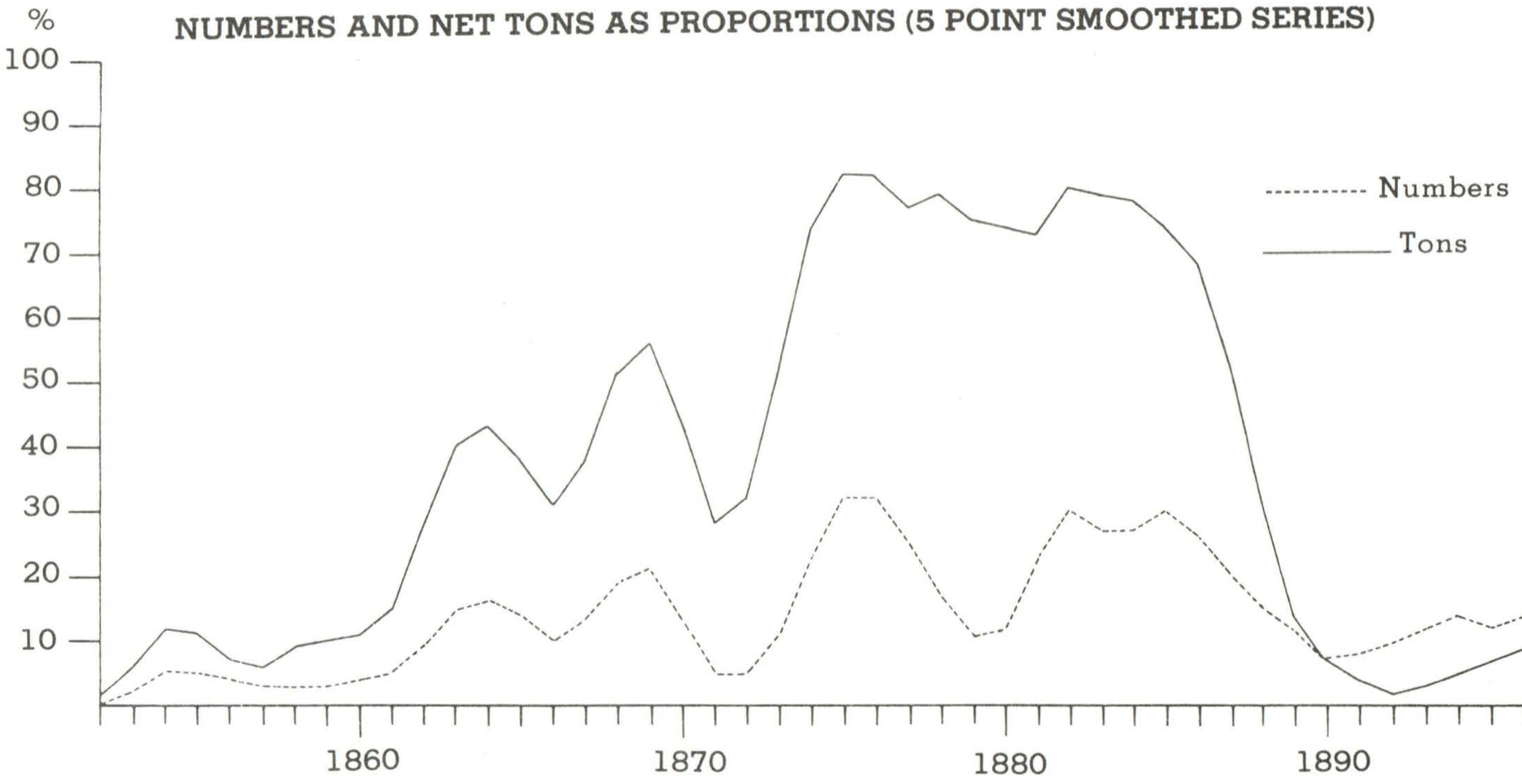
COMPOSITE SAILING SHIPS BUILT IN BRITAIN FOR BRITISH OWNERS
1866-1881; NUMBERS AND NET TONS AS PROPORTIONS



Source: B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), 220-4.

FIGURE 2

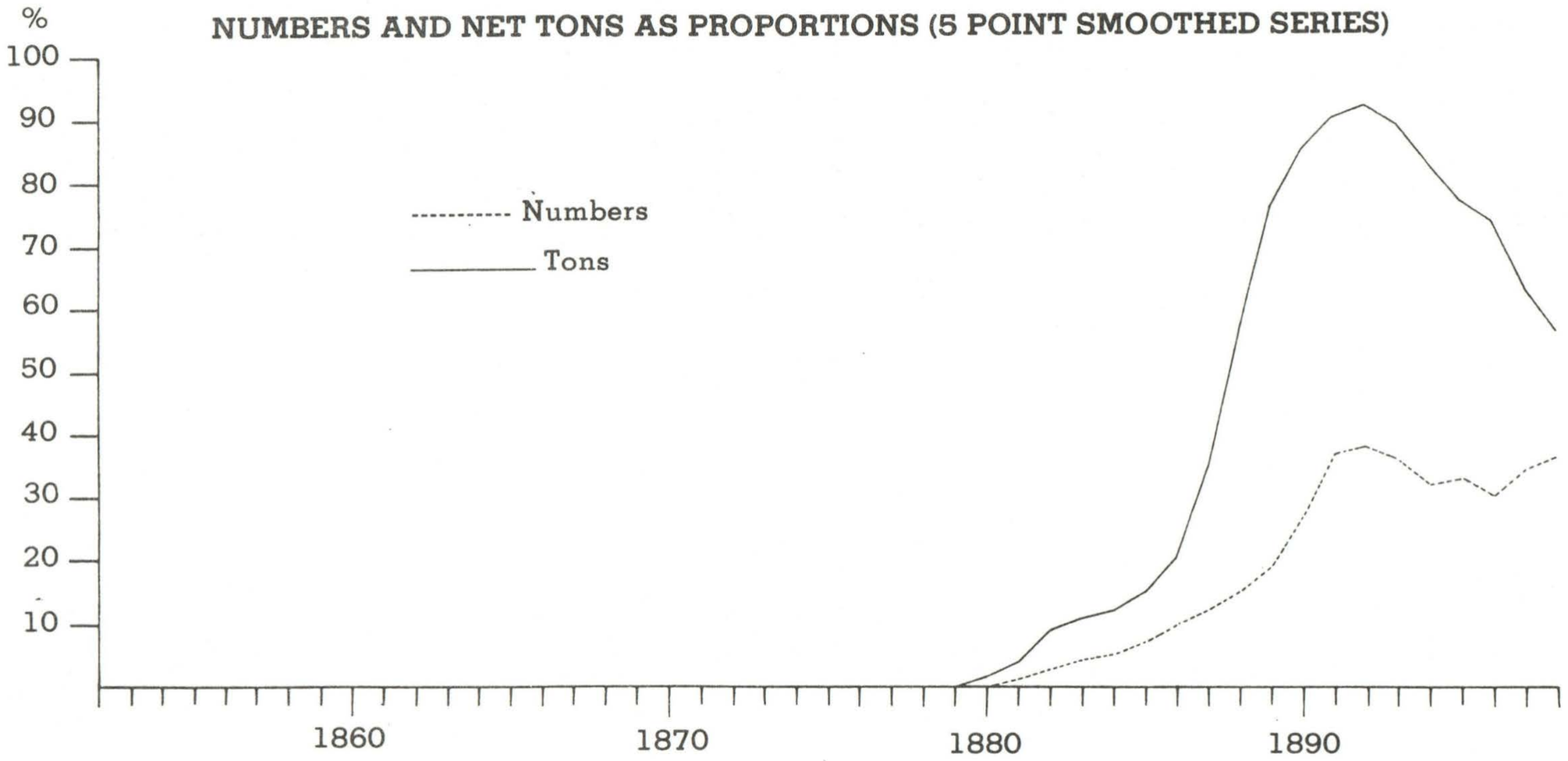
IRON SAILING SHIPS BUILT IN BRITAIN FOR BRITISH OWNERS 1852-1898
NUMBERS AND NET TONS AS PROPORTIONS (5 POINT SMOOTHED SERIES)



Source: Mitchell and Deane, *Abstract of British Historical Statistics,* 220-4.

FIGURE 3

STEEL SAILING SHIPS BUILT IN BRITAIN FOR BRITISH OWNERS 1852-1898
NUMBERS AND NET TONS AS PROPORTIONS (5 POINT SMOOTHED SERIES)



Source: Mitchell and Deane, *Abstract of British Historical Statistics,* 220-4.

The overall effect is that of three great surges of competition stemming from these three forms of competition. That of composite construction (as in the *Cutty Sark*[10]) is but part-recorded, for such ships were only distinguished from 1866; before then they were added with wood or iron. The first, appropriately named *Tubal Cain,* was built in 1859.[11] By 1866, however, they were almost 12.5 percent of the British market. By 1872 they had declined to a negligible level. The second great surge of competition came from iron. This was already significant by 1854 (5.7 percent of ship numbers, 12.7 percent of tonnage) and by 1864 the tonnage of iron sailing ships came to forty-six percent of those British-built for British owners. This was not all. As Fayle says:

> Commercially, iron had two great advantages as shipbuilding material. In the first place, although iron is heavier than wood, its greater strength permitted so large a reduction in thickness that an iron ship weighed about a quarter less than a wooden ship of the same dimensions so that she could carry considerably more cargo, without diminishing her buoyancy. (Secondly) iron permitted the construction of much larger vessels. Whereas the structural limit of length of a wooden ship was about 300 ft. (91.4m) there was no practical limit on the size of an iron ship other than the capacity of her owners to fill and of the ports to handle her.[12]

It may be that Fayle was following Kirkaldy who, after describing official and popular prejudices against iron ships, says:

> In practice it was proved that in spite of the greater specific gravity of iron, an iron ship was of considerably less total weight than a wooden craft of similar dimensions. In a typical wooden ship the weight of hull and equipment was about 40% of the total displacement, whereas in an iron ship it averaged about 30% and this in spite of the fact that the first iron ships contained much more metal (thicker plates and heavier framing) than later experience showed was necessary...Added to these advantages was strength and the possibility of almost indefinitely increasing the dimensions of a ship.[13]

This new ability to build big is shown by comparing the third, sixth and ninth columns of Appendix II. It is a shame we know so little of the early days of composite ships and that we have no frequency distribution of sizes, but we can clearly see that, over the whole period from 1866 to 1871 or 1872, when composite ships were significant, their average size always far exceeds that of wooden ones. Similarly, the average size of iron ships, which starts equal with that of wooden ones in 1850, immediately exceeds it thereafter and continues to do so by factors of up to ten. Kirkaldy continues with a third factor, that of being more easily salvaged when driven ashore, as was *Garry Owen*[14] and the famous stranding of the *Great Britain* in Dundrum Bay.[15] It must be regarded as doubtful whether this was ever regarded as a specific advantage *ex ante,* however, partly because strandings were not the only form of loss and wooden ships were likely to stay afloat longer than iron ones following, say, a collision. There were certainly disadvantages too. First, there was the difficulty of finding anyone who could

repair these unfamiliar vessels; for it was hardly work suitable for a village blacksmith. Secondly, there was the acute difficulty of fouling, for whereas wooden ships could have copper plates nailed over their planking, there was for a long time no adequate antifouling treatment for iron (or steel) ships; and their fouling could be a serious impediment.

According to Mitchell and Deane steel ships were included with iron ones before 1878, but since in 1879 we find only one ship recorded and that of less than fifty net registered tons it seems likely that they were few. This is confirmed by the small numbers built in the early 1880s. This third great surge of new technology took most of the 1880s to gain momentum. By the early 1890s, however, and when the absolute numbers and tonnages had recovered from the slump of 1887-8, steel ships generally constituted thirty to forty percent of the numbers and seventy to ninety percent or more of the tonnages built in Britain for British owners.

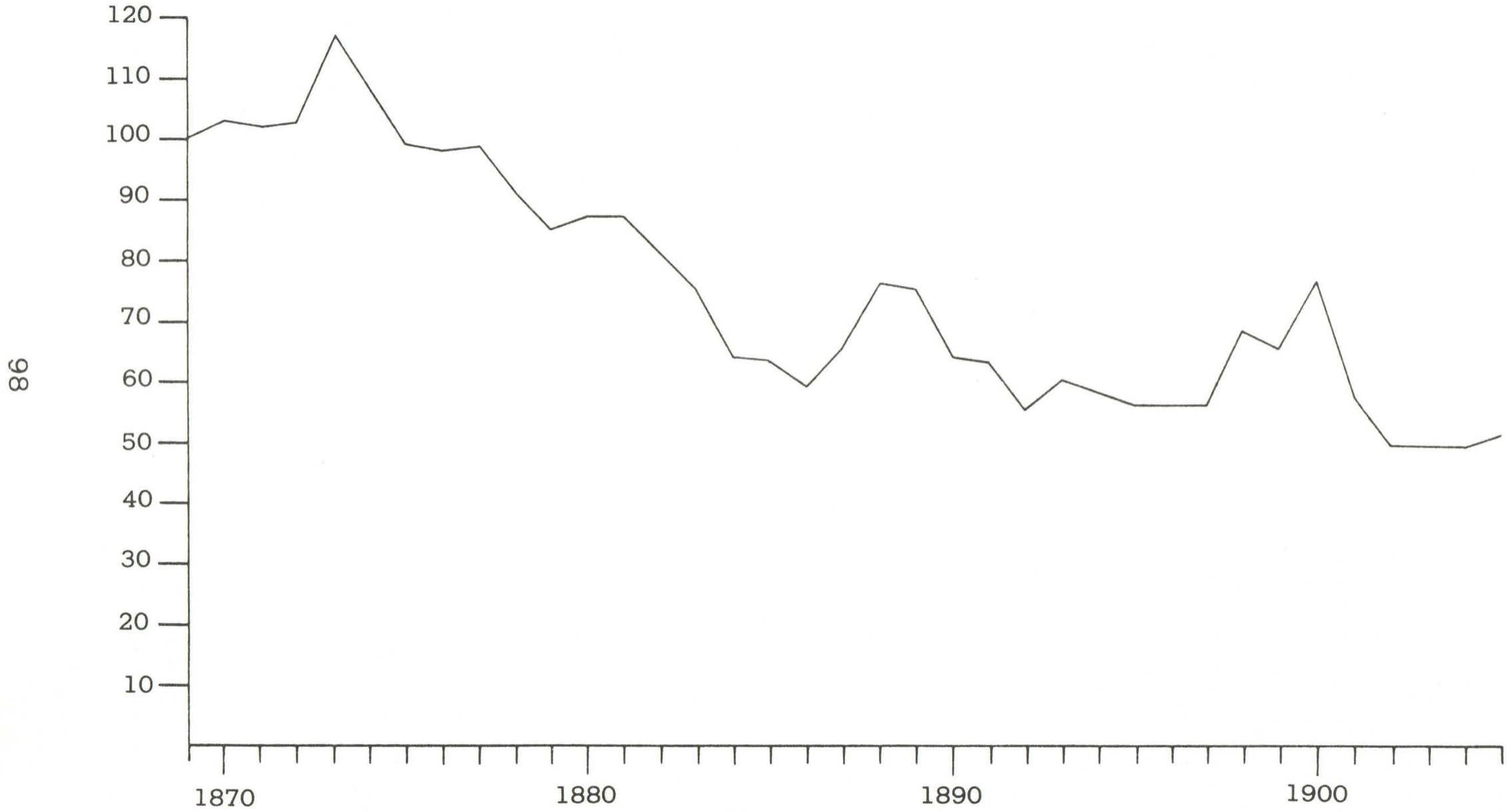
In a broadly competitive market, such as we know shipping to have been in those years, one would expect the economic advantages of such new techniques to be passed on to the consumers by way of prices (or freight rates) which are lower or, in an inflationary age, lower than they otherwise would have been. Light is cast upon this by Isserlis' famous index of freight rates, covering 1869-1900 and onwards, being based on the works of Angier Bros.[16] There being neither averages nor means of weighing them Isserlis took the mean of the highest and lowest reported observation for each year. The figures are shown in column 1 of Appendix IV and in Figure 4. Despite all the fluctuations (such as the rises of 1873 and 1900) the decline is both substantial and fairly steady, indicating that these increases in efficiency were being passed on to the consumers, just as a free competition model would lead one to expect.

The second half of the nineteenth century was a period of great economic development, both geographical, as with the opening-up of new lands, and technological, as with the development of steel railways and the mechanisation of more tasks. Because, like the airship, sailing vessels ultimately became a cul-de-sac, economic historians have tended to emphasise the development of new services by steamers.[17] But in the early days these were either short-sea, where the volume of space occupied by coal left some room for paying cargo, or subsidised (as for instance for mail, passengers and high-value cargo), as were the ships of Samuel Cunard or airlines in the early days of air transport.

As Robin Craig stressed in his phrase "volumes not values" there was a vast and growing volume of low-value cargo transported primarily by sailing ships whose own technological development was considerable.[18] G.S. Graham, in a justly famed article, has explained how and why the transition to steam "was not completed for another three decades or so after 1850."[19] First there were the methods of construction to which I have already referred; then there was a multitude of individually minor improvements, improving strength and reliability, like wire rope for standing rigging, chain cables (and sometimes donkey engines to lift the anchor), steel masts and spars (*Seaforth,* built in 1863, was the first ship to have steel lower masts, topmasts, topsail yards and bowsprit and to have standing rigging of steel wire rope).[20] Iron or steel ships leaked less, particularly when in a seaway, and did not need re-caulking. The alterations of the

FIGURE 4

INDEX OF TRAMP SHIPPING FREIGHTS, 1869-1905 (ISSERLIS)



Source: L. Isserlis, "Tramp Shipping Cargoes and Freights," *Journal of the Royal Statistical Society* (1938).

rules for measuring tonnage, so upsetting to statistical time-series, also made for greater efficiency, as did many labour-saving devices leading to smaller crews despite larger ship sizes. Finally, there was the distinguished work of Lieut. Matthew Fontaine Maury in collecting a vast mass of data concerning oceanic wind and current observations, analysing and presenting it so that the navigator could, for the first time in history, make use of the practical experience of many others in choosing his route and seeking the best winds. This led to significant savings on passage times, enabling the large square-rigged sailing ship to compete successfully with steamers, and especially over long voyages with relatively low-valued cargoes like grain, hides, nitrate and guano. Often these ships were assisted in and out of port by steam tugs. Graham concludes:

> Although the steamship had successfully wedged its way into the overseas trade, mainly by carrying passengers and subsidised mails, the evolving sailing ship of the 1860s and 70s — faster than its predecessors, with double the space for cargo in proportion to tonnage and manned and navigated by one third the number of men — retained on (the) broad oceans a predominance almost as marked as that of the screw steamer in the coastal. . .waters of Europe.[21]

Thus, whilst the opening of the Suez Canal in 1869 posed a threat to the builders of sailing ships (the results of which are clearly visible in columns 1 and 2 of Appendix III) this was overcome, not with steamers, but with sailing ships that were bigger and better than ever before. This, surely, is why this decline of 1870-74 was followed by the boom of 1875-77.

Unfortunately for the Maritimes, these new ships were not — and could not be — built of wood. And, with the one famous exception whose life and works seem to be strangely neglected in this series of conferences, the Canadian shipowners concerned (many of whom seem to have been but briefly concerned with owning their ships, selling them as soon as they reached Britain) did not, or perhaps could not, adapt their techniques into the new materials; and since it is hard to see how they could have had any comparative advantage in doing so, they were probably wise to direct their energies elsewhere. The one exception was, of course, the famous Haligonian, Samuel Cunard, who found it best to relocate his principal place of business outside the Maritime Provinces. Whilst it is fair to add that Cunard's ships were steam from the inception of his trans-Atlantic mail service in 1840 and built of iron from 1855 and thus largely outside the period as well as the location of our interests, his does seem to be the only company which can be said to have lasted.

Does all this tend to confirm my thesis about the loss of comparative advantage? Can any further evidence be produced? Dr. Chandra Lalwani, a colleague at University of Wales Institute of Science and Technology, has very kindly calculated some correlations from the data already presented using the MINITAB statistical package on the VAX750 DEC computer. Taking first the whole period 1850-1900, and remembering that both dates are quite arbitrary, the correlation coefficient between the Canadian Maritimes' shipbuilding output and that of the U.K. (as defined above) was +0.733 for sailing ship numbers and

+0.660 for net tonnages of sailing ships. Both these, and the positive signs, reflect the general economic growth of the period as well as the fact, relevant towards 1900, that both were suffering competition from steam. If we compare, instead, the Maritimes' output with the *proportion* of composite, iron and steel sailing ships in U.K. shipbuilding output for U.K. owners we find entirely different results. Still considering the whole period we find that the correlation coefficients change sign and become -0.723 for ship numbers and -0.427 for net tonnages.

The low values of these, and particularly that for tonnages, stems from both time-series, but particularly the latter, being affected by the same trade cycles. Thus, despite their having opposite trends they have similar cyclical components. After trying a number of other approaches we employed time-series regression analysis, obtaining the following results for the formula $Y = a + bt$, where Y is the dependent variable (ship numbers or tonnages), a and b are coefficients to be determined, and t is the time period in question with 1850 = 1. We obtained the following results:

	a	b	r^2
Ship numbers			
UK sailing ships, % built of metal	-4.04	+1.07	0.870
Built in Maritimes	+467	-6.83	0.628
Ship tonnages			
UK sailing ships, % built of metal	+6.39	+1.95	0.770
Built in Maritimes	+137	-2.26	0.432

Generally, and in this instance, time-series have three main components: a long term trend, cycles, and what may be termed random elements stemming from a variety of causes. Here, matters are complicated by the cycles being of varying lengths as well as amplitudes, so that we are unable to use any such method as moving averages. But the linear regression technique enables us to abstract from the cycles and random elements so as to concentrate our attention wholly upon the long-term trends which are our main interest. The values of r^2 indicate closeness with which the regression lines fit the original data. The signs and values of coefficient b indicate the direction (up or down) and steepness of the regression lines. In this instance, and because there are fifty-one points on the time-series, the first three values of r^2 are highly significant. Even the last (0.432) is still statistically significant, though heavily affected by the apparent change in trend about 1864, when the Maritimes achieved their peak output.

Looking first at ship numbers it can be seen that, as expected, the rate of growth for the percentage of metal ships built in the UK for UK owners (the value of b) is strongly positive at just over one percent a year, while the Canadian Maritimes' rate of decline was nearly seven ships per year. The high values of r^2 indicate the reliability of these results. Looking next at ship tonnages we find that, because metal ships were bigger than their wooden predecessors, the proportion

of metal ships built in Britain for British owners (the third value of b in the text above) is increasing at almost two percent a year, and it was this form of shipbuilding with which the Maritimes could not compete. The validity of the figures in the last line is less (indicated by the low value of r^2) and for reasons mentioned above. For what they are worth, however, they show the trend rate of decline of the Maritimes' shipbuilding output as being in the region of 2.25 thousand net tons a year.

Were we to calculate the correlation coefficients between these regression lines, first for ship numbers and then for tonnages, then it is obvious that because, in each pair, one is rising and the other falling and the cyclical and random elements have been removed we would necessarily obtain indications of perfect negative correlations.

Of course, no correlation can, of itself, indicate the direction of causation. This has to be determined by other means, including qualitative evidence and common sense. Logically, there are three possibilities — that the change in x is causing the change in y, vice versa and that both are being affected by some third factor. Here, it is surely absurd to suppose that the declining trends of ship numbers and tonnages built in the Canadian Maritimes were causing the rising proportion of metal ships built in Britain for British owners. Nor is there any third, or outside, factor which seems to be causing the changes in both.

IV. VALUES, VOLUMES AND PROFITS

Whatever the considerable volumes of cargo which were moved around the world in these well-designed and increasingly-sophisticated sailing ships built in the 1870s and 1880s, there can have been little point in doing it unless there was a reasonable prospect of profitabilty; reasonable, that is to say, with respect to the risks involved and by the standards of what could have been obtained elsewhere. When Robin Craig so rightly stressed that it was "volumes not values" of ships and cargoes that were the crucial matters he did not, I know, intend to decry the importance of profitability. It was, surely, the fact of past profits and the prospect of future ones which brought this whole activity into being. Is it not possible for this to be examined directly?

If Ralph Davis could produce a mass of valuable results on the profitability of English shipping from 1670 to 1730, based on "records scattered among the cases of the High Court of Admiralty in the Public Record Office in London", cannot similar attempts be made in respect of the Maritimes?[22] Cannot wills be examined, and the evidence given in disputes over ships, bills of lading, charters and so on? The life of softwood ships was, of course, far less than that of hardwood ones (Davis suggests a twenty-five year life as typical, though he stresses heavy upkeep costs and especially costs of equipment, presumably ropes, spars and sails). The frequent practice of resale on arrival in Britain complicates matters, but it should be possible to make some representative calculations. Such costs as insurance, wages and victualling ought to be discoverable, though my personal ignorance of Canadian sources prevents my offering specific suggestions. Typical charter rates are often obtainable from Angier and this, together with more direct

evidence, may give an indication of gross revenues. And if an owner's first and only cargo for a vessel built partly with his own hands consisted of timber from his own land then we may impute his earnings by taking the open-market charter rate he could otherwise have obtained (such a procedure may be very helpful in filling gaps). The function of the owner as such and in his other capacity as merchant may thus be separated.

For single or occasional voyages the profitability is probably best determined by the traditional formula

$$ROC = (100)\frac{R - C - D}{Kd}(365) \qquad \ldots\ldots(1)$$

where ROC is the percent rate of return on capital, R is the gross revenue for the voyage, C is the cash costs (wages, insurance, etc.) for the voyage, D is the depreciation allowed, K is the capital cost of the ship, d is the length of voyage in days, and any of these may be imputed if necessary. A refinement of this is to incorporate the need for ships to achieve their earnings in (365 — w) days per year, where w is the number of days spent idle for repairs, etc., and to substitute (365 — w) for 365 in formula 1.

Where a significant proportion of the ship's first cost was explicitly borrowed at an identifiable rate of interest then a further refinement may be to regard the sum of money paid as interest as a cost and to adjust the capital accordingly. We may thus have, as the rate of return on equity:

$$ROC(E) = (100)\frac{R - C - D - I}{bKd}(365 - w) \qquad \ldots\ldots(2)$$

where b is the proportion of capital cost not financed by borrowing.

For ownership periods extending over several years it is probably better to calculate the internal rate of return, i.e., that rate of discount which, when applied to the time-series of (R - C) produces a value equal to, but opposite in sign from K. The theory behind this is that a future net benefit (e.g., the net cash flow R - C) is worth less than a current one, partly because most people look at it that way (i.e., they have a definite rate of time preference) and partly because they could have obtained a return by investing it elsewhere (opportunity cost). A full description of this and associated methods appears in an early work of mine; though this was aimed mainly at *ex ante* calculations it is easily convertible to an *ex post* view.[23] Thus, one takes the formula:

$$K = \Sigma(R_i - C_i)\ (1 + r)^{-i} \qquad \ldots\ldots(3)$$

where r is the rate of discount being sought and i is the year of ship's life in question, and solve it for r. Values of $(1 + r)^{-i}$, known as discount factors, are obtained from financial tables and, frequently, the solution has to be by trial and error. A computer is useful here though some hand calculators, such as the HP 38 E, will produce solutions.

Where R and C are both constant, or where (R - C) is constant, then a direct solution may easily be established by avoiding summation and employing the

sum of the discount factors, known as an annuity factor — this must be so since (R - C) is then in the form of an annuity for, say, n years. The formula then becomes:

$$K = (R - C)\left[\frac{1 - (1 + r)^{-n}}{r}\right] \quad \ldots\ldots (4)$$

Again, values of $\left[\frac{1-(1+r)^{-n}}{r}\right]$, the annuity factor, are easily obtained from financial tables. This formula may be all the more useful in that imputation may involve several years at, one might assume, much the same values. This does, however, have the disadvantage of assuming that repair and maintenance costs are either negligible or constant; and I would have thought that neither was a reasonable assumption with respect to wooden sailing ships and especially those built of softwood.

So far, profitability has been treated as an endogenous factor and, in real life, it obviously is. Nevertheless, it may sometimes be useful to assess a ship's costs (per day, month or year) including appropriate capital charges, possibly in order to compare this with a time-charter rate. Since a sensible businessman seeks more than just the return of his capital it would clearly be a serious understatement of the capital costs if depreciation alone were to be taken as the capital charge. Again, I have dealt with this elsewhere.[24] But the basic approach is to take the annual cash operating costs and to add the result of dividing the capital cost by the annuity factor, thus:

$$C + \frac{K}{\left[\frac{1 - (1 + r)^{-n}}{r}\right]} \quad \ldots\ldots (5)$$

(Note that depreciation is not used here, for the annuity formula automatically incorporates elements of return of, as well as return on, capital.)

Obviously, for any such purposes, r must be exogenously determined by imputation. In a world of fairly stable prices, or where price changes are likely to represent changes in efficiency instead of the inflation to which we are all too accustomed, it may be permissible to take a local bank lending rate or the rate of interest on commercial paper — though the "going" rate of profit in the industry concerned would be better.

V. CONCLUSIONS

In this paper I have attempted to discuss some of the factors which seem to have contributed to the decline of the nineteenth century shipbuilding industries located in the Canadian Maritime Provinces of Nova Scotia, New Brunswick, and Prince Edward Island. Perhaps misleadingly these have been viewed from so far off that they have appeared to be one, despite the significant variations which, I know, existed between them. They often specialised in different rigs or ship sizes, and they often had local, or locally-based trades like sealing or fishing, but all these I have ignored in favour of the overall picture. Much, therefore, remains to be done and by those in more direct contact with Canadian and provincial sources.

Nevertheless it seemed to me that the theory of comparative advantage would probably be relevant, as would the history of technological development in ship design and that evidence, both qualitative and quantitative, could be produced in support of these approaches. It is not for me to say that this evidence is convincing or that my hypothesis that the Canadian Maritime Provinces' comparative advantage in shipbuilding was destroyed by the technological advances in iron and steel-making and the consequential switch in the materials and techniques used in shipbuilding is valid, if only because no one can prove that such a hypothesis is true. Nor is it possible to disprove it. But I have set it up (with some support) and it would be possible for others to make it look silly. This I now invite them to try. Perhaps some will lay much more stress upon steamships' competition than I, though I do not think the chronology supports that view.

In aid of this it would be interesting to have some direct or indirect attempts at studying the profitability of shipbuilding in those years and I have suggested some techniques which might be useful in that context. It would also be useful to have some descriptions of attempts to build composite, iron or steel ships in the Maritimes, and of what happened to the foreign steel allegedly dumped there in successive slumps. Analysis of contemporary discussions about why such vessels could not be built in the Maritimes might also prove useful. It seems unlikely that this was simply because of a third generation of entrepreneurs who, having achieved respectability, had lost their enterprise, because as we have noted enterprise, like capital and good management, was mobile. Among many other factors by no means clear to me, however, is why the decline of the Maritimes' shipbuilding should have been accompanied by the decline of its shipowning industry. In Norway, at about the same time or soon thereafter, there was a growth in shipowning quite divorced from shipbuilding, and one which appears to have been based on the principle of comparative advantage, because, in a country as poor as Norway then was, there were few alternative occupations.

NOTES

1 Graeme Wynn, "Industrialism, Entrepreneurship and Opportunity in the New Brunswick Timber Trade," in Lewis R. Fischer and Eric W. Sager (eds.), *The Enterprising Canadians: Entrepreneurs and Economic Development in Eastern Canada, 1820-1914* (St. John's, 1978), 7-22.

2 A. Gregg Finley, "The Morans of St. Martins, N.B., 1850-1880: Toward an Understanding of Family Participation in Maritime Enterprise," in Fischer and Sager, *The Enterprising Canadians,* 37-54.

3 Finley, "The Morans of St. Martins," 51.

4 P.C. and L.F. Felt, "Capital Accumulation and Industrial Development in Nineteenth Century New Brunswick: Some Preliminary Comments," in Fischer and Sager, *The Enterprising Canadians,* 55-70. They summarise arguments of T.W. Acheson in "The Social Origins of Canadian Industrialism" (unpublished Ph.D. thesis, Toronto, 1972) and various others duly cited.

5 S.G. Sturmey, *British Shipping and World Competition* (London, 1962), 397.

6 Felt and Felt, "Capital Accumulation and Industrial Development," 67-8.

7 E.W. Sager, "The Merchants of Water Street and Capital Investment in Newfoundland's Traditional Economy," in Fischer and Sager, *The Enterprising Canadians,* 75-95.

8 Keith Matthews, "The Shipping Industry of Atlantic Canada: Themes and Problems," in Keith Matthews and Gerald Panting (eds.), *Ships and Shipbuilding in the North Atlantic Region* (St. John's, 1977), 3.

9 Richard Rice, "Measuring British Dominance of Shipbuilding in the Maritimes, 1787-1890," in Matthews and Panting, *Ships and Shipbuilding,* 109-155.

10 See B. Lubbock, *The Log of the Cutty Sark* (Glasgow, 1945).

11 In certain traditions this was the name of the first man to work in metal. See A.W. Kirkaldy, *British Shipping, its History, Organisation and Importance* (London, 1970 edition), 31. *Tubal Cain* was of 787 tons. One advantage of these ships was that they were often planked with teak, a naturally oily timber which neither harms iron nor, as with oak, is harmed by it. It would be interesting to discover any discussions of the prospects of building composite ships in North America, though hardly with teak, and I confess my ignorance on the subject.

12 C.E. Fayle, *A Short History of the World's Shipping Industry* (London, 1933), 239.

13 Kirkaldy, 36.

14 Kirkaldy, 37.

15 E. Corlett, *The Iron Ship,* (Bradford-on-Avon, 1975), 126.

16 L. Isserlis, "Tramp Shipping Cargoes and Freights 1869-1919," *Journal of the Royal Statistical Society* (1938), cited in B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), 224. E.A.V. Angier, "Fifty Years' Freights, 1869-1919," *Fairplay* (1920).

17 But not necessarily for the future. Fossil fuel prices seem likely to rise so high that there may well be a revival of sailing, or sail-assisted, ships. See, for instance, papers to the two Royal Institute of Naval Architects symposia on wind propulsion of commercial ships.

18 R. Craig, "Conference Summary," in David Alexander and Rosemary Ommer (eds.), *Volumes Not Values* (St. John's, 1979), 361.

19 G.S. Graham, "The Ascendancy of the Sailing Ship, 1850-85," *Economic History Review,* IX, No. 1 (1956-7), 75.

20 Graham, "The Ascendancy of the Sailing Ship," 79.

21 Graham, "The Ascendancy of the Sailing Ship," 81.

22 R. Davis, "Earnings of Capital in the English Shipping Industry, 1670-1730," *Journal of Economic History,* XVII, No. 3 (1957), 409-425.

23 R.O. Goss, "Economic Criteria for Optimal Ship Designs," *Transactions of the Royal Institution of Noval Architects* (1965), reprinted in R.O. Goss (ed.), *Studies in Maritime Economics* (Cambridge, 1968), 61-99.

24 R.O. Goss and M.C. Mann, "The Cost of Ships' Time," in R.O. Goss (ed.), *Advances in Maritime Economics* (Cambridge, 1977).

APPENDIX I

BRITISH AMERICAN SHIPBUILDING

Year	Nova Scotia			New Brunswick			Prince Edward Island			Canadian Maritimes		
	Nos	000 nt	Average size	Nos	000 nt	Average size	Nos	000 nt	Average size	Nos	000 nt	Average size
1850	134	17.2	128	71	23.1	325	83	9.6	116	288	49.9	173
1	147	19.4	132	88	32.6	370	83	12.3	148	318	64.3	202
2	186	23.0	124	118	45.0	381	76	9.1	120	380	77.1	203
3	227	29.3	129	121	55.3	457	62	9.5	153	410	94.1	230
4	250	34.5	138	125	69.6	557	94	17.9	190	469	122.0	260
5	236	38.9	165	95	56.7	597	85	14.5	171	410	110.1	269
6	208	41.9	201	129	84.7	657	51	24.2	475	388	150.8	389
7	189	38.1	202	148	76.3	516	104	25.5	245	441	139.9	317
8	151	17.4	115	75	27.9	372	69	13.9	201	295	59.2	201
9	190	25.0	132	93	40.8	439	61	11.8	193	344	77.6	226
1860	233	21.9	94	100	43.4	434	66	13.3	202	399	78.6	197
1	216	25.0	116	80	42.9	536	67	13.5	201	363	81.4	224
2	201	41.7	207	90	51.6	573	80	19.5	244	371	112.8	304
3	207	49.7	240	137	90.4	660	100	26.5	265	444	166.6	375
4	304	77.3	254	163	98.1	602	119	35.3	297	586	210.7	360
5	294	60.2	205	148	69.3	468	126	36.3	288	568	165.8	292
6	300	57.2	191	133	55.7	419	127	33.8	266	560	146.7	262
7	192	38.7	202	104	35.8	344	84	22.3	265	378	96.7	256
8	139	32.8	236	84	25.8	307	75	19.8	264	298	78.4	263
9	105	28.3	270	88	33.9	385	53	16.3	308	246	78.5	319
1870	141	35.7	253	88	37.7	428	53	15.1	285	282	88.5	314
1	146	46.9	321	108	35.6	330	52	14.0	269	306	96.5	315
2	188	56.0	298	93	38.7	416	60	16.0	267	341	110.7	325
3	176	66.7	379	104	45.2	435	75	21.3	284	355	133.2	375

continued

APPENDIX I (continued)

4	181	79.2	438	96	49.5	516	67	15.9	237	344	144.6	420
5	193	89.9	465	83	50.8	612	91	27.5	302	367	168.1	458
6	232	73.2	316	71	41.1	579	90	22.5	250	393	136.8	348
7	234	53.5	229	64	35.1	548	67	16.3	243	365	104.9	287
8	198	50.4	255	50	27.9	558	57	17.5	307	305	95.8	314
9	133	54.0	406	67	34.0	507	28	7.8	279	228	95.8	420
1880	136	40.5	298	48	15.4	321	19	5.9	311	203	61.8	304
1	135	45.9	340	62	21.9	353	18	3.1	172	215	70.9	330
2	122	33.3	273	56	18.6	332	14	4.0	286	192	55.9	291
3	200	39.4	197	76	21.2	279	13	3.9	300	289	64.5	223
4	195	36.7	188	67	23.0	343	22	6.1	277	284	65.8	232
5	133	29.9	225	47	16.1	343	21	5.3	252	201	51.3	255
6	90	22.5	250	28	9.4	336	8	1.3	163	126	33.2	263
7	77	15.1	196	32	7.4	231	14	1.8	129	123	24.3	198
8	106	15.3	144	22	2.1	95	4	0.2	50	132	17.6	133
9	124	14.1	114	42	3.4	81	16	1.6	100	182	19.1	105
1890	114	22.2	195	45	6.9	153	10	1.6	160	169	30.7	182
1	138	35.7	259	69	12.7	184	11	2.0	182	218	50.4	231
2	111	32.1	289	44	4.3	98	5	1.1	220	160	37.5	234
3	108	18.6	172	60	5.3	88	8	1.3	163	176	25.2	143
4	82	9.9	121	113	4.0	35	4	0.4	100	199	14.3	72
5	107	5.8	54	22	0.7	32	1	0.1	100	130	6.6	51
6	70	5.2	74	24	0.6	25	2	0.2	100	96	6.0	63
7	52	4.4	85	30	0.7	23	4	0.1	25	86	5.2	60
8	60	5.1	85	24	1.9	79	1	0.2	200	85	7.2	85
9	69	4.7	68	35	1.2	34	8	0.4	50	112	6.3	56
1900	112	9.2	82	18	0.6	33	1	0.0	—	131	9.8	75

Source: 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, 1978).

APPENDIX II

SAILING SHIPS BUILT AND FIRST REGISTERED IN THE U.K. OR BUILT IN THE U.K. FOR BRITISH CITIZENS OR COMPANIES

	Wood			Composite[1]			Iron			Steel[2]		
Year	No	000 tons	Average size tons	No	000 tons	Average size tons	No	000 tons	Average size tons	No	000 tons	Average size tons
1850	610	117.0	192	—	—	—	11	2.1	191	—	—	—
1	587	124.9	213	—	—	—	7	2.0	286	—	—	—
2	605	134.7	223	—	—	—	3	2.1	700	—	—	—
3	635	146.4	231	—	—	—	10	8.6	860	—	—	—
4	592	115.8	196	—	—	—	36	16.9	469	—	—	—
5	818	211.9	259	—	—	—	47	30.3	645	—	—	—
6	888	175.4	198	—	—	—	33	11.6	352	—	—	—
7	1012	184.2	182	—	—	—	38	13.4	353	—	—	—
8	822	140.4	171	—	—	—	25	14.5	580	—	—	—
9	755	128.3	170	—	—	—	34	19.7	579	—	—	—
1860	786	144.6	184	—	—	—	32	13.6	425	—	—	—
1	731	107.2	147	—	—	—	43	22.7	528	—	—	—
2	758	120.0	158	—	—	—	69	44.0	638	—	—	—
3	739	146.0	198	—	—	—	142	107.1	754	—	—	—
4	713	146.8	206	—	—	—	154	125.7	816	—	—	—
5	806	150.5	187	—	—	—	116	85.1	734	—	—	—
6	815	112.0	137	42	26.1	621	112	69.5	621	—	—	—
7	744	97.2	131	36	18.3	508	99	59.0	596	—	—	—
8	596	87.2	146	29	18.8	648	162	131.7	813	—	—	—
9	499	71.2	143	32	21.2	662	157	138.4	882	—	—	—
1870	450	56.1	125	28	12.1	432	63	48.8	775	—	—	—
1	435	38.5	89	7	1.4	200	30	16.7	557	—	—	—
2	386	39.2	102	4	0.6	150	18	15.1	839	—	—	—

continued

APPENDIX II (continued)

3	369	40.4	109	—	—	—	49	48.1	982	—	—	—
4	382	43.9	115	1	0.2	200	116	143.2	1234	—	—	—
5	372	41.6	112	1	1.3	1300	193	198.9	1030	—	—	—
6	466	45.2	97	3	1.0	333	218	190.7	875	—	—	—
7	532	42.5	80	—	—	—	174	169.7	975	—	—	—
8	480	37.5	78	—	—	—	110	103.7	943	—	—	—
9	352	22.1	63	3	0.1	33	44	136.8	3109	1	50	—
1880	288	17.8	62	21	0.7	33	39	37.3	956	5	1.8	360
1	259	16.5	64	9	0.4	44	87	72.4	832	4	3.1	775
2	232	13.4	58	—	—	—	120	118.5	988	10	13.9	1390
3	247	13.9	56	—	—	—	96	114.1	1189	23	18.7	813
4	297	17.4	59	—	—	—	107	128.3	1199	23	16.3	709
5	265	17.3	65	—	—	—	154	155.5	1010	32	34.5	1078
6	227	13.9	61	—	—	—	93	92.3	992	39	31.8	815
7	179	9.4	53	—	—	—	44	46.6	1059	34	25.2	741
8	176	9.1	52	—	—	—	55	21.0	382	38	45.6	1200
9	191	9.1	48	—	—	—	24	15.1	629	62	93.3	1505
1890	182	9.3	51	—	—	—	25	12.7	508	70	101.3	1447
1	167	8.0	48	—	—	—	25	6.6	264	116	177.3	1528
2	156	8.2	53	—	—	—	28	9.0	321	138	241.5	1750
3	184	8.8	48	—	—	—	50	3.4	68	99	102.7	1037
4	178	8.9	50	—	—	—	46	4.5	98	139	75.8	545
5	180	8.1	45	—	—	—	46	5.0	109	93	41.0	441
6	209	10.1	48	—	—	—	51	5.0	98	129	42.4	329
7	256	11.7	46	—	—	—	90	8.8	98	172	46.2	269
8	297	14.0	47	—	—	—	113	8.0	71	255	19.9	78
9	273	12.7	47	—	—	—	75	5.6	75	222	27.2	123
1900	250	13.0	52	—	—	—	52	3.9	75	202	21.6	107

[1]Composite ships were included in either wood or iron before 1866 and after 1882 they were included with wood. They are excluded above.

[2]Before 1878 steel ships were included with iron.

Source: B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), 220-4. Channel Islands and Isle of Man are excluded.

APPENDIX III

SAILING SHIPS BUILT AND FIRST REGISTERED IN THE U.K. OR BUILT IN THE U.K. FOR BRITISH CITIZENS OR COMPANIES: TOTAL NUMBERS AND TONS; PROPORTIONS OF SHIP NUMBERS AND TONS

	Total		Wood		Composite[1]		Iron		Steel[2]	
Year	Nos	000 nrt[3]	% Nos	% tons	% Nos	% tons	% Nos	% tons	% Nos	% tons
1850	621	119.1	98.23	98.24	—	—	1.77	1.76	—	—
1	594	126.9	98.82	98.42	—	—	1.18	1.58	—	—
2	608	136.8	99.51	98.46	—	—	0.49	1.54	—	—
3	645	155.0	98.45	94.45	—	—	1.55	5.55	—	—
4	628	132.7	94.27	87.26	—	—	5.73	12.74	—	—
5	565	242.2	94.57	87.49	—	—	5.43	12.51	—	—
6	921	187.0	96.42	93.80	—	—	3.58	6.20	—	—
7	1050	197.6	96.38	93.22	—	—	3.62	6.78	—	—
8	847	154.9	97.05	90.64	—	—	2.95	9.36	—	—
9	789	148.0	95.69	86.69	—	—	4.31	13.31	—	—
1860	818	158.2	96.09	91.40	—	—	3.91	8.60	—	—
1	774	129.9	94.44	82.53	—	—	5.56	17.47	—	—
2	827	164.0	91.66	73.17	—	—	8.34	26.83	—	—
3	881	253.1	83.88	57.68	—	—	16.12	42.32	—	—
4	867	272.5	82.24	53.87	—	—	17.76	46.13	—	—
5	922	235.6	87.42	63.88	—	—	12.58	36.12	—	—
6	969	207.6	84.11	53.95	4.34	12.57	11.56	33.48	—	—
7	879	174.5	84.64	55.70	4.10	10.49	11.26	33.81	—	—
8	787	237.7	75.73	36.68	3.68	7.91	20.58	55.41	—	—
9	688	230.8	72.53	30.85	4.65	9.19	22.82	59.97	—	—
1870	541	117.0	83.18	47.95	5.18	10.34	11.65	41.71	—	—
1	472	56.6	92.16	68.02	1.48	2.47	6.36	29.51	—	—
2	408	54.9	94.61	71.40	1.00	1.09	4.41	27.50	—	—
3	418	88.5	88.28	45.65	—	—	11.72	54.35	—	—

continued

4	499	187.3	76.55	23.44	1.00	1.00	23.25	76.45	—	—
5	566	241.7	65.72	17.21	1.00	1.00	34.10	82.25	—	—
6	687	236.9	67.83	19.03	1.00	1.00	31.73	80.50	—	—
7	706	212.2	75.35	20.03	—	—	24.65	79.97	—	—
8	590	141.2	81.36	26.56	—	—	18.64	73.44	—	—
9	399	159.0	88.22	13.90	1.00	1.00	11.03	86.04	—	—
1880	353	57.6	81.59	30.90	5.95	1.22	11.05	64.76	1.42	3.13
1	359	92.4	72.14	17.86	2.51	1.00	24.23	78.35	1.11	3.35
2	362	145.8	64.09	9.19	—	—	33.15	81.28	2.76	9.53
3	366	146.7	67.49	9.48	—	—	26.23	77.78	6.28	12.75
4	427	162.0	69.56	10.74	—	—	25.06	79.20	5.39	10.06
5	451	207.3	58.76	8.35	—	—	34.15	75.01	7.10	16.64
6	359	138.0	63.23	10.07	—	—	25.91	66.88	10.86	23.04
7	257	81.2	69.65	11.58	—	—	17.12	57.39	13.23	31.03
8	269	75.7	65.43	12.02	—	—	20.45	27.74	14.13	60.24
9	277	117.5	68.95	7.74	—	—	8.66	12.85	22.38	79.40
1890	277	123.3	65.70	7.54	—	—	9.03	10.30	25.27	82.16
1	308	191.9	54.22	4.17	—	—	8.12	3.44	37.66	92.39
2	322	258.7	48.45	3.17	—	—	8.70	3.48	42.86	93.35
3	333	114.9	55.26	7.66	—	—	15.02	2.96	29.73	89.38
4	363	89.2	49.04	9.98	—	—	12.67	5.04	38.29	84.98
5	319	54.1	56.43	14.97	—	—	14.42	9.24	29.15	75.79
6	389	57.5	53.73	17.57	—	—	13.11	8.70	33.16	73.74
7	518	66.7	49.42	17.54	—	—	17.37	13.19	33.20	69.27
8	665	41.9	44.66	33.41	—	—	16.99	19.09	38.35	47.49
9	570	45.5	47.89	27.91	—	—	13.16	12.31	38.95	59.78
1900	504	38.5	49.60	33.77	—	—	10.32	10.13	40.08	56.10

[1]Composite ships were included in either wood or iron before 1886 and after 1882 they were included with wood.

[2]Steel ships were included with iron until 1878. In 1879 there was only 1 50 nrt.

[3]All tonnages net.

Source: derived from Appendix II.

APPENDIX IV

INDEX OF TRAMP SHIPPING FREIGHTS, 1869-1905[1]

Year	Index	Year	Index
1869	100	1890	64
1870	103	1891	63
1871	102	1892	55
1872	103	1893	60
1873	117	1894	58
1874	108	1895	56
1875	99	1896	56
1876	98	1897	56
1877	99	1898	68
1878	91	1899	65
1879	85	1900	76
1880	87	1901	57
1881	87	1902	49
1882	81	1903	49
1883	75	1904	49
1884	64	1905	51
1885	63		
1886	59		
1887	65		
1888	76		
1889	75		

[1]1869 = 100. The series extends to 1936 and has been taken, here, to 1905 because it is clear from the figures that 1900, which is the terminal year for most of the time-series in this paper, marked a cyclical peak.

Source: L. Isserlis, "Tramp Shipping Cargoes and Freights," *Journal of the Royal Statistical Society* (1938).

8. COMMENTARY: ON DEMAND AND SUPPLY IN SHIPPING AND REGIONAL ECONOMIC DEVELOPMENT

Peter D. McClelland

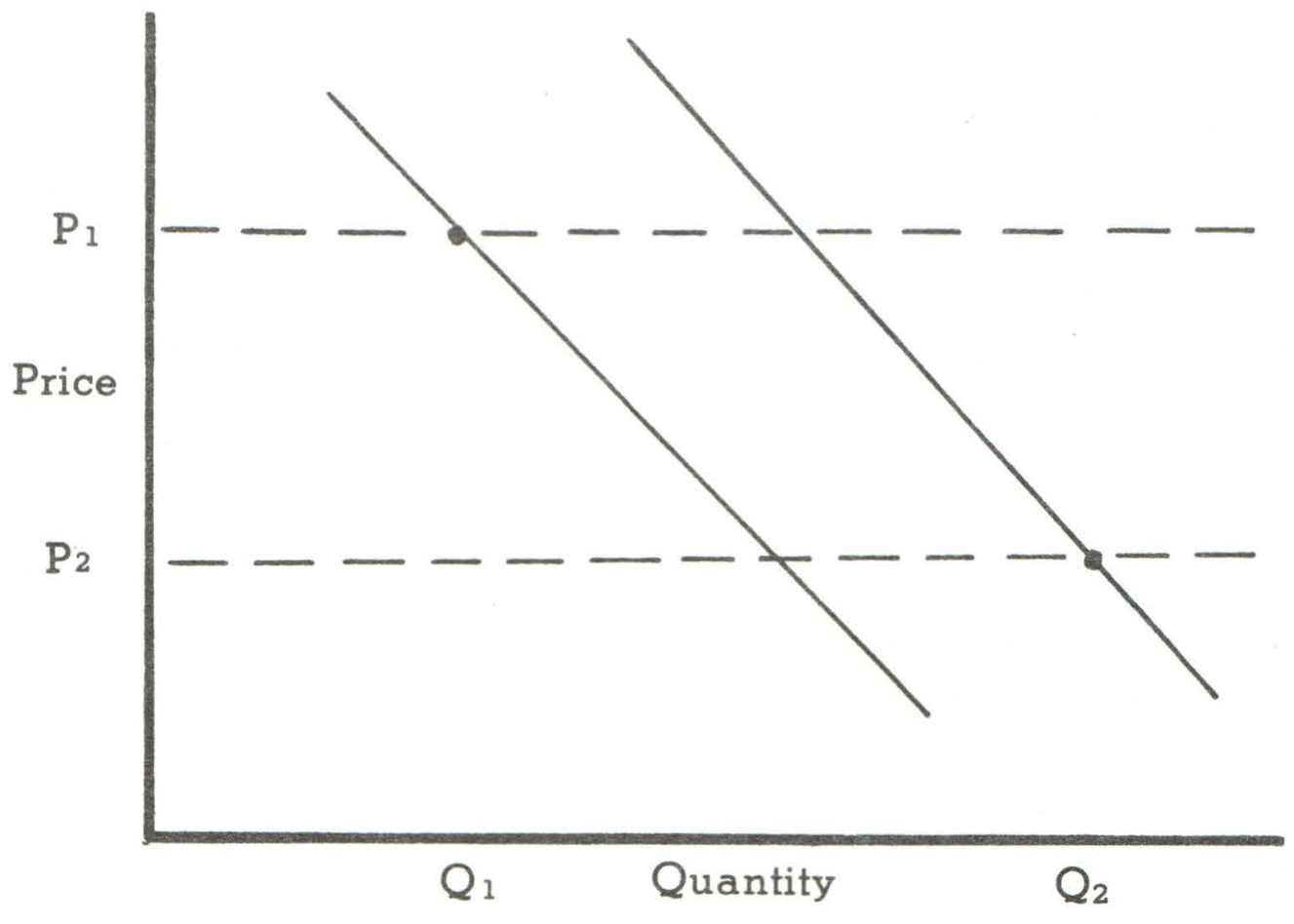
I have written a fifteen page commentary which I plan now to ignore. I feel that what I am about to say is no more dull than what I have written, and so I hope that there is no cause for apology. I should like first to discuss the question of methodology. The controlling question which both Harley and Goss address is the shifting pattern of ship ownership across ports in the late nineteenth century. Clearly it is not enough merely to list the causes behind historical events; historians are expected to weigh causes. It is often difficult to know where historians get their weights for major and minor causes. It is less difficult to show whence economists derive their weights: they derive weights from models and economists' models make their weights quite explicit. The specific model in Knick Harley's work is a partial equilibrium model. At the heart of Harley's analysis is a fairly simple thought process, and his intention is to weigh different causal factors. Harley's partial equilibrium model offers one approach to the "location of industry" question being posed by the members of the Atlantic Canada Shipping Project.

Let us take ship ownership and in the convention of economics let us look at price and quantity. Here price is the price of moving freight and quantity is the quantity of freight moved. If we had only data on price and quantity, what would we see? Simplifying from a complex world, what we would observe for a particular year (say, 1870) is a point between two axes representing a quantity of freight moved in world trade and an average price charged. Then if we considered price and quantity a third of a century later we should plot a second observation which records the steep drop in price and the increase in quantity in the intervening period. On the same axes we could plot the quantity moved by Saint John shipowners. The puzzle for the economist is this: why did price decline? why did quantity increase? To answer these questions you have to look at the supply side and then the demand side, first in aggregate and then within the different regions. Let me suggest one possibility, following Harley's lead and assuming that the supply curve for the world at large is horizontal (although it is an interesting question why that might be the case). What this says (see the Figure) is that the supply curve for the world at large dropped from P_1 to P_2. If we ask why price fell, the answer is clear from the geometry: price fell because the supply curves fell. As long as the curves are horizontal, they will determine price and demand curves will determine quantity. Then if we ask what happened on the demand side to cause quantity to move from Q_1 to Q_2, we would need to know the world demand for shipping and we would plot a demand curve which is downward-sloping, but one which moves to the right over time. Thus, if we are trying to explain the shift from Q_1 to Q_2, part, but only part, of the explanation comes from the sensitivity of

quantity to a fall in price (and if the demand curve had not shifted, quantity would have moved only to that point where the first demand curve intersects the lower supply curve).

Notice that behind this elementary geometry is the weighing of causal factors. Quantity increased in part because price fell, but also because, for instance, of a shift in world technology in certain types of production, or because of a shift in world incomes, or because of some other factor. Returning to the problem of shipping in New Brunswick, we can also consider ship ownership over time within this geometric framework. We have plotted the aggregate movement of quantities; we could also plot a very steep supply curve for New Brunswick, telling us that New Brunswick supply (or quantity of shipping tonnage) actually fell absolutely, and that it fell as a proportion of world tonnage to a large degree *because* the curve is steep. The geometry does not answer questions without relevant evidence, of course; it is simply a way of expressing relationships existing in the real world. But the geometry is a useful way to spell out the procedures used in weighing causal factors in economic analysis. Harley is in fact using a conventional method — supply and demand analysis — to approach what is essentially a "location of industry" question. The model is relevant to the work of the Atlantic Canada Shipping Project; because if the members of that Project, in their weighing of causal factors, do not use this kind of analysis, then they must have another method, or a fall-back position. It is not clear to me what that fall-back position might be. But Harley's approach is based upon the simplest form of economic analysis, and you should not be dismayed by the geometry nor by the complexities involved in estimating the slopes of curves.

Richard Goss has raised the question of profits and suggested some methods by which profit rates can be measured. I suggest that in terms of the "location of



industry" analysis which I would favour, profit rates are not very interesting numbers. Of crucial importance in the geometry discussed above are the supply curves; if you want to delineate supply curves you must know the cost structures, not profit rates. If the Project were to adopt this approach to the weighing of causal factors, cost structures would become the first priority.

Let me return to the controlling question which interests all of us: why did the production of ships, and the ownership of shipping tonnage, boom and then fall? Or, in terms of economic geometry, why do we observe those sharp changes on the quantity axis, and what is the relationship of price to those quantity changes?

A further question, put most explicitly in the paper at this Conference on "Landward and Seaward Opportunities," is this: what has the rise and decline of shipping to do with economic boom and relative decline in the Maritimes? There are, I think, two hypotheses about this latter question, and let me try to outline these hypotheses as precisely as I can. The Project's hypothesis is a fairly conventional one. It suggests that, as of 1830, say, the economy of New Brunswick was based primarily upon timber (and to a lesser extent agriculture), although shipbuilding and ship ownership had already begun. As time passed, shipbuilding and shipping had a profound impact upon the economy. It is implicit in this analysis that the Maritimes failed, and that the loss of maritime industries (especially shipping) had something to do with that failure. The argument is advanced that government policies, and especially the National Policy, distorted the market mechanism by subsidizing activities in the central and western provinces, and by providing incentives in the Maritime provinces for the movement away from the sea and towards the land.

The second hypothesis is very different. Our expectations for regional economies are analogous to our expectations for firms. There are going to be winners and losers. It is reasonable to expect that in competitive regional development there should be some winners and some losers. Notice that "loser" is a relative term. It does not mean that the poorer region has zero growth. It merely says that some regions are growing more slowly than are competing regions, such as Ontario. Is it, for example, a puzzle why Labrador never took off into rapid industrial growth? Why might it *not* be a puzzle that the New Brunswick economy never took off as did the Ontario economy? In my doctoral thesis I began with the dominant activities as they were in the 1820s (particularly timber, fishing and agriculture). I attempted to assess what were the chances for growth in labour productivity in each sector. The results may have been partial and impressionistic. But since productivity is closely associated with opportunities for technical change and capital formation, it appeared that there was not a substantial opportunity for productivity gain in those sectors. Further, when shipbuilding and ship ownership arrived, these provided a mere ripple upon the existing economy. Even if we refer to Lewis Fischer's revised data on shipping's contribution to gross regional product, one is impressed by the small size of the industry as a contributor to the regional economy. One must also reduce that estimate by taking into account the available alternatives to investors. That is, one must ask what investors would have made from the next best alternative, apart

from shipping, and what contribution that alternative might have made to gross regional product. One must therefore reduce Fischer's estimate of the contribution of shipping by the amount contributed by the next best alternative. Of course a small sector can have a large impact if there are enough linkage effects, but I was unable to find very significant linkage effects in the case of shipping and shipbuilding.

If you accept this, then you must agree, surely, that in the New Brunswick economy there would be some growth in labour productivity, but the economy was committed to sectors in which productivity growth was slow relative to productivity growth elsewhere. Productivity growth would be slow in the primary sector, and this slow productivity growth, and the absence of significant linkages, would also constrain growth in the manufacturing sector. The result was an economy suffering not absolute decline, but relative retardation in the long-run. Relative retardation can be compounded, of course, by the tendency of factors of production — labour, capital and entrepreneurs — to migrate to places where returns appear to be higher. This, in rough outline, is the second hypothesis about the development of New Brunswick. Nothing which I have read or heard has persuaded me to abandon this hypothesis.

It is worth asking why secular retardation has become ingrained. Why is it not possible to turn a lagging region into a leading region? This question so discouraged me that I turned my back on the whole question of New Brunswick's economic development from the day that I submitted my doctoral thesis until now. I concluded that many of the answers could not be found in economic theory. If you wish to grapple with the question of regional economic development in Canada, you must inevitably confront the poverty of regional economic theory. It is staggering what regional economic theory cannot do, compared to what it can do. Regional economic theory does not have an enviable record in explaining long-run change. Why should this be so? The answer is complex, but let me suggest one possibility, consistent with Peter Davies' concern for the role of the entrepreneur in maritime history. The entrepreneur has disappeared from modern neo-classical economics. But if you believe that development has something to do with entrepreneurs, then entrepreneurs become a central catalyst for whatever growth possibilities are to be realised. As retardation sets in, some entrepreneurs are going to leave the region. And I asked myself as I walked the streets of Saint John, New Brunswick: what difference does their leaving make to those who remain behind? Some of the best, and presumably most aggressive entrepreneurs go, and in their going they change the environment for those who are left behind. Consider an analogy: if you took from every hockey team in one province the best three players in each year, what would happen to the quality of the sport over time? The same question can be posed not only about the effects of losing entrepreneurs, but also about the effects of migration by skilled labourers. The loss incurred by the departure of entrepreneurs is cumulative, because they leave behind a less competitive environment which can have a debilitating effect on those who remain. I know of

no way ofmeasuring the effect of such losses, and the awesome complexity of this problem is one reason why I abandoned the topic long ago.

But I am convinced of two things. First, these kinds of questions cannot be answered properly within the context of regional economics as it presently stands. Second, if these questions are to be dealt with, then much has to be added into the analysis which has so far been excluded. This process of strengthening future analysis must inevitably draw upon the kind of work being done by the Atlantic Canada Shipping Project, not least because the members of that Project have the advantage that they were not trained in economics at the University of Chicago.

9. DISCUSSION FOLLOWING THE PAPERS OF HARLEY AND GOSS

DAVIES pointed out that the absence of regulation and a conference system in the North Atlantic was important to understanding that trading area. In the West African trades, by contrast, the problem of imbalances in load factors between southward and northward passages was worked out within the context of a tightly regulated conference system.

FISCHER asked which data might be used as the discount factor in Goss's equations.

GOSS replied that there is a considerable literature on the problem of calculating rates of return and opportunity costs of capital. One method, which does not work well, is known as social time preference, involving the idea that society as a whole evaluates a benefit at some time in the future by a certain percentage less than having it now. There are many problems with this approach. Another approach is called social opportunity cost, and this is generally found by looking at the pre-tax opportunity cost of capital in the private sector. The private sector seeks this rate, and it is possible to measure it, although difficult to measure it accurately. Ideally you should look at the social opportunity cost of capital in the localities in question. At what rate of interest could municipalities issue bonds? You might also use both public and private rates of discount.

McCLELLAND thought that if the purpose was to compare returns in shipping with returns in other industries, the correct formula would be a variant of Goss's first formula, measuring returns on an annual basis, and ignoring the fact that some of the capital may have been borrowed. You should then compare returns in shipping with the best available alternative, which is usually some form of bond market or lending market, and you should observe the interest rates in municipal borrowing or mortgage interest rates or something like that. The problem then is to adjust for risk differentials, and there is no easy answer to that. Finally, as a footnote to the economists, in making the comparison it is probably not worth talking about social rates of return, because there is no reason to assume an identity between a social rate of return and a private rate of return. The market system will throw up, through interest rates plus a risk factor correction, an indication of private trade-offs (shipowning versus alternatives) and this is probably the best you can hope for.

FISCHER asked how one then adjusted for the risk factor, since shipping was certainly a very risky business.

HARLEY suggested using Goss's formula to calculate an internal rate of return on shipping, and then comparing that return to returns in the bond market, and to returns on the stock market, since returns in the latter would be a few percentage points higher than those in the essentially riskless bond market over a sufficiently long period of time. Shipping was so risky that you had to

hope for those five good years out of fifteen, and your profits depended upon your having those five good years. In the end you may do no better than saying that returns were somewhere between three and fifteen percent.

GOSS pointed out that the shipowner could insure against the risk of a vessel sinking, and insurance is one of the costs to be deducted when calculating rates of return. There were other risks, but these were primarily financial risks, not necessarily very different from the risks of investing in stocks or bonds in the late nineteenth century (and these latter risks could be considerable). There were many problems involved in calculating rates of return, but at least for the late nineteenth century you had only modest price changes, and no serious problem estimating taxes or the level of tax avoidance.

FRANK suggested that in explaining why the Maritimes' shipowners did not make the transition to iron and steam it might be worthwhile to do an empirical study of those attempts which were made to build steel ships in the region. The question about why the Maritimes did not make the technological transition in shipping was frequently asked in the 1890s and early 1900s. In 1899 J.W. Carmichael wrote an article advocating the establishment of steel shipbuilding in the Maritimes. In Halifax during the next three or four years a substantial effort was made to establish steel shipbuilding. Builders were brought over from the Clyde, and a lobby in Ottawa attempted to secure bounties. Other proposals were made in Sydney, Louisburg, and Saint John. These attempts failed, first because the necessary capital was not raised, which suggests that one ought to look more closely at the capital markets of the region. The attempts failed also because adequate government support, in the form of bounties, was not forthcoming. Such bounties as were established were designed to suit Great Lakes builders. By 1919, however, large steel ships were being built in Halifax, precisely because entrepreneurs from the outside contributed capital, and because the government decided to subsidise steel shipbuilding. These specific episodes should be studied in detail, as well as the larger themes: what was state policy towards marine-based industries in this period? What capital was available in the region?

HARLEY wondered whether you could argue that steel ships could have been built competitively in the Maritimes in 1905. The people with capital apparently thought that such ships could not be built economically.

FRANK suggested that one must know a great deal more about capital movements in order to determine why capital did not go into steel shipbuilding. We must also know more about what conditions potential investors required, and what they were being offered. In the case of at least one Clyde shipbuilder the absence of an adequate bounty was critical. One must remember that bonussing was then very common, and loomed large in investment decisions.

DAVIES argued that steel shipbuilding was the top of the pyramid of industrial development. You cannot have shipbuilding without the developed industrial base which goes with it. For this reason it was unlikely that the Maritimes could have built steel ships in competition with the British at that time.

G. KEALEY thought that there was an ideological point underlying Frank's argument which was being missed. Several speakers had acknowledged the limits to neo-classical economic theory and economic history. There was much to be said for the kind of empirical economic history which Frank was advocating. Historians have often been sloppy and averse to theoretical discussion, but they do have alternatives other than reductionist model-building. The neo-classical approach to regional economic development has been particularly blinkered. The concept of comparative advantage tells us little about regional development. The role of the state, in subsidising Canadian railways, for instance, was of crucial importance. McClelland's idea that there are always going to be "winners and losers" is a mere apologia, and further it tells us nothing about the historical reasons why some regions fared better than others. In pushing the critical historical question there is no need to retreat into behavioural psychology, nor even into the neo-classical notion of comparative advantage. There are interpretations based upon centre-periphery theory, and others which derive from Marxist economic theory.

McCLELLAND suggested that neo-classical theory was one valuable way of looking at the world, and its relevance in a particular historical situation depended on whether markets were relevant. If we ask not the policy question, "what should we do about the New Brunswick economy?" but the historical question, "how do we explain what happened in New Brunswick?" then markets become relevant and markets were working effectively enough to be critical in explaining what happened. On the issue of steel shipbuilding and capital availability, the question as to why there was not enough capital is at best secondary. If money were to be made in building steel ships, capital would have found its way from Liverpool or Boston or Toronto. The fact that it did not find its way is proof that a fortune was not to be made. Second, if we down-play the importance of capital availability, why place so much emphasis on the single factor of government subsidies? The question of the absence of steel shipbuilding is a location of industry question, best answered by a total cost study across major producing centres, the results of which should be contrasted with those actual cases of steel shipbuilding in the Maritimes. Once we get those facts it remains a tricky economic problem, if you believe that markets are working fairly well, to explain which of the cost differences account for most of the failure in the Maritimes. As a first approach to this question this is a reasonable way to proceed, and it requires no reference to Marxist economics. Marxist economics offers a very useful framework for certain historical questions and contexts; but in this case the factors at work have to do with market mechanisms.

FRANK replied that we do know something about capital availability. The Bank of Nova Scotia, for instance, was a net exporter of capital from the region by the early twentieth century. Clearly there were many industries in the Maritimes which would have been profitable and viable, had not the banks preferred to invest in the mid-western United States, for instance. In this period control

over capital was being centralised, and if the banks exported capital to places where opportunities were superior, this does not tell us that opportunities in the Maritimes were non-existent. Further, we cannot ignore the role of the state in structuring the incentives and opportunities presented to banks and other investors in this period. The availability of capital within the region was affected very substantially by centralised control of the capital markets, and by state policy towards economic development in different regions.

10. SHIPPING INVESTMENT IN THE URBAN CENTRES OF NOVA SCOTIA

GERRY PANTING

Atlantic Canada Shipping Project

SHIPPING INVESTMENT IN THE URBAN CENTRES OF NOVA SCOTIA[1]

Gerry Panting

These annual symposia are held in an attempt to provide a thrust to the intellectual development of the Atlantic Canada Shipping Project by exposing the methods and results of research to criticism and cross-fertilization. They present the work of Project investigators and of others who have related academic interests. In such a context this paper is an attempt to delineate, for critical consideration, those research activities denoted as the "Landward Analysis." Because the objective of research into the landward base of the shipping industry is to trace the connections between shipping and the general commercial life of the ports from which it grew, the methods used have had to provide for comparisons between ship deployment and other sectors of the economy.[2] At the same time, comparisons between ports of registry must be made.[3] Some of the illustrative examples in this study will be drawn from those ports of Nova Scotia upon which registry analyses have been performed by other members of the Project.[4] In pursuit of self-examination, the remainder of the paper will consist of a discussion of the rationale and sources of the Landward Analysis (I), followed by its evolution (II), its current characteristics (III), and finally (IV) a projection of the anticipated results of its application and extension.

I

In the interests of comparison it has been necessary to establish the optimum number of features to be sought out in the vessel-owning communities attached to the ports of registry. The unit of analysis, to which all the data has to be related, is the vessel owner who acquired a significant amount of tonnage; the analysis therefore requires a sample of the whole population of owners. This was a necessary step in order to plot the careers of specific individuals. Because the industry proved to rest upon a wide base of partnerships and was characterized by family units of ownersip,[5] both the specific individuals who held tonnage together and the connections of kinship among the major owners had to be established, the latter so far as genealogical data would allow. The second feature was the timing of the entry of individuals into and their withdrawal from the shipping industry.[6] Thirdly, the general business activities of major vessel owners are important because the question of alternative investments to shipping was raised. In order to compare the major owners *as owners* and *as businesmen,* their partnerships and their directorships in public companies were investigated. In turn, the timing of entry and withdrawal related to these activities as well as their variety constituted necessary information. Of course, some owners moved from shipping into alternative businesses while others began in other businesses and then moved

into shipping. Such a consideration called for a broadening of the detail in the analysis. Fourthly, the details of the owners' personal fortunes were required at various points in their careers as well as the disbursement of those fortunes. The fifth feature was based on the assumption that an understanding of the history of the port communities was necessary. More particularly, note has been taken of the commercial growth of communities, including the dates of the appearance of various technologies and businesses.

Unlike the fleet, voyage and crew studies carried out for the Project, the majority of sources for the Landward Analysis are not computerized. Moreover, these sources are varied and embody different kinds of data. The family links of the owners have been drawn from papers held by archival depositories, and from commentaries in newspapers and in the works of local historians. Extremely helpful have been genealogical studies of various kinds.[7] From the computer files on the characteristics of specific fleets the initial information about vessel registrants was taken. This includes the amounts of tonnage acquired by individuals and the partnerships in tonnage registration as well as the occupations and residences of owners. For the development of businesses in the specific centres being studied, information on business partnerships and the contents of advertisements and articles have been extracted from newspapers. The advertisements in business directories were also scrutinized while the categories of activity in these were analyzed line by line. This occupational information was used both to establish the general commercial activities of communities and to identify the specific business activities of the vessel owners. Needless to say, another source of information on individual owners consists of business records and general papers found in archival collections. Other information about public companies was found in the Appendices to Legislative *Journals;* in the statutes by which those companies were established; and in the Canadian *Sessional Papers,* which have been searched for the financial interests of specific owners. Where they were available, wills and inventories provided another official source of information about the distribution of investments by individuals.[8] From such sources the flow of assets within and between families could be assessed to a degree. On the matter of whether owners were oriented toward other marine-related activities, the occupational information derived from the official registers has been construed, along with that from directories, newspapers and archival materials.[9] For background information on matters such as population development and economic activities, the provincial and federal *Censes* are one source while the trade figures in Legislative *Journals* and *Blue Books* constitute another. County and other local histories have been culled for various kinds of information. From such official and unofficial sources, the growth of vessel-owning centres and areas can be determined.

II

Along with other aspects of the Project, the attempts to implement the Landward Analysis have generated publications. The first of these was a joint

paper written by David Alexander and the author in order to incorporate some of the first tentative results. The next was a specific landward study of the Yarmouth vessel owners that outlined the approach to a single port of registry. This was followed by the first comparative study dealing with Halifax and Saint John as well as Yarmouth. Returning to the vehicle of a jointly-authored study of a single port, a paper on Saint John was written in cooperation with Lewis R. Fischer. Finally, a second comparative study was presented to the Fourth Annual Conference of the Project on four Nova Scotian ports of registry — Halifax, Pictou, Windsor and Yarmouth.[10]

In order to deal with individual owners it was necessary to develop a sampling method. This began, in the case of Yarmouth, with a dozen owners, each of whom had registered five thousand tons or more during their shipping careers.[11] The next step was to sharpen the definition so as to include only those committed to the shipping industry. Residents of Yarmouth who registered over five hundred *new* tons through at least two decades between 1840 and 1889 were selected.[12] In an attempt to deal with the problem of differences in the size of gross investment in the different ports of registry two different criteria were applied in the first comparative study. These were one thousand new tons or more for Halifax and Yarmouth and five thousand or more new tons for Saint John.[13] In dealing with the port of Saint John alone the sample of owners was extended to include all those residents who acquired more than one thousand tons of newly-built shipping.[14] But the ownership of wooden sailing vessels, based upon sixty-four shares, made possible a variety of partnership arrangements, including formal business partnerships. Considerable tonnage was held among relatives.[15] The links consisting of blood ties, commerce and marriage were closely analyzed for the port of Yarmouth and the rise and fall of families in the shipping of that port, Halifax and Saint John have been presented in some detail.[16] As a means to a more systematic presentation of the growth and decline of tonnage registration among the prominent owners in each port, the concept of a series of tonnage peaks was applied to the three ports. The relative risk or size of investment was shown in terms of mean tonnage per vessel among owners; the commercial attractiveness of the shipping industry was shown by the proportion of new owners to established ones; and the continuing attractiveness was identified by the proportion of owners who were increasing their tonnage.[17] For the study of Saint John, the idea of activity peaks was developed further. Notably, the historical series were organized quinquennially rather than decadally, and the concept of disinvestment was introduced, as was that of an ebb and flow of activity.[18] The study of Nova Scotian ports of registry was used to define and delineate more sharply the growth and decline of investment and the ebb and flow of activity. The result was a threshold analysis.[19] Moreover, this same study was used to move toward the creation of a regional sample of owners.

From the first attempt at analysis, it was evident that the tonnage registrants were not exclusively that. At Yarmouth, while the 1860s and 1870s were decades of heavy shipping investment, the leading vessel owners pursued other investment opportunities, notably in banks, insurance companies and textiles.[20]

When the expansion and contraction of commercial activities in Yarmouth were placed in historical series, the relative instability of the town's commercial structure was revealed. The groundwork for establishing the connection between these activities and the parallel movements of tonnage investment was laid.[21] Of course, the flow of investment and disinvestment in Yarmouth businesses by sector revealed the spreading investment of vessel owners. With the exception of vessel acquisition, a shift from partnerships to joint stock companies was perceptible in the town's business operations.[22] The occupational background of Saint John and Halifax owners revealed that, as in Yarmouth, they were not drawn from a wide range of businesses.[23] While a majority of the Saint John major owners were merchandisers of consumer and producer goods, emphasis in analysis was placed upon some of their investments in processing and finance.[24] Certainly among the Nova Scotian ports of registry the owners of significant amounts of tonnage were drawn from a narrow range of businesses.[25] The foregoing studies of samples of vessel registrants also revealed a distinction between those who had a general marine orientation and those who did not. This distinction was used as the basis for an analysis of the ebb and flow of shipping investment in Saint John.[26] For example, it appeared that the owners with a landward orientation sustained the shipping industry there until mid-century. Still, over the period from 1820 to 1890 the registrants interested in other marine activities contributed a higher average tonnage than did their landward-oriented colleagues.[27]

Emerging from the studies discussed above are two underlying assumptions. One is that the owners of significant amounts of tonnage determined shipping investment pattens in each of the ports because of their concentrated holdings of tonnage.[28] The other is much more problematic when one considers the conclusions arrived at as a result of these major owner analyses. It is that potential investment in shipping tended to be drawn to other opportunities that were becoming more attractive. From the first study of Yarmouth stemmed the idea that businessmen there moved from a relatively local economic environment into the world carrying trades. At the same time, given the concentration of tonnage holding on the register, it was proposed that a shipping oligarchy tended to exclude potential owners who were unable to meet the requirements for capital and expertise.[29] In addition, the Yarmouth analysis indicated that vessel owners did take up other kinds of enterprises, in some cases giving up shipping investment in order to do so.[30] However, when the analysis was broadened to include Halifax and Saint John, it suggested that, as members of local commercial communities, the major owners did not withdraw capital from shipping to place it elsewhere. On the contrary, banking and insurance were concomitants of a successful career in shipping.[31] From the Saint John study the point was drawn that the ownership of sailing vessels likely provided some training for individuals who entered other enterprises.[32] This became the theme of the Nova Scotian regional analysis in which the shipping industry was seen as an outlet for capital and talent and one way into an industrial economy. An allied point was one about timing. It was noted that ship deployment, as apart from shipbuilding, could be called a tentative undertaking until the 1860s.[33] To date, then, the results of the

Landward Analysis have included individual and family profiles of vessel ownership in the major ports of registry and of their other investments and interests. In addition, some insight into the economic activities of the port communities has been enunciated.

III

The foregoing discussion leads to an assessment of the current state of the Landward Analysis. The view presented does not imply that the shipping activities of owners can be explained entirely by the local economic context. The questions of profitability and revenue in vessel deployment are also being considered in the context of international shipping.[34] Moreover, while interest is focussed upon vessel operators, it is assumed that for those with entrepreneurial intentions, investment in shipping was but one of a number of options. It follows that tonnage acquisition cannot be viewed as a special case of investment behaviour. Then too, because the tonnage attributed to the individual owners is newly-built tonnage, the study deals only with the cutting edge of the industry. Clearly, there are aspects of the registration and deployment of tonnage transfers among owners that cannot be touched upon in this framework.[35] Nevertheless, it should be stressed that fundamental to these studies carried out to date is the assumption that the behaviour of the major owners helps to explain the characteristics of the industry. Therefore, the basic problem of establishing the sample for each port was to capture the names of those investors who could be considered as committed to vessel ownership and operation as opposed to those who simply bought tonnage. Needless to say, this is an examination of a kind of commercial elite. There can be no claim to provide an understanding of either the complete commercial operations of the communities that grew up at the harbours or of the complete population of vessel owners in the ports of registry.

The discussion of explicit individuals, then, has been limited to a select group who registered considerable tonnage. This sample, in each port of registry, is defined as those individuals who registered one thousand newly-built tons or more during the period 1820 to 1889. Some individuals acquired tonnage in more than one port. In order to ensure that owners with a variety of chronological buying patterns are included in the sample, no further *chronological* test was applied. Our analysis of colonial registries begins in 1820 (or in the year when the registry was opened), and the necessary information was extracted for the years to 1889.[36] At Yarmouth the dozen owners who registered over five thousand tons placed twenty-three percent of the port's tonnage on registry during the period 1840-1889, even though they constituted only .5 percent of all investors.[37] In the whole period from 1820 to 1889 there were 2231 acquiring shares in vessels. The sample of *residents* numbered sixty-five (three percent) while there were nine (.4 percent) buying over one thousand tons living elsewhere. In the case of Halifax the estimated number of individual owners between 1820 and 1889 was 5350.[38] By contrast, the sample of *resident* Halifax registrants used consists of forty-eight individuals (.9 percent) and the number in the sample from outside the Halifax-

Dartmouth area was thirty-two (six percent). Therefore, in that port, about two percent of registrants who bought one thousand tons or more of new tonnage constitute a surrogate for the remaining owners of the industry. Of course, the force of the argument for this representative status rests upon the proportion of the total tonnage that they acquired. The Halifax residents bought nineteen percent and the non-residents nine percent. In the case of Yarmouth, the figures were fifty-three percent and four percent. Clearly, for the latter port, three percent of the residents held fifty-seven percent of the tonnage, representing a significant concentration of ownership and, therefore, of decision-making authority.[39] The concentration for Halifax was only slightly less intense since two percent of the registrants held twenty-eight percent of the new tonnage.

Yet, in order to make the foregoing analysis of concentration effective, the individual major owners have to be more distinctly characterized. A rank ordering by total tonnage held reveals that there was a concentration of tonnage even among the committed owners. At Yarmouth, there was a ratio of two owners above the mean tonnage for the period 1820-1889 for every three below it while at Halifax the ratio stood at one to four.[40] This pattern is reinforced if each port sample of owners is grouped, according to their total acquisitions for the century, into tonnage categories. For Halifax, Pictou, Windsor and Yarmouth, the largest number of major owners in each port held between 1000 and 1999 new tons. This pattern of vessel holding raises the question of leadership in an industry composed of a large number of decision-making centres and operating units. Both the existence of managing owners of vessels and the distribution of partnerships are linked to this question. Half of the major Halifax owners but only one at Yarmouth did not have partners among their peers. While one in three of the Halifax sample held over seventy-five percent of the total tonnage in vessels with which they were concerned, for the Yarmouth contingent it was one in ten.

Evidently, the tonnage was more widely distributed at Yarmouth, suggesting, perhaps, a greater collegiality in action.[41] Research into managing owners has yet to be done. Of course, the matter of partnerships is also associated with the question of spreading of risk in shipping investments as was the number of vessels embodying the tonnage purchased by the owners. For example, the major owners of Halifax registered mean tonnages per vessel ranging between sixty-three and 1302 but for about half of them (fifty-five percent) the figure was below 150 tons.[42] At the same time, there is no direct relationship between large tonnage holdings and large average holdings in discrete vessels.

In keeping with the *comparative* aspects of vessel-owning, a framework of analysis that could be applied to any and all ports of registry was required. Moreover, it was necessary to trace the historical development of vessel-owning behaviour in parallel with the other commercial activities of the owners. Inasmuch as the analysis of tonnage registration must be matched to other kinds of information, such as census figures arranged in historical series, the data relating to both the owner samples or components of samples and that concerning specific individuals had to be grouped in a common chronological framework. On the one hand, a decadal analysis would provide commensurability with census data. On

the other hand, an annual analysis would reveal the idiosyncrasies in tonnage acquisition and manipulation relating to a single port. As a compromise between these two ways of aggregating information, the decision was taken to use an analysis by quinquennia. The heuristic device used to reveal the crucial stages in the development of the industry was the threshold analysis referred to in Section II above.[43]

The concept of thresholds entails the idea of groups of owners who cross an obstacle. The attractiveness of the shipping industry can be demonstrated in the passing of the entering and increasing thresholds in a port of registry. The first can be defined as having been crossed when the largest number of investors registering the highest mean tonnage per individual made their first purchases. Then, when the largest number of owners increased their holdings by at least one hundred tons, thereby increasing their tonnage to the greatest extent, the second threshold can be deemed to have been crossed. The peak of tonnage acquisition among major owners marks the ultimate point of attractiveness exerted by the industry. This is the point at which the largest number of registrants acquired the largest mean tonnage. After this point, the industry is deemed to have lost its ability to attract significant investment. Therefore, the leaving threshold can be defined as the point at which the largest number of investors ceased buying tonnage immediately after registering a significant mean tonnage. When this analysis was applied to Nova Scotian ports of registry, it was discovered that the tonnage movements were grouped in four periods — 1835-1839, 1845-1854, 1860-1864 and 1870-1889 — although the various thresholds were crossed in individual ports at different times. This analysis was supplemented by placing the other commercial activities of owners in the same framework.[44]

These activities were scrutinized in order to obtain an answer to the question: "From what range of occupations were the vessel owners drawn?" Their private businesses, partnerships and their investments in public companies were brought together with their tonnage acquisitions. In the analysis of other Nova Scotian ports of registry, as in the case of Yarmouth, the same point emerges about the occupational background of the major registrants. At Yarmouth, half of the businesses that they established were in merchandising, of which eighty percent were general trading businesses. While one in five of their establishments was in transportation, half of these were ship chandleries. Of 214 owners drawn from Halifax, Pictou, Windsor and Yarmouth, there were ninety-four merchants, fifty-five shipbuilders, twenty-seven sea captains, fifteen actual shippers, ten ship chandlers and nineteen in various occupations.[45] One of the significant points to be established is whether tonnage ownership grew out of marine-related operations, such as shipbuilding and ship chandling, or whether a significant number of owners were in seemingly unrelated landward activities. Clearly, the designation of a particular individual by business orientation must take into account his total operations so far as we can know them. Samuel Cunard of Halifax can be considered a marine-oriented owner despite his interest in timber lands. The case is less clear-cut with those shipbuilding timber merchants of the Northumberland Shore, such as Alexander Campbell of Tatamagouche.[46] But,

besides the private businesses of vessel registrants, we have also to consider their investments in public companies. Once having established the general orientation of an individual, other than in shipping, it is possible to plot the ebb and flow or mixture of landward and seaward-related owners who were entering or leaving such activities as merchandising, processing, metallurgy, banking and insurance agencies.

However, the investments in public companies, like the private businesses of the major owners, were elements in the commercial operations of port communities generally. For the port of Yarmouth, an analysis of the town's business, based upon seven sectors of activity — fabrication (manufacturing), finance, merchandising, professions, trades, transportation and utilities — was carried out. These classifications were, in turn, built up from more fundamental categories.[47] An attempt was made to trace the establishment and dissolution of businesses through the use of these classifications in a decadal framework. The result was the exposition of a basic instability among partnerships. Like other businessmen, the major vessel owners moved to the joint stock method of capitalizing enterprises.[48] But, except in the case of steam shipping, they did not apply it to vessel ownership and operation. Turning to the question of financing shipping and other enterprises entered into by tonnage registrants, the investments in public companies are more easily expressed in monetary terms than those in private or partnership businesses. Where it is possible to acquire information about actual holdings of stock, the financial involvement is clearly evident. In those cases where the vessel owner was also the director of a company, it is possible to make an estimate of financial involvement. This technique was applied in some instances in the study of four Nova Scotian ports of registry. At the same time, the tonnage held by the major owners was converted into dollars at the rate of thirty-five dollars per ton.[49] Pervasive throughout all the activities of vessel owners is the sense of family links and their importance. It seems evident that, on the one hand, the shipping industry was supported by individuals drawn from particular families and from a narrow range of businesses. On the other hand, if one considers their involvement with banks and insurance companies, it is equally evident that they were, in the main, individuals who were constantly engaged in creating a flow of goods and money; in other words, they were engaged in providing services. After all, they are included among the individuals to be studied because they were investing in a service industry.

IV

It should be kept in mind that the Landward Analysis must be integrated with the computer-derived analysis of fleets, voyages and crews. Specifically, the registry computer files provide the official information about tonnage registrants from which the study of the landward base begins. Its current chronological scope must be extended because the registry analysis for each port of registry is to be extended to 1914. Once the number of individual owners and their tonnages have been updated, the buying cycle of each sample member, with tonnage and vessel

acquisitions and partnerships distributed by quinquennia, can be established. From this data the necessary calculations of rank order and tonnage categories for the sample of owners can be carried out. It will be possible to establish the status and relationships of the Lovitts of Yarmouth, the Smiths of Windsor, the Churchills of Yarmouth and Hantsport and the MacKenzies of River John and New Glasgow not only within their particular ports of registry but also within the vessel-owning community of the Atlantic region.

Because it rests upon diffuse genealogical records rather than upon data drawn from bureaucratic forms, the delineation of kinship systems in the port communities will continue to be problematical. Some inferential information can be drawn from the partnership information in the registers. However, it may not be possible to lay bare the blood and marriage ties among vessel owners in detail when a regional sample is likely to consist of more than five hundred individuals.[50] Nevertheless, it is now possible to say that particular families in a port were blessed with a number of important vessel owners. Research into this aspect of the landward base will certainly continue by whatever means suggest themselves and, therefore, our knowledge of connections among the vessel owners may be extended.

While the point of sampling the owners was to provide a means by which the characteristics of the shipping industry could be discerned, the Yarmouth sample, for instance, does not appear to consist of the same kind of people as the total population of tonnage registrants. Between 1840 and 1889, there were 4918 individuals in that group, twenty-five percent of whom were shipowners, eighteen percent of whom were merchants but fifty percent of whom were mariners, fishermen and farmers. Taking the sample of major owners for the period 1820-1889, merchants constituted forty-eight percent and shippers only fourteen percent.[51] This suggests that the behaviour of the major owners may be different from that of the rest of the tonnage registrants. In addition, until the role of the managing owners has been considered, it may be difficult to settle the question of how the industry was led. Were there active and passive owners? As to the structure of local economies, an attempt is being made to move from the original analysis of the Yarmouth commercial structure to a more refined categorization of business operations to be applied to the ports. It is based upon differentiations among primary, secondary and tertiary activities.[52] When the various investments of vessel owners are compiled by quinquennia, it may be possible to assess their place in the local economies more accurately. Indeed, it is conceivable that the major owners may constitute a special entrepreneurial group differentiated from other tonnage registrants and other businessmen.

But, what of the framework of port analysis — the thresholds — which have been likened to stages of economic growth?[53] Given the actual pattern of thresholds in the four ports of registry that have been analyzed, a revision suggested itself. In order to account for any lags in the growth or decline of tonnage investment, it was necessary to recognize that there were owners who were neither entering nor leaving the industry and who were not increasing their tonnage. The point at which the largest number of owners performed this

sustaining function also represents a kind of threshold or, at least, a plateau. When this element is put into the threshold analysis of Halifax and Yarmouth, while their entering thresholds were crossed in 1835-39 and 1860-64 respectively, both sustaining plateaus occurred in 1865-69. It happens that, in that quinquennium, there was no significant activity among tonnage registrants in the four Nova Scotian ports of registry studied or in the port of Saint John.[54]

But, at bottom, there are two questions to which answers must be formulated. Each appears to be fundamental. Firstly, how are the various holdings of the major vessel owners to be compared, in monetary terms, so that investment flows between shipping and other sectors of the economy can be traced? We have begun to address this question in a general way through the study of shipping profits.[55] For the Landward Analysis, these flows should be related to specific individuals. Secondly, where are the causal explanation or explanations for the business behaviour of the major owners to be found? Will these explanations arise from the profitability and revenue studies on the deep water fleets we have planned, or will the impulses prove to have arisen in the local economies? For a historian, there is some solace even in this conundrum. It will force us to perform our true function. We will have to use historical imagination and judgement.

NOTES

1 This paper is a small part of a large scale study of the shipping industry of Atlantic Canada being carried out by members of the Atlantic Canada Shipping Project of Memorial University with the support of the Social Sciences and Humanities Research Council of Canada. The author wishes to acknowledge that support; the aid of Heather Wareham and Theresa Bishop, Research Assistants, and of fellow investigators, the late David Alexander, Rosemary Ommer, Eric Sager and Lewis Fischer; and the cooperation of the Public Archives of Nova Scotia, the Nova Scotia Maritime Museum and the Yarmouth County Museum. Needless to say, the substance and conclusions are the responsibility of the author.

2 See the "Second Annual Report of the Atlantic Canada Shipping Project" (1978), 34-9 and the "Fourth Annual Report" (1980), 8-9.

3 Ports of registry are the official places designated as the depositories of ship registries.

4 David Alexander, before his death, undertook the development of a pilot study on the registry port of Yarmouth. Lewis R. Fischer has analyzed the ports of Charlottetown, P.E.I. and Saint John; Rosemary Ommer is dealing with Miramichi, Pictou and Windsor; and Eric W. Sager with St. John's and Halifax.

5 This was one of the characteristics exhibited by the entire population of tonnage registrants in the various ports of registry. For example, see Fischer, "The Port of Prince Edward Island, 1840-1889: A Preliminary Analysis," in Keith Matthews and Gerald Panting (eds.), *Ships and Shipbuilding in the North Atlantic Region* (St. John's, 1978), 51; and David Alexander and Gerry Panting, "The Mercantile Fleet and Its Owners: Yarmouth, Nova Scotia, 1840-1889," *Acadiensis,* VII (Spring, 1978), 23-5.

6 This too is an extension of the analysis of the general ownership in the ports of registry.

7 These were found at such institutions as the Yarmouth County Museum and the Public Archives of Nova Scotia.

8 The wills and inventories or warrants of appraisement have been sought in County Probate Offices.

9 There is at least one source that would be helpful in this respect that has not yet been exploited. This is the R.G. Dun Collection at Harvard University's Baker Library.

10 The following are the papers: Alexander and Panting, "The Mercantile Fleet and Its Owners," 3-28; Panting, "Cradle of Enterprise: Yarmouth, Nova Scotia, 1840-1889," in Fischer and Sager (eds.), *The Enterprising Canadians: Entrepreneurs and Economic Development in Eastern Canada, 1820-1914* (St. John's, 1979), 253-271; "Vessel Owners of the Atlantic Provinces, 1820-1890" (paper presented to the Canadian Historical Association, Saskatoon, Saskatchewan, June 1979), 1-24; "Harbour and Metropolis: The Shipping Industry of Saint John and the Urban Economy, 1820-1914" (paper presented to the Atlantic Canada Studies Conference, Halifax, April, 1980), a revised version of which appears in this volume (with L.R. Fischer); "Personnel and Investment in Canadian Shipping, 1820-1889," in Rosemary Ommer and Gerald Panting (eds.), *Working Men Who Got Wet* (St. John's, 1981), 335-360.

11 "The Mercantile Fleet and Its Owners," 21.

12 "Cradle of Enterprise," 256.

13 "Vessel Owners of the Atlantic Provinces," 1-2.

14 "Harbour and Metropolis," *this volume.*

15 "Vessel Owners of the Atlantic Provinces," 4-5.

16 "Cradle of Enterprise," 260; and "Vessel Owners of the Atlantic Provinces," 5-15.

17 "Vessel Owners of the Atlantic Provinces," 2-4.

18 "Harbour and Metropolis," *this volume.*

19 "Personnel and Investment in Canadian Shipping," 344-6.

20 "The Mercantile Fleet and Its Owners," 26.

21 "Cradle of Enterprise," 256-7, 263.

22 *Ibid.*, 258.

23 "Vessel Owners of the Atlantic Provinces," 15.

24 "Harbour and Metropolis," *this volume.*

25 "Personnel and Investment in Canadian Shipping," 252.

26 "Harbour and Metropolis," *this volume.*

27 *Ibid.*

28 "The Mercantile Fleet and Its Owners," 20-2.

29 *Ibid.*, 27.

30 "Cradle of Enterprise," 261, 264.

31 "Vessel Owners of the Atlantic Provinces," 17.

32 "Harbour and Metropolis," 24.

33 "Personnel and Investment in Canadian Shipping," 351-2.

34 Fischer, Sager and Ommer, "The Shipping Industry and Regional Economic Development in Atlantic Canada, 1871-1891: Saint John As A Case Study," *this volume.*

35 See the discussion in Ommer and Panting (eds.), *Working Men Who Got Wet,* 361-3.

36 Yarmouth and Pictou opened their registers in 1840 while that of Windsor began in 1849.

37 "The Mercantile Fleet and Its Owners," 21.

38 The registers have been analyzed from 1820 to 1903 and the total number of individuals involved was 6,924.

39 These calculations are based upon the registry information in the computer files on ports of registry. See "Personnel and Investment in Canadian Shipping." 337-8.

40 *Ibid.,* 338.

41 "Vessel Owners of the Atlantic provinces," 4-5.

42 These calculations were based upon the registry information in the computer file on Halifax. Only .9 percent of the owners registered a mean tonnage per vessel over three hundred.

43 "Personnel and Investment in Canadian Shipping," 344-5.

44 *Ibid.,* 345-51.

45 *Ibid.,* 343.

46 *Ibid.,* 346-8.

47 "Cradle of Enterprise," 265, n.14.

48 Note that the sample of vessel owners was selected by somewhat different criteria than the Yarmouth contingent used in this paper; *Ibid.,* 256-8.

49 "Personnel and Investment," 358, n.49; 359, n.61; 357, n.43.

50 Including both residents and non-residents of the ports of Halifax, Yarmouth and Saint John. The Windsor and Pictou samples are not restricted to residents in those two centres.

51 "The Mercantile Fleet," 19, and "Personnel and Investment," 343.

52 I am indebted to James M. Gilmour, *Spatial Evolution of Manufacturing: Southern Ontario 1851-1891* (Toronto, 1972), 195-205, and to my colleagues R. Ommer and E. Sager, and to Patricia Thornton of Concordia University.

53 See the suggested comparison in Ommer and Panting (eds.), *Working Men Who Got Wet,* 370.

54 "Personnel and Investment in Canadian Shipping," 344.

55 Fischer, Sager and Ommer, "The Shipping Industry and Regional Economic Development in Atlantic Canada, 1871-1891: Saint John as a Case Study," *this volume.*

11. HARBOUR AND METROPOLIS: THE SHIPPING INDUSTRY OF SAINT JOHN AND THE URBAN ECONOMY, 1820-1914

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HARBOUR AND METROPOLIS: THE SHIPPING INDUSTRY OF SAINT JOHN AND THE URBAN ECONOMY, 1820-1914

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"Oh! This magnificent Harbour," enthused an anonymous writer in 1848, "upon it we shall build, indeed are building, a metropolis of which our children can be proud."[2] This type of perceived linkage between the future of the city and its waterfront was common throughout much of the nineteenth century, as civic boosters promoted a strong relationship between the vitality of the city's marine sector on one hand and economic growth and prosperity on the other. Indeed, as Elizabeth McGahan has shown, it is possible to trace these inter-connections during much of the century through as seemingly mundane a factor as choice of residence location by the leading businessmen in the community.[3]

The obvious connections between maritime industries and urban growth were simply assumed by early historians, such as Frederick William Wallace.[4] But an interpretation, which was to survive for almost four decades, was established by Harold Innis. Employing the concepts of staple theory, Innis argued that there was a "splendid integration" between shipbuilding and the local economy.[5] This paradigm, while remarkably durable, has been subject to serious challenge in recent years. In a pathbreaking thesis completed in 1966 for Harvard University, Peter McClelland effectively refuted Innis' argument that shipbuilding had been the "linchpin" of the New Brunswick economy. He accomplished this task superbly, and was in fact able to demonstrate that there were few linkages between shipbuilding and the developing urban economy.[6] However, in the process McClelland left a great many other questions unanswered. For example, he concluded that *both* shipbuilding and shipowning were of "negligible significance" in fostering capital accumulation and economic growth. He also argued that shipowning offered "a dubious earnings record after 1865." From this he suggested that shipowning was in fact akin to "gambling" with an increasingly obsolete technology, leading to a drain of entrepreneurial talent and perhaps investment capital away from more "productive" sectors such as manufacturing. In other words, McClelland contended that the shipping industry (a combination of shipbuilding and shipowning) acted as a constraint on the growth of local industries.[7]

Based upon research completed thus far, we believe that both sides in the debate missed their marks. Innis was clearly wrong in his claims for the importance of shipbuilding although, as we will argue, shipbuilding did have a positive impact on at least some sectors of the economy. But we also doubt that shipowning was ever the wasteful gamble that McClelland believed it to be. Indeed, there are a number of factors which suggest that shipowning continued to be a dynamic economic enterprise long after McClelland argued for its demise. Although our work remains in the preliminary stages, we believe that the shipping

industry had many more positive effects upon the Saint John economy than the recent literature would suggest.[8]

In this paper we shall explore in a general way the relationship between the shipping industry and the general economic life of Saint John. In Part I we shall look at some impacts which the industry had upon both the local and regional economies on the macro-level. In Part II we shall suggest that far from being a drain on entrepreneurial talent and capital, the shipping industry in fact served as a springboard for many of Saint John's leading investors into other sectors of the economy.

I

The Fundy rim was a centre of Maritime-oriented activities in the nineteenth century. Ports such as Windsor, Digby, St. Andrews, and Yarmouth all enjoyed prosperity based upon the building and owning of wooden-hulled vessels during the "age of sail." But no port in the region was as important as Saint John. With a registration of slightly in excess of 1.8 million tons of new shipping between 1820 and 1914, the principal port of New Brunswick dwarfed not only the remaining Fundy centres but also the other ports of registry in the Atlantic region.[9] This investment was massive in dollar terms as well: we have estimated elsewhere that the investment in new shipping by Saint John residents alone probably exceeded $100 million.[10]

As impressive as these figures may be, they do not tell us much about the importance of the industry to the economy. We do know that the correlation between decadal changes in investment in shipping and similar changes in population yields a correlation of +.72 between 1820 and 1875, which was the year in which the decline in gross physical investment began.[11] This suggests (but does not prove) a strong relationship between the city and its fleet. We also know that there was a strong relationship between New Brunswick timber exports, tonnage clearing New Brunswick ports, and investment in new tonnage, particularly in the first half of the nineteenth century: correlations of *annual* changes in these three series yield positive values of between +.61 and +.69 for the period from 1820 to 1850.[12] This suggests a strong symbiotic relationship between shipping and the city's principal export during the crucial early years when a viable fleet was being established.

But how did growth in the shipping industry compare with growth in other sectors of the economy? There are a host of problems involved in answering this question; the best that we can do here is to illustrate some likely trends.[13] Comparisons with growth in other sectors in the Saint John economy are difficult to make, since we have just begun the process of estimating net capital formation and sectoral growth rates. However, in colonial economies so heavily dependent upon the export of staple products, one approach might be to take the growth of the volume of exports as a surrogate for growth, at least in the major staple industries. For technical reasons, it has not yet proved feasible to calculate growth rates for Saint John's exports as divorced from those of the remainder of New Brunswick. But by comparing growth in shipping with growth in the volume of exports from

New Brunswick, we shall have at least a rough comparison between growth in shipping and growth in other major economic sectors. Export values for New Brunswick have been deflated using Taylor's Canadian export price index after 1870 and with a British price index before that time, since there is at present no Canadian index.[14] As well, since after 1870 exports to other Canadian provinces are not included, the figures for the later decades may underestimate the real growth in external trade.[15] Nonetheless, Table 1 shows that shipping was a consistent growth sector within the Saint John economy before the 1880s. The Saint John fleet grew more quickly than did the New Brunswick economy in four out of five decades between 1830 and 1880.

While this type of comparison may be interesting, it still is not a strict comparison between investment in shipping and investment in the economy as a whole, unless one assumes a constant capital-output ratio over the period; this assumption likely would be tenuous at best. While estimates of gross investment in physical assets do not exist for Saint John (or even for Canada) for most of the nineteenth century, we do have O.J. Firestone's estimates that such investments grew at a rate of 3.8 percent a year between 1870 and 1890. Even investment in machinery and equipment grew at only 4.5 percent a year in the same two decades.[16] If we apply Firestone's methods to the Saint John economy, we find that the growth rates for Saint John between 1871 and 1880 and 1881 and 1890 (4.1 percent and 3.8 percent respectively) approximated the national averages.[17] By these standards, the growth of the rate of investment in shipping was comparable to other sectors at least through the mid-1870s.

TABLE 1

ANNUAL GROWTH RATES OF SHIPPING TONNAGE ON REGISTRY AT SAINT JOHN AND ANNUAL GROWTH RATES OF THE VOLUME OF EXPORTS FROM NEW BRUNSWICK

Decade	Shipping Growth Rates	N.B. Export Growth Rates
1830-39	12.5%	3.3%
1840-49	1.1	3.9
1850-59	3.2	-0.2
1860-69	4.1	1.5
1870-74	3.5	1.1
1875-79	0.2	0.5
1880-89	-2.1	1.3
1890-99	-7.3	4.8

Growth rates are calculated from regression equations of the form LogY=a + bt. Export values were deflated by appropriate price indices (see Text). Sources: BT 107/108, Saint John ship registries; New Brunswick, *Journals;* Canada, *Sessional Papers.*

But even these estimates are at best crude ways of approaching the issue. An alternative would be to compare growth in output between the shipping industry and other sectors of the economy. One method for doing this for shipping was developed within the Atlantic Canada Shipping Project by David Alexander and a full discussion of the methodology is available elsewhere.[18] However, a brief explanation is perhaps in order here. Using "Crew Lists"[19] we begin with an estimation of the annual rate of growth of physical output according to the following 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 equation measures the growth of output in terms of total entrances into port, cargo-carrying capacity, available freights, sailing and turn-around times, time lost due to repairs, total fleet size, and so on. This method of proceeding is feasible primarily because our sample of Crew Lists, especially for Saint John, is so large.[20] This equation can then be modified to estimate productivity, or average output per vessel, depicted by the relationship,

$$\overline{GOV} = \overline{EN} + \overline{SV} - \overline{FL}$$

where $\overline{FL}$ is the rate of growth of the number of vessels in the fleet. The equations are then revised to take into account the inevitable increase in the ratio of entrances in ballast to entrances with cargo, particularly on the North Atlantic routes where sailing vessels were increasingly challenged (and eventually superceded) by steam. We think it reasonable to assume that vessels entering British or European ports carried cargo, but that outward sailings, particularly to North America, were increasingly in ballast. Conservatively, then, we have assumed that only 75 percent of North American entries in our base year (1863) were fully laden, and that this proportion fell at a constant rate to 10 percent in 1890. The trend in total entrances has been deflated to produce $\overline{REV}$, which estimates the growth in cargo-carrying entrances.

But the resulting equation only allows an estimate of physical output. Estimates of revenue are introduced by adjusting for trends in freight rates, using the Isserlis index.[21] These indices have in turn been deflated to take into account price changes in the Atlantic economy, using the aforementioned Taylor Canadian import price index. Thus, real gross output in each fleet is estimated by the equation,

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

where $\overline{FRW}$ is the rate of growth of the weighted freight rate index. Vessel productivity (output per vessel) in turn is estimated by,

$$\overline{GOV} = \overline{REV} + \overline{SV} + \overline{FRW} - \overline{FL}$$

It may be, however, that by using vessel entrances as a crucial component in the estimation of output and productivity we misrepresent growth. A few examples may illustrate the point. A vessel engaged in the North Atlantic trades may simply sail from Liverpool to New York and back to Liverpool. By our first

method, this voyage would include two entrances: New York and Liverpool. But suppose that the vessel stopped in Cardiff to pick up a load of coal on its westbound leg across the Atlantic. Such a voyage would have *three* entrances, even if the time required for such a voyage was not substantially greater than in the first example. An even more important case might occur if a vessel were used in the North Atlantic one year, making about four voyages and accounting for eight or more entrances; the next year it was shifted into the rice trade from Burma. In such a trade, an average voyage might take up to nine months but would account for only two or three entrances. Was the vessel being less productive? Logic suggests that it was not. Further, since we know that over time a greater percentage of Saint John vessels were being used in non-North Atlantic voyages, this becomes a crucial question.

Thus, we have estimated output and productivity using a second method as well. In these calculations we have replaced the factor $\overline{REV}$ with one depicted as $\overline{RVT}$, which represents the annual growth rate of actual time spent on potential revenue-producing voyages. We have deflated this figure using the same procedure described earlier for estimating $\overline{REV}$. Estimates using both methods are included in Table 2, along with some estimated sectoral growth rates for comparative purposes.

Several significant results are clear from the Table. First of all, it is clear that our two output and productivity equations yield slightly different results. We estimate a slightly lower annual growth rate of output in the 1863-77 period using the second equation, but the decline in output after the fleet reached its peak is somewhat mitigated using the revised formula. On the other hand, our alternative method of calculating productivity yields slightly higher estimates of productivity increases in both periods. Perhaps more important, it is clear that at least through the mid-1870s opportunities for investment in shipping were increasing at a more rapid rate than for any of the other sectors, either locally or nationally. This hardly supports the contention that the industry was becoming something of a burden. As well, it suggests an argument for investment patterns in the industry: when investment opportunities were better in shipping, investors flocked to the industry. However, when investment opportunities reversed in the late 1870s, perhaps because of decisions associated with the passage of the National Policy, investors looked for alternative opportunities. As we will show in the second half of the paper, the bulk of the investment shift went into the tertiary sector, which was a particular "growth sector" in the 1880s.

Of equal interest is the result of the productivity equation, which estimates gains in average vessel output even during the 1880s. The Saint John fleet was pruned of older and smaller vessels, the remaining stock was operated with greater efficiency, and many vessels were transferred out of North Atlantic operations and into the Pacific and Indian Oceans. The evidence therefore suggests that smaller fleets were able to increase productivity, but diminishing opportunities persuaded owners not to replace vessels when they went out of service.[22]

The rapidly growing output of the Saint John fleet in the 1870s helps to dispose of the notion that shipowning was an unprofitable gamble after 1865.

TABLE 2

ESTIMATED GROSS OUTPUT AND PRODUCTIVITY: SAINT JOHN FLEET, SAINT JOHN ECONOMY AND CANADA

(A) Saint John Fleet

	Equation 1[1]		Equation 2[2]	
	Gross Output	Productivity (output per vessel)	Gross Output	Productivity (output per vessel)
1863-77	+6.8%	+3.9%	+6.4%	+4.5%
1878-90	-0.8%	+6.1%	-0.2%	+6.6%

(B) Sectoral Growth Rates, Saint John City and Canada

	Canada (Gross Output)	Saint John City (Gross Output)
Iron and Iron Products		
1871-80	+2.0%	+1.4%
1881-90	+5.8%	+2.6%
Food and Beverages		
1871-80	+2.7%	+3.8%
1881-90	+3.7%	+3.7%
Textiles and Clothing		
1871-80	+5.1%	+4.1%
1881-90	+5.2%	+8.9%
Wood Products		
1871-80	+3.0%	+2.6%
1881-90	+2.2%	+0.7%
Tertiary Sectors (Value Added)[3]		
1871-80	+3.0%	+2.7%
1881-90	+5.1%	+6.3%

[1]Gross Output Calculated by equation $\overline{GO} = \overline{REV} + \overline{SV} + \overline{FRW}$; Productivity calculated by equation $\overline{GOV} = \overline{REV} + \overline{SV} + \overline{FRW} - \overline{FL}$.

[2]Gross Output calculated by equation $\overline{GO} = \overline{RVT} + \overline{SV} + \overline{FRW}$; Productivity calculated by equation $\overline{GOV} = \overline{RVT} + \overline{SV} + \overline{RW} - \overline{FL}$.

[3]Tertiary sector growth rates are for value added. For Saint John, these have been calculated by grouping census categories in each year.

Sources: Agreements and Accounts of Crew; Firestone, *Canada's Economic Development,* 1867-1953; Canada, *Census,* 1871, 1881, 1891, 1901.

But it is more difficult to dispose of McClelland's arguments regarding economic growth. We would agree with his contention that *employment opportunities* for Maritimers were limited, both in shipbuilding and shipping.[23] As well, the backward linkages from either industry were likely not very extensive. But it appears to us that McClelland's argument is wrong for at least two reasons: first, we have some additional evidence which suggests that shipping was an important component of the region's economy and did foster substantial capital accumulation; and second, that investment in shipping did not represent a drain of talent from manufacturing and a constraint on growth of local industries (we shall deal with this point in the second part of the paper).

McClelland's evidence for the poor earnings record of shipping is based almost entirely upon an analysis of net earnings by an average of eleven Moran family vessels between 1867 and 1878. Using figures derived from the surviving ledgers, McClelland calculated earnings per ton and net earnings for each year. He discovered that both gross earnings and earnings per ton increased at least until 1874, an argument with which we have no quarrel, for at least the trend is going in the right direction. But McClelland seriously underestimated the rate of return on these vessels because he overestimated the capital value of the vessels when newly built. The price per ton for finished sailing vessels in this period was not the ten pounds sterling that he estimated; indeed, vessel prices were relatively flat in the 1870s, and were almost always under seven pounds sterling per ton.[24] Using his figures, McClelland found that net earnings as a percentage of depreciated value of assets varied from a low of 1.4 percent in 1870 to a high of 18.9 percent in 1874, before turning negative in the late 1870s. But if we recalculate the rate of return using an initial capital valuation of seven pounds per ton (which is a generous estimate), and adjust slightly the rate of depreciation to reflect the fact that Moran vessels in the period differed slightly from the fleet average, then the rate of return is substantially higher, ranging from a low of just under eight percent in 1870 to a high of twenty-six percent in 1874; further, the rate of return remained positive through the late 1870s.[25] The mean annual rate of return averaged close to twenty percent. While we have just begun the arduous task of assembling data on profitability, other evidence also suggests that a rate of return of around twenty percent was typical of the 1860s and 1870s (and indeed may have characterized both earlier and later periods as well).[26]

If such a rate of return reflects reality at all, then the shipping industry must have contributed substantially to capital accumulation in Saint John. At such a rate, vessels owned by owners resident in the city would have accounted for a net flow of income into Saint John of over one million dollars a year between 1867 and 1878, and this income would have represented almost a quarter of the declared value of all exports from New Brunswick over the period. Or, put another way, it would have represented on average almost thirty percent of Saint John's gross output throughout the 1870s. While it is difficult to be as precise about these figures at this point as we might like to be, it is clear that if we are on the right track, then shipping could hardly have been the insignificant contributor to the local economy that McClelland claimed.[27]

One final indicator of the importance of the shipping industry to the local economy may be considered. We have shown elsewhere that if the sale of ships in export markets is considered for Prince Edward Island, that province's balance of trade shifts from a chronic deficit to a surplus in most years.[28] We have worked out preliminary figures for Saint John, as well. While they remain far too incomplete to be reported here, it does appear that when both receipts from the sale of ships and projected earnings derived from the operation of vessels are included in balance of trade figures, they alone are sufficient to transform the balance into a positive figure for over half the years between 1845 and 1878. However, additional data is required before these figures can be put forward with any degree of confidence.

II

But what of McClelland's argument that continued investment in an increasingly obsolete technology led to a drain of both entrepreneurial talent and capital away from presumably more profitable sectors? First, the question of timing is important. Certainly there was the expectation during the 1860s that steamships would monopolize traffic on the main trade routes.[29] Yet during the 1860s and 1870s, the productivity of sailing vessels in the main trans-Atlantic trades was rising as a result of technological change as well as managerial factors.[30] Secondly, it is necessary to ask what sectors of the local economy were in competition with vessel ownership for investment and managerial talent. In order to formulate an answer to this question and, therefore, to the main one, an analysis of the investments made by a sample of vessel owners may prove useful.

The proposed sample consists of residents of Saint John who, between 1820 and 1889, registered more than one thousand tons of newly-built shipping. While these figures will not provide the actual size of the fleets deployed by these owners, they will make clear the continuing *investment* put by the owners into vessels. Of the 4124 individuals who appear on the Saint John registry during that period, five percent (220) met the above criteria. They accounted for about sixty percent of the total new tonnage acquired during the period under study.[31] While the average acquisition for the total population of registrants was 388 tons, that for the sample was 4679. About one quarter of them registered seventy-five percent or more of the tonnage embodied in the vessels with which they were involved, while one in five held twenty-five percent or less.[32] In addition, a number of these major registrants were also managing owners,[33] presumably responsible for vessel deployment.

Having established the elite status of this group *as vessel owners,* it is necessary to characterize them further in terms of their business activities. There are two groups of businessmen from which they are almost exclusively drawn. These were merchants and shipbuilders, two categories accounting for between eighty-five percent and ninety-nine percent of the vessel owning sample for the period 1820 to 1889.[34] Not only did merchants constitute the largest group within the sample, but some of them were part of an elite among Saint John

businessmen. Of the forty "Great Merchants" identified by T.W. Acheson for the period 1820-1850, twenty-nine were members of this sample of vessel registrants.[35] By definition, then, all owners were involved in a service industry. But one of the most important links of vessel deployment was with the "Great Merchants" and their lesser colleagues. Was the shipping industry, then, an outgrowth of the mercantile activity in the port of Saint John; was it the result of investment spreading from one tertiary activity to another? The answer must be: not entirely, since there was a strong link to ship deployment from the secondary sector of the economy. Shipbuilders were supplying an international market with vessels, but they did sell their vessels on their own account or, alternatively, they could enter the carrying trade. So could those who supplied them and the vessels. At any rate, the shipbuilding industry called for considerable judgement and the ability to adapt to changing economic conditions. To an extent, therefore, the shipping industry was an extension of the port's maritime activity. Since there were "landward" and "seaward" routes into the industry, an analysis of both these contributions will be needed in order to reach some conclusion.

But how did the Saint John shipping industry develop as seen through the tonnage registered by major owners? By 1839 their combined tonnage acquisition had reached 157,788 and the seventy-seven registering held 1079 tons on average.[36] The highest mean tonnage for the period (1693) was attained in 1850-4. From this point the total and average tonnage declined. For the port of registry as a whole the high point of vessel acquisition occurred in 1877, some twenty years after the elite. Between 1855 and 1877, therefore, the major owners reduced their average risk as the ninety-five percent of investors who acquired less than one thousand tons expanded their total holdings. The next step is to analyze the contribution made by maritime and non-maritime owners to this development.

Considered as individuals, seventy percent of the sample consisted of people whose occupational links were with landward enterprises. So, across the period 1820 to 1889, those engaged in other maritime activities were obviously a clear minority. In 1850-4, when 102 major owners were acquiring tonnage, fifty-eight of them were landward-oriented, i.e., they were in merchandising. At that point their maritime-oriented colleagues were in shipbuilding (twenty-nine); ship chandling and brokerage (six); master mariners were concerned only with shipowning.[37] But when tonnage is taken into account, with the exception of 1830 to 1844, the "seaward" owners contributed a better or equal mean tonnage than the rest of the sample. The largest average tonnage among these owners was acquired in 1850-4 and for six of the nine quinquennia between 1845 and 1889 it was over one thousand tons. Only between 1820 and 1844 did the non-maritime owners clearly sustain the shipping industry. From 1840 they were ceasing to acquire new tonnage in significant numbers.[38] Perhaps the clearest indication of the relative contributions can be seen in the proportion of individuals — thirty percent maritime and seventy percent landward — as against the proportion of tonnage — forty percent maritime and sixty percent landward.

Having seen the characteristics of the shipping industry and of the major owner sample, it is necessary to consider the kind of enterprises that competed with ship deployment for investment and talent. Needless to say, given the population growth between 1824 and 1891,[39] there were certainly accompanying investment opportunities. As the shipping register was opened in 1820, financial institutions had begun to appear. This element in the local economy was one of the ties with the more sophisticated economic system of the Atlantic rim. The Bank of New Brunswick was established in 1820 and the City of Saint John Savings Bank in 1823, followed by marine and fire insurance companies and agencies, as well as other banks during the late 1820s and the 1830s. During the same period, while the number of male adults and potential vessel owners in the town had doubled, from 3500 to 7000 (approximately), the actual owners had tripled from twenty-six to seventy-seven.[40]

While wood dominated the economy of Saint John well into the nineteenth century,[41] the development of metallurgy began in the 1820s. The first foundry was built in 1831. As secondary processing grew, between 1835 and 1839 the first nails and spikes were produced, to be followed by more complicated items in the 1840s. By that time, there was stiff competition among hardware merchants who had begun to specialize, some of those handling heavy hardware moving into metal shipfittings.[42] Allied to this expansion in the secondary and tertiary aspects of metallurgy was the development of steam power and its fuel source, coal. From the 1820s there were steamboats on the routes across the Bay of Fundy. In addition there were effects on secondary manufacturing. The first boiler and engine were produced locally in 1836, and steam mills were erected in 1838. Steam was introduced into the tanning process in that year and it had been tried in baking by 1852 and in cabinet and furniture making by 1854.[43] Primary activity was stimulated as the first coal was shipped from Grand Lake to Saint John in 1832, and before 1840 mining had arrived.[44] Other kinds of primary manufacturing were also carried on. Whale oil, a useful substance in many ways, was produced by a company formed in 1837.[45] Another extractive industry was stone quarrying. In 1848, for example, granite was imported, while by the early 1870s it was being quarried locally.[46] Along with the above economic activities, stage coaches and omnibus services were established as were water and lighting systems. In 1846 the pipes of the Saint John Gaslight Company were laid. The Saint John Water Company grew from a partnership for water delivery (1832) to a public company (1837) and a publicly-operated system (1854), as the new metal plumbing technology became widespread.[47]

Of course, by the 1850s, the true herald of the age of steam and iron — the railway — had arrived. By that point a business in the making and installation of steam, gas and plumbing fittings had come into existence. Needless to say, there were investment opportunities in supplying the quantities of food, drink and clothing required by a growing population. From the 1820s, a business in readymade clothing existed.[48] The 1851 census reveals that Saint John and Portland had twenty-one saw and grist mills. To these primary manufacturing establishments could be added such secondary operations as sixteen tanneries,

four breweries, six foundries and fifty-four miscellaneous "factories." According to that census, as well, the town had about eight thousand adult males who were potential heads of households, entrepreneurs and investors. The shipping elite was reaching the high point of their investment in new vessels, which placed the aggregate acquisitions at 497,320 tons. From this point the number of adult males remained relatively steady until 1881 and the number of major tonnage registrants began to decline in 1870-4.[49]

Given that there were alternative investment opportunities for vessel owners, it is necessary to determine where they did invest. The principal areas in which the sample of vessel owners placed their other investments were in primary extraction and manufacturing, in banking and insurance, as well as in service enterprises. Their forays into secondary manufacturing, other than shipbuilding, were strictly limited. Although major vessel owners were involved with the water company between 1835 and 1859, the whale fishery from 1837 to 1869, a boom company from 1855 to 1874, as well as with mining (1835-1889) and quarrying (1875-1884), few maritime-oriented shippers went in for such investments.[50] The same limited participation can be discerned in banking and insurance. After a tentative movement, by 1834 vessel registrants took up fifty-nine directorships in this sector, representing the heaviest involvement for the period 1820 to 1889.[51] Eleven shipbuilders accounted for the input of seaward owners and three of them are in Acheson's list of "Great Merchants" as well. It is clearly the mercantile contingent who acquired both vessels and bank shares. With the addition of two more shipbuilders to the list, this statement could be extended to include primary gathering and manufacturing.[52] In such enterprises as the provision of lighting, gas, telegraph, bridge and hotel facilities, there were five shipbuilders who appeared regularly on boards of directors between 1835 and 1879.[53] Perhaps it is needless to say that they also appear on the short list of maritime-oriented owners who invested in primary and financial institutions. Therefore, thirteen shipbuilders, three of whom doubled as "Great Merchants," provided much of the thrust from marine secondary industry into other economic sectors in Saint John.

Of course, some vessel owners did invest in secondary manufacturing, but again these were recruited from merchandising rather than shipbuilding. When William H. Scovil, a merchant with banking and insurance directorships, began to buy new tonnage (1838), he also acquired a nail works. In 1854 he ceased buying vessels and sold his factory, which his successors developed into the Cold Brook Rolling Mills.[54] During the 1840s D.J. McLaughlin and erstwhile vessel owner C.C. Stewart were directors of the Saint John Mills and Manufacturing Company. William Parks, a drygoods merchant, moved out of shipping in order to manufacture cotton cloth and yarn. By 1867 the New Brunswick Cotton Mill was the result.[55] From 1860 to 1874 tonnage registrants invested in an iron works, a cordage and oakum factory and two paper manufacturing establishments.[56] Acalus L. Palmer, a shipowning lawyer, was also the proprietor of the Saint John Manufacturing Company (1870). Shifting from wool to cotton production, by 1874 he owned the Mispeck Mills.[57]

The foregoing analysis indicates that the sample of major vessel owners did not constitute a cross-section of the local economy of Saint John. While a core of them came from shipbuilding, the majority of the sample were merchandising consumer and producer goods. Together, these two sets of owners created a flourishing service industry. However, the chronology of development in that industry is crucial to an understanding of its character. The most important investments made by the mercantile component took place by mid-century. This occurred during the period when timber exports and tonnage clearances seemed to track the investment in new tonnage. By the 1860s the sailing ship was under pressure from the steamship. However, by adjustments in technology, i.e., in shipbuilding, as well as the judicious use of assets, i.e., vessel deployment, it was possible during the 1860s and 1870s to ensure good returns on vessels. It was during the 1850s and 1860s that the shipbuilders and their maritime-oriented colleagues began to increase their average investments in shipping. At the same time, their merchandising counterparts began to leave the industry, presumably looking for greener pastures.

The evidence suggests, therefore, that the practitioners in the related shipbuilding and shipping industries were relatively reluctant to direct their money further afield. It is conceivable that they did not regard sailing ship technology as obsolescent. They clearly had an interest in keeping shipping as competitive as possible.[58] However, they constituted only thirty percent of the vessel owning sample. In contrast to their lacklustre performance in spreading investment, the larger proportion of the sample were more ready to invest outside the shipping industry and, indeed, to cease acquiring new tonnage. Since they were doing this in significant numbers by the 1860s and 1870s, they were in a position to invest in the industrial enterprises which appeared under the stimulus of the National Policy.

If there was a constraint upon any sector of the local economy of Saint John, it was not a result of investment in an obsolete technology. Shipowners were willing to move capital and managerial talent into non-maritime sectors. In doing so they acted as a stimulant to the growth of those sectors. It is arguable, however, that shipowners did more to stimulate merchandising and service industries than they did to stimulate secondary industry. Our rebuttal of McClelland's thesis is therefore a partial and qualified one, since the relationship between shipowners and the expanding economy of Saint John was clearly very complex, and differed from one type of shipowner to another. Certainly shipowners were not a discrete group within the business elite of Saint John, except by virtue of their relatively large investment in ocean shipping. They were an integral part of a wider urban economy in the first stages of industrialization.

NOTES

1 This paper is an outgrowth of work in connection with the Atlantic Canada Shipping Project, funded by the Social Sciences and Humanities Research Council. We would like to acknowledge the assistance of our colleagues — David Alexander, Keith Matthews, Eric Sager, and Rosemary Ommer — throughout. Special thanks are extended to Heather

Wareham, Research Assistant with the Project. We would also like to thank Monica Robertson of the New Brunswick Museum for her kindness in supplying almanacs and directories dealing with the province on extended loan. These materials provided the basic data for our analysis of the business community of Saint John.

2 *New Brunswick Courier,* 10 September 1848.

3 Elizabeth McGahan, "The Port of Saint John, New Brunswick, 1867-1911: Exploration of an Ecological Complex," *Urban History Review,* III (1976), 3-13.

4 Frederick William Wallace, *Wooden Ships and Iron Men* (London, 1924); *In the Wake of the Windships* (New York, 1927); *Record of Canadian Shipping* (London, 1929). For a review of recent literature in the field see David Sutherland, "Wooden Ships and Iron Men Revisited," *Acadiensis,* VIII (Autumn 1978), 101-107.

5 C.R. Fay and Harold Innis, "The Maritime Provinces," *Cambridge History of the British Empire,* VI (New York, 1930), 663.

6 Peter D. McClelland, "The New Brunswick Economy in the Nineteenth Century" (unpublished PhD thesis, Harvard University, 1966); "The New Brunswick Economy in the Nineteenth Century," *Journal of Political Economy,* XXV (1965), 686-690.

7 McClelland, "The New Brunswick Economy" (PhD thesis), iii.

8 McClelland's contentions have been accepted by T.W. Acheson, "The Great Merchant and Economic Development in St. John, 1820-1850," *Acadiensis,* VIII, No. 2 (Spring 1979), 3-27. For partial rebuttals, see Lewis R. Fischer, *Enterprise in a Maritime Setting: The Shipping Industry of Prince Edward Island, 1787-1914* (forthcoming, St. John's, 1981); Eric W. Sager and Lewis R. Fischer, "Patterns of Investment in the Shipping Industry of Atlantic Canada, 1820-1900," *Acadiensis,* IX, No. 1 (Autumn 1979), 19-43; Sager and Fischer, "Wooden Ships and Iron Men Revisited: The Canadian Shipping Industry in the Nineteenth Century" (paper presented to the Economic History Society, University of Liverpool, April 1980).

9 For a fuller discussion see Lewis R. Fischer, "From Barques to Barges: The Shipping Industry of Saint John, New Brunswick, 1820-1914" (paper presented to the Atlantic Studies Conference, University of New Brunswick, April 1978).

10 Fischer, "From Barques to Barges," 25; Sager and Fischer, "Wooden Ships and Iron Men," 24-25.

11 Decadal analyses were required here because of the inability to obtain yearly estimates of population growth. The possibility of using regression equations to estimate growth was eliminated because of the difficulty in assuming linear growth patterns based upon population trends observed after Confederation.

12 See Sager and Fischer, "Patterns of Investment," for a fuller discussion.

13 The difficulty here obviously is the comparability of data. For a discussion of some of the difficulties, see Lewis R. Fischer, "A Good Poor Man's Country: Trade, Shipping and the Prince Edward Island Economy, 1802-1873" (paper presented to the Atlantic Conference, Mount Allison University, October 1979).

14 This index was developed by K.W. Taylor, and is cited in M.C. Urquhart and K.A.H. Buckley (eds.), *Historical Statistics of Canada* (Toronto, 1965), 300; the British index is the Rousseaux index.

15 This point is more fully discussed in Lewis R. Fischer, "The Shipping Fleets of Atlantic Canada and the International Carrying Trade, 1863-1914" (paper presented to the

Canadian Historical Association, University of Saskatchewan, June 1979); Fischer, *Enterprise in a Maritime Setting,* chapter V; Sager and Fischer, "Patterns of Investment," 26-27. There may also be yet another problem with the figures for the latter decades: they may not accurately reflect the volume of exports actually *produced* in New Brunswick. After the completion in 1874 of the Intercolonial Railway there is no longer any definitive way of determining the origins of exports from Maritime ports, nor in determining the proportion of Maritime produce exported through ports such as Montreal. It is possible, for example, that a good deal of the rather dramatic rise in wheat exports from New Brunswick in the 1890s consisted of Manitoba wheat.

16 O.J. Firestone, *Canada's Economic Development, 1867-1953* (London, 1958), 178.

17 Canada, *Census,* 1881, 1891. This point will be more fully developed in a forthcoming article by the present authors.

18 See David Alexander, "Output and Productivity in the Yarmouth Ocean Fleet, 1863-1901," in David Alexander and Rosemary Ommer (eds.), *Volumes Not Values: Canadian Sailing Ships and World Trades* (St. John's, 1980), 61-83; Lewis R. Fischer, "Did Herman Bermer Sink the Fleet?: Some Hypotheses Concerning the Decline of the Eastern Canadian Shipping Industry, 1870-1914" (paper presented to the Great Plains Historical Conference, University of Winnipeg, October 1979).

19 Crew Lists are the Agreements and Accounts of Crew, held in the archives of the Maritime History Group in St. John's. These documents are the actual agreements signed by a master and his crew for ocean-going voyages. A complete description of the contents of crew lists may be found in Keith Matthews, "Crew Lists, Agreements, and Official Logs of the British Empire, 1863-1913," *Business History,* XVI (January 1974), 78-80. A complete explanation of the methodology used for analyzing these documents may be found in Lewis R. Fischer and Eric W. Sager, "An Approach to the Quantitative Analysis of British Shipping Records," *Business History,* XXII, No. 2 (July 1980), 135-151.

20 There are almost nine thousand voyages in the Saint John file. For a preliminary analysis, see Lewis R. Fischer, "The Great Mud Hole Fleet: The Voyages and Productivity of the Sailing Vessels of Saint John, 1863-1912," in Alexander and Ommer (eds.), *Volumes Not Values,* 117-157.

21 L. Isserlis, "Tramp Shipping Cargoes and Freights," *Journal of the Royal Statistical Society* (1938), 304-417.

22 See Fischer, "The Great Mud Hole Fleet," for a fuller discussion.

23 See McClelland, "The New Brunswick Economy" (PhD thesis), 168-235.

24 We have devised a series of vessel sale prices for the region, largely from the detailed data available in the letterbooks of James Peake, a major merchant-shipowner on Prince Edward Island. This data has been supplemented by a variety of other sources. See Fischer, *Enterprise in a Maritime Setting,* 247-256.

25 We have adjusted depreciation to reflect fleet averages of vessel life expectancy. These are described in Fischer, "From Barques to Barges." Using McClelland's own life expectancy figures to calculate depreciation rates yield rates of return during the period between six and thirty percent.

26 The Peake Letterbooks show returns approximating this in the 1840s and 1850s. David Alexander has also found Yarmouth, N.S., vessels with similar rates of return in the 1880s.

27 See footnote 7, and Fischer, Sager and Ommer, "The Shipping Industry and Regional Economic Development," *this volume.*

28 Fischer, "A Good Poor Man's Country," 21-29.

29 Keith Matthews, "The Canadian Deep Sea Merchant Marine and the American Export Trade, 1850-1890", in Alexander and Ommer (eds.), *Volumes Not Values,* 224.

30 Alexander, "Output and Productivity in the Yarmouth Ocean Fleet, 1863-1901," in Alexander and Ommer (eds.), *Volumes Not Values,* 86-90.

31 The original file of owners and tonnage was drawn from the shipping registers (B.T. 107/108) and was created by Fischer. Between 1820 and 1890 the 220 members of the sample registered 1,033,957 tons. For a similar study of a harbour business community see Gerry Panting, "Cradle of Enterprise: Yarmouth, Nova Scotia, 1840-1890," in Lewis R. Fischer and Eric W. Sager (eds.), *The Enterprising Canadians: Enterpreneurs and Economic Development in Eastern Canada, 1820-1914* (St. John's, 1979), 253-271.

32 Panting, "Vessel Owners of the Atlantic Provinces, 1820-1890" (paper presented to the Canadian Historical Association, University of Saskatchewan, June 1979). For the kinship and business links of a smaller sample of Saint John owners see 2-3, 5-6, 8-12.

33 Of the 164 managing owners, twenty-six were listed for more than fifty voyages. One was listed for 571, another for 214 and a third for 180 voyages.

34 Information concerning the investments of vessel owners was drawn from files based upon the biographical files of the New Brunswick Museum in Saint John; *New Brunswick Courier,* 1811-1865; *Saint John and Its Business; The City of Saint John* (Saint John, 1908); Everett and Day, *St. John Business Directory and Almanac* (Saint John, 1857); *Hutchinson's St. John Directory* (1863-64); *Saint John, New Brunswick Directory* (1865-66); Hook and Greenough, *St. John and Fredericton Business Directory* (1862); *McAlpine's St. John City Directory* (1869-72, 1877-79, 1890-92); *New Brunswick Directory* (1877-80, 1889-96); *Saint John and Maritime Business Directory* (1870-71, 1880-81). S. Wiggins and W.H. Scovil were directors of the Bank of New Brunswick. T. Barlow, D. Hatfield, and G.D. Robinson, as well as Wiggins, were directors of the Saint John Marine Insurance Company. In 1825-9 shipbuilders (nine) and merchants (thirty-four) made up forty-three of forty-four vessel owners registering tonnage (ninety-nine percent). In 1850-4 the figures were shipbulders (twenty-nine) and merchants (fifty-eight) or eighty-seven of 102 vessel owners (eighty-five percent). In the quinquennia prior to 1850-4 these occupations tended to be over ninety percent; after 1850-4 they tended to be less than ninety percent of the total.

35 The twenty-nine vessel owners who also are named as Great Merchants were: Thomas Barlow, Ezekiel Barlow, Jr., Isaac Bedell, Robert W. Crookshank, John Duncan, Henry Gilbert, John Hammond, David Hatfield, Hugh Johnston, Sr., John H. Kinnear, James Kirk, Thomas Leavitt, William H. Leavitt, Thomas Millidge, Thomas E. Millidge, William Parks, John Pollok, Robert Rankin, E.D.W. Ratchford, Hon. John Robertson, W.H. Scovil, Walker Tisdale, John Walker, John Ward, Jr., Charles Ward, Stephen Wiggins, John M. Wilmot, R.D. Wilmot and John Wishart.

36 This figure is arrived at by aggregating the tonnages registered by all the owners in the sample for each of the quinquennia involved.

37 These latter individuals were concerned with steam vessels as ferries and river transportation.

38 The ratio of non-maritime owners registering their last new tonnage to the total numbers doing so are as follows: 1840-4: 9/13; 1845-9: 17/18; 1850-4: 13/14; 1855-9: 9/13; 1860-4: 9/18; 1865-9: 9/15; 1870-4: 13/29; 1875-9: 11/17; 1880-4: 22/29; and 1885-9: 15/22.

39 These dates are census years. The population of Saint John and Portland for those censuses is as follows: 1824: 11,531; 1834: 17,150; 1840: 25,488; 1851: 30,895; 1861: 38,817; 1871: 41,325; 1881: 41,353; 1891: 39,179.

40 The numbers of adult males in the population of Saint John and Portland were as follows: 1824: 3907; 1834: 4780; and 1840: 6970.

41 In the first half of the nineteenth century, wood exports in a "raw" state reached eighty-two percent in 1844 and seventy-six percent in 1848 of the total value of exports in those years.

42 Saint John Board of Trade, *St. John and Its Business* (Saint John, 1876), 76, 100, 103-4.

43 *Ibid.,* 101-3, 105.

44 *Ibid.,* 34, 75.

45 Kathryn Y. Johnston, "The History of Saint John, 1837-1867: Civic and Economic" (B.A. Hons. Dissertation, Mount Allison University, 1953), III, 7.

46 *Saint John and Its Business,* 135.

47 Johnston, "The History of Saint John," III, 21, 26, 42-3; *Saint John and Its Business,* 33, 35.

48 *Saint John and Its Business,* 105.

49 On the industrial establishments in 1851 see New Brunswick, *Journal of the Legislative Council* (1852), Appendix I. The number of adult males by census year was as follows: 1851: 8154; 1861: 8070; 1871: 8034; 1881: 7653; and 1891: 7517. The number of vessel owners registering tonnage by quinquennia was as follows: 1850-4: 102; 1855-9: 98; 1860-4: 95; 1865-9: 100; 1870-4: 83; 1875-9: 69; 1880-4: 42; and 1885-9: 23.

50 The number of directorships held in primary gathering and manufacturing enterprises by quinquennia, vessel owners/maritime-oriented owners, was as follows: 1835-9: 19/2; 1840-4: 16/2; 1845-9: 18/5; 1850-4: 17/7; 1855-9: 10/4; 1860-4: 6/0; 1865-9: 12/0; 1870-4: 6/0; 1875-9: 4/0; 1880-4: 5/0; 1885-9: 2/1.

51 The number of directorships held in financial enterprises by quinquennia, vessel owners/maritime-oriented owners, was as follows: 1820-4: 2/0; 1825-9: 6/0; 1830-4: 12/0; 1835-9: 61/5; 1840-4: 41/6; 1845-9: 35/9; 1850-4: 27/7; 1855-9: 25/9; 1860-4: 17/8; 1865-9: 11/2; 1870-4: 6/1; 1875-9: 4/0; 1880-4: 5/1; and 1885-9: 1/0.

52 The thirteen shipbuilders were: Edward Budd, John Duncan, John Haws, John Owens, Robert Rankin, James Reed, Robert Reed, William Ritchie, James Smith, Henry Vaughan, Thomas Vaughan, John Walker and William Wright. Duncan, Walker and Wright were "Great Merchants."

53 The number of directorships held in tertiary enterprises by quinquennia, vessel owners/maritime-oriented, was as follows: 1835-9: 7/1; 1840-4: 7/2; 1845-9: 13/6; 1850-4: 17/11; 1855-9: 8/5; 1860-4: 9/5; 1865-9: 12/6; 1870-4: 14/3; 1875-9: 9/1; 1880-4: 7/1; 1885-9: 1/0.

54 *Saint John and Its Business,* 78, 100.

55 *Ibid,* 121.

56 The proprietor of the Phoenix Foundry, 1835-9, was Thomas Barlow while William H. Scovil had a nail and spike factory. From 1860-9 Edwin Fisher was proprietor of Union Iron Works. George McKean and Zebedee Ring were directors of the Cold Brook Rolling Mills in

1875-9. T.E. Millidge and Joseph Pritchard were directors of New Brunswick Oakum Manufacturing Co., 1865-1874. George Marsters and J.H. Thomson were directors of the New Brunswick Paper Mill in 1865-9 and were joined by James Reed in 1870-4. In that quinquennium Marsters invested in another paper mill as well. Acalus L. Palmer was proprietor of textile concerns in 1870-9 and Alexander Shives was a director of the St. John Cotton Mill during 1885-9. The two maritime-oriented owners were James Reed and Joseph Pritchard.

57 *Saint John and Its Business,* 169.

58 For a rather different approach to this point, see Acheson, "Great Merchant," 3-27.

12. COMMENTARY: ON SHIPOWNERS AND THE LANDWARD ECONOMY IN ATLANTIC CANADA

Larry McCann

Let me begin by making a few preliminary comments about what has become a growth industry in itself — the history of the Atlantic region of Canada. The renaissance in historical writing in this region, epitomized perhaps by the rebirth of *Acadiensis,* is the work of many young scholars, and some older scholars as well, whose dedication and spirit of co-operation is fully shared by those at Memorial University, where at these Conferences we landlubbers meet the old salts of the sea. My personal debt to members of the Atlantic Canada Shipping Project is substantial. The Project has already achieved wide recognition. Although very valuable work is being done here, nevertheless I feel that something is lacking. There is not yet a full and careful integration between the study of the seaward side of the economy and the study of the landward side. I base this comment in part upon assumptions contained in the two papers before us. Let me quote from Gerry Panting's paper: "We need to trace the connections between shipping and the general commercial life of the ports from which it grew." There is here a recognition that we must know something about the towns, the cities, and the regional economy as a whole. And in the paper by Fischer and Panting we read that the decline of shipping was related very directly to developments in the landward side of the economy. In this commentary I hope to point out where some of the gaps remain in the attempt to link landward and seaward developments, and to suggest how some of these gaps might be filled.

What seems to me to be lacking is a context or framework for understanding the landward side of the economy. David Alexander has, of course, written about the economic development of the Atlantic region from Confederation to about 1940. Nevertheless I believe that some factors essential to explaining the decline of the shipping industry remain embedded, as yet unobserved, within the wider context of economic change. Two contexts are relevant here: the context of wider regional economic development; and the context of urban developments. First, over the period from roughly 1830 to about 1890 the economy shifted in general terms from a mercantile economy to an industrial economy, and then after the turn of the century to an economy with a large tertiary sector, and an economy in which government policy and public investment are critically important. In the twentieth century a great deal of the urban economy of Halifax is sustained because of the success of Haligonians in exploiting their alleged oppressors in central Canada, extorting military bases and ocean terminals from the so-called metropolis. Nevertheless, the broad trend is clear. We began with an export-led economy, based first on such staples as timber and fish, but gradually moving to other staples, such as coal, pulp and paper, and other mineral products. Attempts to attract the new industrialism began even before the National Policy, but surged in the decade after the introduction of the National Policy. Later there occurred the

transformation to a service economy. If we look at the flows of capital and labour, and at the movement of entrepreneurs, we quickly acquire a sense of a peripheral region interacting with core regions. At whatever stage we consider the economy of the Maritimes, we are dealing with a region which was peripheral, within a larger system, either international or continental. There are, of course, many studies dealing with these patterns of development. But I think that members of the Atlantic Canada Shipping Project must develop a new means of summarizing these developments, and a summary which situates the shipping industry within developments on the landward side of the economy.

Urban centres, their development running parallel to developments in the economy as a whole, have also made the transition from a mercantile to an industrial world, and thence into the world of so-called state capitalism. Just as the growth of the regional economy has been relatively slow, so the growth rates for urban places in the nineteenth and twentieth centuries have been low by national standards. We must recognise that opportunities in urban centres were limited, relative to opportunities elsewhere; we must also recognise that many towns were experiencing declining rates of growth (a phenomenon which was particularly noticeable by the 1920s, when about half the urban places in Nova Scotia declined in population). This context of urban development must be kept in mind when considering the transition from seaward to landward activities.

Having outlined the broad development of the regional economy, let us note how the Maritimes interacted with the international economy, and let us attempt to situate the shipping industry in this context of interaction. There was an outward flow of staple products, and an inward flow of manufactures. Incomes earned from staple trades to Europe or the West Indies were used to purchase manufactures imported from abroad. Staples were the basic stimulus for growth. But where does shipping fall within this pattern? Shipping is, first of all, a basic service industry within such a staple economy. It is also a growth-inducing industry within the staple economy, and this may be true even when the ocean shipping of the Maritimes has entered the cross trades from American even more than Canadian ports.

But what happened to this vital connection with international trade flows when the Maritimes entered Confederation? Now the Maritimes increasingly supplied primary products and primary manufactures to Canada in return for manufactured goods; and the value of "imports" from central Canada was greater than the value of "exports" to central Canada. What happened to those who had owned shipping when this new interaction began? Obviously the new interaction with the rest of Canada, and the National Policy which followed, had the effect of creating substantial new investment opportunities. But there was another effect: the merchants of the Maritimes no longer received so large a proportion of regional "imports" by waterborne transportation. Let me give you an example of this change within the history of a single firm, the Halifax firm of S.A. White and Company, established in 1845 (taken over by Cunningham and Curran in 1882). They were flour and commission merchants who later established mills. In the beginning they imported flour from the United States; they went into shipping,

and registered tonnage in Halifax, in order to facilitate their imports and to reduce their costs of operation. But by the 1860s wheat and flour were beginning to come to Halifax from Ontario, via Pictou County and the new rail lines. At this time White ceases to appear on the ship registries. By the 1880s they buy wheat and corn from Chicago; they buy stout and flour from Ontario. They are no longer dependent on a seaward distribution network. I suggest that the withdrawal from shipping may be related to the way in which the region was being integrated into a national economy, not only in production but also in distribution of goods. This process of integration can readily be studied through the kinds of sources which members of the Project are already using.

Gerry Panting has collected and sorted a wealth of information about shipowners, their businesses, their personal fortunes, their partnerships, and their genealogies. This is precisely what needs to be done. I have a quibble, however, about the sample of large shipowners. Is it not possible to establish a comparative framework, and to compare shipowners with other businessmen who were not in shipping but may have been leading figures in the urban or regional economy? If you are to argue that a shift of investment into the landward side of the economy was critical, how can we accept that argument unless you compare shipowners to the wider sample of entrepreneurs in the urban economies? The problem is not insurmountable because there are data bases which allow answers to be formulated; particularly useful are tax assessments at key points in the development of various cities.

It would also be useful to have comparisons between rates of return on investment in shipping and returns in landward industries. Scotia Steel seemed always to offer an eight percent dividend; was that more attractive than returns in shipping? There is a list of all shareholders in Scotia Steel in 1910; it would be useful, surely, to compare those names with names on the shipping registries, to observe those who were moving into the landward economy. There are, therefore, sources which allow us to trace shipowners and their investments. When tracing the movement of investments from seaward to landward it is not necessary to look only at the sample of very large shipowners. Would it not also be possible to look at a sample of smaller shipowners, and to see whether they too follow the movement from seaward to landward?

I am impressed by the very rich data base which has been created here for the study of major shipowners and their landward activities. The analysis which emerges will be strengthened by a careful attention to the wider economic context within which shipowners functioned as businessmen. Such analysis will in turn deepen our understanding of wider economic developments in the Maritimes.

13. DISCUSSION FOLLOWING THE PAPERS OF PANTING AND FISCHER AND PANTING

PANTING agreed that much work remained to be done to set shipowners within the wider economic context of the Maritimes. Discovering even basic things about that wider economic context often required original research, however. It was in this area, more than any other, that the Project required assistance from other historians. On the question of selecting a sample of major shipowners any method was bound to be arbitrary, but selecting those who held more than a thousand tons at least allowed comparability across ports. It would be very useful to study a sample of small vessel owners, but it was much more difficult to find information on small vessel owners than to find information on the owners of large ocean-going vessels, and time constraints had so far prevented such a study. In any case it was the small number of major shipowners who determined the overall pattern of investment, and so they must have first priority in our attempt to explain the decline of the industry.

MCCANN wondered whether it would be possible to explain the decline of the shipping industry at all unless one looked at a sample of all types of vessel owner, examining for each class of owner the reasons for the shift from seaward to landward investment.

PANTING agreed that it might not be possible to explain the decline of the entire industry. To explain the decline of the schooner-based coastal trades in Nova Scotia would require a wider focus and a wider sample of owners. But if the Project could explain the withdrawal from shipping of those major owners responsible for most of the ocean-going fleets in major shipping centres, this would be a worthwhile achievement. Terminological exactitude was essential here lest we make generalisations which our evidence cannot support.

BUCKNER thought that further analysis at the level of communities and individuals was essential if the behaviour of either major or minor shipowners was to be understood. Even tentative answers to the questions being posed required an intimate understanding of the community within which shipowners lived and worked. The macro-economic data on investment in shipping and on investment and output in the landward provincial economy were not enough. In order to understand the decisions of businessmen you had to understand their environment, and to look at what they said; there was no substitute for reading newspapers and other contemporary sources in order to find out what was going on. The quantitative analysis of macro-economic data could tell you a great deal about what happened; it would tell you much less about why it happened.

FISCHER replied that he did have some idea of what was going on in Saint John, but that the first priority was to determine as precisely what happended at the "macro" level before delving into non-quantitative sources.

SAGER added that the analytical distinction between seaward and landward was breaking down, as Gerry Panting himself pointed out. The analysis of economic data was proceeding at the "micro" level and at the level of counties and towns. Extensive reading of newspapers was being done; but it was first necessary to establish basic time series before contemporary opinion and qualitative evidence could reveal much about economic change over time.

MCCLELLAND doubted that the estimates of productivity by Fischer and Panting really measured what economists commonly call productivity. On the basis of this measure you cannot conclude that shipowners were doing very well, or that their investment in shipping was yielding substantial profits to the shipowners or substantial economic benefits to the region.

HARLEY pointed out that Fischer and Panting were estimating productivity by multiplying the number of entrances by average vessel size and by a weighted freight rate, and then dividing by the number of vessels. Consider, however, two entrances, each having the same freight rate but the first having a vessel of five hundred tons and the second having a vessel of one thousand tons. In this case "productivity" would have doubled, and the growth rate over ten years would approximate six percent, but the only thing being measured was the increasing size of vessel. It is possible that costs and inputs had doubled at the same time, however, in which case there would have been no productivity gain in any real sense. For the productivity measure to have any meaning it must measure output per input, and in the estimates by Fischer and Panting the inputs are not there.

FISCHER replied that his "productivity" estimates were not estimates of total factor productivity in shipping, but merely estimates of potential output per vessel. The increases in output per vessel were a function not simply of increasing vessel size, but also of known savings in passage times, port times and turn-around times at the end of voyages. It would of course be preferable to look at output per input costs, but the cost data were still being collected. It is reasonable to assume that total factor productivity was increasing, however, since we know that there were savings in labour and in the wage bill, and that other costs were constant or declining in this period.

SAGER pointed out that the Project's "productivity" estimates were not being used to support an argument about economic benefits to the region, nor to make a comparison between productivity in shipping and productivity in landward industries. The critical comparison was between gross output in shipping and output growth in landward sectors.

HARLEY agreed that the method used to measure output made sense, but pointed out that load factors were likely to be declining, and although the formula made some adjustment for this it was difficult to be precise about changing load factors.

GOSS suggested that in making the argument about alternative landward investments it was essential to look more closely at the movement and availability of capital within the region. The existence of mechanisms of transfer was of critical importance. In explaining the decline of the industry,

the concept of comparative advantage might have limited usefulness when applied to shipping rather than shipbuilding, unless the region had some conspicuous disadvantage in the area of capital flow and availability. The ships, their crews, insurance and other necessary inputs could be acquired regardless of the residence of the owner. Certainly the lesson of the twentieth century was that location of ownership and registration was largely irrelevant.

MCCLELLAND agreed that the thesis about alternative investment opportunities was worth pursuing, but argued that it might be misleading to apply this thesis only in the context of the years after 1874. There would in each year be a flow of revenues from shipping; with a large fleet this would be a substantial flow. Thus each year entrepreneurs would be faced with the decision: how much should be saved and how much consumed? For that portion to be saved, where should it be invested? This decision about alternatives was continual and ongoing. It was confined not only to the last decades of the century, but occurred from the beginning of the nineteenth century.

14. FIFTEEN YEARS OF REGIONAL INDUSTRIAL DEVELOPMENT POLICY: A CASE STUDY OF NOVA SCOTIA

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FIFTEEN YEARS OF REGIONAL INDUSTRIAL DEVELOPMENT POLICY: A CASE STUDY OF NOVA SCOTIA[1]

Roy E. George

Though no one living can remember the "Golden Years" of the mid-1880s, many Nova Scotians still suffer from nostalgia for them. Nova Scotia was then a prosperous part of North America. Sitting astride some of the major world shipping routes, it shared with New Brunswick a merchant fleet which was the fourth most important in the world in terms of registered tonnage. It exploited its natural resources, principally fish and lumber, carrying on a large export trade in both; and it had some healthy manufacturing industries, boatbuilding being the most prominent.

Though things seemed to start going wrong soon after Confederation, in reality signs of Nova Scotia's decline were to be seen thirty years before. The British free trade policy undermined its protected position in world trade, lumber markets were drying up or being closed off, and technological developments were working to its disadvantage. During the next century, the decline continued. Agriculture suffered from the inflow of cheaper foodstuffs from central Canada; Atlantic fishing slipped into a rut as markets for saltfish dwindled, other markets were slow developing and the Grand Banks were over-fished; lumbering suffered from a decline in wooden shipbuilding and from west coast competition when the Panama Canal was opened, though in the present century pulp and paper has tended to fill the breach; coal mining sank with its counterparts in other countries after the First World War due to general depression and competition from oil; Halifax harbour became a ghost port compared with the bustling picture it presented in the nineteenth century, as ships by-passed it by using St. Lawrence or American eastern seaboard ports; and manufacturers could not withstand the eastward flow of goods produced by new large-scale technology in Ontario and Quebec and carried along the rail link that came with Confederation.

Adjustment was clearly necessary. If Nova Scotia was to retain its position, it would have to abandon its old way of life and adapt to the new environment. But it did not do so. Shipbuilding was perhaps the best example. The province's pre-eminence in building wood sailing ships was undermined by technical development which called for a change to steam-driven steel ships. But the industry continued in the old way, making no concession to progress, and died.

Nova Scotians did not suffer their misfortunes quietly. Most blamed it all on Confederation and the protectionism of John A. MacDonald's "National Policy," which benefitted central Canada at the expense of the Atlantic Provinces. Their continuous complaints, which blended in with those of New Brunswick and Prince Edward Island, led to the setting up of the Royal Commission on Maritime Claims in 1926. Out of this commission came the Maritime Freight Rates Act which provided subsidies on railway freight rates for Maritime goods transported

westward as far as Quebec City; but otherwise the attitude of federal governments was unsympathetic and even scornful. They provided doles in the form of intergovernmental fiscal transfers, but they tended to take the attitude expressed by the 1957 Royal Commission on Canada's Economic Prospects, that the only solution was for residents of the Atlantic Provinces (Newfoundlanders having joined the backward region by this time) to pack their bags and move west. It is true that some measures of assistance did, incidentally, help Nova Scotia's industries and some (those for coal-mining were the best example) were specifically directed at assisting an ailing Nova Scotian industry, but there was no sign of a policy designed to raise the general state of the Nova Scotian economy.

About 1960 there was a radical change of heart, and the federal government became committed to reducing, if not eliminating, regional economic disparities. The purpose of this paper is to consider the industrial development policy which became the main element of this new initiative. It will examine the rationale of this policy, the task it faced, the strategy it employed, its effects, and the reasons for its lack of complete success. Finally, it will explore what more might be done.

At the time not everyone was convinced that the new policy was wise. Some were afraid that interfering with economic forces and trying to change the "natural" pattern of industry within the country would result in high cost industry unable to compete in world markets and an increase in the cost of things that Canadians buy. While such fears seem to have a rational foundation, there are two circumstances in which steering firms to the poorer areas of the country may be justified on purely economic grounds. First, if it can be shown that through ignorance or prejudice firms cluster in the richer areas though locations in the poorer areas are sometimes at least as satisfactory, then coaxing or bribing them to locate in the poorer areas may actually result in a lower-cost distribution of industry. Second, if firms establishing in a poor area would employ labour and other resources that otherwise would be idle, then the cost to the nation of using those resources would be little and, from the public viewpoint, the poor area might offer the lower-cost location. Both these circumstances seemed to exist at that time. A study carried out in the early 1960s suggested that firms establishing new manufacturing plants in Ontario and Quebec almost completely ignored the possibility of locating in Nova Scotia, while unemployment in the locations most firms selected for their new factories was relatively low.

These are economic justifications. But political decisions are made for political reasons, and the new policy came during the phase in Canadian history when the future seemed to belong to Canada and when a stream of programs originated in Ottawa aimed at providing everyone with medical services, making a university education available to all those with sufficient ability, trying to further urban planning, and otherwise bringing the good life to all Canadians, wherever they lived in Canada.

Whatever the reason for the new industrial development policy, it certainly faced a formidable task. The regional disparities then existing were considerable. Though Nova Scotia was the richest of the Atlantic Provinces, its personal income per head of the population (ignoring transfer payments) was, in 1960, only about seventy-two percent of the corresponding figure for Canada as a whole. In that

year, the average monthly unemployment was 8.1 percent of its labour force, compared with the national average of seven percent, and only 47.8 percent of its population was in the labour force, compared with a figure of sixty-four percent for the whole country. Two of the staple industries, coal and steel, were in precarious positions. The rather gloomy economic prospects caused an annual net migration from the province of over four percent of the population, mostly from the younger elements of the population. Its manufacturing industry, which was to become the main target of the policy, was relatively underdeveloped, accounting for only 1.5 percent of the Canadian value-added, though on the basis of population it should have had 3.8 percent.

The program got underway in 1961 when double depreciation was permitted as a tax incentive to firms manufacturing new products or establishing new operations in areas of high unemployment. Two years later a tax holiday was granted by the Area Development Incentives Act (ADIA). In 1965 amendments to the ADIA provided for capital grants which partially superseded the tax incentives; and these grants were the core of the industrial development policy for the next ten years, though tax concessions also continued in various forms, and loan guarantees were added. They went through a number of modifications, the largest coming in 1969 with the Regional Development Incentives Act (RDIA). Two agencies were entrusted with implementing the policy. In 1963 the Area Development Agency (ADA) was created and concentrated its efforts on implementing the ADIA, until it was replaced in 1969 by the Department of Regional Economic Expansion (DREE), whose main industrial development thrust during its first five years of life was based upon the RDIA industrial incentive grants.

A big shift in regional policy occurred in 1974 when "General Development Agreements" (GDA's) were signed by the federal government and each provincial government except Prince Edward Island (which had had its own "Comprehensive Development Plan" in operation since 1969). As their title implies, they were general in nature and were concerned with many sectors of the economies of the provinces. They were umbrella agreements under which "subsidiary agreements" have been concluded to provide for programs managed and financed jointly by DREE and the provincial governments concerned (though the federal government has supplied the lion's share of funds). Although much less well-known than the RDIA program, they now represent DREE's major regional development thrust.

Though several of the subsidiary agreements concluded with Nova Scotia are in part concerned with industrial development, the industrial development subsidiary agreement signed in 1976 is the one of primary interest to this paper. In it the governments set aside about twenty-three million dollars (the federal share was eighty percent), mainly to identify development opportunities and to provide industrial parks and other infrastructure. Another element of regional industrial development policy in Nova Scotia was manifested in the Cape Breton Development Corporation (DEVCO). Created in 1967 to run down the Cape Breton coal mines, it was also charged to develop employment opportunities in

Cape Breton to absorb displaced miners. Its development task was therefore much the same as that of ADA and DREE, though its geographical scope was limited. It was given a very free hand to do what it thought best and it has created and operated its own enterprises as well as giving a variety of financial and other assistance to private enterprise which promised to expand development in Cape Breton.

ADA, DREE and DEVCO were all set up as agencies of the federal government and are the focus of interest in any discussion of regional industrial development policies. In Nova Scotia the provincial government, through Industrial Estates Limited (IEL) and its Department of Development (established in 1958 and 1970 respectively), has also been deeply involved in industrial development in the province; but its role is the same as every other provincial government and is concerned with regional industrial development only in the sense that the governments of Ontario, Alberta, British Columbia and other provinces seek to stimulate the economies of their own jurisdictions. Therefore, although its importance is great, its policies will not be considered here.

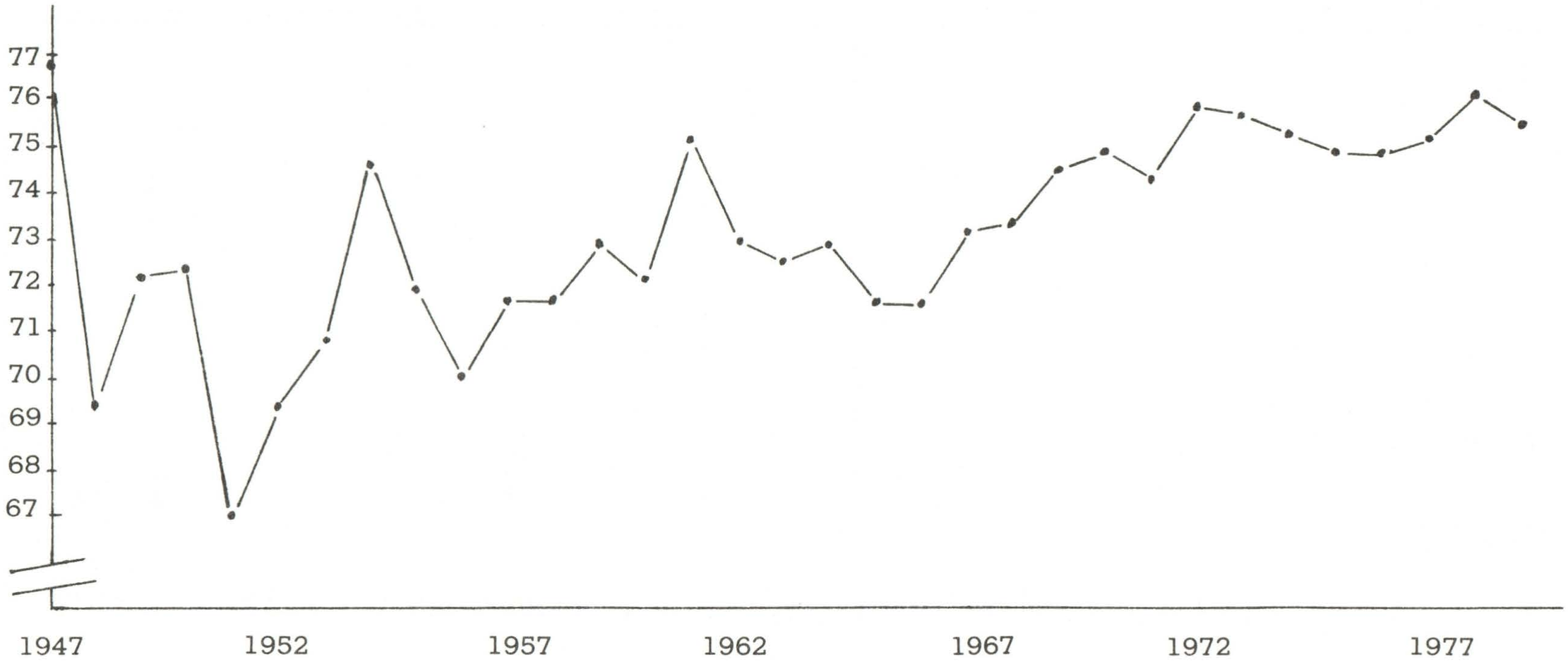
Figures 1, 2, 3, 4 and 5 show the movement of certain variables indicative of economic conditions in Nova Scotia and Canada since the Second World War. While time series of this nature cannot, of course, prove whether or not the regional industrial policy has succeeded in improving Nova Scotia's relative economic position, they do allow one to see if any obvious changes have occurred since that policy was introduced.

Figure 1 shows that the improvement in Nova Scotia's relative position, measured by personal income per capita, has been consistent since 1948, except for the inevitable fluctuations. The trend appears gradually to be flattening out, so that, although one may reasonably expect continued improvement, there seems little hope of Nova Scotia catching up with the rest of Canada in the foreseeable future, unless there is a significant change in the economic environment (a big find of oil might do it), or a new regional policy which really takes hold. What is important for our present purpose is that there is nothing in the series to indicate that anything happened after the mid-1960s to suggest that the trend had been significantly affected by the regional industrial policy. Indeed, the annual improvements after that time are somewhat smaller on average than they were before. This does not give grounds for concluding that the policy has been completely ineffective or even detrimental, since there is always a possibility that without it the trend would have turned down (the early 1960s did indicate some tendency to decline). But it certainly provides no assurance that the policy has been successful.

A similar conclusion seems to follow from Figure 2. Except in 1970 unemployment has always been higher in Nova Scotia than in Canada as a whole. Nova Scotia's relative position improved for short periods around 1955 and 1970, but these improvements seem to have been temporary deviations from a 1.5 percentage point disadvantage. After 1965 the average was 1.35 percent compared with 1.85 percent before that year, and one might see some slight hope in that, although the gap seems to be widening again in the latter part of the 1970s.

FIGURE 1

PERSONAL INCOME PER CAPITA (EXCLUDING TRANSFER PAYMENTS), NOVA SCOTIA AS A PERCENTAGE OF CANADA, 1947-79



Source: Statistics Canada, 13-201.

FIGURE 2

UNEMPLOYMENT AS PERCENTAGE OF LABOUR FORCE,* NOVA SCOTIA AND CANADA, 1947-1980

*Note: Over 14 years up to 1965; over 15 years thereafter.
Source: Statistics Canada 71-201 and DREE tabulations from DBS.

FIGURE 3

LABOUR FORCE AS PERCENTAGE OF POPULATION,[1] NOVA SCOTIA AND CANADA, 1947-1980

[1]Over 14 years up to 1965; over 15 years thereafter.
Source: Statistics Canada 71-201 and DREE tabulations from DBS.

Participation of persons in the labour force is also a relevant statistic, since it would be scant comfort to see unemployment falling merely because people were dropping out of the labour force due to lack of employment opportunities. Figure 3 illustrates the situation. A break in the basis upon which data were collected occurred about the time of the introduction of the regional policy, so one cannot interpret the figures without some hesitancy (Statistics Canada's analysis of the results of this data break suggests that it down-played Nova Scotia's relative disadvantage). But again no significant change occurred about 1965 which might prompt one to see an improved relative economic climate in Nova Scotia brought about by the regional policy. Indeed, Nova Scotian participation rates relative to Canada as a whole seem to have worsened a little after the policy began.

Defenders of the policy understandably protest that, while unemployment in Nova Scotia has not noticeably improved since 1965, the record of job creation in the province since that date has been impressive. As Table 1 indicates, they are perfectly right. During the post-1965 period, Nova Scotia's performance is eighty percent of the Canadian average, compared with only thirty-four percent during the preceding nine years. However, all this has achieved is to prevent the unemployment position in Nova Scotia slipping further relative to the rest of Canada; there has been no catch-up.

One other series which is sometimes taken as an indication of the relative economic condition of Nova Scotia is the net migration from the province. If conditions are relatively attractive in the province, one would expect Nova Scotians to stay at home and others to move in. Figure 4 suggests that this became the situation after the regional policy was introduced. From being consistently a net exporter of migrants, the province became a net importer during most of the 1970s. This is unreliable evidence, however. People migrate as a result of conditions at both their points of departure and their destinations. And whereas up to the second half of the 1960s employment opportunities were fairly plentiful in Ontario and many Nova Scotians moved to Toronto and a few other locations,

TABLE 1

EMPLOYMENT GROWTH, NOVA SCOTIA AND CANADA, 1946-1980

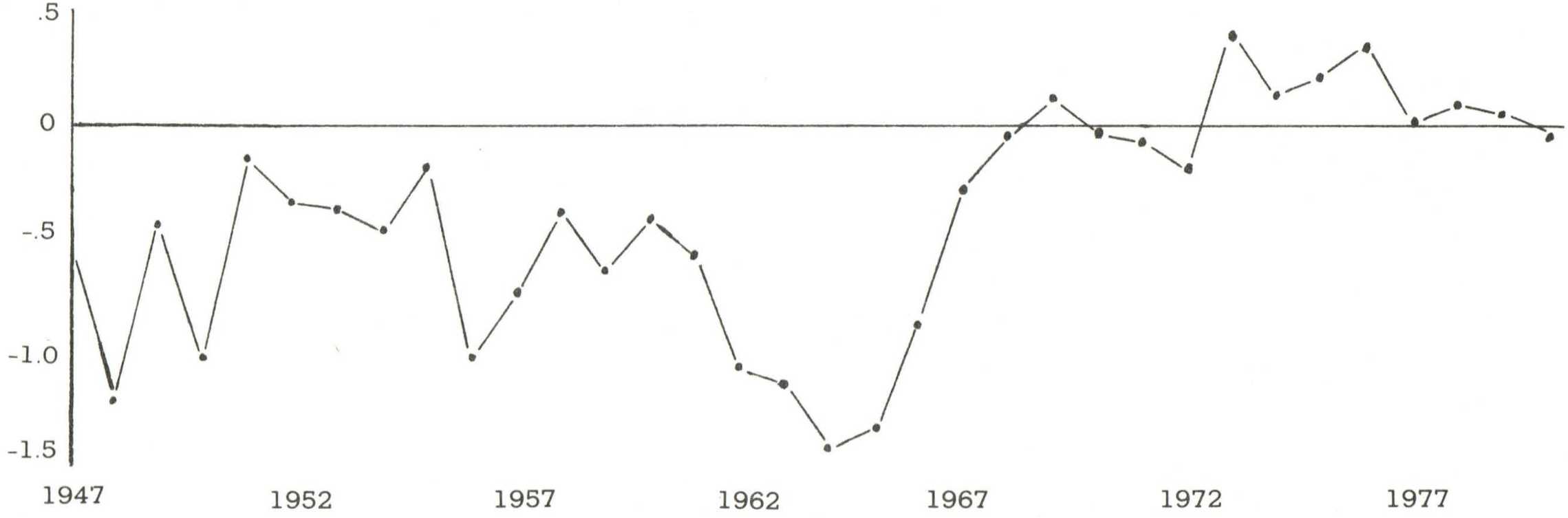
(FIVE YEAR INTERVALS)

Mid-Years	Nova Scotia	Canada
1946-50	1%	7%
1950-55	1%	8%
1955-60	1%	11%
1960-65	12%	15%
1965-70	7%	13%
1970-75	19%	17%
1975-80	12%	15%

Source: Statistics Canada 71-001.

FIGURE 4

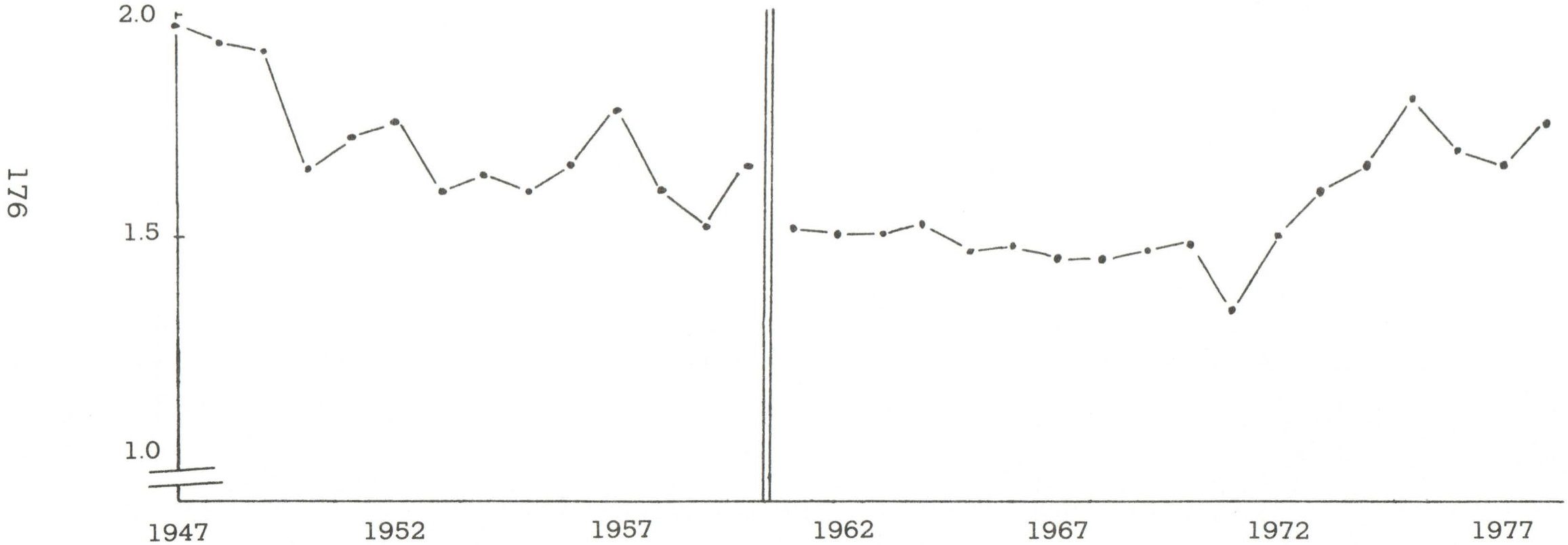
NET IMMIGRATION AS PERCENTAGE OF POPULATION, NOVA SCOTIA, 1947-80



Source: Statistics Canada, 84-001, 84-202, 91-001.

FIGURE 5

VALUE ADDED[1] IN MANUFACTURING INDUSTRY, NOVA SCOTIA AS PERCENTAGE OF CANADA, 1947-78



[1]Manufacturing activity up to 1960; total activity thereafter.
Sources: Statistics Canada, 31-203.

after that time the job situation in Toronto deteriorated, and many Nova Scotians who might have emigrated evidently decided they would prefer to be unemployed at home than in Toronto.

Finally, let us look at Nova Scotia's manufacturing sector, the principal target of the regional policy. Figure 5 shows the percentage of Canadian value-added in manufacturing accounted for by Nova Scotia. In 1965, the proportion was 1.47 percent; by 1978 (the latest year for which figures are available), it had risen to 1.76 percent. So, after more than fifteen years of the operation of a regional industrial policy, one-fifth of Nova Scotia's lag in the manufacturing sector has been eliminated.

The statistical evidence is therefore mixed. As far as the province as a whole is concerned, there is little to indicate that the regional industrial policy has been successful in reducing Nova Scotia's economic disparity. However, the evidence does not prove the converse either — one may not assert that the policy has failed to reduce the province's economic backwardness, since it is possible that, in the absence of the policy, Nova Scotia's position would have deteriorated. Nevertheless, the onus is on supporters of the policy to prove that the $285 millions or so it has cost through ADIA, RDIA, GDA Industrial Development Sub-Agreement and DEVCO alone since 1965 have been justified.

When one focuses exclusively on the manufacturing sector, the picture is somewhat more encouraging, Nova Scotia's manufacturing production having made a significant gain relative to the rest of Canada. However, value-added by manufacture per capita in Nova Scotia is still less than half the national average, so there is a long way to go. At the present rate of improvement, very few Nova Scotians alive today have any hope of seeing even the manufacturing disparity eliminated; and judging by past performance, even then income disparities will remain.

One's judgement upon Canada's regional industrial development policy really depends upon what one considers was its main objective. Discovering precisely what that was is difficult. There is no doubt that the early discussion was in terms of "reducing regional disparities", which were usually measured in per capita income differences. However, the ADIA afforded assistance to "designated regions" chosen because of their high unemployment rates; so presumably its objective was to reduce unemployment. Since then, in keeping with the desire of politicians to appear to be in favour of everything good, "opportunities for employment and income", "economic development and industrial adjustment", "realization of economic and social potential", and other worthy objectives have been mentioned. Since the objectives are vague, judgement of performance is difficult. Still, I believe it fair to say that even the most ardent admirer of the policy would admit of its having been less successful than we hoped in the heady days when it was conceived, and that in its present form it holds out no real promise of bringing regional disparities down to a generally acceptable level in the foreseeable future.

Why has the policy not been more clearly a success? Before we start discussing the reasons, it is important to remember that nowhere in the world have

regional economic policies been unqualified successes. The confidence existing twenty years ago in the ability of governments to redistribute economic activity has been shown to be largely unjustified. Nevertheless, if the policy is to be continued in Canada, it is right that the policy and the programs designed to implement it should be reviewed regularly and steps taken whenever possible to improve them.

The limited success of the policy may be attributed to five main reasons. Up to about the end of the 1960s, the disadvantage of Nova Scotia as a location was taken for granted and there seemed general acceptance of the position that all manufacturing firms establishing there inevitably laboured under inflated costs due to long lines of communication, low labour productivity, and expensive financing. More recently, the pendulum has swung over to the other extreme and there is a tendency to deny that Nova Scotia has any locational disadvantage. The truth lies between these two extremes. Research undertaken over the last fifteen years confirms that the disadvantages of Nova Scotia have been exaggerated and that some manufacturing industry (estimated to be perhaps fifteen percent of the whole) is at least as well off in Nova Scotia as in central Canada.[3] But the fact remains that most manufacturing plants would be at some disadvantage if they were located in Nova Scotia. This, then, must be one reason for regional policies' lack of success. Nova Scotia simply is not the best Canadian location for most manufacturing industry.

A second reason for the lack of success of regional development policies is the geographic focus of government incentives. The focus of the programs carried out under the GDA Industrial Development Sub-Agreement and by DEVCO is, of course, clearly Nova Scotia. That of the ADA and DREE capital grants however became fuzzy with time. There is no doubt that they were originally conceived to benefit Quebec and the Atlantic Provinces, but political pressure expanded the eligible areas so that most of populated Canada is now included, though higher grants are available in the Atlantic region than elsewhere. The effect of this diffusion has probably been to reduce the power of the program to steer firms to Nova Scotia. Research elsewhere suggests that firms diverted from the traditional industrial areas of a country by government incentives usually go to locations eligible for incentives which are as near possible to the traditional areas.[4] The focus has also been blurred by leakages. Because of Nova Scotia's small industrial base, grants made for plants established or expanding in Nova Scotia have mostly (probably to the extent of about seventy percent) been spent on capital equipment and materials produced outside the province. A considerable part of the benefit of grants has therefore accrued to the relatively rich areas of Canada instead of to Nova Scotia.

A third reason for lack of success is that much government assistance has had little effect on recipient firms' location decisions. It was recognized that many of the ADIA grants had gone to firms such as pulp and paper manufacturers, which established operations in designated areas merely because that is where the trees were, and in 1969 the new RDIA grants were made discretionary, the intention being to deny them to firms who would establish in designated areas even without

them. Implementing this policy obliged DREE project officers to guess whether or not a grant was necessary to ensure that the plant in question would be established or expanded in a designated area and, if so, how large the grant needed to be. Several studies have been undertaken to find out how successful they have been, but the results have been inconclusive, producing estimates of the percentage of plants which would have ended up in the same locations, even if the grants they were given had been refused, of between thirty percent and eighty percent. If one chose to accept a middle of the range estimate, it would seem that between a third and a half of the grants have had no effect upon plant location.[5]

There are also undoubtedly instances where public funds have been pumped into projects which should have been recognized as being unlikely to provide viable activities. The agencies concerned should not, of course, be criticized for occasionally supporting firms that fail — the only way to avoid that would be to do nothing. But in their eagerness for results, some glaring mistakes have been made. The pre-1971 history of DEVCO stands out in this respect. Some thirty million dollars were poured out over a four year period, mainly to American firms to induce them to set up factories in Cape Breton. By the end of the period, virtually all had failed and almost nothing remained. Also, political pressure has sometimes been responsible for the support of sick industries which showed no promise of ever being anything else.

Research nowadays seems to be consistently coming to the conclusion that a shortage of entrepreneurs and good managers is the most important reason why industrial development has been relatively slow in Nova Scotia. Had the regional industrial development programs been without fault, this shortage would have stood in the way of their success. Though the programs have basically, I consider, been very sensible, they are in the main passive and rely upon a response from the private sector. Their principal strategy is to offer money to those business people who do certain things — usually those who set up new enterprises, carry out re-equipment or expand their operations. If there is no response they are powerless. It is true that, on some occasions, DEVCO has gone into business on its own account or in partnership with private persons or companies, and that DREE and the Department of Development have, under the GDA, carried on a project to coax potential entrepreneurs to come out of the woodwork; but these are of limited scope and form a minor part of the programs.

Though there are some very progressive and well-managed industrial firms in Nova Scotia, the general picture is one of psychological inertia. Most firms rely upon traditional products made by traditional methods and sold on traditional markets. The prevailing attitude seems to be that, so long as existing operations provide a reasonable living and governments can be relied upon to step in with protection or subsidies if more energetic producers threaten, then why bother to seek out new opportunities and go to trouble and risk to exploit them?

Largely as a result of this attitude, Nova Scotia industry has been relatively inefficient. Figure 6 shows value added per employee by manufacturing industry in Nova Scotia as a percentage of the corresponding figures for Canada as a whole. For thirteen years after 1961 (and almost certainly from 1947, though data on all manufacturing activity are not available farther back than 1961), Nova

FIGURE 6

VALUE ADDED[1] PER EMPLOYEE BY MANUFACTURING INDUSTRY, NOVA SCOTIA AS PERCENTAGE OF CANADA, 1947-78.

[1]Manufacturing activity up to 1960; total activity thereafter.
Source: Statistics Canada, 31-203.

Scotian productivity measured in this way seldom reached seventy-five percent of that of Canada. Three workers in Canada produced as much as four in Nova Scotia. Calculations performed on data up to 1976 suggest this cannot be explained in the conventional ways — that it is due to Nova Scotia plants being small or concentrated in industries where value added per worker is always low, or because the Nova Scotia worker does not have as much horsepower at his elbow as do other Canadian workers — and that it seems highly likely that it is a reflection of poor management.[6] It is true that in the 1970s there seems to have been a considerable improvement, but this may result from the coming on stream of a few large capital-intensive activities sponsored by outside companies (two heavy water plants, an oil refinery, a pulp and paper mill extension, and two plants of a tire manufacturer), rather than from any changes in the basic Nova Scotian industry.

Other indications of the apathy of management in Nova Scotia show up in the lack of interest in research and development and in training. Only four-tenths of one-percent of all canadian research and development expenditure takes place in the province, though its share of industry is at least four times that percentage. Little in-house training of workers is undertaken in Nova Scotian plants, while the quite wide assortment of management courses offered in the province are poorly attended.

Though the main cause that Nova Scotian industry has not responded to regional development programs appears to be psychological inertia, it should be recognized that the task of discovering what government incentives exist and how to take advantage of them is a formidable one. A count taken two years ago turned up fifteen government agencies offering over forty different programs of possible interest to manufacturing firms in the province. While large firms can set up the mechanism to keep up-to-date with programs and plug into them (I know of one Nova Scotia firm which used to have a vice-president who devoted most of his time to this), small firms find it difficult to do so.[7]

Stimulation of local firms is, of course, only part of the concern of regional industrial development programs. Indeed, the original thinking was that the salvation of the poorer areas lay mainly in their ability to attract in footloose industrial activities from elsewhere; and the present day thinking is not that much different. But here another very difficult obstacle presents itself, and this is the fifth main reason for the lack of success of regional industrial policies: firms outside Nova Scotia almost never seriously think of that province as a possible location for new manufacturing activity. Of 350 firms which set up new manufacturing plants in Quebec or Ontario between 1960 and 1964, only five gave any thought to the possibility of locating their new plants in Nova Scotia, and not one carried out a systematic study of the province's suitability. Yet from other studies it appears that about fifty would have been at least as well off in Nova Scotia.[8] There seems to be a prejudice based upon ignorance on the part of outside firms. Even the dangling of attractive financial incentives does not do the trick, except perhaps in a few isolated cases. Attempts have been made to discover outside firms which were about to make decisions concerning where to build new plants (Industrial Estates

Limited has been the principal agency concerned with this task in Nova Scotia), and to ensure that they knew the financial incentives and other advantages which would rise from locating in Nova Scotia; but the task of locating appropriate firms at the crucial time is extraordinarily difficult and successes have been few (though one or two — Michelin is the outstanding example — have been important).

The future for Nova Scotia industry gives cause for uneasiness. The traditional industries which have been its mainstay — coal, steel, shipbuilding, knitwear and a few others — are growing slowly throughout the world, and must expect more and more competition from industrializing countries. If it is to survive and prosper, it must catch up with developing technology and restructure itself into areas in which it has special expertise. But, as we have seen, the spirit needed to bring this about is missing in Nova Scotia, except in a few progressive firms, and outside enterprising firms which might effect this revitalization largely ignore the province's potential. While one cannot say with assurance that the regional industrial development programs have been ineffective, it is clear that, if carried on in their existing form, they will not bring about the changes needed to reduce significantly the economic disparity existing between Nova Scotia and the rest of Canada.

The official reaction to a recognition that existing programs have not achieved their objective is always to create new programs. But the new programs are seldom more obviously successful than the ones they replace. This should surprise no one. The old programs were devised by intelligent people and were almost always sensible. No doubt, there is still scope for improvement in them. Perhaps the geographical focus could be sharpened so that the incentives are clearly focussed on the poorer regions, and perhaps they should be delivered in a way that they more often affect location decisions, rather than rewarding firms for doing what they would have done anyway. But the main reason the regional industrial development policy has not achieved what was hoped for is that the programs do not crack the shell of inertia surrounding local business, or the barrier of ignorance and prejudice which repels outside firms. Government agencies should stop writing programs and seek to set up mechanisms which will overcome the inertia and eliminate the ignorance and prejudice. The task is one of program delivery rather than of program design.

Finally, does experience with regional development policies in the twentieth century have implications for the study of regional economic development in the nineteenth century? Although the contexts are very different, there are, it seems to me, lessons from contemporary experience which the historian must bear in mind. It is true that the Canadian state wielded enormous power over economic forces in the late nineteenth century; but the experience of the twentieth century suggests that we should not exaggerate that power. It would have required feats of planning, beyond the capacity of the small state apparatus of the nineteenth century, to reverse the westward flow of capital, resources and labour. When we consider the fate of the shipping industry in Atlantic Canada, it is worth bearing in mind that the Galt tariffs of 1859, which offered considerable protection for Canadian shipbuilding, did not arrest the decline of the shipbuilding industry around Quebec. Something of the maritime sector of Atlantic Canada might have

been saved by different government priorities or better planning. But planning for industrial development is no simple panacea; and we must remember that in the 1870s and 1880s few politicians thought a panacea necessary, and none could forsee the relative economic decline of the Maritimes in the twentieth century.

NOTES

1 The author acknowledges with thanks the asisstance of Mr. Gordon DeWolf of the Department of Regional Economic Expansion and Mr. Paul Dober of the Nova Scotia Department of Development.

2 R.E. George, *A Leader and a Laggard: Manufacturing Industry in Nova Scotia, Quebec and Ontario* (Toronto, 1970).

3 George, *A Leader and a Laggard* and "A Leader and a Laggard Revisited" (unpublished typescript, 1979).

4 For instance B.J. Loasby, "Making Location Policy Work," *Lloyds Bank Review,* no. 83 (January 1967).

5 D. Springate, *Regional Incentives and Private Investment* (Montreal, 1973); Department of Regional Economic Expansion, *Assessment of Regional Incentives Program* (Ottawa, 1973); Atlantic Development Council, *Regional Development Incentives Program: Atlantic Region* (St. John's, 1976); D. Tate, *Government Assistance and Corporate Investment in Canada* (unpublished Ph.D. thesis, Harvard University, 1980). All except the last were discussed in Economic Council of Canada, *Living Together: A Study of Regional Disparities* (Ottawa, 1977).

6 George, *A Leader and a Laggard* and "A Leader and a Laggard Revisited."

7 Research at present being undertaken by the Economic Council of Canada suggests that most loans granted by government lending agencies end up in the pockets of large firms; see Economic Council of Canada, *Au Courant,* I, no. 3 (Winter 1981).

8 George, *A Leader and a Laggard.*

15. SOME PRELIMINARY COMMENTS ON THE EXTENT AND CONSEQUENCES OF OUT-MIGRATION FROM THE ATLANTIC REGION, 1870-1920

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SOME PRELIMINARY COMMENTS ON THE EXTENT AND CONSEQUENCES OF OUT-MIGRATION FROM THE ATLANTIC REGION, 1870-1920[1]

Patricia Thornton

"Generally speaking the trend in population, especially in a 'new' country is regarded as an index of its prosperity....The study of population tendencies in the Maritime Provinces [and Newfoundland]...may therefore be regarded as illustrating and reflecting the course of their economic development."[2] An examination of the decadal rates of population growth in Atlantic Canada compared to Ontario, Quebec and Canada (Table 1) shows that the last one hundred and thirty years can be broken down into three fairly distinct phases:

period 1851-1881, when growth rates in the region were high: 24.5 percent, 15.6 percent and 13.5 percent respectively for the Maritimes; 15 percent, 18 percent and 21.6 percent respectively for Newfoundland;

period 1881-1931, when growth rates were very low in the Maritimes: 1.2 percent, 1.5 percent, 4.9 percent, 6.6 percent and 0.9 percent; higher than the Maritimes but still lower than the rest of Canada in Newfoundland at 3 percent, 9 percent, 9 percent, 9.6 percent and 7 percent;

period 1931-1961, when growth rates were higher again at 12.6 percent, 11.2 percent and 14.6 percent in the Maritimes; 10 percent, 19 percent and 27 percent in Newfoundland.

No such clear and abrupt changes occurred in Ontario although it too experienced relatively slower growth rates in the 1880s and 1890s. But this slower growth lasted only twenty years, compared with fifty years in Atlantic Canada.

Population is controlled by two mechanisms, the balance of births and deaths (natural increase) and the balance of in-migration and out-migration (net migration). By and large in industrial countries, regional differences in population growth are primarily a function of differences in net migration. Since at least the 1880s, the Maritimes have generally been subject to the same influences and attitudes towards family formation, health, nutrition, education, medical standards and social welfare as the rest of Canada and North America, with the consequence that regional fertility and mortality have not differed significantly from the national average despite differences in levels of economic wealth. This is not to deny the importance of fertility and mortality, but to say that, relatively speaking, it is less important than migration. The exceptions to this generalization are French Canadians and Newfoundlanders, who remained relatively isolated from national trends. The observed differences in growth rates of population, therefore, between the region and the nation, particularly the very

TABLE 1

PERCENTAGE INTERCENSAL POPULATION CHANGE

	1851-61	61-71	71-81	81-91	91-01	01-11	11-21	21-31	31-41	41-51	51-61
Nfld.	15.0%	18.0%	21.0%	3.0%	9.0%	9.0%	8.0%	7.0%	10.0%	19.0%	27.0%
PEI	29.0	16.3	15.8	0.2	-5.3	-9.2	-5.5	-0.7	8.0	3.6	6.3
N.S.	19.5	17.2	13.6	2.2	2.0	7.1	6.4	-2.1	12.7	11.2	14.7
N.B.	30.1	13.3	12.5	0.0	3.1	6.3	10.2	5.2	12.0	12.7	15.9
Maritimes	24.5	15.6	13.5	1.2	1.5	4.9	6.6	0.9	12.0	11.2	14.6
Ontario	46.6	16.1	18.9	9.7	3.2	15.8	16.1	17.0	10.4	21.4	35.6
Quebec	24.9	7.2	14.1	9.5	10.8	21.6	17.7	21.8	15.9	21.7	29.7
Canada	32.6	14.2	17.2	11.8	11.1	34.2	21.9	18.1	10.9	21.8	30.2

Sources: Newfoundland, *Census,* 1857, 1869, 1874, 1884, 1891, 1901, 1911, 1921, 1935; Canada, Dominion Bureau of Statistics, *Census,* 1951, 1961; Michael Staveley, "Aspects of Migration in Newfoundland and Labrador" (unpublished Ph.D. thesis, University of Alberta, 1973), 70. Note that before 1891 the intercensal periods for Newfoundland are 1857-69, 1869-74, 1874-84 and 1884-91.

static growth rates between 1881 and 1931, must be a function of out-migration.

Several estimates have been made of the extent of out-migration from the Maritimes between 1881 and 1931, although as yet none exist for Newfoundland. In 1927 and again in 1948, the Dominion Bureau of Statistics estimated gross out-migration from the Maritimes over this period at approximately 600,000 persons, and net out-migration was estimated to be in the range of 470,000 people; Keyfitz (1950) and Levitt (1960) estimated net out-migration at nearer to 485,000 persons.[3] Either way, this represents close to fifty percent of the 1931 population. Table 2 draws upon these data to show intercensal net migration in the Maritimes relative to the rest of Canada between 1851 and 1941. Out-migration from the region had in fact commenced as early as the 1860s but for twenty years it was relatively slight and not disporportionate to that for the rest of Canada. The crucial turning point in the growth of the Maritimes compared to the rest of Canada appears to have occurred in the 1880s.

This timing may be important since economists have largely agreed that the economic recession of the 1880s and 1890s was general throughout Canada and may not have been any worse in the Maritimes than elsewhere. The great economic boom which swept Canada at the turn of the century, however, produced only a slight reverberation in the Maritimes' economy and must be taken as a more serious sign of economic stagnation. It must be asked whether, and in what way, the persistent high levels of out-migration, in the 1880s and 1890s particularly, affected the potential for the economic development of the region. Indeed since the 1920s a recognition of and concern for economic stagnation has prompted a large number of official enquiries, many of them looking specifically at the relationship between migration and economic development.[4] By the same token, higher levels of population growth in

TABLE 2

NET MIGRATION, MARITIME PROVINCES AND THE REST OF CANADA ('000s)

	1851-61	61-71	71-81	81-91	91-01	01-11	11-21	21-31	31-41
Maritimes	+25	-13	-25	-101	-89	-75	-76	-107	-5
Rest of Canada	+146	-178	-60	-104	-92	+790	+189	+227	-91
As % base year population									
Maritimes	+4.3	-2.0	-3.3	-11.6	-10.1	-8.4	-8.1	-10.7	-0.5
Rest of Canada	+7.7	-6.9	-2.1	-3.0	-2.3	+17.6	+3.0	+2.9	-1.0

Sources: 1881-1921: Nathan Keyfitz, "The Growth of Canadian Population," *Population Studies,* IV, No. 1 (1950); 1851-1881 and 1921-1951: Kari Levitt, *Population Movements in the Atlantic Provinces* (Atlantic Provinces Economic Council, 1960); 1951-1961: D.B.S., Census of Canada, 1961, General Review, *Growth of Population in Canada* (Bulletin 7.1.1); D.J. MacDonald, *Population Migration and Economic Development in the Atlantic Provinces* (Atlantic Provinces Economic Council, 1968), 12.

Newfoundland may not necessarily reflect a more satisfactory economic performance but may indicate nothing more than greater barriers to out-migration and therefore increasing impoverishment of the population. Indeed, overpopulation has been perceived as Newfoundland's prime economic problem since at least the 1880s.[5]

It is normally assumed that migration is the dependent variable responding to changes in aggregate economic activity. Assuming that there are no obstacles to migration and that migration costs are negligible, economists believe that people will move from low income to high income areas in response to differences in productivity and opportunity. Neo-classical theorists believe, assuming labour to be homogeneous, that such migration will result in regional equalization of income.[6] Centre/periphery theorists, on the other hand, maintain that such migration will serve only to increase wage and productivity differences, because migrants are demographically and economically selective and also because money and investment concentrates in the centre where economics of scale, agglomeration, market potential and hence productivity, are greatest.[7] Migration theory clarifies this somewhat, recognizing that there are basically two sets of economic processes — "push" and "pull" forces.[8] Where push factors at origin are strongest (such as rural poverty, low wages and incomes, few or declining employment opportunities, absence of amenities, poor education facilities and the like) then migration is relatively less demographically and economically selective. Under these circumstances out-migration may be beneficial to the region, relieving it of surplus labour. However, where pull forces are strongest, such as the lure of cheap farm land, virgin forests, attractive opportunities for employment, promotion or good salaries, along with readily available amenities such as schools and hospitals, then migration is usually highly selective of the young, dynamic, better-educated and more highly-skilled.

By placing the emphasis on the relative strengths of push and pull forces, the importance of intervening opportunities (such as distance, costs, migration laws and information channels) is not ignored, nor are personal factors such as kinship; instead attention is focussed on two important spatial and temporal issues. First, we are forced to recognize that the relationship between migration and economic growth depends to a large extent upon the conditions at origin and destination. Where there is high unemployment or an oversupply of labour at origin along with a shortage at destination, as with what Okun and Richardson call low stagnant or low growing regions,[9] net out-migration is likely to have a relatively beneficial effect, although lack of information or other barriers may actually frustrate migration. The greatest threat is posed by net out-migration from high stagnant regions, regions in which industries enjoyed their secular peak of activity at an earlier date after which a sufficient number of newer and rapidly growing industries have failed to appear. Here information about job opportunities elsewhere is likely to be great and to affect the most skilled, educated and dynamic. Immigration may occur, but usually of less demographically and economically selective peoples forced out from low stagnant regions. In this case, out-migration of "high quality" immigrants poses a threat to the continued

industrial transformation of the region. In general terms it would seem that Newfoundland was a "low stagnant" region in the nineteenth and early twentieth centuries while the Maritimes more closely resembled a "high stagnant" region.

This focus on the relative strengths of push and pull forces also focuses attention on the crucial issue of the timing of greatest migration. Logic about the relationship between migration and economic development in the nineteenth century and proven experience in this present century both suggest that migration follows major national and international cycles of economic growth.[10] In Canada and the United States these cycles have continental impact. Consequently out-migration from the Maritimes has always been highest when economic growth in Canada or the U.S. is most rapid. When economic growth slows down, out-migration also slows.[11] Ironically, then, since regional trends in economic activity are roughly parallel to those of the nation as a whole, albeit at a lower level, large scale out-migration occurs when the region is most likely to require investment in the size of the labour force and not when it is in a position to release surplus manpower. The significantly higher levels of outmigration from the Maritimes, then, in the crucial decades of the 1880s and 1890s, may well have jeopardized a successful industrial transformation of the region.

This theoretical discussion of the relationship between migration and economic development as it pertains to the Atlantic region suggests that in the near future we should be focussing our attention on the extent, timing and characteristics (age, sex, education and occupation) of out-migrants from the region between 1870 and 1930. In particular we must address the issue of the consequences of out-migration rather than its causes or even the destination of the migrants. Moreover it would seem immediately fruitful in the Maritimes to concentrate on the crucial early decades that seem to represent the turning point in the economic well-being of the region.

So far, studies of out-migration have tended to analyse demographic trends solely at the national, provincial or regional level, which will lessen, and may even obscure, the local impact of out-migration. We know relatively little about the age and sex characteristics of migrants or regional variations in net migration and most people have concluded that this had relatively little effect on the age structure and labour force characteristics of the population. However, internal movements within the region were almost definitely quite large and hence the impact of out-migration on local (county) populations may have been much greater than we have suspected and also of tremendous significance to local economies.[12] Finally, almost no one has satisfactorily attempted to bridge the Cabot Strait and examine the Atlantic region as a whole. In 1978 David Alexander attempted to do so in an examination of the economic growth of the region, and I shall attempt here to do so with respect to population dynamics, particularly out-migration.[13]

There are a number of studies of out-migration from the Maritimes *per se*, some of which are "macro" in scope, such as the work of Hansen and Brebner and its companion volume by Truesdell.[14] Others are more "micro", especially the work of Alan Brookes.[15] These studies tell us most about the post-migration

characteristics of migrants, but cannot provide information on the migration itself or the pre-migration characteristics of the migrant stream, based, as they are, on data from the U.S. They therefore tell us nothing about the extent, timing and effect of out-migration on the region and moreover entirely ignore out-migration to other parts of Canada, although this assumed major proportions after 1900.

Before further micro-analysis of this migration process can be useful, then, it is necessary to return to the macro-level and estimate levels of out-migration by county, and by age and sex characteristics, so as to provide a comparative basis for local studies and also to revive interest in the consequences of out-migration for the region of origin.[16] I have therefore attempted to estimate, at the county level, net migration levels and rates by age group for the four Atlantic Provinces, including Newfoundland. I have also tried to estimate the local demographic impact of such migration. So far, it has been possible to do this only for the 1870s and 1880s, although it should be possible to continue the age-specific series for the 1890s. It has also been possible, using vital statistics, to estimate overall net migration levels by county for certain decades in the twentieth century. Ultimately this should be possible for all provinces for the 1910s and 1920s.

As stated earlier, populations grow by two mechanisms, natural increase and net migration, which can be expressed as

$$P_2 = P_1 + (B-D) + (I-O)$$

where

P_1 = population at time 1
P_2 = population at time 2

B,D,I,O = numbers of births, deaths, in-migrants and out-migrants respectively during that time period.

Unfortunately we have no direct information on out-migrants for this period and therefore it is necessary to resort to indirect techniques in order to estimate the number of migrants. For our purposes, we are most concerned about *net* migration, or the balance of in-migrants over out-migrants, since this determines the effect on the region of the migration phenomenon. However, given the notion developed earlier of quality exchanges of migrants as it relates to high stationary regions, it might ultimately be useful to examine whether there were any age, sex or occupational differences between in-migrants to and out-migrants from the Maritimes.

The basic demographic equation for estimating net migration is

$$NM = P_2 - P_1 + (B-D)$$

The main source of information on the number of births and deaths are vital statistics. Until 1922 (in all parts of Canada except Quebec and Newfoundland) vital statistics were a provincial responsibility and varied a great deal in their availability and reliability. Generally speaking, it is not possible to use vital data in Atlantic Canada until about the 1910s and hence it is possible to estimate net migration at the county level for all four provinces only for the 1910s and 1920s, although data are available for the 1900s for Newfoundland and New Brunswick.

Prior to 1900, if one requires a breakdown of migrants by age, it is necessary to resort to intercensal cohort analysis. Given the age structure of the population at a particular time, usually a census year, and a comparable age structure for the same area a number of years later, life table factors can be used to project the age groups in the initial population forward, and those in the terminal population can be adjusted to allow for deaths occurring during the period. The difference between the expected and the actual populations gives two estimates of net migration by age group which, when averaged, will give a final estimate (see Table 3). Where reliable age, sex and survival data exist, this method produces extremely good estimates of the age and sex structure of net migration.[17] Unfortunately no age-sex data exist in Canada after 1901.

The problems of cohort analysis are threefold. First, it is necessary to have comparable age-sex breakdowns between censuses, and these are not consistent prior to 1871; and to have censuses which were taken at regular intervals such that all persons in one age cohort in the earlier census will be in a different, but single, age cohort in the subsequent census. This does not happen in Newfoundland prior to 1891, except for the period 1874-1884. Second, it is necessary to have relatively reliable age-sex reporting although, within reason, the under-estimates of one cohort will usually be compensated for by over-estimates in the adjacent cohort, and thus will be smoothed out over the whole population. It would appear that such a problem of age-reporting exists in 1881-1891 statistics, resulting in apparently heavy out-migration in the cohort who were 45-49 years at the beginning of the period and also very low out-migration or net inmigration in the cohort who were fifty to fifty-four years old at the beginning of the period. In the overall statistics those will counteract each other and in the age-specific net migration graphs these groups have been averaged (see Table 3). The third, and indeed major, problem centres around estimating ten year survival factors.[18] In the past either adjusted English life tables or U.S. — especially Massachusetts — life tables have been used.[19] Here I have used Canadian abridged life tables for 1871 and 1881 based upon Nova Scotia, New Brunswick, Quebec and Ontario age-specific death rates as reported in the censuses of that period, which have been checked for reliability against the 1921-1931 vital data.[20] It should ultimately be possible to develop life tables for the 1890s to extend the analysis, but this is time consuming and has not yet been possible.

In this study one further problem emerges. This comes from applying Canadian survival factors to county populations where significant differences in mortality levels exist, especially between urban and rural populations. Some analysis of these differentials can be made for the early twentieth century in New Brunswick, and moreover, while the actual level of migration may be affected (especially towards understatement of out-migration from urban areas), nevertheless the age characteristics of the migration will *not* be affected, since mortality, regardless of level, affects the age structure in a consistent way.

Before interpreting the data, I should also identify a few problems involved therein. It was possible to break down the 1870s data for Nova Scotia and New Brunswick into seven cohorts between ages six and sixty-one, the first three being five-year cohorts and the remainder ten-year cohorts. For Prince Edward Island

TABLE 3

COHORT NET MIGRATION ESTIMATES 1881-1891

HALIFAX CITY, N.S.

1881 Age Group	1891 Age Group	1881 Population[1]	1891 Population[1]	10 Year Survival Rates[2]	Forward Projection Survivors (3) x (5)	Forward Projection Net Mig. (4) - (6)	Reverse Projection Survivors (4) - (5)	Reverse Projection Net. Mig. (8) - (3)	Average Intercensal Net Migration (7) + (9)/2	Net Migration Ratio[3]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
				Males						
5-9	15-19	2050	2052	.94772	1943	+109	2165	+115	+112	+55
10-14	20-24	1851	1863	.95953	1776	+87	1942	+91	+89	+48
15-19	25-29	1772	1520	.95014	1584	-164	1600	-172	-168	-102
20-24	30-34	1616	1142	.93624	1513	-371	1220	-396	-384	-228
25-29	35-39	1353	1066	.93553	1266	-200	1139	-214	-207	-171
30-34	40-44	1051	1010	.93694	985	+25	1078	+27	+26	+13
35-39	45-49	1140	865	.92976	1060	-195	930	-209	-202	-201
40-44	50-54	899	765	.91939	827	-62	832	-67	-64	-77
45-49	55-59	780	457	.90431	705	-248	505	-275	-261	-422
50-54	60-64	541	390	.87160	472	-82	488	-94	-88	-189
55-59	65-69	439	292	.81108	356	-64	360	-79	-71	-194
Total		16727	18175						-1218	-70

continued

TABLE 3 (continued)

Females

5-9	15-19	2049	2313	.94178	1930	+383	2456	+407	+395	+181
10-14	20-24	1898	2436	.92765	1761	+674	2626	+728	+701	+323
15-19	25-29	2190	1855	.92873	2034	-179	1997	-193	-186	-92
20-24	30-34	2408	1410	.92977	2239	-829	1517	-891	-860	-450
25-29	35-39	1900	1212	.92367	1755	-543	1312	-588	-565	-363
30-34	40-44	1280	1089	.92496	1184	-95	1177	-103	-99	-83
35-39	45-49	1257	926	.92468	1162	-236	1004	-256	-246	-225
40-44	50-54	932	754	.91668	854	-100	823	-109	-105	-128
45-49	55-59	828	479	.90021	745	-266	532	-296	-281	-430
50-54	60-64	624	486	.87655	547	-61	554	-70	-65	-117
55-59	65-69	494	334	.82538	408	-74	405	-89	-82	-198
Total		19340	20265						-1395	-70

Total net migration (males and females): -2613

Net migration ratio (males and females): -70

Sources: 1. *Census of Canada,* 1881, 1891.

2. Canada, Dominion Bureau of Statistics, *Canada Abridged Life Tables, 1881* (Ottawa, 1937), 17. Survival rates are based on probabilities of living ten years. Estimates are based on mid-age group rates; i.e., ages 7, 12, 17, 22.
3. Calculated by dividing column (10) by the median population in each age group between the two decades; i.e. (3) + (4)/2

only four cohorts could be used over the same age range, and the data are therefore coarser in later age groups in Nova Scotia and New Brunswick and coarser throughout for P.E.I. A more serious problem is that for Newfoundland, data from ten to thirty-nine years only could be used, and this was divided into three ten-year cohorts. Consequently, while the data will under-estimate net migration from all provinces it will do so much more severely for Newfoundland, perhaps by as much as fifteen percent.[21] In the 1880s regular five-year cohorts are used for all three Maritime Provinces and data are therefore comparable from province to province. But this means that relative to the 1870s age-specific net migration rates will appear to be higher in the 1880s.

Table 4 gives estimates of total net out-migration from each of the four provinces of the Atlantic region for the 1870s and for the Maritimes for the 1880s. Even in the 1870s net out-migration was considerable — sixty thousand people — significantly higher than earlier estimates. The flow was greatest out of New Brunswick, where over eight percent of the total population left, and high also in Nova Scotia where over seven percent left. It was considerably lower out of P.E.I. and almost negligible out of Newfoundland. Nevertheless, in the crucial labour force age groups in the Maritime Provinces, it represented from twenty to thirty percent of the population. By the 1880s net out-migration had assumed major proportions and in every province represented over ten percent of the total population and between thirty-eight and fifty percent of the young labour force group. Out-migration in general was greatest out of P.E.I., closely followed by New Brunswick, but it was considerably lower out of Nova Scotia. In the 1870s there appears to have been no sex bias in New Brunswick and P.E.I. but males predominated in Nova Scotia and Newfoundland. However, by the 1880s, while there was no difference in the rate of net out-migration of males and females in Nova Scotia, in New Brunswick and P.E.I. males were migrating at a faster rate than females.

Table 5 gives the same information at the county level. It confirms that at this level rates of total out-migration were in some cases high, and that a certain amount of redistribution of population within the region was occurring. In the 1870s Halifax city was a net recipient of in-migrants, but Saint John, N.B., was experiencing the highest levels of out-migration of any district in the region, losing over twenty percent of its total population in that decade. Similarly in P.E.I., Queens Country (in which Charlottetown is situated) experienced the highest level of out-migration. By contrast, in Newfoundland, St. John's was growing through in-migration.

Apart from these main cities, in Newfoundland the relatively newly-settled north-east and south-west coasts were growing through in-migration but the much earlier-settled "English Shore" and especially the south coast were experiencing net out-migration. In Nova Scotia the industrial centres of Cumberland, Colchester and Pictou were losing relatively fewer migrants, although they were still net exporters of population. Cape Breton was losing population at a faster-than-average rate. In New Brunswick only Westmorland was a net recipient of migrants, and in this province it appears that it was the rural

TABLE 4

NET MIGRATION ATLANTIC REGION 1870s, 1880s

	Nova Scotia	New Brunswick	P.E.I.	Nfld. (1874-84)	Atlantic Region
1871-1881					
Net Total Migrants	-30199	-24762	-4935	-2640	-62536
NMR	73	82	48	15	
Male NMR	77	81	49	21	
Female NMR	69	82	48	8	
NMR M (21-41)[1]	202	205	268	81	
F (21-41)	221	249	326	114	
1881-91					
Net Total Migrants	-52212	-47125	-16239		-115576
NMR	117	147	149		
Male NMR	117	152	155		
Female NMR	118	141	143		
NMR M (20-34)	376	393	491		
F (20-34)	384	408	437		

		1870s	1880s
Coats estimates:	Maritime Provinces:	40,000	103,000
Levitt's estimates:	Maritime Provinces:	25,000	101,000
Thornton estimates (above):	Maritime Provinces:	60,000	115,000

[1]NMRM/F = Net Migration Ratio Males/Females

Source: Author's own calculations based upon Canada, *Census,* 1871, 1881, 1891; Dominion Bureau of Statistics, *Canadian Abridged Life Tables, 1871, 1881* (Ottawa, 1939); Dominion Bureau of Statistics, *The Maritime Provinces Since Confederation* (Ottawa, 1927); Nathan Keyfitz, "The Growth of Canadian Population," *Population Studies,* IV, No. 1 (1950); R.H. Coats, "Canada," in W.F. Willcox (ed.), *International Migrations,* Vol. 1 (Statistics), 357-70. See also Levitt, *Population Movements.* NMR in this and subsequent tables is always negative unless otherwise indicated.

TABLE 5

NET MIGRATION RATES

	1871-81		1881-1891	
	Totals	NMR	Totals	NMR
Nova Scotia	-30199	73	-52212	117
Guysborough	-2135	124	-3012	172
Halifax (city)	+323	+10	-2611	70
Halifax (county)	-1603	54	-4123	128
Lunenburg	-1261	48	-2786	94
Queens	-1716	162	-1118	106
Shelburne	-499	37	-1957	131
Yarmouth	-1538	77	-2268	104
Digby	-1174	64	-2838	143
Annapolis	-843	44	-3305	166
Kings	-1999	89	-3515	153
Hants	-2117	95	-3913	173
Cumberland	-1497	59	+201	+6
Colchester	-1321	53	-3209	119
Pictou	-2313	68	-4916	140
Antigonish	-1622	94	-2941	172
Inverness	-2302	94	-3221	125
Victoria	-1080	91	-1677	135
Cape Breton	-2240	78	-1784	53
Richmond	-1361	93	-2749	187
New Brunswick	-24762	82	-47125	147
Albert	-713	62	-2723	234
Saint John (city)	-5577	203	-3708	149
Saint John (county)	-1518	61	-4228	162
Charlotte	-3827	147	-4706	188
Kings	-2941	117	-5217	216
Queens	-1892	136	-3039	252
Sunbury	-1084	161	-1359	219
York	-2193	76	-3667	120
Carleton	-1002	46	-3412	149
Victoria	-135	10	-1644	97
Westmorland	+147	+4	-3206	81
Kent	-1404	67	-3446	148
Northumberland	-863	38	-3692	145
Gloucester	-2285	113	-2422	104
Restigouche	-310	49	-433	58
Prince Edward Island	-4935	48	-16239	149
Prince	-1482	44	-4692	133
Queens	-3797	85	-8269	100
Kings	-1802	73	-2855	108

continued

TABLE 5 (continued)

	1874-84	
	Totals	**NMR**
Newfoundland	-2640	15
St. John's East	+314	+16
St. John's West	+286	+20
Harbour Main	-189	24
Port de Grave	-429	52
Harbour Grace	-445	32
Carbonear	-171	30
Bay de Verde	-420	53
Trinity	-499	29
Bonavista	-565	39
Fogo/Twillingate	+533	+30
St. Barbe/St. George	+417	+66
Burgeo/LaPoile	-152	27
Fortune	-369	59
Burin	-642	79
Placentia/St. Mary's	-361	34
Ferryland	-275	22

Source: Author's own calculations based upon Canada, *Census,* 1871, 1881, 1891; Newfoundland, *Census,* 1874, 1884; Dominion Bureau of Statistics, *Canadian Abridged Life Tables, 1871, 1881* (Ottawa, 1939).

counties, especially in the north and east, which experienced relatively slower losses while the southern Fundy and lower Saint John Valley counties were losing large populations.

By the 1880s the situation had both worsened and the pattern altered. Halifax was not a net exporter of population and the industrial centres of Colchester and Pictou were losing population at above average rates. Only Cumberland and Cape Breton counties were showing net in-migration. Cape Breton Island was still a massive exporter of population as now were also the counties along the Fundy rim, while the Atlantic seaboard counties were doing relatively better. In New Brunswick, the north/south dichotomy had become even more pronounced, with all counties south of Sunbury losing between fifteen and twenty-five percent of their populations, while the northern counties were losing only between five and fifteen percent. Thus it is beyond dispute that out-migration was strong, and indeed endemic, by the 1880s in the Maritime Provinces. The fact that this occurred from urban and industrial centres as early as the 1870s, but especially by the 1880s, may well have jeopardized the growth potential of the region. However, it would appear that, with the exception of the south coast of Newfoundland, that island remained relatively isolated from out-migration at that time and, given the slow growth of Newfoundland's economy, this may have created more problems than it solved.

Let us now examine the age-sex composition of migrants. The graphs in Figures 1 and 2 strongly support the hypothesis of pull factors being stronger in the Maritimes, since there was clear age selectivity of migrants with out-migration strongly biased in favour of the fifteen to thirty age groups. It would seem from both graphs that this age selectivity was especially pronounced for P.E.I., but least so for Newfoundland, perhaps suggesting the greater strength of push forces in the latter area. There appears, however, to have been a tendency for a second small peak of both male and female migrants around the forty-year age group, which is most likely explained by parents following younger children; it could, of course, also reflect push factors operating to force even older families out. It should be mentioned in this respect that adults in their forties are most likely to have had children of an age to be most affected by perceived shortages of employment and opportunities. In both decades the peak age group of male out-migrants from New Brunswick was younger than that for women or men elsewhere. Moreover, teenage women seem to have been less prone to out-migration than teenage males. Finally, Figure 2 shows that, while males of fifty-five to fifty-nine showed a tendency to return to the Maritimes, no similar trend is obvious among women, who are more likely to have married abroad or had children married and living abroad, and who were therefore less attached to the region.

Figure 3, showing the age composition of migrants by district for Newfoundland from 1874 to 1884, is instructive for two reasons. First, it shows that the age distribution of migrants permits clear regionalization of districts into St. John's and its drawing area (Ferryland), the overpopulated old English Shore, the new expanding north and west coasts, and the south coast. It also clarifies somewhat the question of the selectivity of migrants according to the relative

FIGURE 1
NET MIGRATION RATIOS 1871-1881
(MIGRANTS PER 1000 POPULATION)

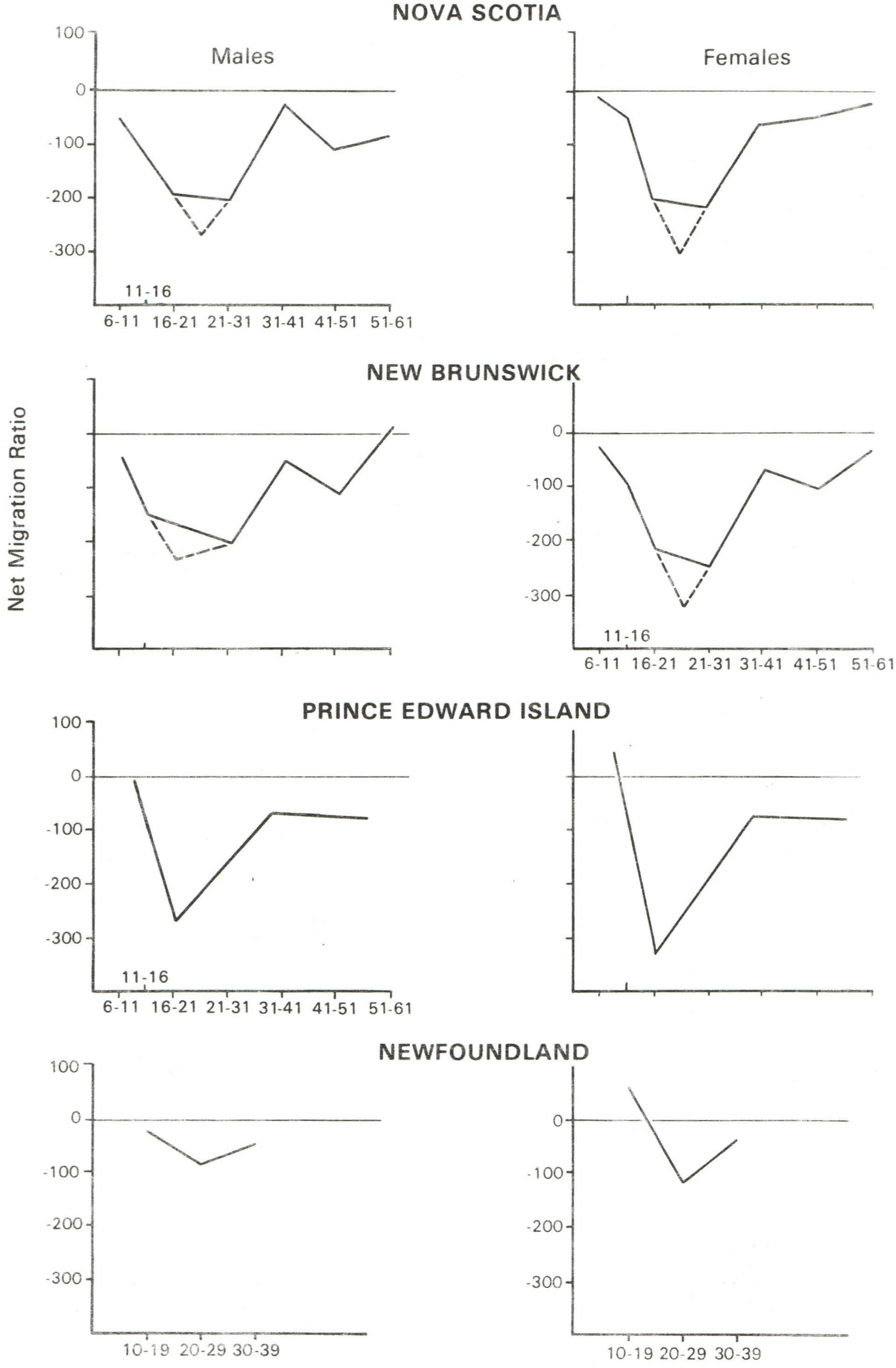


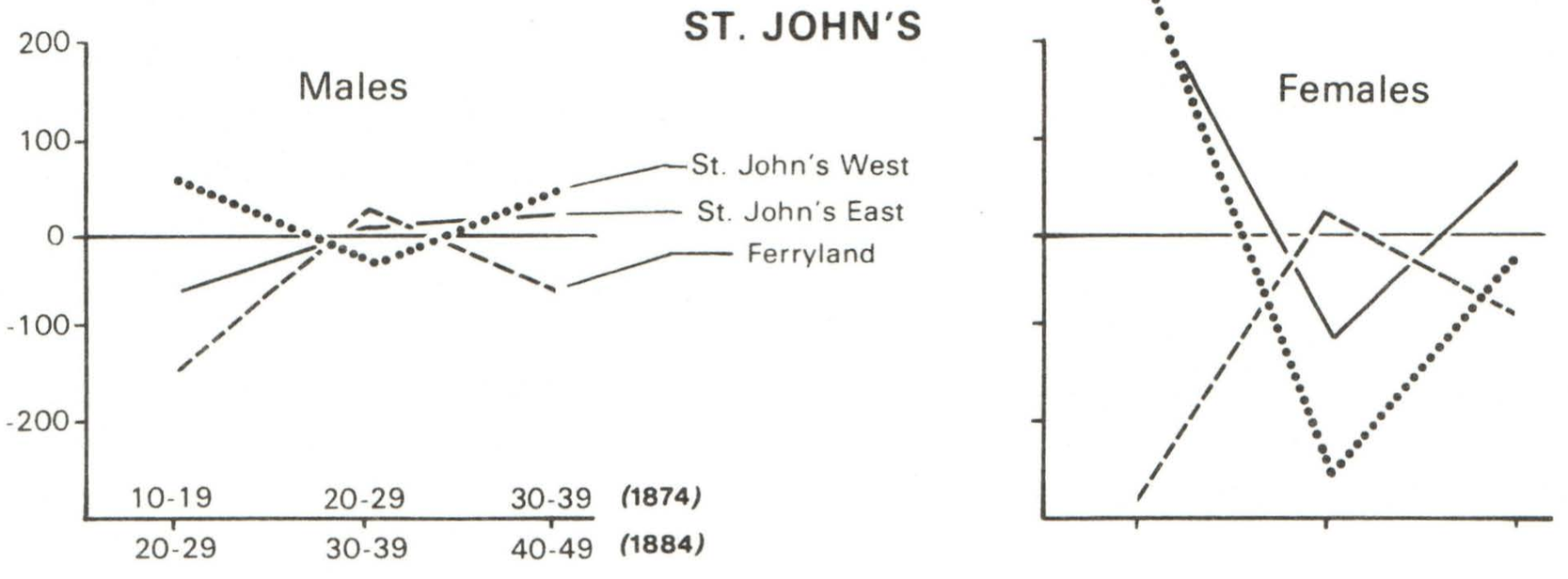
FIGURE 2

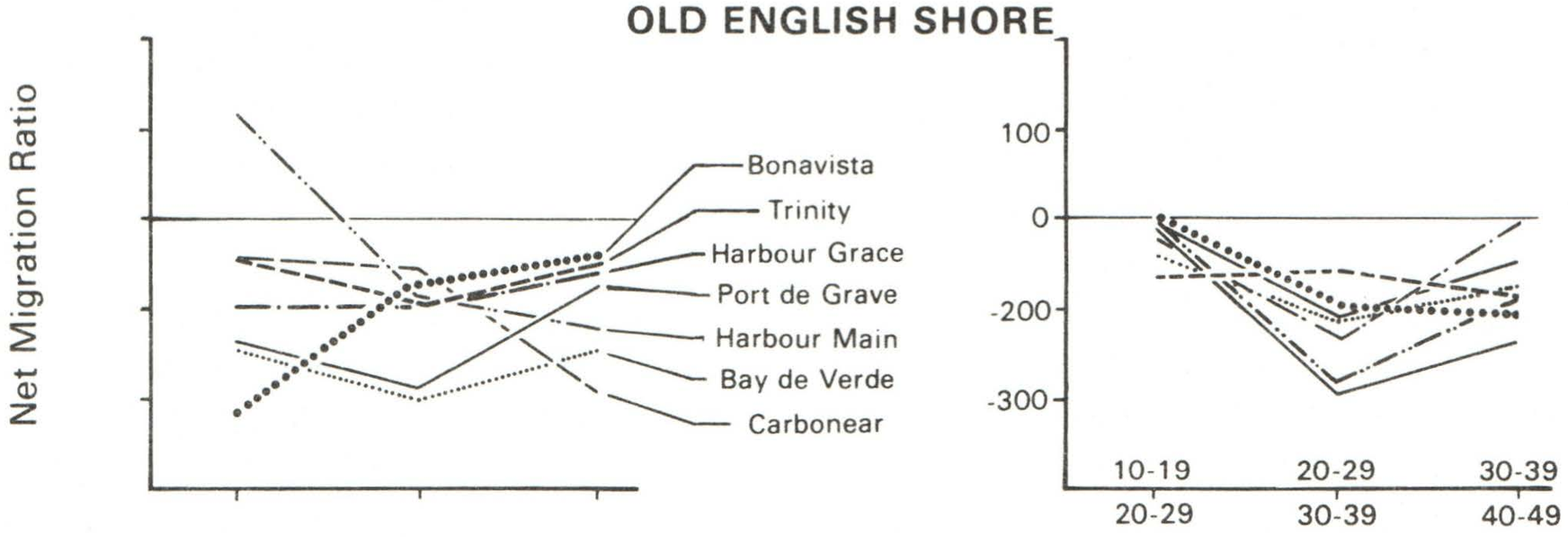
NET MIGRATION RATIOS, MARITIMES, 1881-1891

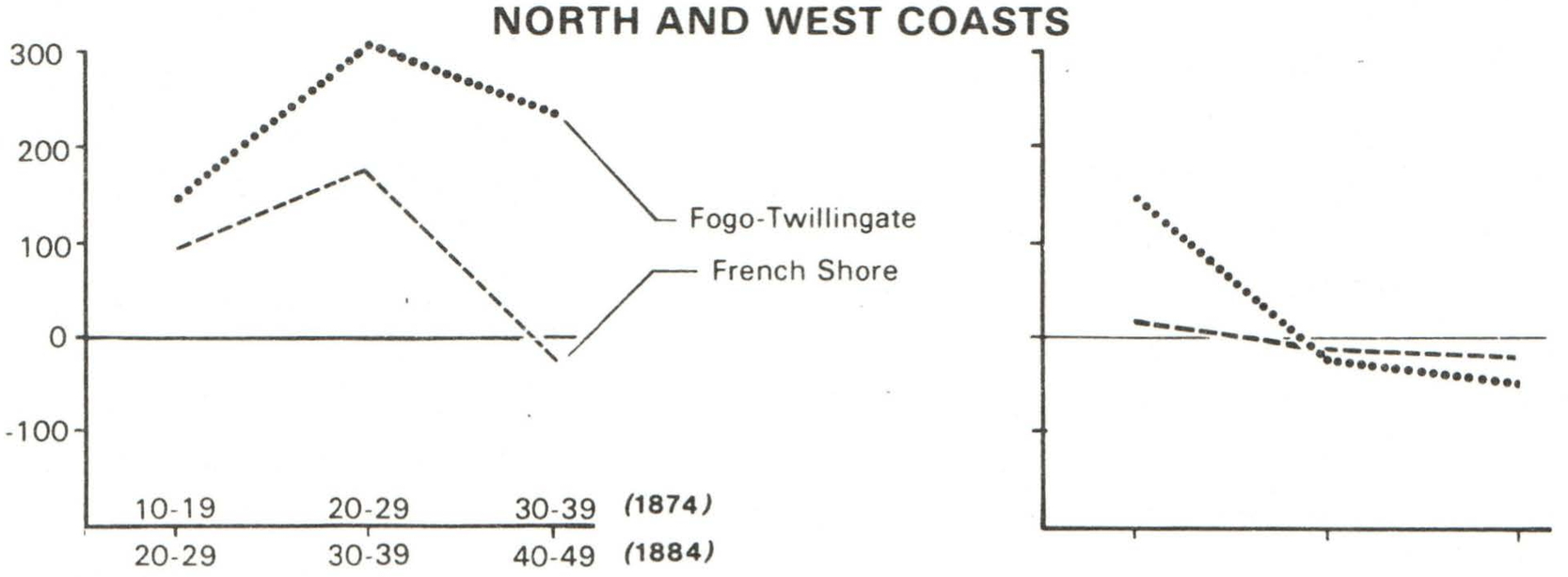
(MIGRANTS PER 1000 POPULATION)

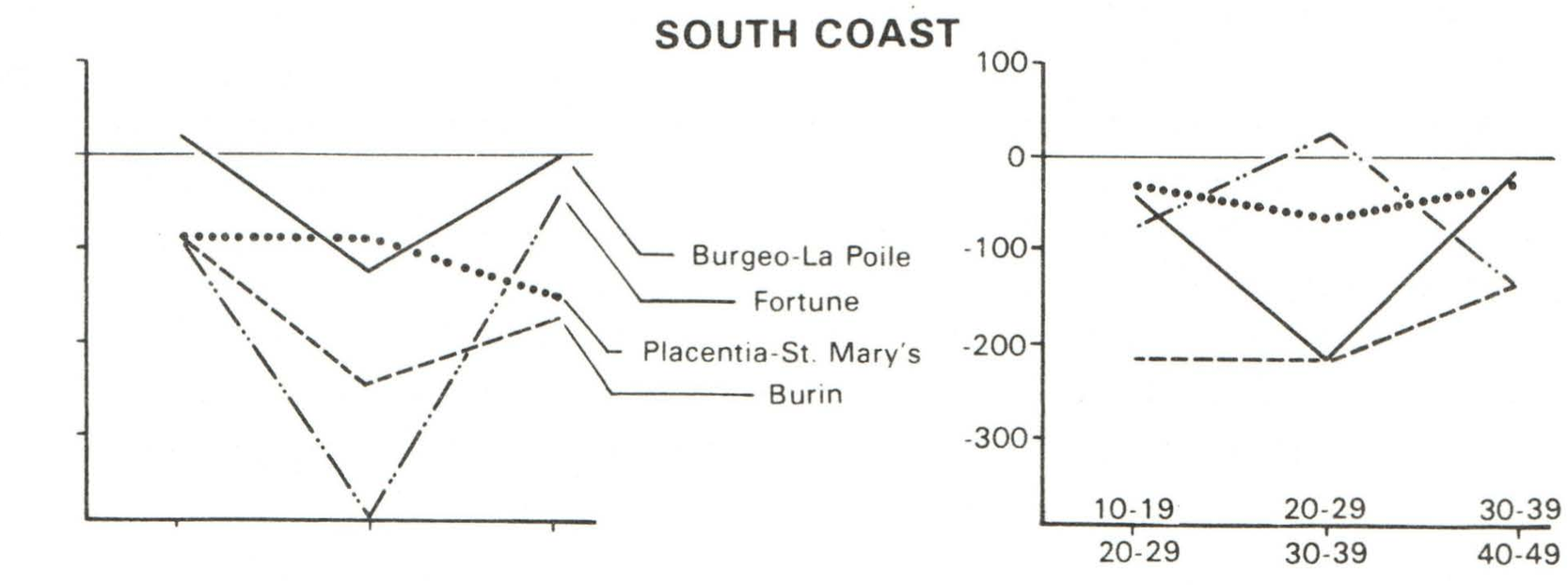
FIGURE 3

NET MIGRATION RATIOS, NEWFOUNDLAND, 1874-1884









strength of push and pull forces. On the old English Shore, where considerable evidence exists of population pressure,[22] male migrants showed relatively low levels of age selectivity. On the other hand, where migrants were responding to pull forces — as in-migrants to the newly-settled north and west coasts or out-migrants from the relatively open south coast — there was a much greater tendency for migration to be selective of the young and active age groups. Moreover, it confirms that, even in Newfoundland where net out-migration was very low in the 1870s, locally among certain age groups it could be significant. For example, in Fortune, thirty-eight percent of all males aged twenty to twenty-nine in 1874 and thirty to thirty-nine in 1884 out-migrated.

The data for the Maritimes are similarly instructive. They confirm that in the 1870s as many as forty-two percent of all males between sixteen and thirty-one, and forty-eight percent of all females between twenty-one and forty-one out-migrated from Saint John, N.B., while similarly high levels were achieved among the sixteen to thirty-one males in Kings County. Elsewhere, Victoria and Westmorland both experienced significant in-migration of males. The data also confirm that, while at the level of the province as a whole there was no difference in migration rates between males and females, nevertheless at the county level there were significant differences. This is particularly characteristic of very high levels of migration of very young females *into* Halifax particularly in the 1870s but also in the 1880s, at the same time as older males and females were exhibiting high levels of out-migration. More generally, however, in seven counties of New Brunswick and five of Nova Scotia in the 1870s, females experienced significantly higher levels of out-migration than men. In the industrial counties of Nova Scotia in the 1880s (Colchester, Pictou and Cape Breton), out-migration was female-led, while on the Fundy rim it was predominately male-led. In New Brunswick a geographical pattern is less obvious. Moreover, the age data also show that in the 1880s particularly levels of out-migration among young people were commonly on the order of fifty percent of the population of that age group and occasionally rose even as high as sixty or seventy percent.

It now remains to look briefly at the impact of migration on the age-sex structure of the population of the region. Table 6 shows that selective net in-migration of young females and net out-migration of males severely distorted the sex balance of all the Atlantic region cities. In the industrial counties, selective out-migration of females made them progressively more unbalanced in favour of males, although, with the exception of Cumberland, they were starting in the 1870s from a surplus of women. The selective out-migration of males from the Fundy rim made these counties biased in favour of women while the selective out-migration of women in the 1880s in Cape Breton Island eventually turned these from female-dominant to male-dominant counties. For the remaining counties the tendency was almost universal for net out-migration to leave male-dominated rural populations, and probably reflected the tendency for women to migrate within the region to local cities. The sex structures show that selective out-migration did have a considerable impact on the sex composition of the local areas, with females predominating in the cities where opportunities were

relatively more abundant, while relatively more men remained behind. The serious question, however, revolves around the sex composition of the industrializing counties, which tended to work against males in the early decades.

Table 7 takes a preliminary look at the age composition of selected county populations in 1871, prior to massive out-migration, and in 1891, after the initial impact should have been felt. It would seem that the percentage of young active males in the twenties age group was consistently well below the national average, and that the gap widened over the twenty years. The same was true also of the percentage of the population in the active ages. This must seriously have

TABLE 6

SEX RATIOS (MALES PER 100 FEMALES), 20-29 AGE GROUPS

	1871	1881	1901
Cities:			
Halifax	68	69	60
St. John's	77	82	77
Saint John	78	68	81
Fredericton	73	n.d.	n.d.
Industrial Counties:			
Cumberland	108	109	110
Colchester	98	104	101
Pictou	94	98	102
Cape Breton	89	94	135
Fundy Rim:			
Hants	95	105	97
Annapolis	89	101	82
Kings	94	103	94
Yarmouth	94	93	86
Antigonish	83	87	102
Northumberland	100	106	108
Sunbury	110	107	107
Lunenburg	101	109	106
Newfoundland:			
Carbonear	104	107	99
Fortune	154	136	109
St. Barbes/ St. Georges	102	112	118

Source: *Census of Canada,* 1871, 1881, 1901; *Census of Newfoundland,* 1874, 1884, 1901.

undermined the tax base for the provision of adequate education and medical services as well as starving the region of its most productive labour force. Within the region the industrial counties of Cumberland, Pictou and Cape Breton started, as one might expect, with above average populations in these productive age groups, but over the twenty years the situation deteriorated, especially in Pictou. Nevertheless, Cumberland and Cape Breton remained above average. Halifax and Saint John showed above average populations in the productive age groups although, significantly, Saint John slipped below average in its percentage of males in the twenties age group by 1891. The remaining three counties are included only because they contain ports which are studied by the Atlantic Canada Shipping Project. They show below average active populations and young males, and it would appear that this demographic trend followed rather than forced the economic trends in the welfare of those ports.

Thus it would be fair to say that the age structures, especially of young males, were affected by out-migration, but at least in the cities and industrial areas the population was tenaciously holding on, either by rapid natural increase or by internal migration. What remains to be done in later research is to examine the ultimate impact by the 1920s, which must have been more decisive.

What, then, can be said about the impact of out-migration upon the economic structure of the Atlantic region? Brookes, in his study of Maritime in-migrants to

TABLE 7

AGE-STRUCTURE OF POPULATIONS, 1871 & 1891

	% male population		% total population	
	1871 (21—31)	1891 (20—29)	1871 (16—61)	1891 (15—64)
Prince Edward Island	n.d.	16.4	52.0	57.2
Nova Scotia	16.6	16.8	52.3	58.6
New Brunswick	16.1	15.9	52.8	57.8
Canada	17.1	17.8	n.d.	59.5
Cumberland	17.1	18.2	52.0	57.5
Colchester	15.7	16.7	51.3	58.6
Pictou	18.0	16.2	54.7	58.8
Cape Breton	18.2	17.5	53.5	59.0
Halifax	17.5	18.6	57.8	63.4
Saint John	17.1	16.7	56.8	64.7
Hants	15.3	16.3	50.3	57.9
Yarmouth	16.3	16.7	50.6	58.7
Northumberland	17.4	15.0	52.5	55.9

Source: *Census of Canada,* 1871, 1891.

New England and Boston, hints that in-migration was heaviest among craftsmen moving to conserve their skills rather than make the transition to "iron, coal and rail".[23] They did so by moving either to "new" rural areas or to larger cities which could support a larger service sector of this nature than that which existed in the Maritimes. Brookes also suggests that it was during this earlier period prior to 1890 that age selectivity among in-migrants was at its highest and therefore the prejudicial impact on the labour force was likely to be greatest then too.

It has been argued that the Maritimes was industrializing during this period and we now know that its traditional sectors of "wood, wind and sail" were still expanding during the 1870s. Thus, severe out-migration during this period may well have contributed to the decline of the traditional sector in the 1880s and almost definitely served to starve the modern sectors of "iron, steam and rail" of needed labour. Moreover, the highly selective nature of these out-migrations meant that the region was losing the very people on whom a successful transition to self-sustained growth depended.

NOTES

1. This paper is a preliminary examination of out-migration from the Atlantic Region. It is designed only to provide the beginnings of a reliable data base on levels of out-migration at the county level by age and sex, and to provide a framework in which to look at out-migration. The results are in no way designed to prove or disprove the "hypothesis" I pose at the outset. Indeed it is doubtful that such "macro" studies ever could. That task will have to await micro-studies of process. Nevertheless without such macro statistics as provided here the question could not have been posed.

2. Canada, Dominion Bureau of Statistics, *The Maritime Provinces Since Confederation* (Ottawa, 1927), 3.

3. D.B.S., *The Maritime Provinces Since Confederation,* 10; Canada, Dominion Bureau of Statistics, *The Maritime Provinces in Their Relation to the National Economy of Canada* (Ottawa, 1948), 7-9; Nathan Keyfitz, "The Growth of Canadian Population," *Population Studies,* IV, No. 1 (June, 1950); Kari Levitt, *Population Movements in the Atlantic Provinces* (Atlantic Provinces Economic Council, 1960).

4. For a discussion of the post-World War I enquiries into the economic stagnation of the Maritimes in general see David Alexander, "Economic Growth in the Atlantic Region, 1880 to 1940," *Acadiensis,* VIII (Autumn, 1978), 48. Specific studies on population migration in relation to economic development include: Dominion Bureau of Statistics, *The Maritime Provinces Since Confederation* (Ottawa, 1927); Dominion Bureau of Statistics, *The Maritime Provinces in Their Relation to the National Economy of Canada* (Ottawa, 1948); Nova Scotia Economic Council, "The Problem of Population in Nova Scotia," *Report of the Nova Scotia Economic Council,* II (1938), 54-68; Kari Levitt, *Population Movements in the Atlantic Provinces* (Atlantic Provinces Economic Council, 1960); D.J. MacDonald, *Population Movements and Economic Development in the Atlantic Provinces* (Atlantic Provinces Economic Council, 1968).

5. The earliest expression of overpopulation as the root of Newfoundland's economic problems was by William Whiteway in a report of the Select Committee on the Construction of the Railway. See Newfoundland, *Journals of the House of Assembly* (1880), 126. The most

recent expression was contained in a report by the Canadian Council for Rural Development on resettlement in which Parcival Copes stated that "academics have long suspected that the basic problem of Newfoundland was that of overpopulation." Parcival Copes, *The Resettlement of Fishing Communities* (Ottawa, 1972), 18.

6. See for example J. Isaac, *Economics of Migration* (London, 1947).

7. See for example John Friedmann, *Regional Development Policy: A Case Study of Venezuela* (Cambridge, Mass., 1966), 10-19.

8. This approach has been highlighted in International Labour Office, *Why Labour Leaves the Land,* Studies and Reports, New Series, No. 59 (Geneva, 1960), 17. The original formulation of the "push" and "pull" theory of migration was by E.G. Ravenstein, "The Laws of Migration," *Journal of the Royal Statistical Society,* 52 (1889), 214-301.

9. Bernard Okun and Richard W. Richardson, "Regional Income Inequality and Internal Population Migration," *Economic Development and Cultural Change,* IX (January, 1961), 128-143.

10. Brinley Thomas argues that before the First World War West European and American trade cycles were out of phase so that when America was experiencing a boom Europe was enduring slump conditions. This situation was ideal for generating migration since it contained both the classic push and pull factors. Brinley Thomas, *Migration and Economic Growth: A Study of Great Britain and the Atlantic Economy* (Cambridge, 1954); and Brinley Thomas, *Migration and Urban Development: A Re-Appraisal of British and American Long Cycles* (London, 1972). In the twentieth century, however, the cycles appear to have run parallel.

11. Migration has peaked during periods of economic upswing such as that which occurred after World War II and dwindled to negligible proportions during times of economic recession as in the 1930s and 1970s. Hart, looking at twentieth century migration, has established that highest levels of migration occur when rates of growth in buildup and manufacturing are also at their highest, and that the highest gross flows are between prosperous regions. R.A. Hart, "A model of inter-regional migration in England and Wales," *Regional Studies,* IV (1970), 279-96. We must be cautious, therefore, in interpreting gross mass inter-regional migration flows in terms of adjustments to regional disparities.

12. J.W. Grant, "Population Shifts in the Maritime Provinces," *Dalhousie Review,* XVII, No. 3 (1937), 282-294.

13. Alexander, "Economic Growth in the Atlantic Region."

14. M.L. Hansen and J.B. Brebner, *The Mingling of the Canadian and American Peoples* (New Haven, 1940); and L.E. Truesdell, *Canadian-born in the United States: An Analysis of the Canadian Element in the Population of the U.S., 1850-1930* (New Haven, 1943). These are fine but dated and general monographs, neither of which adequately deal with the effects of out-migration on the region.

15. Alan B. Brookes, "Out-migration from the Maritime Provinces, 1860-1900: Some Preliminary Considerations," *Acadiensis,* V, No. 2 (Spring, 1976), 25-56; and his yet unreleased Ph.D. thesis for the University of New Brunswick, 1979. R.K. Vedder and L.E. Gallaway, "Settlement Patterns of Canadian Emigrants to the U.S., 1850-1960," *Canadian Journal of Economics,* III (1970), 476-486, found that the availability of job opportunities, per capita income, and population density were most important factors in determining the extent and destination of Canadian out-migration to the United States. Other more general

micro-demographic studies include T.W. Acheson, "A Study of the Historical Demography of a Loyalist County," *Social History,* I (1968), 53-65; and Enid Charles, "The Trend of Fertility in Prince Edward Island," *Canadian Journal of Economics and Political Science,* VIII (1942), 213-246.

16. For a good discussion of the whole question of studying internal migration in the nineteenth century see Richard Lawton and Colin G. Pooley, "Problems and Potentialities for the Study of Internal Population Mobility in Nineteenth Century England," *Canadian Studies in Population,* V (1978), 69-84.

17. For a discussion of these techniques see Everett S. Lee, *et al., Population Redistribution and Economic Growth, United States, 1870-1950* (Philadelphia, 1957), Vol. 1, 15-54; Leroy O. Stone, "Evaluating the Relative Accuracy and Significance of Net Migration Estimates," *Demography,* IV (1967), 310-30; United Nations, *Methods of Measuring Internal Migration,* Popultion Studies, No. 47 (New York, 1970), 24-36; and Jacob S. Sieger and C. Horace Hamilton, "Some Considerations in the use of the Residual Method of Estimating Net Migration," *Journal of the American Statistical Association,* XLV (September, 1952), 475-500.

18. For a discussion of the influence of mortality on internal migration see D. Freidlander and R.J. Roshier, "A Study of Internal Migration in England and Wales, Part I: Geographic Patterns of Internal Migration, 1851-1895," *Population Studies,* XIX (1966), 239-279.

19. MacDonald and Levitt both used Keyfitz's migration estimates which were based upon modified English life tables for Canada as a whole. Keyfitz, "The Growth of Canadian Population"; Levitt, *Population Movements in the Atlantic Provinces;* MacDonald, *Population Movements and Economic Development in the Atlantic Provinces.* The two Dominion Bureau of Statistics estimates were based upon Massachusetts life tables: *The Maritime Provinces since Confederation* and *The Maritime Provinces in Relation to the National Economy.* For a discussion of the relative merits of each see Duncan M. McDougall, "Immigration Into Canada, 1859-1920," *Canadian Journal of Economics and Political Science,* XXVII (1961), 162-175. It would appear that the English life tables are most reliable and consistent and represent approximately the conditions of mortality in the United States and hence Canada at the time. However, for the Atlantic Region *per se* it could be argued that the more geographically limited Massachusetts data might be more representative if less reliable.

20. Canada, Dominion Bureau of Statistics, *Canadian Abridged Life Tables, 1871, 1881, 1921, 1931* (Ottawa, 1939).

21. This estimate was derived by calculating the percentage of total net migration accounted for by the over forties age groups in Nova Scotia.

22. Michael Staveley, "Aspects of Migration in Newfoundland and Labrador" (unpublished Ph.D. thesis, University of Alberta, 1973); and Patricia A. Thornton, "The Demographic and Mercantile Bases of Initial Permanent Settlement in the Strait of Belle Isle," in J. Mannion (ed.), *The Peopling of Newfoundland: Essays in Historical Geography* (St. John's, 1977).

23. Brookes, "Outmigration from the Atlantic Provinces, 1860-1900."

APPENDIX I

NET MIGRATION RATES — NEW BRUNSWICK[1]

	Total Migrants			Net Migration Ratios		
	1870s	1880s	1920s	1870s	1880s	1920s
Albert	-713	-2723	-1610	62	234	198
St. John City	-5577	-3708	-4859	203	149	80
St. John County	-1518	-4228		61	162	
Charlotte	-3827	-4706	-1946	147	188	91
Kings	-2941	-5217	-1960	117	216	97
Queens	-1892	-3039	-1551	136	252	136
Sunbury	-1084	-1359	-49	161	219	7
York (incl. Fred.)	-2193	-3667	-2736	76	120	85
Carleton	-1002	-3412	-2487	46	149	119
Victoria	-135	-1644	-823	10	97	59
Westmorland	+147	-3206	-3185	+4	81	57
Kent	-1404	-3446	-4135	67	148	174
Northumberland	-863	-3692	-5176	38	145	152
Colchester	-2283	-2422	-857	113	104	21
Restigouche	-310	-443	-431	49	58	16
Madawaska	n.d.	n.d.	-1482	n.d.	n.d.	66
Total	-25593	-46912	-33287			
New Brunswick	-24762	-47125	-34074	82	147	91

[1]Net migration ratio = number of net migrants per thousand head of population.

Source: Author's own calculations based upon *Census of Canada,* 1871, 1881, 1891, 1921, 1931; New Brunswick, Department of Health Annual Reports, *Vital Statistics,* 1921-31 (Fredericton, 1922-1932). Total refers to the sum of counties and cities; New Brunswick refers to the published figures for the province. This convention also applies to subsequent appendices. Counties totals exclude cities unless otherwise indicated.

APPENDIX II

INTERCENSAL COHORT ESTIMATES OF NET MIGRATION, NEW BRUNSWICK, 1870s

	Total Number of Net Migrants	NMR[1]	NMR Males	NMR Females	Cohort with highest NMR Males	Cohort with highest NMR Females	NMR Greatest Group Males	NMR Greatest Group Females	
Albert	-713	62	48	78	(21-31/31-41)	(16-21/26-31)	-177	-316	F
St. John City	-5577	203	214	194	(16-21/26-31)	(21-31/31-41)	-421	-480	M
St. John County	-1518	61	64	57	(11-16/21-36)	(21-31/31-41)	-233	-209	M
Charlotte	-3827	147	146	149	(16-21/26-31)	(16-21/26-31)	-375	-353	=
Kings	-2941	117	108	127	(16-21/26-31)	(16-21/26-31)	-429	-309	F
Queens	-1892	136	126	147	(16-21/26-31)	(16-21/26-31)	-387	-365	F
Sunbury	-1084	161	163	158	(21-31/31-41)	(16-21/26-31)	-396	-514	=
York (incl. Fred.)	-2193	76	74	78	(16-21/26-31)	(16-21/26-31)	-221	-254	=
Carleton	-1002	46	43	50	(16-21/26-31)	(16-21/26-31)	-168	-220	F
Victoria	-135	10	+2	23	+(31-41/41-51)	(16-21/26-31)	+74	-206	F
Westmorland (incl. Moncton)	+147	+4	+10	1	+(51-61/61-71)	(11-16/21-26)	+110	+122	
Kent	-1404	67	57	79	(16-21/26-31)	(21-31/31-41)	-179	-197	F
Northumberland	863	38	20	57	(21-31/31-41)	(21-31/31-41)	-126	-227	F
Gloucester	-2285	113	125	100	(16-21/26-31)	(16-21/26-31)	-344	-348	M
Restigouche	-310	49	53	45	(21-31/31-41)	(21-31/31-41)	-322	-218	M
Total/Average	-25593	86	80	89	—	—	—	—	F
New Brunswick	-24762	82	81	82	(16-21/26-31)	(31-41)	-230	-249	=

[1]NMR = Net Migration Ratio (number of net migrants per thousand population).
F = Females
M = Males

Source: Author's own calculations based upon *Census of Canada,* 1871, 1881; D.B.S., *Canadian Abridged Life Tables,* 1871 (Ottawa, 1939).

APPENDIX III

INTERCENSAL COHORT ESTIMATES OF NET MIGRATION, NEW BRUNSWICK, 1880s

	Total Number of Net Migrants	NMR	NMR Males	NMR Females	Cohort with highest NMR Males	Cohort with highest NMR Females	NMR Greatest Group Males	NMR Greatest Group Females	
Albert	-2723	234	217	253	(20-4/30-4)	(20-4/30-4)	579	575	F
St. John City	-3708	149	173	125	(15-9/25-9)	(20-4/30-4)	492	442	M
St. John County	-4228	162	163	160	(15-9/25-9)	(20-4/30-4)	482	487	=
Charlotte	-4706	188	200	177	(15-9/25-9) (20-4/30-4)	(15-9/25-9)	507	389	=
Kings	-5217	216	229	204	(15-9/25-9)	(15-9/25-9)	719	513	M
Queens	-3039	252	232	275	(15-9/25-9)	(20-4/30-4)	636	557	F
Sunbury	-1359	219	191	249	(15-9/25-9)	(15-9/25-9)	529	633	F
York (incl. Fred.)	-3667	120	121	118	(15-9/25-9)	(20-4/30-4)	383	436	M
Carleton	-3412	149	160	138	(20-4/30-4)	(20-4/30-4)	441	472	M
Victoria	-1644	97	90	105	(20-4/30-4)	(15-9/25-9)	330	336	F
Westmorland (incl. Moncton)	-3206	81	89	73	(20-4/30-4)	(20-4/30-4)	318	285	M
Kent	-3446	148	160	136	(15-9/25-9)	(15-9/25-9)	513	435	M
Northumberland	-3692	145	156	134	(15-9/25-9)	(20-4/30-4)	426	337	M
Gloucester	-2422	104	112	96	(15-9/25-9)	(20-4/30-4)	435	389	M
Restigouche	-443	58	58	58	(15-9/25-9)	(25-9/35-9)	356	274	=
Total/Average	-46912	155	152	140					M
New Brunswick	-47125	147	152	141	(15-9/25-9)	(20-4/30-4)	445	408	M

Source: Author's own calculations based upon *Census of Canada,* 1881, 1891; D.B.S., *Canadian Abridged Life Tables,* 1881 (Ottawa, 1939).

APPENDIX IV

NET MIGRATION RATES, NOVA SCOTIA

	Total Migrants			Net Migration Ratios		
	1871-81	1881-91	1911-21	1871-81	1881-91	1911-21
Guysborough	-2135	-3012	-3228	-124	-172	-198
Halifax City	+323	-2611	+11859	+10	-70	+134
Halifax County	-1603	-4123		-54	-128	
Lunenburg	-1261	-2786	-2723	-48	-94	-81
Queens	-1716	-1118	-978	-162	-106	-98
Shelburne	-499	-1957	-2131	-37	-131	-154
Yarmouth	-1538	-2268	-3118	-77	-104	-137
Digby	-1174	-2838	-2764	-64	-143	-139
Annapolis	-843	-3305	-1774	-44	-166	-97
Kings	-1999	-3515	-100	-89	-153	-4
Hants	-2117	-3913	-2264	-95	-173	-115
Cumberland	-1497	+201	-6282	-59	+6	-154
Colchester	-1321	-3209	+611	-53	-119	+24
Pictou	-2313	-4916	+2070	-68	-140	+54
Antigonish	-1622	-2941	-449	-94	-172	-38
Inverness	-2302	-3221	-3504	-94	-125	-142
Victoria	-1080	-1677	-1399	-91	-135	-149
Cape Breton	-2240	-1784	+1190	-78	-53	+15
Richmond	-1361	-2749	-1876	-93	-187	-146
Nova Scotia	-30199	-52212	-15903	-73	-117	-31

Source: Author's own calculations based upon *Census of Canada,* 1871, 1881, 1891; D.B.S., *Canadian Abridged Life Tables,* 1871, 1881 (Ottawa, 1939); Nova Scotia, *Journals of the House of Assembly,* Appendices, Report of Department of Public Health, 1911-21 (Halifax, 1912-22).

APPENDIX V

INTERCENSAL COHORT ESTIMATES OF NET MIGRATION, NOVA SCOTIA, 1870s

	Total Migrants 6-69	NMR[1]	NMR Males	NMR Females	Cohort with greatest NMR Males	Cohort with greatest NMR Females	NMR Greatest Group Males	NMR Greatest Group Females	
Guysborough	-2135	124	123	126	(21-31/31-41)	(21-31/31-41)	326	378	=
Halifax City	+323	+10	5	+22	(41-61)	(21-31/31-41)	176	285	
					+(11-16/21-26)	(11-16/21-26)	+59	+440	F
Halifax County	-1603	54	49	60	(21-31/31-41)	(16-21/26-31)	179	247	F
Lunenberg	-1261	48	37	60	(11-26/21-26)	(16-21/26-31)	108	348	F
Queens	-1716	162	153	172	(11-16/21-26)	(16-21/26-31)	396	410	F
Shelburne	-499	37	40	33	(21-31/31-41)	(21-31/31-41)	141	114	M
Yarmouth	-1538	77	82	73	(16-21/26-31)	(16-21/26-31)	294	216	M
Digby	-1174	64	49	79	(16-21/26-31)	(16-21/26-31)	157	308	F
Annapolis	-843	44	43	44	(16-21/26-31)	(16-21/26-31)	192	159	=
Kings	-1999	89	90	88	(16-21/26-31)	(16-21/26-31)	318	400	=
Hants	-2117	95	95	95	(16-21/26-31)	(16-21/26-31)	327	307	=
Cumberland	-1497	59	60	57	(21-31/31-41)	(16-21/26-31)	237	245	=
Colchester	-1321	53	50	55	(16-21/26-31)	(16-21/26-31)	210	242	=
Pictou	-2313	68	78	59	(21-31/31-41)	(21-31/31-41)	257	220	M
Antigonish	-1622	94	84	103	(21-31/31-41)	(21-31/31-41)	263	392	F
Inverness	-2302	94	110	87	(16-21/26-31)	(21-31/31-41)	361	264	M
Victoria	-1080	91	98	84	(21-31/31-41)	(21-31/31-41)	325	238	M
Cape Breton	-2240	78	77	78	(21-31/31-41)	(21-31/31-41)	254	237	=
Richmond	-1361	93	103	82	(21-31/31-41)	(21-31/31-41)	335	307	M
Total/Average	-28298	68	69	67					
Nova Scotia	-30199	73	77	69	(21-31/31-41)	(21-31/31-41)	202	221	M

[1]NMR (Net Migration Ratio) is the number of migrants per thousand head of population.

Source: Author's own calculations based upon *Census of Canada,* 1871, 1881; D.B.S., *Canadian Abridged Life Tables,* 1871 (Ottawa, 1939).

APPENDIX VI

INTERCENSAL COHORT ESTIMATES OF NET MIGRATION, NOVA SCOTIA, 1880s

	Total Number of Net Migrants	Net Migration Ratio			Cohort with Greatest NMR		NMR Greatest Group		NMR
		Both	Males	Females	Males	Females	Males	Females	Females/Males
Guysborough	-3012	-172	168	176	(20-4/30-4)	(20-4/30-4)	496	561	=
Halifax City	-2611	-70	70	70	+	(10-4/20-4)		+323	
					(20-4/30-4)	(20-4/30-4)	278	450	
Halifax County	-4123	-128	126	130	(20-4/30-4)	(20-4/30-4)	340	407	=
Lunenburg	-2786	-94	95	92	(20-4/30-4)	(20-4/30-4)	322	300	=
Queens	-1118	-106	104	107	(20-4/30-4)	(20-4/30-4)	360	356	=
Shelburne	-1957	-131	131	131	(15-9/25-9)	(20-4/30-4)	357	346	=
Yarmouth	-2268	-104	125	84	(15-9/25-9)	(20-4/30-4)	392	303	Males
Digby	-2838	-143	144	142	(15-9/25-9)	(15-9/25-9)	435	372	=
Annapolis	-3305	-166	176	154	(15-9/25-9)	(20-4/30-4)	504	406	Males
Kings	-3515	-153	164	142	(15-9/25-9)	(20-4/30-4)	480	396	Males
Hants	-3913	-173	176	168	(15-9/25-9)	(20-4/30-4)	557	450	Males
Cumberland	+201	+6	+28	17	+(35-9/45-9)	(5-9/15-19)	+131	+90	
					(20-4/30-4)	(20-4/30-4)	99	165	
Colchester	-3209	-119	113	126	(20-4/30-4)	(20-4/30-4)	406	479	Females
Pictou	-4916	-140	135	146	(20-4/30-4)	(20-4/30-4)	456	462	Females
Antigonish	-2941	-172	193	152	(20-4/30-4)	(15-9/25-9)	603	477	Males
Inverness	-3221	-125	119	132	(25-9/35-9)	(25-9/35-9)	464	485	Females
Victoria	-1677	-135	136	134	(20-4/30-4)	(25-9/35-9)	491	405	=
Cape Breton	-1784	-53	39	70	(20-4/30-4)	(20-4/30-4)	270	268	Females
Richmond	-2749	-187	173	200	(20-4/30-4)	(20-4/30-4)	547	673	Females
Total/Average	-51742	-116	-115	117					
Nova Scotia	-52212	-117	117	118	(20-4/30-4)	(20-4/30-4)	376	384	=

Source: Author's own calculations based upon *Census of Canada,* 1881, 1891; D.B.S., *Canadian Abridged Life Tables,* 1881 (Ottawa, 1939).

APPENDIX VII

INTERCENSAL COHORT ESTIMATES OF NET MIGRATION, P.E.I., 1870s, 1880s

	Total Migrants	NMR	NMR Males	NMR Females	Greatest Group Males	Greatest Group Females	NMR Greatest Group Males	NMR Greatest Group Females	
1871-81									
Prince	-1482	44	51	38	(16-21/26-31)	(16-21/26-31)	140	254	Males
Queens	-3797	85	88	82	(16-21/26-31)	(16-21/26-31)	322	347	Males
Kings	-1802	73	74	72	(16-21/26-31)	(16-21/26-31)	218	372	Males
Total	-7081	70							
P.E.I.	-4935	48	49	48	(16-21/26-31)	(16-21/26-31)	268	326	=
1881-91									
Prince	-4692	133	138	127	(20-4/30-4)	(20-4/30-4)	396	375	Females
Queens	-8269	100	182	68	(20-4/30-4)	(20-4/30-4)	596	548	Males
Kings	-2855	108	135	79	(20-4/30-4)	(20-4/30-4)	426	407	Males
Total	-15816	145							
P.E.I.	-16239	149	155	143	(20-4/30-4)	(20-4/30-4)	491	437	Males

Source: *Census of Canada,* 1871, 1881, 1891; D.B.S. *Canadian Abridged Life Tables,* 1871, 1881 (Ottawa, 1939).

APPENDIX VIII

NEWFOUNDLAND NET MIGRATION RATES

	Totals				NMR			
	1874-84	1901-11	1911-21	1921-31	1874-84	1901-11	1911-21	1921-31
St. John's E.	+314	+1424	+1337	-4	+16	+33	+27	-86
St. John's W.	+286				+20			
Harbour Main	-189	-1136	-1545	-581	-24	-120	-165	-61
Port de Grave	-429	-1148	-967	-691	-52	-159	-143	-110
Harbour Grace	-445	-2045	-1629	-1159	-32	-166	-139	-104
Carbonear	-171	-246	-894	-804	-30	-46	-180	-179
Bay de Verde	-420	-738	-727	-993	-53	-73	-70	-97
Trinity	-499	-97	-1029	-1994	-29	-5	-45	-85
Bonavista	-565	-711	-866	-2459	-39	-33	-36	-100
Fogo	+533	-234	-115	-597		-30	-13	-64
Twillingate		+1130	+372	-2128		+54	+15	-76
St. Barbe		+501	-441	-950		+54	-39	-71
St. George	+417	+173	-1035	+719	+66	+16	-81	+41
Burgeo/La Poile	-152	-771	-471	-934	-27	-105	-58	-105
Fortune	-369	-400	-579	-268	-59	-43	-54	-22
Burin	-642	-539	-375	-1925	-79	-49	-31	-162
Placentia/St. Mary	-361	-1328	-1602	-926	-34	-85	-98	-54
Ferryland	-275	-535	-241	-8	-22	-93	-41	-1
Total/Average	-2967	-6700	-10807	-15702	-22	-50	-70	-79
Newfoundland	-2640	-9242	-9167	-12693	-15	-41	-37	-47

Source: *Census of Newfoundland,* 1874, 1884, 1901, 1911, 1921, 1935; D.B.S., *Canadian Abridged Life Tables,* 1881 (Ottawa, 1939); Newfoundland, Department of Health, *Vital Statistics, 1901-1931* (St. John's. 1902-1932).

APPENDIX IX

INTERCENSAL COHORT ESTIMATES OF NET MIGRATION, NEWFOUNDLAND, 1874-84

	Total Number Net Migrants 10-49	NMR	NMR		Cohort with Greatest NMR		NMR Greatest Group		
			Males	Females	Males	Females	Males	Females	
St. John's E.	+314	+16	+12	+20	(10-9/20-9)	(10-9/20-9)	+53	+282	F (+)
St. John's W.	+286	+20	-8	+47	(10-9/20-9)	(10-9/20-9)	-61	+277	F (+)
Harbour Main	-189	24	-6	-42	(30-9/40-9)	(20-9/30-9)	-120	-183	F (-)
Port de Grave	-429	52	-61	-42	(20-9/30-9)	(20-9/30-9)	-190	-185	M (-)
Harbour Grace	-445	32	-39	-25	(10-9/20-9)	(20-9/30-9)	-100	-135	M (-)
Carbonear	-171	30	-37	-22	(30-9/40-9)	(20-9/30-9)	-191	-106	M (-)
Bay de Verde	-420	53	-148	-33	(20-9/30-9)	(20-9/30-9)	-197	-119	M (-)
Trinity	-499	29	-27	-30	(20-9/30-9)	(30-9/40-9)	-97	-86	
Bonavista	-565	39	-51	-25	(10-9/20-9)	(30-9/40-9)	-217	-111	M (-)
Fogo	+533	+30	+42	+17	(20-9/30-9)	(10-9/20-9)	+173	+18	M (+)
Twillingate									
St. Barbe	+417	+66	+91	+23	(20-9/30-9)	(10-9/20-9)	+304	+148	M (+)
St. George									
Burgeo/									
La Poile	-152	27	-15	-40	(20-9/30-9)	(20-9/30-9)	-126	-213	F (-)
Fortune	-369	59	-87	-24	(20-9/30-9)	(30-9/40-9)	-382	-128	M (-)
Burin	-642	79	-70	-89	(20-9/30-9)	(10-29/20-39)	-246	-219	F (-)
Placentia/									
St. Marys	-361	34	-46	-19	(30-9/40-9)	(20-9/30-9)	-151	-61	M (-)
Ferryland	-275	22	-31	-56	(10-9/20-9)	(10-9/20-9)	-144	-282	F (-)
Newfoundland	-2640	-15	-21	-8	(20-9/30-9)	(20-9/30-9)	81	114	

Source: *Census of Newfoundland,* 1874, 1884; D.B.S., *Canadian Abridged Life Tables 1881* (Ottawa, 1939).

16. COMMENTARY: ON THE STATE AND REGIONAL ECONOMIC DEVELOPMENT

James M. Gilmour

I feel somewhat out of place as a commentator in this session of a Conference on maritime history, since I know nothing about shipping, little about the Maritimes, and nothing about demography and its methods of analysis. What little I know about the nineteenth century seems immaterial. Further, I no longer do research myself; I am a research administrator, a poacher of other people's intellectual output. A final reason for feeling misplaced is that, while this Conference is about the nineteenth century, Professor George has presented a paper on the twentieth century and I wish to take the discussion into the twenty-first century.

I have some difficulties with Professor George's paper, not so much for what it said but for what it did not say. Professor George has told us about the labour force, unemployment, per capita incomes, and value added. But there are other things which the regional economic policy of government might have affected. It would have been useful to know whether the structure of industry changed in Nova Scotia in this period, and whether the product mix in manufacturing changed. Did the internal structure of firms change? Was the mix of skills up-graded or not? Did the marketing methods of Nova Scotian manufacturers change? Did we see the introduction of design and engineering capabilities that had not been there before? The reason I should like to know these things is because the measures which Professor George cites could indicate changes (either improvement or deterioration) quite unrelated to the regional economic policy itself. It is possible that manufacturing could be showing significant improvement, by the measures used by Professor George, while by other criteria things could be going very wrong. Given the measures used by Professor George, however, I do not dispute his basic conclusions.

I also have some difficulty with the final section of Professor George's paper. I agree with him that the existing industrial program as carried on in its present form will not bring about the changes necessary to reduce significantly the economic disparity between Nova Scotia and the rest of Canada; I also agree that we must look for mechanisms to overcome inertia, ignorance and prejudice. But he does not tell us what those mechanisms might be.

Given that the key point of regional development policy was to achieve manufacturing gains in Nova Scotia, I think it essential to understand the nature and structure of manufacturing in Canada as a whole during the period when the policy was implemented. Nova Scotia was considered disadvantaged only by comparison with the greater economic entity which is Canada. The success or failure of the regional policy can be understood only within the context of that wider economy. What we had in the 1960s and 1970s was a semi-industrial economy, an economy which was relatively underdeveloped in manufacturing in quantitative terms. The manufacturing sector was heavily concentrated in

southern Ontario and southern Quebec. The operation of free trade within the market area of Canada had led to a high degree of spatial concentration of manufacturing. The policies and processes by which Canada acquired such manufacturing as it has, while successful for a while if measured in particular ways, had given us by the 1960s (and even more so today) a manufacturing sector which is profoundly disquieting and unsatisfactory. What we had achieved by the 1960s was a modest development in manufacturing without a parallel development in technological and innovative capability. Our policies placed a heavy reliance upon foreign direct investment, foreign technology, imported finished components, imported design specifications, and imported skilled personnel. As a result most of our larger firms were foreign controlled and technologically dependent or imitative. They exported little or nothing; they lacked innovative capability; they were massive importers of parts, goods and services. On the other hand we have many small firms in Canada. The majority of these are domestically controlled, but they are technologically unprogressive. Moreover we see a dislocation in the system because the smaller and larger firms are not technologically joined. In a normal industrial system you would observe a whole series of linkages between smaller and larger firms, an interweaving of firms through services, and through inputs and outputs. This dislocation is a consequence of the massive externalisation of linkages, matching the externalisation of linkages which has for so long been a characteristic of Canada's resource industries. This may be a crude summary of a complex situation; but it is worth remembering that this was the environment in which Nova Scotia was attempting to acquire more manufacturing industry.

At best Nova Scotia could hope for some spill-over from central Canada, or random catches missed by Ontario or Quebec. At best Nova Scotia could only recreate a very limited imitation of the form of industrialisation acquired by Ontario and Quebec. Professor George goes a long way towards explaining the difficulties Nova Scotia was having in persuading firms to come to Nova Scotia. If the world had stood still those difficulties would have been serious enough. But the world has not stood still, and as Canada's manufacturing sector finds itself in an ever more precarious position, so Nova Scotia's chances of acquiring manufacturing spill-overs are reduced.

The basis of competition for manufacturing in industrialised countries is changing. Technology and innovative capability are increasingly becoming the major determinants of industrial competitiveness for high-cost countries. But while high-cost countries are competing in those products where technological performance is the critical competitive element, Canadian industries are becoming increasingly non-competitive in mature technology products. This is a problem which also faces other industrialised countries, as newly industrialising countries acquire readily available technology and enjoy the benefits of lower labour costs. What is even more disturbing is that the technological capability of newly industrialising countries is becoming ever more sophisticated. We are seeing also an increasing saturation of markets and a wider range of products.

There came through the entire industrial system, from the 1930s through to

the end of the Second World War, a wave of innovation which has long since moved to maturity and market saturation. A wide variety of technologically new products appeared, creating new demand and raising new industries to meet that demand. Eventually these new industries faced market saturation (the best example of this being the automobile industry in North America), and in the process Canadian manufacturers began to find themselves squeezed. The problem here is that the environment needed to switch to a new level of technologically-intensive production has not been put in place. Our competitors, by contrast, do see their salvation in new technologies, and they benefit from interventionist national policies designed to achieve rapid adjustments to the new realities of world trade and technology. Our competitors link industrial health to national purpose, and in spite of platitudes about laissez-faire, we are in fact entering a new era of protectionism. Even where nominal tariff barriers are sometimes reduced, non-tarriff barriers are raised and they can be very complicated and very effective. We see one country after another supporting infant industries. We see governments enforcing specialisation, and choosing between various types of industry. They may well choose as intelligently as businessmen would; we have, after all, seen business itself make terrible mistakes. The effectiveness of their choices depends very much on how choices are made, and upon the relations between business and government. National procurement policies can help to sustain industries which government chooses to favour. All such policies are worthwhile it they meet the test of strengthening market forces and entrepreneurship: the industrial strategies of Japan, Germany, France and Sweden, varied though they are, are all designed to meet that test. The only country which may not have to adopt such intcrventionist policies is the United States, because of the enormous size of its domestic market. A smaller country like Canada cannot rely upon market forces alone.

I advocate for Canada an interventionist approach which encompasses the following elements. We have often been told that in Canada we have far too small a market. But if at last we link our resource base to secondary manufacturing, then there is a market. Canada has the world's largest market for hard rock mining machinery. We have only one viable company which manufactures such machinery. We must encourage industrial productivity through investment in new forms of capital and technology. We must change the behaviour of foreign-controlled firms in Canada by means of world product mandating. We must increase the domestic ownership and control of industry, and this is happening already, although slowly.

If this is what we require at the national level, I would suggest that the old regional development policies are redundant and belong to a different era. If the market did not work for Canada in the past, it will not work for Nova Scotia. The so-called free market did not work for Nova Scotia in the past; it demonstrated instead the principle of cumulative causation, which in a common and unregulated market means that the strong get stronger and the weak get weaker. Certainly in the Canadian common market cumulative causation favoured those nodes of strength which existed when the market was established. Today most of the

provinces recognise that the unhindered operation of market forces will not give them the industrialisation which they want. We see across Canada the establishment of provincial industrial strategies. Nova Scotia itself appears to be laying the ground work for such a strategy. The provinces have come to recognise that comparative advantage is not a static thing. They recognise that comparative advantage can even in certain circumstances be created. I am reminded of remarks made by the President of the Bank of Japan in 1947: he argued that it was futile to attempt to build an automobile industry in Japan, because an international division of labour made if preferable for Japan to buy automobiles from the United States. Nobody listened to him. The Japanese created their own comparative advantages. Today Alberta is creating its own capability in oil sands technology. Saskatchewan adopts similar policies. There is nothing wrong with provincial industrial strategies, provided that we also have an umbrella national industrial strategy which harmonizes and co-ordinates the developing provincial strategies. Within that national strategy certain regions would have to be given preference for certain types of industry, and the instruments are available to do this. The national strategy must link provincial resource exploitation with provincial manufacturing capability. What I am advocating is a new National Policy, which if worked properly would create those linkages which have for so long eluded us, the linkages between our resource base and our technological capabilities.

Finally, turning briefly to Pat Thornton's paper, I admit that I have as yet no idea whether her hypothesis is correct or not. This is a preliminary essay, but it contains the beginnings of a very important data base, and it states an hypothesis which all historians and historical geographers working on this region must consider very seriously. It is difficult to say what may become of her hypothesis and her challenge to conventional wisdom. But her paper takes us back to the very roots of regional economic disparities in Canada, to the years even before our first National Policy, and it is with her findings in mind that our discussion of the Maritime provinces in their historical context ought now to continue.

17. DISCUSSION FOLLOWING THE PAPERS OF GEORGE AND THORNTON

GEORGE agreed with Gilmour that other measures of the effect of regional development policies should be attempted, but pointed to the difficulty of gathering data on such things as marketing. On the impact of particular industries or firms, such as Michelin, the official statistics say little or nothing. On the need to encourage high technology industry through proper incentives or a national policy, we cannot surely place too much reliance upon government to pin-point accurately industries of high growth potential. There is a great danger that government might pin-point infant industries which will remain infant industries. We must also remember that research and development is a cost; our purpose should be to get the best results from the least amount of research and development expenditure, which means that such expenditure must be carefully tailored to meet the needs, not only of fledgling industries, but also of successfully established industries.

FISCHER, commenting on George's view that government should not be considered omnipotent in the area of economic development, asked if there were lessons which might be drawn from this about the nineteenth century.

NORDVIK suggested that the Norwegian case did not prove that shipping or shipbuilding could or should be sustained by massive government intervention. Norway, like Canada, possessed comparative advantages in the building of wooden vessels, and it would have been neither desirable nor necessary for government to intervene. In order to establish a viable steel shipbuilding industry, you would have to demonstrate that the cost of inputs would have been sufficiently low to generate a profitable industry, and that would be very hard to prove either for Atlantic Canada or for Norway eighty years ago. Shipping is another matter. The Norwegians made the transition from operating sailing vessels to operating steam vessels later than did the British, but they were able to make the transition because they had great experience and expertise in the management of shipping. This advantage, and possibly the advantage of cheap labour in the transition period, were more important than any advantages in the availability of capital. The success Norwegians enjoyed in shipping, and the record of growth in the Norwegian economy in the twentieth century, does not strengthen the case for economic development through government intervention. The Norwegian growth record is based on Norway's having been forced to compete in international markets in particular sectors where Norway possessed skills and particular advantages.

DAVIES pointed out that Japan, although having no iron ore and no indigenous fuels, had a shipbuilding industry large enough to produce over half of all world tonnage in the last decade; to this extent they had created their own comparative advantage. Nevertheless, they did not ignore comparative advantage nor expect government to fly in the face of it; indeed, the Japanese

Shipbuilders' Association today foresees little future for shipbuilding in Japan.

GILMOUR agreed with previous speakers that government was not omnipotent, but argued that governments did have to make choices, in co-operation with business, and that government support worked best when directed towards those industries which through their own efforts and advantages were already becoming winners. Identifying winners was not easy, but it was not so difficult to identify future growth industries if you paid attention to current industrial and technological growth patterns. It was obvious that micro-electronics would revolutionise all industrial processes, for instance. In the field of offshore oil and gas development the Norwegian government quickly spotted a winner and increased very substantially the Norwegian content of services and goods used in the offshore industry.

BUCKNER argued that in an historical context the policies of government could never be treated as though they had marginal impact, particularly when looking at regional development. The massive concentration of war-time and related industries in Ontario was not the result simply of the unfettered operation of comparative advantage. It was also the result of policies enacted by people like C.D. Howe. Returning further into the historical context, did not Thornton's evidence reinforce the hypothesis of Alan Brookes that "pull" factors were crucial? Ship carpenters moved to New England to take advantage of demand for their skills in New England. Perhaps that growing demand for labour from the south had an important impact on the viability of shipbuilding in New Brunswick. To the extent that shipowning in the region depended upon the local supply of vessels, perhaps this contributed also to the decline of shipowning.

THORNTON agreed that pull factors were important; her own work on migration from the Strait of Belle Isle area, though based on very few cases, tended to confirm the hypothesis. But it was still a hypothesis requiring a great deal of further testing.

HARLEY commented that implicit in much of the discussion about regionalism was the idea that money should have been channelled from places where people were relatively prosperous to places where people were less prosperous, in order to keep people where they already were. If "pull" forces indicate that people wanted to move to places where they were better off, what was the problem?

THORNTON replied that the problem lay in the consequences for the region from which skilled labour departed. People were being pulled from the region just when they were most needed, and when there was still demand for their labour, with the result that economic growth, while remaining positive, was slower than it would otherwise have been.

HARLEY thought that there was a problem in sorting out the causes of a subsequent decline in per capita incomes following upon out-migration. If a substantial proportion of highly-paid labour left, then their departure would by itself cause a fall in per capita incomes. How much of the decline in per

capita incomes could then be attributed to the cumulative effects of out-migration?

THORNTON replied that if fifty percent of a city's population between the ages of twenty and twenty-nine left in a decade, the cumulative effects would be enormous.

HARLEY admitted that the character of the city would be changed, but wondered what difference it would make to those who had left if they were able to enjoy the same services and better wages elsewhere?

THORNTON replied that it made a great difference to those who remained in the region.

BUCKNER thought that much depended on whether one believed that there were particular social and cultural values, and a way of life, associated with particular communities, and whether one believed that these were worth preserving.

FRANK suggested that it would be useful to know more about the debate over regional policies as it developed a hundred years ago. As early as the 1850s individuals were aware of problems in the economy of the Maritime colonies. There was a debate in the region at the time of Confederation between the shipping and shipbuilding sectors and the new sectors based upon iron, coal and railways. In showing how these debates related to the social realities of the time, one could learn a great deal about the attitudes and forecasts of shipowners. Such a study would also serve to cast doubt on the notion that if capitalists were unwilling to invest in regional development, therefore nobody was willing and there was no alternative. There were alternatives, as the Maritime Rights movement and the co-operative movement stated so clearly. What if any vision of economic development did businessmen have in the late nineteenth century? The profile of merchant-shipowners could not be complete without some answer to this question.

BUCKNER agreed that the profile of the shipowner which we had so far was incomplete, and argued that a basic mistake was made if these men were treated as shipowners and nothing else. These men were not shipowners; they did not live in communities of shipowners. They were merchants and entrepreneurs who invested in many things, which for a period of time included shipping. Shipowning itself emerged from the shipbuilding and timber industries; when the shipbuilding industry collapsed they kept some vessels, but they left the business as soon as they could. We do not yet know how many of these shipowners thought of themselves as shipowners at all. T.W. Acheson's sample of "Great Merchants" has been mentioned, but Panting has mentioned only three of that sample who were major shipowners.

PANTING pointed out that of Acheson's forty "Great Merchants" twenty-nine were major shipowners and thirty-eight owned shipping tonnage.

18. CONFERENCE SUMMARY

Douglass North

I have eleven pages of notes about all the things that we have been talking about, and when I sat down to figure out how to translate those notes into something coherent and systematic, I found it was not an easy task. I read the Conference Summary given last year by Robin Craig, and I note that he began by acknowledging the marvelous hospitality of his hosts, and I want to second that. The hospitality has been very impressive. I noted also that Craig had something nice to say about everybody. He found something lovely to say about all the papers. I am not going to do that. There were many good papers, of course; but I think I can be more useful by taking your main theme, which is methodology, and exploring that theme, weaving together some of the arguments and some of the issues relating to the historical problems which you confront.

I must say, first of all, that listening to you all over the last few days has brought back many happy memories. I had almost forgotten that I was in the merchant marine for four years, and it was not until Richard Goss reminded me of some problems involved in cargo loading that I thought back happily on all those wonderful days, and especially the days I spent trying to figure out freight rates and productivity indices in ocean shipping. I remember spending three years with my son building ship models of every sailing ship I could find, in order to discover if I could what technological changes had occurred, and that was so much fun that I almost forgot about doing anything else.

I propose to begin with a very general and perhaps diffuse discussion of the problems of explanation in economic history. I hope to end with a few specific suggestions for the members of the Atlantic Canada Shipping Project. Let me remind you, and I think you need to be reminded, that what you are attempting to do is to explain historical change over a lengthy time period, and you are doing this not merely for a particular industry, but also for the people who lived in this region of Canada for the better part of a century. It may seem trite to say this, but all explanations involve theory, and if you do not have a theory you do not have an explanation. I say that very carefully, because I have heard many assertions and *ad hoc* arguments around here which I fear may have no basis in theory. I have heard some trenchant criticisms of existing theory; but let me remind you that if you do not propose alternative theoretical frameworks, you do not help the Project.

In economics we have only three bodies of theory. We have neo-classical economic theory; we have classical economic theory; and we have Marxian economic theory. Surprising as it may seem to some of you, they are not all that different from each other. Classical theory, the theory of Smith and Ricardo and Malthus, was guided by the notion that you had fixed factors — land and resources — and the result was a dismal set of predictions about the human condition. Marxian theory emerged, and as Paul Samuelson has pointed out, if you introduce land and resources as a fixed factor in Marxian theory you come up with

something which looks very much like classical theory. Marx embedded the theory in an overarching framework of political, social and institutional theories, and this has given it much of its power and attractiveness, particularly to scholars disappointed by some of the narrow aspects of neo-classical theory. Neo-classical theory came after Marxian theory, and confined itself to quite a narrow range of topics. It addressed itself essentially to the economics of production. Its attractiveness derived from the fact that it provided a neat but narrow analysis of the way in which human beings co-ordinate their activity to produce output. It never did develop an effective theory about income distribution; but it did provide us with a framework by which we could derive analysis and refutable tests about specific aspects of the way in which people produce.

Let me suggest briefly what neo-classical theory tells us about the way in which people produce. It is this framework of neo-classical theory which has guided the new economic history, or cliometrics. The theory tells us that we have a set of inputs — land, labour and capital — and given production functions, however specified, we derive some amount of output. Put in that way it is unimpeachable and it has not said much. We can make more sense of the theory by refining it, perhaps as follows: we say that the input of labour consists of people, which means that you must know what is the size of the population, how population varies over time, what percentage is in the labour force, and what skills are embodied in the people. All these questions are refinements of neo-classical theory, essential for the economic historian. We have also physical capital, which includes machines and equipment and improvements, all of these embodying technology. If we wish to make any sense of capital, we must understand that capital is a function of technology in one sense: that the degree to which we have command over nature allows us to make our capital work better for us and to produce more for us. Further, we have land and resources, and these too are closely related to the state of technology, since a resource does not exist as such until we have devised a technology which makes it useable by human beings. This, of course, is where classical and neo-classical theories diverged: because it is a fundamental assumption of neo-classical theory that underlying technology there is a stock of knowledge, and that the stock of knowledge is elastic. This is crucial, because if you have a stock of knowledge which is elastic, then where you encounter diminishing returns in land and resources, you may raise the rate of return on developing new techniques and on exploring for new knowledge, and so you may surmount the problem of diminishing returns on land and resources.

We have, then, the following inputs in our neo-classical production function: human capital, or the amount of labour times its skill; physical capital, in which is embodied technology; land and resources; technology and the stock of knowledge behind technology. What we assume is that these are capable of substitution at the margin; and we assume that any difference in the rate of return on any one of these leads us to invest in the other. If we are running out of petroleum, for instance, we invest resources in (a) developing substitutes, and (b) advancing the stock of knowledge to allow us to derive new substitutes. Since we have made the crucial assumption that the stock of knowledge is elastic, we have an optimistic view of how the world operates, and we are optimistic as well because we assume that we

always do invest where the rate of return is highest, and so we create for ourselves a happy, continuously productive system.

Now you will all say that this is a crock of rubbish. It is, and it isn't. If you look at the last 125 years of human existence, neo-classical theory mirrors in a very general way what has happened. In the last 125 years we have seen population grow at a rate unprecedented in human history. And while population has grown we have managed to enjoy growth in incomes, and in per capita incomes, for a large part of the world. The only way to explain this remarkable phenomenon is by that neo-classical paradigm. There is no other way to explain what it is that separates us from the ten millenia that preceded our era. For those preceding millenia the classical model is much more interesting, since then we did have diminishing returns and Malthusian crises, and these were crucial for the human experience.

Having said a nice thing about neo-classical theory, let me tell you what is missing in that theory. This marvelous world of neo-classical theory assumes zero transactions costs. That is, it assumes a frictionless world in which we put things together and obtain a set of results. It is precisely because transactions costs are positive that we have all of the conundrums which confront you in the issues being considered here. If the neo-classical model worked frictionlessly, incomes would be equalised all over the place, and an adjustment process would work to equalise growth rates between regions. But it is not a frictionless world, and the neo-classical model, powerful though it is, must be supplemented with what we are beginning to learn about those frictions and problems which produce the uneven pattern of historical reality and historical change.

What are transactions costs? You may think of them as the other half of the economic world that Adam Smith should have talked about. Adam Smith, in what remains the most elegant and impressive book ever written in economics, said that there exists specialisation and division of labour, and that this specialisation and division of labour produces the wealth of nations. All of the subsequent production theory which we elaborate upon in economics is nothing but an elaboration upon specialisation and division of labour. It is true that there are improvements in technology over time, but the way in which those improvements work out within the system is usually through greater specialisation and division of labour. And so if the wealth of nations is a function of growing gains from trade, the other side of the coin is the costs of trade, and that is what transactions costs are. It is most useful to the economic historian to think of transactions costs as those costs which arise because individuals engage in exchange. In a world of perfect self-sufficiency we would have no need for the state, or for intermediaries such as markets, firms, corporations, trade unions, and so many of the other institutions which make up our world. Translated loosely, transactions costs are the basis of institutions, both political and economic. You do not have government where you do not have specialisation, division of labour, and all the other things I have just mentioned. If you conceive of institutions as means by which human beings attempt to deal with the resource costs of interaction, then you begin to understand what transactions costs are.

We are still unable to elaborate the idea of transactions costs into a theory of

the political process or a theory of the state. To do this it would be necessary to combine aspects of transactions costs with the major characteristic of the state, its monopoly of coercion. With respect to economic institutions, we have yet to connect transactions costs with the ways in which we organise economic activity. Why do we sometimes engage in transactions through markets? Why do we sometimes combine them into firms? Why do we sometimes integrate firms vertically so that they engage in a whole range of activity? The modern literature on industrial organisation is attempting to confront these issues: that literature has important implications for the economic historian, and for all of you here, in the issues with which you are dealing.

Much of the recent literature on economic organisation and transactions costs is still concerned with the problem of defining transactions costs. Why does it take resources to enable people to engage in co-ordinated activity? Let me digress for a moment to give you some idea of the magnitude of transactions costs in a modern economy. They comprise most of what government does. They comprise most of the activities of lawyers and auditors. They comprise all of what we put in national income accounts as trade. They include a vast amount of activities within firms, in terms of the supervising and co-ordinating of activities, and some measure of the increasing resource costs involved may be obtained by looking at the expansion of white collar work compared to blue collar work in the last seventy years. White collar work has been growing at about five times the rate of blue collar work, and in absolute terms now exceeds blue collar work. To put it another way: it takes more resources to integrate and co-ordinate productive activity, than it does to produce. These costs are very large, and they are not dealt with in national income accounts.

It is interesting, and a bit dismaying, to observe how national income accounts have become an albatross around our necks when we come to deal with historical problems. As one example, let me tell you about the problem as it was confronted by Simon Kuznets, who had his eightieth birthday celebration recently. Kuznets always understood the dilemmas of national income accounting. He was trying to decide how to treat military expenditures in war-time: should we treat them as final output, or should we treat them as an intermediate good? It is very difficult to think of them as final output, because they are not final output in any sense. If you consider defence expenditures as essential means of preserving economic activities and the rules of the international games, then surely defence expenditures are an intermediate good. That is, they are the costs which we must incur in order to have a given amount of exchange, trade, and so on. You can broaden the focus to include a vast array of government regulatory and administrative activity: much of this activity must be defined as an intermediate good. Similarly in the context of the firm, many of the activities of lawyers and auditors are treated as final output in national income accounts, when in fact they are an intermediate good. These activities are essential for co-ordinating and integrating the economy to produce the desired output of goods and services.

I think that transactions costs consist of two types of cost. First, they consist of the costs of specifying the terms of exchange, and the costs of specifying the functions of agents. I have, by the way, spent a few years arguing about this with people such as Oliver Williamson, so you do not have to accept my definitions. By

an agent I mean simply somebody who works for somebody else. In a market situation the first part of transactions costs are simply the costs of delineating the characteristics of a good or service and specifying them. Thus if apples are exchanged for money, the characteristics of both apples and money must be specified and understood by both parties in order that the exchange can take place. It is not always easy to specify the characteristics of what is being traded. We do not buy apples by their taste or shape, for instance; we buy them by such surrogates as weight or volume. Specifying the characteristics of manufactured goods and services in a modern economy is complicated and costly. It is much more complicated to specify the performance of agents, because agents will not always do what you want them to, unless they are perfectly constrained. It takes enormous resources to contrain agents; hence all the rules and regulations which we adopt to constrain agents. The obvious rent dissipation which occurs through devising rules and monitoring behaviour is enormous. This is the first part of transactions costs.

The second type of transactions cost is the cost of enforcement, or the cost of ensuring that the constraints we put in place actually work. Each institution has its principals and its agents. As Chairman of a Department of Economics I am a principal in my relationship to my faculty, and much of my job is given over to seeing that my faculty do what they are supposed to do; and I am an agent of the Dean of Arts and Sciences and of the President and the Board of Regents. All of our tasks, as principals and agents, are part of this phenomenon of transactions costs, and the institutions of society are derived ultimately from these transactions costs which I have been attempting to define.

Now where does this leave us? Before I go on to draw some lessons from all this, I want to say something about some terms which have been bandied about here in the last few days. First, the term "laissez-faire." There is no such thing as laissez-faire. Milton Friedman may like it, but that is because it serves a very immediate purpose for him. What we are really talking about here is the set of rules or specifications which define the way in which markets work, the way firms work, and the way in which any kind of economic exchange takes place. If indeed you could have a world of laissez-faire, that would only mean anarchy, or a situation where there is no exchange at all. A functioning market system is precisely the reverse: it is a world in which there are very precise rules and property rights which govern the way in which exchange takes place. Since the essence of property rights is the right to *exclude,* they are just the reverse of laissez-faire. This is not a semantic distinction. Consider some of the arguments which used to be advanced about the industrial revolution, which said that the industrial revolution came about because of the growth of laissez-faire. This is nonsense. The industrial revolution was brought about in part by things such as enclosures, and enclosures represented a shift from a common property use of resources to exclusive ownership of resources. This was a means of defining rights over an asset so as to change the way in which it was used. Such changes in property rights changed the incentive structure by providing exclusive use, and exclusive rights to derive income from or to alienate an asset. Statutes of monopoly and patent laws are other examples of this shift to exclusive ownership. So the pertinent questions

about any exchange are these: how are rights defined? How are rights specified and how effective are they? How much leakage is there in the system? That is, how much rent is dissipated in exchange; or, what is the difference between the private and social costs and benefits in an exchange? The neo-classical model assumed that the private and social costs and benefits were equal. In fact they are not equal, they never have been, and they never will be. The difference between them is at the heart of the way in which exchange takes place; that difference is also very much what government is for. For it is government which specifies the rules of the game, the property rights structure, the relationships between principals and agents in the management of labour, and so on. We must therefore throw out such notions as laissez-faire. We must throw out the notion that the state was anything like a neutral body. We must understand property rights, and how they are defined and specified, and the role of the state in this process, if we wish to understand how economic exchange takes place, and how the process of exchange itself changes over time.

Let me say something about another term used here: "opportunity costs." Behind opportunity costs lie the shape and elasticity of supply curves, and the relationship of supply curves to demand curves; behind these also lie a structure of rights. This is crucial if we wish to specify opportunity costs. If, for instance, we say that shipowning declined because of a relative change in opportunity costs of capital such that gains from landward activities became superior to those in seaward activities, then the interesting question is not the relative rates of profit in these activities, assuming that rates of profit can be measured. The interesting question is this: what lies behind those changes? What lies behind them, in addition to the factors specified in neo-classical theory, must be the costs of transacting.

You are concerned here with the calculus of the shipowner, with his decision-making, and with the opportunity costs which bear upon his activity. Incidentally, I will not give much shrift to the argument that people do not pursue opportunity costs. Neither will I listen for very long to the argument that people do not maximise. People do purposeful things, and they do make choices. Of course we do wish to specify what is in people's utility function which leads them to make such choices as they do. But to say that choices are random, or that they are based upon things which we cannot discover, is both uninteresting and wrong. I am assuming that we believe that opportunity costs do count. Think, however, of all the things which might be taken into account when analysing the profitability of shipowners. Take, for instance, the kind and amount of taxes on ships. Taxes have unexpected consequences, because when you produce a good or service, there are multiple margins. Produce an orange and you have an orange, but the orange has texture, flavour, vitamins, and juice. All these are valued parts of the orange, and if you tax one part of it (and taxes are always levied upon one dimension of larger entities), you may end up with a very different orange. An historical illustration is provided by the way in which the British used to tax shipping. When ships came into British ports they were taxed on the basis of tonnage. The British worked out a formula to measure tonnage, and in the formula were length, breadth and a ratio. The result was, of course, that the British built long and narrow ships,

and the characteristics of these ships significantly affected their performance. Take another problem relating to profitability and taxation: how do you determine what the depreciation rate is on ships with respect to taxation? Or, how do you specify the safety requirements of ships? Obviously safety requirements vary, and they can affect the comparative advantage of some places compared to others with respect to the registering of ships. Further, most countries make specifications about manning requirements, and these specifications impose costs which alter relative profitability. Another problem is the theft of cargo, and the costs which may be incurred in ensuring that a minimal amount is stolen. All these things, and many others, make up the costs of operating shipping. The movement of shipowning in space and time is often a function of shifting costs resulting from the imposition of rules by government. Theft, of course, results from the imperfect enforcement of rules. But all of these factors are relevant to your calculation of the opportunity cost of capital and to the decision-making calculus of the shipowner.

If you are concerned with the opportunity costs of capital in comparative terms, then you must undertake the same kind of analysis for the landward side. You must look at those transactions costs, government edicts, and government policies which influenced the profitability of landward activities. Many of these factors have been mentioned in the course of our discussions, but they have appeared in an *ad hoc* way. You have mentioned Confederation, tariffs, subsidies, government support for railways, and so on. But I think there is much more to be studied here. How did the enforcement of various kinds of contracts in landward activity change over time? How did judicial decisions affect the way in which property was regarded? One of the most remarkable changes occurring in the United States in the first half of the nineteenth century was the change in the judicial interpretation of what constituted injury to property. This change revolutionised economic activity in the United States. It revolutionised economic activity because it said that where one individual wished to make productive or profitable use of a resource or asset, and another wished to make frivolous use of it for his own enjoyment, then there was no injury to the latter party when the former pursued his productive interests. In other words, if I had a lovely pool in a river where the salmon were plentiful, something dear to my heart, and if there were a pulp mill up river dumping effluent, then at the beginning of the nineteenth century I could have prevented the pulp mill from dumping effluent; but as the law changed by the middle of the nineteenth century my activity was regarded as frivolous and I could not collect damages from the pulp mill. The way in which judicial interpretation of property rights changes, and the way in which enforcement changes, is enormously important. We are just beginning to think about these things; but they are relevant because they affect opportunity costs and the returns on our use of assets. All of these aspects of transactions costs as they are embedded in law and in government policy cannot be treated simply by looking at the gross policies of protection; they can, I think, be treated only by looking in detail at the actual contractual relationships (how transacting occurs, how it is specified, how it is enforced, the degree to which it is enforced, and so on), for these are critical to the way in which the system works and the way in which opportunity costs arise.

Let me restate my position very succinctly. The choice-theoretic approach, which is at the heart of neo-classical theory, says that people make choices, and that those choices are in some sense rational. Those choices are governed by two things: by opportunities, and by taste. What we must first define is how the opportunity set changes. Part of the change in that opportunity set you can capture in the traditional neo-classical way, by looking at costs and benefits and how they change. The other part you will capture only if you look underneath, at the changing transactions costs. The second thing which governs choice is taste. It is a fundamental presupposition of neo-classical theory that taste and preference are stable, or a constant. For much of what neo-classical theory attempts to do, that is a very useful assumption. Nevertheless the assumption involves us in serious problems, and it involves the economic historian in serious problems, since over long periods of time it is obvious that tastes do change. This is a can of worms because there is no satisfactory body of theory which allows us to treat the sociology of knowledge, or ideology, or what I call norms of behaviour. The only point I wish to make about taste and preference is this: if you took the neo-classical maximising assumption, and if you really believed that everybody maximises at all times and at any margin, then the world would be a non-livable place. It would be a non-livable place because it would mean that if I could beat my competitor by burning down his store and if nobody was going to catch me, then that is the way I would compete. If your back was turned and if I could get away with it, I should murder you if I could collect something for doing so. We do not behave in this way. Instead we have norms of behaviour, or constraints on maximisation. These constraints are crucial, and until neo-classical economists can recognise them and deal with them, there will remain many misunderstandings about industrial organisation. We all know, for instance, what an immense difference there can be between the performance of individuals who work. Consider the implications of this for the neo-classical production function, which says that output is a function of inputs: the variation in output which results from the degree to which labour believes that the contract is fair or legitimate can be enormous. Norms of behaviour governing such situations do change, and they pose a serious problem for the economic historian. I mention the problem for the sake of completeness, but it is not obvious to me that you can do much about it in your present studies.

Now what should you, the members of the Atlantic Canada Shipping Project, be doing in the next fourteen months? What remains to be done before the history of the shipping industry can be written? First, I think that you want to treat government as endogenous. You want, I think, to treat government as an integral part of the way in which the regional economy evolved. Not only should you analyse government in terms of its rules, regulations, property rights, and so on; you should also look at the reciprocal effect which a democratic society has upon government, pressuring government to behave in certain ways. You are concerned with the reciprocal process by which government evolves, and with the process by which government modifies the rules and contractual relationships embodied in shipbuilding and shipowning. You cannot treat government properly by writing a separate chapter about it; government is not separable from the historical phenomena you are dealing with. It is true that you do not have a

neat body of literature about the political process and the role of the state. But there is a literature on public choice and decision-making, and this literature will give you clues about how to look at the role of government. So I think that government should be brought into your story, as an endogenous part of the story of shipping in eastern Canada.

My second specific recommendation involves that old dilemma — export-base theory or staple theory. This is a very useful vehicle and a very frustrating one. It is useful in this way: if you look at many of the new regions of the world, obviously export staples play a big part in the working of the system. Therefore for a *part* of our history we can tell a very interesting story using export-base theory. For a little while, because of peculiar resource endowments which allow a people to produce something for which there is demand (however specified and however growing), that people can capture significant rents. Those rents, because they make the opportunity costs of capital so high that they pull in factors from elsewhere, produce a predictable pattern of growth. The pattern of growth continues until you arrive at an equilibrium, a point at which you have dissipated the rents so that, in the traditional neo-classical model, you have an equation between the opportunity cost of capital in a particular export industry and in other economic activities. Then we have arrived at the end of what export-base theory can tell us. Before then, in the period of expansion before the equilibrium point is reached, export-base theory is very useful. The frustrating thing is: what happens then? Here an enormous literature has grown up, some of which says that countries with export bases stagnate, and some of which points to export-base countries which do not stagnate. I think that at a certain point you arrive at the end of what export-base theory can tell us — except for the following. What you want to ask is, did the export base lead to changes in the endowments of the region, with respect to two things: first, the factor endowment; second, the role of government in the region? With respect to factor endowments, it appears that, to the extent that an export can lead to the growth of human capital and to a substantial increase in the skills of a people, then you tend to have an easier shift from that export into the production of other things. It is clear that many export-base activities do not produce these results. So you do wish to look at how factor endowments change, and particularly at human capital and skills, but also at changes in certain types of physical capital which, while serving the export sector, may also lower the costs of producing other things. This has all been discussed in the literature. But how did the export base affect the role of government, and government investment? It may be that the nature of the export base has led to government investment, not only in the interest of the export, but to the long-term benefit of other productive activities. This may be something you wish to consider. What I am saying about export-base theory is that it is very useful for particular periods of time, and when applied to new countries, but after that it is much less useful and we are exploring other questions.

My third specific point I'll introduce by telling you about a paper written by a friend of mine called "Does Money Buy Happiness?" He came up with two conclusions. The first conclusion was yes, money buys happiness. The second conclusion was no, money does not buy happiness. Both conclusions were consistent with each other. What made them consistent was the following: it is true

that people tend to be happier if they have more money; but they are not happier if everybody else is getting richer. People are only happier if they are getting richer than other people. The reason that this is relevant to what you are doing is that, lurking behind everything you are doing is an explicit or implicit comparison with the rest of Canada. You are always in the position of regretting that you did not do so well as the rest of Canada; the fact that you have done better than ninety percent of the world has not entered your calculus at all. It is understandable that you should compare economic growth in this region with economic growth in the rest of Canada. But you should not take this too far, because if you wish to compare the economic experience of this region with that of the rest of Canada, you would have to do an enormous study of what happened to the rest of Canada, and you do not want to do that, nor do you want to be trapped inadvertantly into doing that. Of course you must consider how the rest of Canada may pull people and capital out of your region (or push capital into your region). But you do not want the comparison with the rest of Canada to dominate your attitude to the shipping industry, nor seduce you into going too far afield.

My fourth point is that in a real sense you are prisoners of your data base. You appear at times to be gathering and organising statistics without having a theoretical purpose for doing that. Now do not misunderstand me. There is a game which some people play — gathering numbers and then finding a theory. They play this game in the National Bureau, and many years ago a friend of mine and I used to take members of the National Bureau out to lunch and we'd ask them such questions as these: what are you doing? Well, they would be gathering statistics on mortgage rates, or something like that. Why are you doing it? Well, there is a marvelous body of data to be found. Where is it going to lead you? Well, they didn't quite know. We would keep on bugging them and ruin their lunch. After a year we had exhausted the whole Bureau staff. We do have a tendency to become enamoured of data. There is a quite sophisticated technique which allows you to take data and try to derive a theory from it, but this is a very preliminary and very risky game. Now it may be that you have a theory behind your work here, and I may have been missing the point. I think it is always worth asking yourself: is it worth gathering these numbers? What am I going to get from these numbers by way of explanation — what explanation of the evolution of the Maritime Provinces? Some of the things I have heard clearly relate to that explanation. Other things do not so clearly relate. For instance, when I hear discussions about families of shipowners, I wonder if you have some theory behind this discussion. If you do have a theory that shipowners are influenced by the characteristics of merchants, or family behaviour, or whatever, then you should be quite explicit about the theory, and you should be certain that your theory is grounded in some theoretical framework which you believe to be valid. On the other hand, you are occasionally trying to get too much out of the data, even to the extent of deriving things which the data will not allow you to get. I do not think, for instance, that you can derive a productivity index from the particular body of data you have been using; further, it was not obvious to me that you needed a productivity measure, given the questions you were asking. The data base is of course marvelous. Begin,

however, with a set of important basic questions, and see how far the data will allow you to answer those questions.

My final point is a very general one. What should the final product of this Project be? I think you have an exciting research project, you have an important story to tell, and you are doing in a systematic fashion what clearly needs to be done. I think your story should be told as clearly and as cogently as possible, and as I shall say in a moment I think you should direct your story to two different audiences. But whoever your audience may be, I think your story should have two parts. First, you should tell what happened, painting your portrait of the shipping industry with quantitative and qualitative evidence, and showing what you can of the role of shipping in the economic history of this region. Implicit within your story will be the body of theory which allows you to tell the story in that way, and so the second thing to do is to lay bare that theory as explanation. You want to be able to say: I can explain this set of phenomena by this analytical framework, by this theory. There is much that remains to be done, but you do have the bits and pieces of an explanation.

I think this story should be told at two levels, for two audiences. It should be told in popular fashion, for a popular audience, because it is a fascinating story. It should be written as a *story,* and not only for those with some technical knowledge of economics or economic history. It should be told also for the scholarly world, as an analytical and theoretical story, as a contribution to our understanding of the way in which a particular part of the world developed over time, and as a contribution to economic history.

19. DISCUSSION FOLLOWING THE SUMMARY OF DOUGLASS NORTH

McCLELLAND reiterated the different hypotheses about shipping, his own and that of the Project. Members of the Project believed that investment in shipping in the 1860s and 1870s was a sensible thing to do, both at the time and in retrospect; that the shipping sector exerted a powerful influence on the economy; that the central puzzle was why the New Brunswick economy did not convert more successfully to other activities. The other position, yet to be refuted, held that investment in shipping in the 1860s and 1870s was not optimal behaviour; that the shipping sector exerted a minor influence on the rest of the economy; and that the relative economic retardation of New Brunswick was not a great puzzle, given that province's natural endowments and locational disadvantages. Three kinds of evidence have been advanced about these hypotheses. The first suggested that profit rates were extremely high, but these estimates remain unconvincing. The second suggested that there was a surge in vessel productivity from 1863 to 1890, but the formula used by Fischer did not measure productivity as economists usually use that term. The third piece of evidence, presented by Patricia Thornton, suggests that massive out-migration was occurring in the 1870s, just when shipping was, according to members of the Project, yielding high returns and contributing to economic growth. This evidence supports the hypothesis that shipping was a constraint, not an engine of growth. These disagreements aside, we see here a very impressive assembly of data which will be the starting point for all subsequent work, and that in itself is a contribution of the first importance.

FISCHER responded by pointing out that there were areas of substantial agreement between himself and McClelland. He accepted that there were few linkages between shipping and the rest of the New Brunswick economy. To the extent that linkage effects were few shipping was not a contributor to long-term economic development. Thornton's data were therefore no surprise: to the extent that businessmen in Saint John were investing in an industry with few linkages, they were not helping to create substantial new employment opportunities. On the other hand it is likely that shipping did contribute to local capital formation. We know that there was a significant increase in capital investment in many landward sectors in the last three decades of the century. Recalculating profit rates with a lower estimate of potential revenue-earning days suggests that profit rates were high, certainly higher than McClelland's original estimates.

BUCKNER agreed with McClelland that the data bank created here was of great importance to regional scholars. But he wondered if North and others were asking too much of this Project by assuming that its task was to explain not only the decline of the shipping industry but also the decline of the regional

economy as a whole. The history of shipping and shipbuilding could provide at most only part of the explanation for the relative decline of the economy of this region. Part of the problem is that we too often speak of the region as a single entity, when it was a series of sub-regions and communities with different economies. The decline of shipping in a small town such as Yarmouth may tell us much about the decline of Yarmouth, since there was little else in that town; the decline of shipping will tell us much less about Saint John, a large and complex urban centre in which shipping was not the most important business activity. Even for the region as a whole the shipping industry was not central; it was a linkage from something much more important, the timber trade. In itself shipping generated few linkages. The industry left very little behind it. Shipping was not therefore so large nor so central that you can draw from it a thesis about the economic decline of the region. The primary focus upon shipping leads, regrettably, to an overwhelming concern for comparisons with Norway and other shipping nations, and such comparisons are fraught with problems. North warned against the obsessive concern for comparisons with the rest of Canada; but this has never been a problem, Buckner felt, with members of this Project. The primary focus must be upon the structure of those communities within which entrepreneurs worked.

HARLEY, speaking as one interested in the international context of maritime history, hoped that the concern for institutional structures, theoretical frameworks, and community studies, important though these undoubtedly were, would not hinder the completion of the one percent sample of British Empire Crew Lists. This sample is necessary to allow us to set the Canadian industry in its context; it is also of enormous potential value for maritime historians. Detailed studies of local communities will be undertaken most profitably when the present task of data collection is completed.

GOSS agreed that emphasis must continue to be given to the international context within which Canadian shipping operated. Events in the United States and in Scandinavia were relevant to the shipping industry of this region. The calculations of profits and productivity must be refined. It is foolish to argue that the industry must have been profitable and productive, merely because shipbuilding figures show that many were investing in tonnage. It is possible that businessmen were investing for non-rational reasons in an industry with relatively low returns. Were shipowners rational men equalising marginal utility? Or were there non-rational elements in their investment choices? We do not know until we have an accurate measure of profitability. The neo-classical assumption about profit-maximisation must itself be submitted to empirical testing, as part of the explanation for the investment behaviour of Canadian shipowners.

G. KEALEY agreed with North that there were some assumptions common to classical, neo-classical and Marxian economic theory. But surely out of classical Marxism has evolved an historical materialism applied to social history which has yielded great insights about the historical problems of

human behaviour. The problem of "noise" or friction within the economic system was a serious one for the neo-classical model. Is there room within that model, or within North's amplification of that model, for the concept of social class?

NORTH agreed with previous speakers that half-baked political economy and partial, imperfect answers were not good enough. Those of us who are practitioners of this arcane art of economic history know that our models are limited. But we must work with what we have, or else improve on it. We must begin with political economy, for political systems have already dictated the way in which economic systems work. The beginning of economic history must be politics, not economics. However limited our theory, we must begin with theory because otherwise we leave the door open to *ad hoc* statements which cannot be used meaningfully nor refuted.

There are many ways of looking at the entrepreneur, for instance, even if theoretical frameworks are still being debated and tested. You can look at the entrepreneur as a type of super-human being who emerges at random to make the economic system work. You can argue that incentives in a particular environment encourage the use of talents and the emergence of talents, in which case you must focus upon the structure of property rights and the incentive system. There is a recently developing theory called agency theory which attempts to deal with the problem. However imperfect such theories may be, you must begin with them. Underlying all of the social sciences is the search for a theory of human behaviour. We do not have such a theory, and we know that the theory of maximisation and the choice-theoretical approach is a very crude and partially correct argument about human behaviour. We can do no more than broaden our neo-classical model, and broaden its utility function, to incorporate those elements which so far have not been included.

Neo-classical theory has nothing like the grand over-arching body of theory contained in Marxism. Marxism is unique in providing us with a theory about institutions, about the state, about ideology, about political systems, and about economic systems. The greatest difference between the neo-classical and Marxist approaches comes over the question of class. The individual is the unit of aggregation in the neo-classical model, for it is the individual in this model who makes the choices. The Marxist would agree but would say that the choices made by the individual are not the interesting choices; the unit of aggregation should be the class, not the individual. The rejoinder to this is, very briefly, as follows. If I start with the individual as the unit of aggregation, there is nothing which prevents me from aggregating thereafter into a class. If it appears that a large number of people have similar utility functions which persuade them to act in similar ways, then they may be aggregated accordingly. Sometimes the result is a class. But if groups do not behave in similar ways aggregation into class is not useful. You cannot say anything very interesting about American economic history if the unit of analysis is class in the Marxist sense. Most of the interesting changes in American economic history occurred as the result of conflict within classes,

and in any case the conflicts between a bourgeoisie and a proletariat reveal little. Sometimes the concept of class will strengthen an analysis, as for instance when looking at Europe in the nineteenth century. A final caveat is a major one: the "free rider" dilemma. This dilemma is that if one can get the same benefits by acting individually as one can from acting in a group, why incur the costs of acting in a group? People do act as "free riders" so much of the time that groups are inherently unstable, and the proletariat does not act as the proletariat should act in Marxist theory.

This may seem to have taken us some distance away from the shipping industry and the Maritimes in the nineteenth century, but it is not so far after all. For this is the larger context of theory which must guide your approach to historical problems, and whatever constraints there may be upon your time, you cannot lose by pausing to consider the connections between your data and economic theory.