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The Atlantic Canada Shipping Project

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PANEL REVIEW

The Atlantic Canada Shipping Project

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Keith Matthews and Gerald Panting, eds., *Ships and Shipbuilding in the North Atlantic Region*, 1978; Lewis R. Fischer and Eric W. Sager, eds., *The Enterprising Canadians: Entrepreneurs and Economic Development in Eastern Canada, 1820-1914*, 1979; David Alexander and Rosemary Ommer, eds., *Volumes not Values: Canadian Sailing Ships and World Trades*, 1979; Rosemary Ommer and Gerald Panting, eds., *Working Men Who Got Wet*, 1980; Lewis R. Fischer and Eric W. Sager, eds., *Merchant Shipping and Economic Development in Atlantic Canada*, 1982; Lewis R. Fischer and Gerald E. Panting, eds., *Change and Adaptation in Maritime History: The North Atlantic Fleets in the Nineteenth Century*, 1985.

Quantitative Dimensions of Canada's Shipping

THE ATLANTIC CANADA SHIPPING PROJECT at Memorial University of Newfoundland has produced the six conference volumes listed above, in addi-

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tion to numerous additional journal articles since its beginning in the mid-1970s. The project was conceived as a major quantitative study relevant to the historical development of the Atlantic region. The maritime industries were large in international terms and have often been seen as crucial to that region. Furthermore, the decline of the industry in the fourth quarter of the nineteenth century seemed to accompany the relative decline of the region. Perhaps the failure of shipowners to adopt metal and steam was symptomatic of a failure of entrepreneurs in the region to adjust to new technologies.

One of the major contributions of the project to maritime history was to obtain and preserve the files of crew agreements deposited by law during the nineteenth century with the British Registrar of Shipping that were being discarded by the British Public Record Office. These files provide voluminous information not only about crews but also about ship movements. The official registry documents for the ports of Atlantic Canada were combined with this enormous documentary collection to form the archival basis for the project. The project members then spent several years creating computer-readable files from these two data sources. Together they provided a magnificent opportunity to survey the industry at an unprecedented level of detail.

The quantification that this has provided represents an important contribution to both the history of Canadian industry and to the history of nineteenth century merchant shipping because this sort of comprehensive information is required for reliable conclusions. The registries, after corrections for deficiencies in the original sources, yielded information about the quantitative dimensions and ownership of the fleets. This has been combined with biographical material to provide detailed evidence about the relationship between shipping and other activities in the ports of ownership (see particularly *The Enterprising Canadians* and *Merchant Shipping and Economic Development in Atlantic Canada*). Rigorous empirical study of the sources of capital and entrepreneurship in relation to the broader economy is now possible.

Computerized analysis of the registries has also greatly extended our knowledge of sailing ships during the last years of their commercial importance. In addition to providing detail concerning the nature of the labour force in merchant sail (see particularly the articles in *Working Men Who Got Wet*,) diligent analysis of the crew agreements of individual voyages delineates the deployment of ships over time. This provided clear evidence that prior to the period of decline beginning in early 1880s, Canadian-owned ships were overwhelmingly deployed in the North Atlantic. After 1880 they increasingly found employment in less central trades, particularly on the east coast of South America. The voyage details permitted calculation of time spent on various voyages and in port, an important element in productivity about

which there was scant previous knowledge. We learn that not only did the manning rates on Canadian ships decline in the third quarter of the century but so did passage times and times in port. By that time steamers had largely supplanted sailing ships in the carriage of premium cargoes. The economies that owners undertook as they concentrated on bulk cargoes, and the characterization by many shippers of sailing ships as the "cheapest warehouses in the world", led most scholars to expect an increase in passage and port time. The evidence to the contrary is conclusive (see particularly the papers in *Volumes not Values*).

The Atlantic Canada Shipping Project and its annual conference became the center for maritime history on an international scale. Invited scholars presented papers that placed the project in a wider context of world shipping, making the conference papers essential for anyone interested in research into maritime history.

A final volume presenting the conclusions of the research has not yet appeared. Many of the conference papers were acknowledged to have been working papers and criticism of the results presented may prove inappropriate. The papers, nonetheless, provide major contributions in the interpretation of a massive set of documentary sources that will serve as a firm foundation for further interpretation. This data analysis is presented with definitive thoroughness and candor. The broader interpretations that project members have provided is particularly hard to review here since it is impossible to distinguish the preliminary from the more fully considered results until a final volume is available. Furthermore, any broad interpretation will inevitably be subject to criticisms that are inappropriate for the data analysis.

In the narrow area of shipping I am uneasy about three areas of interpretation: the relationship of the initial growth of shipowning to the region's shipbuilding; the attempts to calculate productivity and profitability over time; and the nature of the industry's decline. Richard Rice's paper at the first conference demonstrated that a shipbuilding industry based primarily on sales to Britain developed prior to extensive ownership in Atlantic Canada. In their analysis of ownership and its growth over time members of the project are convinced that the development of the Canadian fleet after mid-century was qualitatively different from the earlier temporary ownership of ships built as speculation for the British market. Nonetheless it seems strange that there is little attempt to explore the links with the region's shipbuilding more fully. I am tempted to speculate that local shipbuilding was an important element in the industry's rapid rise and decline. Many owners appear to have lacked commitment to shipping (see Gerald Panting, "Personnel and Investment in Canadian Shipping, 1820-1889" in *Working Men* and Lewis R. Fischer and Gerald Panting, "Harbour and Metropolis: the Shipping Industry of Saint John and the Urban Economy, 1820-1914" in *Merchant Ship-*

ping). These individuals may have invested in shipping as one of a range of alternative assets. Local contacts provided reliable information that made shipping attractive. In this view the rise of shipping reflected the rise of local wealth channelled into shipping because of the information that local shipbuilding provided.

Calculations of productivity and profitability, crucial to many of the analytical conclusions of the project, worry me greatly. Obviously the analysis required calculations of output and revenue (see papers by Alexander, Sager, and Fischer in *Volumes not Values* and by Sager, Fischer and Ommer in *Merchant Shipping*). These help to give an overall sense of the magnitude of the fleet as an economic whole. To explore productivity change, output per average vessel was calculated. This is an unfortunate productivity measure. Productivity measures output per unit of one or all inputs. A ship was not a constant unit of input since average size increased over time. Increasing output per ship reflected increased capital and labour inputs as well as increases in their productivity. In places the interpretation seems to overlook this.

Profit estimates were calculated from information on freight rates and operating costs (see Fischer, Sager and Ommer, "The Shipping Industry and Regional Development..." in *Merchant Shipping*, pp. 37-45). These calculations indicated very attractive rates of return on assets. The mid-range estimates of return on the depreciated value of assets were 31% in 1871, 14% in 1881, 22% in 1891. This led to the conclusion that low and falling profits were not a primary cause of the industry's decline.

These estimates of high profits underlie many of the subsequent analytical conclusions regarding shipping and the regional economy. It is, therefore, unfortunate that these results must be seriously questioned. Profits were calculated by subtracting an estimate of costs from an estimate of revenues. The cost estimate seems quite reasonable. The same cannot be said about the revenues. Earnings per day were estimated as the freight rate on grain from New York to Liverpool divided by the typical passage time at sea. Annual earnings calculations assumed that if a ship were successful in obtaining cargo in both directions across the Atlantic it would earn this rate daily except while in its "home" port—Liverpool. In recognition of the unlikeliness of a ship finding cargo on all voyages by this period, estimated revenue was based on the assumption that in 1871 the average ship would earn revenue 75% of the time; in 1881, 65% of the time and in 1891, 55%.

Plausible as this calculation at first appears, it is not acceptable. Let us glance briefly at the numbers. In 1871 the average North Atlantic voyage involved a passage of 51.4 days from Liverpool to New York, 21.3 days in New York, and 28.3 days back to Liverpool. The ship remained in Liverpool for 24.1 days before departing again (*Volumes not Values*, pp. 136-8).

The profit calculation used assumes that in the total 125 days the ship earned 3.6 (101/28.3) times the New York to Liverpool freight if fully employed. This is clearly incorrect. It is much more likely that the ship only earned the New York to Liverpool freight. Although charters were liable to pay demurrage for excessive delay, there was no additional revenue from normal time in port. Furthermore, because the average westbound passage took some two-thirds longer than the average eastbound passage, westbound earnings were far below eastbound. The only well-paying westbound cargoes were passengers and high quality manufactured goods, both of which had been completely captured by the steam liners. Competition from sailing ships with excess capacity drove freights on such westbound cargoes as were available to very low levels. In the 1860s the records of William Thomson and Co. of Leith (in the University of Edinburgh Library) show ships in the timber trade carrying coal on the owners' account, presumably as much for ballast as for revenue.

In the table below I have presented two more realistic calculations along with the middle range estimate by Fischer et al. The first calculation assumes that the ship only earned revenue eastbound; the second that it earned half as much westbound. This second calculation probably exaggerated earning possibilities on the North Atlantic in 1871 and certainly does by 1891. Also included are operating costs (wages plus other costs), and depreciation, both from Fischer et al., and estimated net operating revenue (revenue less operating costs). The first calculation, which I think is closest to the truth, shows operating losses in 1871 and 1881—perhaps reflecting the ongoing process of steam domination in the North Atlantic. Even an assumption of half the eastbound earnings on the westbound voyage leaves no margin over depreciation. New shipping certainly did not appear to be an attractive investment.

Table 1
Alternative Calculations of St. John Profitability
('000)

	1871	1881	1891
Operating costs	$1190	$945	$348
Revenue: a.East only	1023	866	533
b. West = 1/2 East	1534	1299	800
c. Fischer et al.	2747	1802	943
Net Operating Revenue: a.	-167	-79	185
b.	345	354	452
c.	1550	857	595
Depreciation	351	379	201

Even if my profit figures are accepted, the question remains: why did local capitalists not invest in metal and steam? The technology of trade and communication increasingly favored management concentrated in the centres of commerce and communications, particularly in Britain. Ship managers in Atlantic Canada moved their base of operation to Britain. Samuel Cunard is only the most prominent. Under these circumstances shipping ceased to be an attractive outlet for local wealth because the owner was increasingly separated from information, management and control of his assets.

The assertion that shipping was highly profitable is central to the project's interpretation of the relationship between the maritime industries and the greater Atlantic Canadian economy. The maritime industries are seen to rise in prosperity as a manifestation of growing wealth and entrepreneurial vigor. The profitability figures indicate that the later decline was not the result of the collapse of an insolvent industry. Since the industry is seen to have been profitable in its decline, the shift in investment had to be in response to even more attractive alternatives. This view is in sharp contrast to a picture of regional decline in response to forestry depletion and changing shipping technology beginning before mid century (presented most comprehensively by Peter McClelland in his 1966 Harvard Ph. D. thesis). This interpretation sees depletion as a real problem to the economy whose prosperity had been based on a staple. To McClelland, local ownership arose because the profitability of selling ships in Britain declined as a result of competition from metal hulls and steam power. Local builders accepted ownership as the best remaining alternative. The evidence that the project has accumulated on ownership and the growth of the fleet in the third quarter of the century demonstrates that this view is too gloomy. My alternative suggestions on profitability, however, imply a gloomy interpretation of the industry's decline. At best, new wooden ships ceased to be an attractive investment in the last quarter of the century; at worst, investors in the region suffered large capital losses as competition from improving metallurgical and engineering technology drove ocean freight rates down.

Although the final conclusions are not yet available, some things are clear. The project has made undeniable contributions to the history of the region and the history of merchant shipping, as a unique study based firmly on detailed analysis of comprehensive data sources. The profit calculations are among the few that can be criticized. This is particularly unfortunate since much of the interpretation of the industry's decline, and its place within the regional economy, depends on the industry's profitability. Those of us who have followed the project over the years have learned much from it. We now await the promised comprehensive volume that will tie the conclusions together. This will provide the opportunity to present final versions of the many still incomplete investigations reported in the conference volumes and

also to present considered conclusions now the research is complete. This will, however, require a careful reconsideration of the profit calculations. Either a more careful investigation will confirm continued profitability and convince the skeptics, or some alternative interpretation will have to be entertained. I look forward to interpretations that will stand on the same firm footing as the results that have emerged from the careful empirical work. (C.K.H.)

The Enterprising Canadians: An Outsider's Thoughts on the Atlantic Canada Shipping Project.

Economic history textbooks invariably stress the importance of the so-called transport revolution. In many cases, however, this seems simply to be a useful phrase under which a number of factors can be categorized and then ignored. Some discussion of railways is not uncommon, but the most important aspect of this "revolution", the tremendous technical development of marine transportation, is only rarely touched upon.

This lack of discussion reflects a lack of interest: shipping has not been one of the favourite topics of "New Economic History." There may be many reasons for this, but one of the most important is the difficulty of collecting the quantitative data which is needed to construct production statistics. Shipping, being international, is a much more complicated matter than, say, the manufacturing industry or railways, which can be covered by single national statistics. On the other hand, although study of shipping is difficult it can, when properly conducted, yield rich returns: the economic history of almost any national fleet is also a study of international shipping.

The Atlantic Canada Shipping Project is well worth this lengthy introduction, because it undoubtedly is such a study, a study which will be of tremendous importance not only to the history of the shipping industry but also to the study of the "transport revolution". But one should note that the full value of the project depends, not only on its objectives but also, and importantly, on the way it is being executed: on the systematic and extensive collection of data and the high degree of sophistication involved in both its methodology and its theoretical approach. Compared with the nostalgic and antiquarian spirit of older (but still common) maritime history studies, these features represent a definite step towards modern economic history. Of additional merit are the annual workshops or conferences which the project has organised since 1977. They have resulted in a number of publications which have allowed those who were not participants to benefit from the project's work.

Indeed, the six volumes published so far make a very valuable collection of up-to-date articles on Atlantic shipping before World War I. As confer-

ence proceedings they, of course, have some limitations: the papers are so diverse that they do not always form a logical whole, and even though each volume has a special theme, it cannot be regarded as exhaustive and complete. On the other hand, what is lost in coherence is won in the richness of the different approaches and methods. For a student of maritime history — or anyone who wants to know what is going on in this field — these volumes are a must.

My intention is not to give here a critical review of the publications — it would require too much space, and is, indeed, beyond my competence.[1] I would like only to point to some especially interesting contributions. *Volumes Not Values* (1979) contains three important papers on the productivity of Canadian shipping (David Alexander, Eric W. Sager and Lewis R. Fischer). In *Merchant Shipping and Economic Development in Atlantic Canada* (1982) these productivity calculations are brought one step further (Sager, Fischer and Rosemary E. Ommer) in an attempt to evaluate the gross revenues and contribution to total production of shipping in certain ports. This volume also contains two good papers on the economics of shipping (C. Knick Harley and R.O. Gross). Perhaps the most useful of all the volumes — at least for the "general" reader — is the most recent one, *Change and Adaptation in Maritime History: The North Atlantic Fleets in the Nineteenth Century* (1985). It is a virtual textbook of American, British, German and Scandinavian shipping for the period 1850-1913. A special case among the publications is *Working Men Who Get Wet* (1980), a volume dedicated to seamen. It can perhaps be called a by-product of the project, but sailors are regarded not only as labour but also as a distinct (international) social group. As most of what has been written of seamen and their conditions of life has not been, strictly speaking, scientific study — I may just mention Alan Villiers' interesting observations in *By Way of Cape Horn* — this is a valuable contribution.

In all the volumes the papers presented by the members of the Atlantic Canada Shipping Project stand out as empirically well-founded and contain much new data which cannot be found in the printed sources, as well as revisions of the "official" figures. An example of the latter is the figures of registered tonnage for those ports which have been studied in detail: as registrars cleaned their books (perhaps once in a decade) there was a fluctuating number of "ghosts" in tonnage figures, and these have been corrected. By far the most valuable data are, however, the crew lists since 1863, because they reveal many things about which the official statistics have never supplied any information. Above all they tell of the voyages, that is the end product of shipping, and do so in such detail that not only ports of departure and destination, but also time spent at sea and in harbour, can be examined. They also give information on the number and wages of the crews.[2] This means that the project has a far better chance of calculating relevant

production figures than those studies which are contented with official statistics, which usually only give entrances and clearances to and from the ports of a country.

Yet there are still many difficulties to be overcome before reliable figures for gross revenue and the value-added of shipping services can be presented. The project seems to have relied mainly on macro-level accounting in order to arrive at these results — at least I have not noticed any systematic use of private accounts-books. Two different methods have been used: one, which could be called a short-hand method (obviously developed by David Alexander), uses the rates of *growth*: that is, the growth of gross output is estimated from the growth rates of entrances into ports, vessel size and freight rates. The other method (Fischer) uses actual values: the tonnage of vessel and freights paid in grain trade from New York to Cork for orders form the basis of calculation, and allowances are made for vessel utilization ("lading factor"), the actual amount of cargo carried per registered ton and the time of utilization per year (which seems rather complicated but obviously depends on the way the freight rates have been calculated). The weak point of the former is that it gives equal value to all entrances irrespective of the length of the voyage (if I have understood it correctly), while the latter supposes that all tonnage had freight earnings comparable with one single — though important — trade.[3] Such approximation can never be avoided — unless we have a representative sample of account-books — and, as usual, the weak point is the transformation of physical quantities to monetary values. It would be very useful if the transport output could be expressed in physical volumes as well, that is, the production measured as ton-miles (ton meaning here, reg. ton) in addition to dollars. This would be a nice service for all those who may doubt the validity of the freight rate series used here, and, moreover this method gives a real measure of production — it tells what the shipping actually did produce, irrespective of how much it was paid at different times. This measurement of ton-miles has just one weakness: it does not take into account loading and discharge, which, however, in typical charter-parties of the time were included in the freight, and were, indeed, a substantial share of total performance.[4] At any rate, the estimation of gross revenue can be made a little easier if we start with a measure of real production such as ton-miles: at least, then, we do not need any lading-factor or time of utilization factor.

As gross revenue inevitably is a result of approximate calculation, figures on value-added will unavoidably be even more uncertain: to arrive at them we have to deduct costs which cannot be precisely determined. In Lewis Fischer's paper, "other costs" have been calculated as three times wages, and this, indeed, is a ratio which sounds very probable and corresponds quite well with the Finnish material with which I am familiar. But in Fischer's calcula-

tion this results in a value-added estimate which is two-thirds of gross revenue, far more than I would have thought possible. In Finnish and Swedish calculations, value added for sailing ships has been taken as 50% of gross revenue, and for steamers as 30-35%. Of course I cannot claim that these calculations are better than Fischer's, and furthermore, his estimates of gross revenue are per ton not very different from gross income in Finnish sailing ships. However, it would be very useful, and make comparison easier, if all the figures on income, costs and profit could be expressed per ton, and separately for different size-classes as well.

The project has made me aware of numerous similarities between the development of shipping in Canada and Finland, and I have also noted with particular satisfaction, that most of the conclusions drawn by the members of the project have been rather similar to my own: I hope this does not impair my objectivity! Finnish shipping grew with the export of stable products, first tar and then saw wood. In this respect the best parallel to Canada is Ostrobothnia, which for two centuries produced most of the tar exported from Sweden ("Stockholm tar") and, later, from the grand duchy of Finland. Before 1776 Ostrobothnians could sail only to Stockholm, but as foreigners were not allowed to sail to the Gulf of Bothnia, they had, in effect, a monopoly of tar-transport to the capital. The Ostrobothnians were also important shipbuilders for the burghers of Stockholm. During the 19th century, however, the ties of shipping and staple production were loosened, apparently simply because international tramp shipping became a much more lucrative alternative. This meant that, in normal years, 80-90% of Ostrobothnian ships made most of their voyages in the cross-trades, and the interest in domestic export cargoes diminished to such an extent that an increasing share of these had to be transported in foreign ships. Thus, not only Ostrobothnian, but most of the Finnish shipping as well, became a part of international shipping — exactly as happened in Canada. In both cases, the development culminated in the 1870s (around 1870 Finland was, in terms of tons per capita, fifth in the world while Canada was second), and the growth of shipping obviously depended — as indeed has been suggested in a couple of papers by the project members — on comparative advantages. Both Canada and Finland had plenty of good and cheap timber (Finland had also very cheap labour), and therefore the capital costs of shipping remained modest. And in both cases the coming of iron steamships destroyed this advantage: the greater it had been, the greater was the new disadvantage. In Finland the price of imported steamships was three times as high per net ton as the newbuilt cost of wooden sailing-ships (it would be interesting to know how great the price differential was in Canada), and quite soon, when the demand for sailing ships collapsed, the difference became greater still. This naturally meant that the capital, and especially the opportunity

costs, of steamshipping were unreasonably high, and thus it is no wonder that the transition from sail to steam was extremely slow both in Canada and Finland.

In Canada the new situation led to a rather rapid decline of shipping — exactly the same happened in Ostrobothnia — and the Shipping Project has quite logically concluded that this was because landward opportunities became more appealing. In this respect, too, the Finnish experience seems to give support to such a conclusion: traditional ocean shipping lived on only in the Aland Islands and some nearby coastal regions,[5] which did not experience any proper industrialization.

These rather hasty observations show, I hope, how fruitful it can be to compare maritime development in different regions. The contribution of the Atlantic Canada Shipping Project does, of course, go much farther: it will inevitably shed a lot of new light on the development of the international shipping industry in its period of great transformation. I hope we will see more results from this project in the near future. (Y.K.)

Notes

[1]One minor thing I must, however, say: the tables are not always as clear as they should be — there is, indeed, more than one case in which the table heading lacks important information (e.g. it is not always clear whether the "tons" referred to are registered tons, measurement tons, displacement tons, etc.) or is in some other way difficult to understand.

[2]Would it be possible to combine the data on registered vessels and voyages? It could be extremely useful, as it would give a superb means of cleaning out the "ghosts".

[3]One great problem in this respect is that different commodities require different amounts of cargo space, and "stowage factors" can therefore be very different. Relatively light commodities which can be carried on deck are different for sailing ships and steamships. So a sailing ship could, for example, rarely carry more than 0.5 standards of sawn wood per net ton while the rate for a steamer could be 0.8 stds.

[4]The freight-rate per mile was always higher for short than for long voyages — see e.g. C. Knick Harley's paper (1982) — and the differences depended on the different share of harbour activities (but of course also on the market situation). It is suggested that, for example, in the grain trade these harbour activities could be compared to some 1200-1300 miles of plain sailing, and in the coal trade to more than 2000 miles.

[5]They actually bought quite a lot of ships ("Nova Scotia men") from Canada.