WORKING MEN WHO GOT WET

Edited by

ROSEMARY OMMER GERALD PANTING

Maritime History Group

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IN MEMORIAM

DAVID ALEXANDER

1939-1980

Editors' Note

This volume is dedicated to David Alexander, a founding member of the Maritime History Group and a Principal Investigator in the Atlantic Canada Shipping Project. The lead paper in the volume is the last essay he wrote and it is published here unchanged from his last draft. The paper was read at the Conference the day before he died and the Certificate of Merit was presented to him that same day.

Although he died with his work for the Project unfinished, his influence will continue to be felt in this undertaking and the debt of other Project members to him is immeasurable. The Atlantic Canada Shipping Project, the Maritime History Group, Memorial University, Newfoundland, Canadian and indeed international scholarship will be the richer for his contributions and the poorer for his passing.

CERTIFICATE OF MERIT — DR. DAVID ALEXANDER

presented by Julian Gwyn (Canadian Historical Association)

I want to present David Alexander with a Certificate of Merit which, in fact, he was awarded this year for his work in regional history. Every year the Canadian Historical Association makes a number of such presentations and his name was included among those who received this Certificate in June at the annual meeting of the Canadian Historical Association.

I would propose to read to you the citation which went with this Certificate of Merit, as agreed by the Committee on regional history.

"Through his numerous articles in *Acadiensis, The Journal of Canadian Studies,* the Canadian Historical Association's *Historical Papers* and *Canadian Forum,* Professor David Alexander has established himself as the leading authority on the history of the Atlantic Provinces after Confederation. His most recent book, *The Decay of Trade,* is the most important study yet written on the economic impact of Confederation upon Newfoundland. Professor Alexander has also been the guiding light behind the Maritime History Project at Memorial University, providing the intellectual leadership for a group of younger historians whose work has begun to reshape our understanding of the economic history of the Atlantic Provinces."

The scroll will be presented to him by Philip Buckner later today.

DR. STUART PIERSON

It is my sad duty to inform you that David Alexander died this morning, just before 3 a.m. His wife, his mother, Kay Matthews and his doctor were with him. You all know Dylan Thomas's poem:

> Do not go gentle into that good night...
> Grave men, near death, who see with blinding sight
> Blind eyes could blaze like meteors and be gay,
> Rage, rage against the dying of the light.

And he did not go gentle; he was not finished. He had so very much to do. He had so very much to say to us. He had so very much to give to us. You here at this Conference know what David has done.

I think there is no need, on this occasion, to review his work, or his thinking or his 'contribution'. Rather, let me tell you an anecdote or two which I hope will illustrate his character. In the Fall of 1961 David, having got his Bachelor of Arts degree at the University of British Columbia in Victoria the Spring before, enrolled in a graduate seminar at the University of Washington in Seattle. The seminar was led by Professor Gordon Griffiths of the History Department there and it was to meet weekly to discuss Renaissance Political Theory, historically considered, 16th century. The students who gathered around the table for the first meeting were more or less casually dressed, some even affecting such a studied Bohemian indifference to the age, cleanliness and colour coordination of their apparel as to mark them undoubtedly as students, for they could not be anything else. None of the other students had ever seen David Alexander before. David was there in proper flannel trousers, a dark blue V-neck sweater with shirt and tie. Professor Griffiths explained the subject matter of the course and mentioned some of the questions it was going to raise, issues of church and state, theories of political authority, the right of resistance, that sort of thing. It sounded thrilling — in that special way that fine sounding abstract problems have before you get to them. The students were, most of them, very pleased, as it were, to be aboard. But it was the first day of school, the day for vague instructions to be handed out, followed by rapid dismissal and retirement to the coffee shop. "Are there any questions?", Professor Griffiths asked. Five seconds, let us say, of silence, then the first words I ever heard David Alexander speak — "Yes, *what exactly* do you want us to do for next week?" Gone the breeziness, gone the game. The man had a way of raising the level of seriousness of any discussion he took part in.

In the 18th century, Dr. Johnson remarked of a very famous man, a very famous Englishman of the 18th century, Edmund Burke: "Burke, sir, is such a man that if you met him for the first time in a street where you were stopped by a drove of oxen and you and he stepped aside to take shelter but for five minutes, he talked to you in such a manner that when you parted, you would say that *this* is an extraordinary man." David Alexander was such a man. Last Thursday Eric Sager telephoned me in the morning to say that David had had a very bad night and that he was not likely to live very many more days. As I had not seen David for a week or ten days, I went to him as soon as I could, and could see that he was indeed in very rough shape. I took his hand and cried a little. David said, "Stuart, don't do that, it only makes things worse" — he was *always* right. There was an embarrassed silence on my part. David, who had had an injection of morphine shortly before, dozed for five minutes then roused himself to say, not anything about final matters of life and death, no metaphysical speculations — and this is where the horrible and comic meet — "What colour", he asked, "are you going to paint your house?"

On Monday the 26th of November, 1963, at 9 a.m. Professor Leonard Wilson walked into his History of Biology class — this was at an American University — to begin his lecture on Galenic medicine. John Kennedy had been shot on Friday and national life virtually stopped over the weekend — grief and shock, as today. Wilson, who is southern Ontario Scotch, resembles David Alexander in many ways — in his uprightness, in his industry, in his search for clarity and order, in his never having an axe to grind and in his stern compassion. Leonard Wilson strolled in as usual, read two passages from the Bible, and said "and now I think the interests of this republic will be best served by our getting down to our daily work." With that he proceeded to lecture on Galen.

Now Wilson differed from David in an important way. Wilson would take a small glass of sherry on special occasions; David on the other hand, while I would not have called him a bibulous man, neither would I have called him an abstemious man.

May I therefore suggest to you who knew and loved him that you lift a glass when you can to his memory. He would have appreciated that. Meanwhile, to paraphrase Leonard Wilson, I think we can now best serve the memory of David Alexander by getting down to our daily work. He would have appreciated that too.

EDITORS' NOTE

This is the fourth volume of papers from the annual workshops of the Atlantic Canada Shipping Project. Having focussed in past conferences on the nineteenth century merchant fleets of the North Atlantic, entrepreneurs and economic development in nineteenth century eastern Canada and, last year, on the great bulk trades of that era, this volume is concerned with understanding the labour force on Canadian vessels of that time within the wider international context. Alexander's paper on literacy among crew members of the Yarmouth fleet opens the volume and sets the theme of sailors as a labour force like others of the century in many respects, other than the marine nature of their workplace. McMurray's paper continues the discussion with an examination of the status of the ship's engineer within this sea-going labour force but derived in part from the landward technological revolution which made the marine engine possible. Fischer's paper looks at crew members who deserted their seaward employment, while Matthews, by contrast, examines crew retention and persistence among the employees of the merchant fleet of one British firm. Williams and Sager both examine man-ton ratios in the nineteenth century, with Williams studying the wider context of the sailing ships of the day whose commerce took them through Liverpool, while Sager focusses on the Halifax fleet and savings in labour as part of a measure of productivity in the Canadian merchant marine. Ommer looks at nationality and regional bias in the crew composition of the Windsor fleet, while Battick draws a profile of the seamen from one small corner of New England. Dixon provides an examination of lascars, a section of the labour force at sea with some of the characteristics of a class and a distinct ethnic group. McKay, Fingard and Panting all focus on features of the landward side of this marine labour force, McKay looking at waterfront craft organization, Fingard at supply and demand factors affecting this pool of labour and its organization through crimping. Panting provides a regional picture of the ownership and investment patterns behind the Canadian merchant marine. From this collection of essays and the discussions surrounding them, a preliminary picture begins to emerge of the nineteenth century sailor and the economic context within which he operated. It appears as though many of the problems with which the industry wrestled were those which concerned most nineteenth century enterprises: productivity, technological change and labour supply, for example. It was the marine environment in which they were employed, rather than something in the nature of seamen themselves, which distinguished this labour force from others of the nineteenth century, and which gives this collection of papers its title of 'working men who got wet'.

We wish to acknowledge the assistance of all those people whose joint efforts this volume represents. In particular we wish to thank our colleagues in the Maritime History Group, Heather Wareham, Janet Bartlett, Roberta Thomas, Doris Pike and all the staff. We are grateful to Mary Langhout and Elaine Pitcher for converting the original typescript into print. Gary McManus and Kevin Tobin drafted the figures. The Social Sciences and Humanities Research Council has provided the support for this project and its conferences and Memorial University of Newfoundland provided the funds for publishing the proceedings. Our debt to the late Dr. David Alexander, and our loss at his passing, are incalculable.

Rosemary E. Ommer
Gerry Panting
St. John's, October 1980

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CONTENTS

1. LITERACY AMONG CANADIAN AND FOREIGN SEAMEN, 1863-1899

DAVID ALEXANDER

Maritime History Group

LITERACY AMONG CANADIAN AND FOREIGN SEAMEN, 1863-1899

David Alexander

I

Dr. Johnson undertook two short coastal voyages during his lifetime and this was sufficient for him to establish views about life at sea which were as firm as the others which he held. As he said to Boswell, "A ship is worse than a gaol. There is in a gaol, better air, better company, better conveniency of every kind; and a ship has the additional disadvantage of being in danger." When men came to like a sea life, he said, "they are not fit to live on land." It happens that "Men go to sea, before they know the unhappiness of that way of life; and when they have come to know it, they cannot escape from it, because it is then too late to choose another profession; as indeed is generally the case with men, when they have once engaged in any particular way of life."[1]

On the last point Johnson was quite wrong. In the American merchant marine at the end of the eighteenth and beginning of the nineteenth centuries, the median age of seamen was between twenty two and twenty four years and the average length of service about seven years.[2] Data from the 1801 census suggest a very similar pattern of behaviour among Norwegian seamen,[3] as does the information on Canadian and foreign seamen in the late nineteenth century which is presented later in this paper. Relatively few men out of the total seafaring population pursued the ocean trades past their twenties or early thirties and so, contrary to what Johnson said, most escaped from whatever horrors and perils it entailed.

But were the nasty aspects of life at sea the reason for the youth and instability of the labour force? From the nineteenth century there is a huge literature of memoirs written by American and British mariners — far larger without doubt than can be found for any other sector of the economy. Some of it, written by evangelical converts, describes conditions far worse than ever Johnson might imagine;[4] but most of it, while emphasizing the hardship and brutality of a seaman's life, tends to a perverse pride in that fact and concludes that it was as honourable and worthy a life as any working man might hope to find.[5] The literature is repetitous and, whatever the moral stance of the writer, there is common agreement on many points. For sheer thuggery and abuse American ships, including

colonial American ones, surpassed the British, although they were far better provisioned. Secondly, seamen were inclined to improvidence when ashore and were the frequent victims of unscrupulous lodging house keepers.[6] And thirdly, the social conditions for seamen on board and ashore began rapidly to improve in the last quarter of the nineteenth century.

Apart from saying that 'Jack' was badly put-upon and was commonly drunken on shore and violent when on board, the contemporary literature does not provide a very clear portrait of who these men were — where they came from, their education and the social and economic circumstances of their families. Among the Americans who made their way from forecastle to command, the impression is that they entered the industry from respectable families and with a typically thorough New England education. For example, William Paddack who went to sea in the 1850s had been to a primary school from age six, an intermediate school from age nine to fourteen and an academy for two more years.[7] Similarly John Whidden, who went to sea around the same time, claimed to be "a fair scholar, well up in reading, writing, and geography, fair in arithmetic, and intensely interested in books of travel and adventure...."[8] By contrast, Captain Samuels, who ran away as a young boy from a difficult home and who lived and pursued for some years a most violent life, eventually rose through the ranks by means of self-education.[9] His experience seems closer to that of the British seamen of Runciman's experience. "Books, other than the Bible," he wrote, "did not interest them. Indeed, some of them could not read or write...."[10] Runciman himself left school at age twelve and found it a difficult task to master the technical material necessary to pass the Board of Trade examinations.[11] His experience was apparently a common one, for he knew a large number of first-class captains from Blyth who had no benefit of "any school education at all...."[12] One of them could hardly write, but the shipowner did not mind since the "faculty of letter-writing did not get his ship to and from and out of port expeditiously."[13] But with character, determination, at least an elementary education and with the assistance of the mates and master, a boy could learn in the forecastle what was necessary to become an officer. As the American Samuels wrote, once he had decided to rise to the quarter-deck to order others about rather than being kicked about himself,

> I went to work with a will. Every spare moment was occupied in the study of Bowditch, and by...dint of extraordinary application I had been taught enough navigation to fit me to be an officer.[14]

Given the condition of forecastle on most sailing ships the dint of application would need to be extraordinary indeed.

The men who made the transition from forecastle to quarter-deck were the exception, certainly in character and determination. Most did not make the effort and the portrait offered of their characters and attributes is frequently an unattractive one. The editor of one set of memoirs argued that the decline in seafaring among the American population was a functin of the increasingly depressed and depraved quality of recruits. From the 1840s, it was said, parents were increasingly reluctant to apprentice their boys because "ships were now manned more and more by foreigners, drawn all too generally from low, ignorant, unambitious classes."[15] In both America and England the impression was held that a better class of man sailed on the coastal than the foreign-going vessels.[16] But this may have reflected nothing more than xenophobia and Runciman's depiction of typical seamen has the smell of truth about it:

> The popular idea...was that these old sailors...were a hard-drinking, hard-swearing, and hard-working race. This belief is delusive; many of them were afflicted with both the former vices, but a large proportion...were not.... It is a curious thing that landsmen always seem to associate sailors with vices that are practised to a larger degree by a certain class of shore workmen....[17]

If Runciman is right, then the implication is that seamen were drawn randomly, in terms of social background, moral character and education, from the working classes of their respective countries. If life at sea was unusually brutal, degrading and poorly paid relative to shore-based opportunities for the working class, then there should be some evidence to show that seamen were a particularly depressed *lumpenproletariat* forced by lack of alternative into a life which was worse, according to Johnson, than a term in prison.

To establish the matter one way or another implies a task of research which is quite monumental. Something much more modest is intended here, namely to estimate the level of literacy among seamen, to compare this with national literacy rates and to establish, in the few ways that are possible, whether the level of literacy (the possession of at least an elementary education) was related to performance and behaviour. If seamen were substantially less well educated than the labouring classes from which they were recruited, then there would be reason to suspect that they did represent a distinct, depressed sub-population. If this was not the case, then there is support for Runciman's suggestion that they were no different, no worse and no better than those who stayed ashore.

The ocean-going ships of the port of Yarmouth, N.S. offered over 100,000 crew positions between the early 1860s and the turn of the

century. Data on the personal characteristics and performance of almost 50,000 of these men (and a few women) have been collected from the Agreements and Account of Crew. From this, two random samples of three thousand each, stratified by decade of service, have been selected. One represents seamen born in British North America and the other seamen born elsewhere in the world. From these samples it is possible to draw some inferences about the characteristics of the population of men who manned the port's vessels and to explore whether evidence about the level of their education in any way affected their performance. The evidence which relates to educational status is unavoidably crude and incomplete, as it is limited to whether or not the crewmember was able to sign his name to the crew agreement. Generally in the literature the ability to sign one's name is taken as a 'middle estimate' of literacy.[18] That is, fewer people could sign their name than the number who had some capacity to read, while more people could sign their names than were able to read and write with fluency. In the case of seamen the need to sign one's name probably occurred more often than was the case in the vast bulk of manual occupations. It is not unlikely, therefore, that some fraction of the crew who signed had learned this simple skill while never acquiring, or forgetting through infrequent use,the more general skills of literacy. In an effort to cope with this possibility an attempt was made during the coding process to distinguish between those who signed with ease and those who did so with difficulty. The distinction, however, proved to allow far too much variance in judgment upon the part of the coder to provide a convincing measure of relative levels of literacy. Hence it is necessary to fall back on the simple dichotomy that those who signed were literate, in the sense that they had some capacity to read and write, while those who did not had no ability to write and no or little ability to read. Given that some illiterate seamen probably had learned to sign, the estimates of literacy generated in this paper probably overestimate its extent relative to literacy estimates derived from signature rates in documents such as parish registers.

II

Employment in the shipping industry was dominated by young men, as Table 1 shows. Over eighty two per cent of the Canadians recruited in 1865-69 were under thirty years of age as were seventy two per cent of the foreigners. Men in the 20-29 year group were always the largest single cohort, but over the years there were significant age shifts, especially among the Canadians. By the second half of the 1880s very few Canadian boys under fifteen were going to sea on Yarmouth vessels and by 1890-94 the percentage of young Canadians aged 15-19 in the crew had dropped

by sixty eight per cent compared with 1875-79. This was clear evidence that from the 1880s a career at sea was no longer regarded as a promising future for young Canadians. At a still earlier point, recruitment of men in their twenties had also fallen off. The proportion of Canadian crew in their twenties fell by forty two per cent between 1865-69 and 1890-94. There was accordingly a sharp increase in the proportion of Canadian crew who were in their thirties, forties and even older, and the trend remains pronounced when officers are removed from the analysis. For example, in 1865-69 eighty five per cent of the Canadian deckhands were under thirty, but only fifty two per cent by 1890-94. The evidence is suggestive that over the three decades Yarmouth vessels were gradually losing a Canadian labour supply.

Among the foreign crew the recruitment of boys and young men aged 15-19 held up much better as a percentage of the total labour force. But as with the Canadians there was contraction of the proportion of crew in their twenties, from sixty three per cent in 1865-69 to fifty two per cent by 1890-94. There was not among the foreign crew a significant increase in the proportion of men in their thirties, but there was a sharp increase in the

TABLE 1

AGE COMPOSITION OF CREW

Age	1865-69	1870-74	1875-79	1880-84	1885-89	1890-94
			Canadians			
9-19	16.0%	16.1%	17.6%	13.3%	10.0%	5.6%
20-29	66.6	56.8	52.8	51.7	44.2	38.7
30-39	15.0	21.7	24.9	24.8	30.6	29.9
40-49	2.2	4.8	4.1	9.2	11.2	18.6
50+	0.3	0.6	0.5	1.2	4.0	7.2
N =	320	627	587	778	249	124
			Foreign			
9-19	8.8%	9.1%	9.3%	8.7%	7.3%	10.2%
20-29	63.3	59.0	59.1	54.5	51.7	51.6
30-39	19.4	22.5	22.8	23.4	23.7	20.7
40-49	8.0	7.7	7.6	11.0	14.9	13.9
50+	0.4	1.7	1.4	2.7	2.4	3.7
N =	237	529	649	659	342	217

Source: Yarmouth computer files

share who were forty years of age and older. Quite clearly the labour force was aging. In 1865-69 some seventy four per cent of the crew, Canadian and foreign, was under thirty years; this fell to sixty nine per cent in 1875-79 and steeply to fifty nine per cent by 1885-89. Either the sailing ship fleet of Atlantic Canada was increasingly unattractive to young seamen, native and foreign, or a career at sea was becoming for more men a lifetime occupation rather than something that was abandoned precipitously in one's late twenties.

The crew was overwhelmingly drawn from Western Europe and North America, which were also the focal points of fleet traffic. Interpolating from the samples to the national composition of the crew, the most notable change was the decline of the Canadian component from nineteen per cent in the 1860s to ten per cent in the 1890s, most of which was attributable to the withdrawal of Nova Scotians. The U.S. component also dropped sharply from sixteen per cent in the 1860s to eleven per cent in the 1870s and 1880s. Canadians and Americans were replaced by a sharp increase

TABLE 2

DISTRIBUTION OF CREW BY NATIONAL ORIGIN

Nationality	1860s	1870s	1880s	1890s
Canadians	19%	16%	15%	10%
Nova Scotia	12	11	10	5
New Brunswick	5	3	3	3
Newfoundland	1	1	1	1
Other Canada	1	1	1	1
United States	16	11	11	9
West Indies	1	1	1	2
United Kingdom	35	31	32	36
Scandinavia	14	21	20	20
Germany	6	5	7	6
Low Countries	1	3	2	4
France	1	2	2	4
Southern Europe	2	3	1	1
Other Countries	5	8	8	10

Source: Yarmouth computer files

in Scandinavians from fourteen per cent to around twenty per cent thereafter, while the United Kingdom share of the crew was relatively stable at about a third. The most striking point about the distribution is that the U.K. and Western Europe together supplied about two thirds of the labour force compared with only about a quarter from the Atlantic Coast of North America.

There were two reasons for the heavy participation of foreigners in Yarmouth's vessels. The first is that the vessels mainly worked out of foreign ports and this must have limited the opportunities for local men to participate, especially if they were not trained as officers. Only eight per cent of the deckhands were recruited in Canadian ports, compared with a huge forty one per cent in the U.K., thirty per cent in the U.S.A. and seventeen per cent in Europe. In Canadian ports Canadian seamen were recruited at more than twice the rate of foreigners, but ninety two per cent of the positions were offered outside the country, and eighty two per cent of the positions taken up by Canadians were therefore located abroad. In these circumstances it was inevitable that a very large fraction of the crew would be foreign.

TABLE 3

RECRUITMENT OF CREW, EXCLUDING OFFICERS

Ports	Canadian	Foreign	All
Canadian	17%	7%	8%
U.K.	46	40	41
Europe	13	18	17
U.S.A.	22	31	30
Other	1	4	4

Source: Yarmouth computer files.

The second and more important factor explaining the magnitude of foreign recruiting, however, is simply a matter of potential labour supply, for the participation rate of Nova Scotians and New Brunswickers vastly outstripped that of any other national group.

TABLE 4

CREW PARTICIPATION RATE PER 10,000 OF AVERAGE POPULATION, 1870-1889

	Including Officers	Excluding Officers
Nova Scotians	92.1	61.2
New Brunswick	38.8	33.4
Scandinavia	9.1	8.9
U.K.	3.4	3.1
U.S.A. (North East and South)	1.3	1.2

Source: Yarmouth computer files.

Nova Scotians took up ninety two positions per ten thousand of average population in the 1870s and 1880s and New Brunswickers some thirty nine positions. On the same basis, the next closest 'national' group was the Scandinavians at nine positions per ten thousand. This high participation rate by Maritimers remains striking even when officers are excluded from the analysis. And while the Maritimes did not have the labour supply to man more than a minority of the positions offered on their vessels, they did reserve to themselves a rough majority of the positions for officers and a large fraction of these for petty officers. Almost invariably the master was a Yarmouth man and chose another as his first officer. For example, Captain B.F. Gullison of the *N.B. Lewis* wrote to the managing owner N.B. Lewis from New Orleans on 23 November, 1887:

> I telegraphed you on Saturday asking you to send me mate. I received yours today. 'Can't find mate, will have to do best you can'. I am very sorry as I am in want of one very much, the fact is I cannot get along with the one I have and there is none here at present that I would take and no likelihood of there being any very soon. I know the cost is considerable from home here but sometimes the dearest article is the least expensive in the end....[19]

Most masters must have viewed the matter in the same way, for sixty seven per cent of the Canadian first officers were drawn from the town of Yarmouth.

TABLE 5

PERCENTAGE OF POSITIONS HELD BY CANADIANS

	1860s	1870s	1880s	1890s
Officers	52%	47%	56%	40%
Petty Officers	21	27	33	20
Deckhands	15	10	10	7

Source: Yarmouth computer files

In summary, most of the crew (eighty one per cent) who served on Yarmouth vessels signed on during the 1870s and 1880s. A crewmember was typically under thirty years of age and most signed on and left the industry for the land while in their twenties. Between the 1860s and the 1880s, however, there was a trend for both Canadian and foreign crew to get older — more of the crew were in their thirties and forties by the 1880s than had been the case in the 1860s. The typical deckhand was a foreign seaman, but the typical officer was a Canadian and in particular a Nova Scotian. In the 1860s around seventy per cent of the crew would have spoken some brand of English as a native language, but with the expansion of the fleet in the 1870s and the gradual withdrawal of Canadians and Americans from the industry, this share had fallen to around fifty five per cent by the 1890s. While the fleet was owned in North America and largely commanded by Canadians it was always, and increasingly, supplied with labour from the United Kingdom and Western Europe.

III

The typical crewmember was literate in that he was able to sign the articles and the Canadian crew tended to be more literate than the foreign. In large part, however, this reflected the disproportionate number of officers among the Canadian crew. The masters of big ocean going vessels had to be both highly literate and numerate, for communication with owners and dealings with port officials, agents and shippers was a very complex matter. This meant that officers too were drawn from the better educated population. Some ninety eight per cent of the officers on Yarmouth vessels were literate. Even the petty officers, while less literate than the officers at a rate of eighty four per cent, were considerably better educated than the seamen at seventy three per cent. If officers are removed from the analysis then it becomes apparent that, while the Canadian deckhands were at first better educated than the foreigners, the foreign

deckhands were more literate than the Canadians from the first half of the 1880s. The literacy rate of the foreign deckhands was consistently improving at a rate of 4.5 per cent per quinquennium, compared with a more erratic growth of only 1.6 per cent among the Canadians. While the Canadian literacy rate improved very rapidly through the 1870s, it fell back in the 1880s, perhaps reflecting the difficulty of recruiting the better educated young Canadians to a life at sea. If we interpolate from the samples to reconstruct the entire labour force irrespective of national origin, then the conclusion is that crew literacy improved rather slowly from the 1860s through the 1870s, then quite rapidly in the 1880s, stagnating in the 1890s. Do these results indicate, first among the Canadians in the 1880s and then among the foreigners in the 1890s, that the ageing sailing fleet was increasingly forced to recruit its labour from among the more poorly educated?

TABLE 6

LITERACY OF ALL CREW

1865-69	69%
1870-74	73
1875-79	74
1880-84	78
1885-89	84
1890-94	85
1895-99	85

Source: Yarmouth computer files.

TABLE 7

LITERACY OF CREW

	Including Officers				Excluding Officers			
	Canadian		Foreign		Canadian		Foreign	
	N	%	N	%	N	%	N	%
1865-69	320	76.6	237	67.5	236	69.9	222	65.3
1870-74	627	81.5	529	70.9	448	74.6	500	69.6
1875-79	587	84.2	649	71.9	433	78.5	610	70.1
1880-84	778	80.5	659	77.0	577	74.0	636	76.2
1885-89	249	82.7	342	84.2	179	76.5	327	83.8
1890-94	124	86.3	217	85.2	90	81.1	206	84.4

Source: Yarmouth computer files.

A way of testing this is to analyse literacy by age and educational cohort. If a seaman joining a vessel in 1865-69 was in the age cohort 15-19 years, then it can be roughly assumed that he acquired literacy in 1860-64 while aged 10-14 years.[20] This assumption is applied to each age cohort from 1865-69 to 1890-94 as shown in Table 8. It gives the path of literacy growth for all crew and for crew excluding officers. Since officers were disproportionately Canadian and disproportionately present among the oldest age cohorts, the panel which excludes officers is the most reliable. Among the Canadians, however, the number in the sample is inadequate before 1845-49 for meaningful generalization. Of those who should have been exposed to schooling in 1845-49, only fifty two per cent were literate. This rose rapidly over the next two quinquennia, stagnated for those educated in 1860-64, and resumed growth thereafter to reach a literacy level of ninety five per cent by 1880-84. This indicates a rate of growth of literacy of 7.9 per cent per quinquennium for those educated between 1845-84 and rather faster during 1845-59 (10.7 per cent) than during 1860-84 (6.5 per cent).

TABLE 8

LITERACY OF EDUCATIONAL COHORT

Cohort	All Crew				Excluding Officers			
	Canadian		Foreign		Canadian		Foreign	
	N	%	N	%	N	%	N	%
1835-39	18	72.2	42	66.7	11	54.5	29	51.7
1840-44	48	81.3	70	60.0	28	71.4	54	53.7
1845-49	113	66.4	139	71.2	73	52.1	123	68.3
1850-54	305	76.1	255	72.2	192	63.5	221	68.8
1855-59	516	79.3	425	67.3	355	70.7	399	65.9
1860-64	506	77.3	507	72.2	378	69.8	478	70.5
1865-69	472	85.4	485	78.1	342	79.8	473	77.6
1870-74	434	88.7	353	81.6	324	85.2	349	81.4
1875-79	168	89.3	201	87.6	147	87.8	197	87.3
1880-84	46	97.8	90	92.2	45	95.6	83	92.2

Source: Yarmouth computer files.

Among the foreign crew the Table indicates a substantial growth of literacy between the 1840-44 education cohort who were fifty four per cent literate and the 1845-49 cohort who were sixty eight per cent literate.

But there was no improvement in the literacy of foreign crew from the 1845-49 cohort to the 1860-64 group. Thereafter there was a sharp improvement in the literacy rate, reaching ninety two per cent for the 1880-84 cohort. The growth of literacy among the foreign crew was thus substantially lower (3.8 per cent) than among the Canadian (7.9 per cent) during 1845-1884. This was because of an initially higher level of literacy among the foreign crew and a lack of improvement in literacy until the school generation of the late 1860s. But the growth of literacy from 1860-84 among foreign crew was close (5.5 per cent) to that of the Canadian (6.5 per cent) with a slightly lower level being reached by the 1880-84 generation. Thus, the apparent stagnation in literacy improvements among the crew in the 1880s and 1890s was not a function of recruiting less literate young men, but rather a function of the general ageing of the crew and the relatively greater presence in the crew of less well-educated generations.

The younger the crewmember the more likely he was to be literate. Table 9 shows that among the Canadians ninety one per cent of the 15-19 year olds were literate, declining steadily to fifty five per cent among those aged 45-49 years. The high literacy rate among the younger Canadians relative to the foreign crew disappears, however, when officers are excluded and the foreign deckhands aged twenty five or more tended to be more literate than the Canadians.

TABLE 9

LITERACY AND AGE OF CREWMEMBER, 1865-1894

Age	Including Officers				Excluding Officers			
	Canadian		Foreign		Canadian		Foreign	
	N	%	N	%	N	%	N	%
15-19	355	91.0	211	84.4	342	91.2	210	84.3
20-24	812	84.1	877	77.5	610	79.0	867	77.3
25-29	627	80.2	616	75.5	405	70.6	581	74.2
30-34	375	79.2	345	71.6	230	66.5	312	68.6
35-39	261	78.5	248	71.4	177	68.9	229	69.4
40-44	125	68.0	155	67.7	99	56.6	139	64.7
45-49	58	55.2	107	68.2	41	39.0	98	65.3
50+	36	66.7	47	74.5	28	78.6	44	72.7

Source: Yarmouth Computer files.

Within each group the older age cohort tended to be less literate than the one which preceded it and those who remained at sea into their thirties and forties were significantly less literate than those who joined while in their late teens and twenties. Is this evidence that illiteracy was a characteristic which tended to trap men to a life at sea, whereas the better educated were more mobile and able to transfer themselves into shore-based employment?

A method of testing this hypothesis is to observe the literacy rate from first recruitment of non-officer crew at age 20-24 years (which was usually the largest intake) as that cohort aged in the service. The most complete age cohort available for both Canadians and foreigners was the 20-24 year olds who were recruited in 1865-69. For both groups as indicated in Table 10 there is no evidence that it was the less literate who remained at sea into their thirties and forties. The critical age cohort to observe is 30-34, for it was in that age group that large numbers of men went ashore. If illiteracy trapped men into a life at sea, then the literacy rate of that group should fall relative to the 25-29 year olds. It is only among the Canadian cohort recruited in 1870-74 that the literacy rate of the 30-34 year old group changes significantly. In general it must be concluded that being illiterate was not a factor in determining whether a man left the sea in his twenties or pursued the occupation into middle age.

TABLE 10

LITERACY OF RECRUITMENT COHORTS EXCLUDING OFFICERS

Period Recruited	20-24		25-29		30-34		35-39		40-44	
					Canadians					
	N	%	N	%	N	%	N	%	N	%
1865-69	103	73.8	112	66.9	55	78.2	66	72.7	13	53.9
1870-74	135	73.3	92	72.9	70	52.9	26	69.2	n.a.	
1875-79	134	79.9	96	67.7	24	75.0	n.a.		n.a.	
1880-84	182	83.0	36	83.4	n.a.		n.a.		n.a.	
					Foreign					
	N	%	N	%	N	%	N	%	N	%
1865-69	94	64.9	121	66.9	84	64.3	63	60.3	26	73.1
1870-74	177	70.1	149	67.8	79	67.1	38	79.0	n.a.	
1875-79	219	73.5	150	80.0	37	78.3	n.a.		n.a.	
1880-84	206	82.5	72	86.1	n.a.		n.a.		n.a.	

Source: Yarmouth computer files.

There was an enormous range in literacy rates among countries and regions. The Germans (who were mostly North Germans) stood far out from all other national and regional groups in the high level of literacy among their seamen. Substantially below them, but still in a high literacy group, were the seamen from Belgium and Holland, Nova Scotians, the Americans, the British and Scandinavians. A substantially less literate group included the French, Irish and mainland Canadians other than Nova Scotians and also a very mixed group of seamen from Central and Eastern Europe most of whom were from Poland and the Baltic states. Finally, there was a very low literacy group of seamen drawn from South America (although the number is so small as hardly to be significant), Newfoundland, the West Indies and Southern Europe.

TABLE 11

REGIONAL AND NATIONAL LITERACY RATES, 1860-1899

	N	%
Germany	202	92
Nova Scotia (Includes Officers)	1668	89
Low Countries	80	84
Nova Scotia (Excludes Officers)	1036	83
Wales	38	82
U.S.A.	375	80
Scandinavia	640	79
Scotland	166	78
England	473	77
France	772	72
New Brunswick (Includes Officers)	536	69
Ireland	343	68
New Brunswick (Excludes Officers)	344	65
Prince Edward Island	88	65
Ontario and Quebec	158	64
Central and Eastern Europe	53	62
South America	22	46
Newfoundland	85	44
West Indies	44	39
Southern Europe	71	35

Source: Yarmouth computer files.

For most of the national groups the literacy rate for deckhands showed a distinct improvement across the quinquennia as Table 12 shows. The most rapid growth of literacy was among the Americans, but characterized by an extremely sharp discontinuity between 1865-74 and 1875-94, with the literacy rate being low in the first period and very high in the second. A literacy rate of sixty to sixty five per cent was certainly lower than the average education cohort rate in the New England and

TABLE 12

NATIONAL AND REGIONAL LITERACY RATES, EXCLUDING OFFICERS

1865/69 - 1890/94

	1865-69	1870-74	1875-79	1880-84	1885-89	1890-94
Nova Scotia	77.7	83.6	86.4	83.6	84.3	82.2
New Brunswick	61.2	66.3	63.9	62.4	66.7	81.3
Great Britain	69.6	75.4	71.3	71.2	85.9	84.1
Ireland	60.9	64.3	63.5	67.1	76.3	80.9
Scandinavia	68.2	70.0	75.4	82.5	89.7	91.1
Germany	93.3	87.1	85.7	94.9	100.0	93.8
U.S.A.	60.0	64.1	92.2	83.3	91.4	88.2

Note: Excludes officers. Figures in brackets are based on less than thirty five observations.

Source: Yarmouth computer files.

TABLE 13

RATES OF GROWTH OF LITERACY**

	Equation	Corr. Coef.	Rate%
U.S.A.	Y = 4.37 + .063	.787	6.5
Scandinavia	4.37 + .052	.992	5.3
Ireland	4.23 + .045	.938	4.6
Great Britain	4.33 + .030	.768	3.0
New Brunswick*	4.15 + .011	.471	1.1
Nova Scotia	4.42 + .005	.360	0.6

Note: *New Brunswick excludes 1890-94.

**Based on quinquennial figures.

Source: Yarmouth computer files.

Mid-Atlantic states in 1865-74 while the figures thereafter are much closer to the average rate. Thus, for some reason, up to the mid 1870s Yarmouth ships recruited less literate Americans and perhaps less literate than average American seamen. This may be a reflection of the rapid decline of opportunities for Americans to serve in ships under their own flag in the years after the Civil War.

The growth of literacy was most impressive, because it was rapid and stable, among the Scandinavians where it rose from around seventy per cent in 1865-74 to around ninety per cent in 1885-94. Among the Irish and British literacy did not improve strikingly from the mid 1860s to the mid 1880s, but for both there was rapid improvement thereafter. The least improvement was apparent among the Maritimers, suggesting that the industry faced increasing difficulty in recruiting the better educated among their youthful populations.

How closely did these literacy rates for seamen reflect that of the countries and regions from which they came and in terms of primary education, how typical were seamen of their countrymen in general? This can be answered only very roughly, for national literacy data for the nineteenth century is scattered and calculated in a myriad of ways. Moreover, the literacy levels indicated for seamen constitute a special population — mostly young and mainly recruited from the working class.

For Nova Scotia and New Brunswick it is possible from the 1891 *Census of Canada* to project back age cohorts and thereby estimate the literacy level (ability to write) of males educated in a particular decade. That is those who were 10-19 in 1891 would have acquired their literacy in the 1880s and so on. These educational cohorts can be matched with the literacy levels calculated for crew (excluding officers) under the assumption that the bulk of them were in their mid twenties. Given, as we have seen, that the crew was ageing and in each period included older and less well-educated men than would be found in a particular education cohort, we should expect the level of crew literacy to be lower than the census educational cohort. We would also expect it to be lower because the crew would be drawn principally from the working class population and therefore presumably a less well-educated population than characterized the country as a whole. With these adjustments in mind, there is no good evidence that the Nova Scotia seamen were less literate than the male population of Nova Scotia. There is a large enough difference, however, to suspect that New Brunswick seamen were drawn from a more poorly educated sub-population.

TABLE 14

CENSUS AND CREW LITERACY COMPARED

Recruited	Completed Education	Nova Scotia Census	Nova Scotia Crew	New Brunswick Census	New Brunswick Crew
1865-69	1855-59	82%	78%	80%	61%
1870-74	1860-64	86	84	81	66
1875-79	1865-69	86	86	81	64
1880-84	1870-74	88	84	84	62
1885-89	1875-79	88	84	84	67
1890-94	1880-84	87	82	81	n.a.

Source: Yarmouth computer files; *Census of Canada*, 1891.

For Great Britain and Ireland it is possible to match seamen's signature rates against Cipolla's figures on bridegrooms who were able to sign the marriage registry.[21] The age distributions among the two samples is likely to be quite close, although the marriage series would be less class biased. For Great Britain in some quinquennia the difference in the two rates is quite narrow and within the bounds of adjustment for class bias and the increasing age bias of the crew, while for others the difference is quite wide. For Ireland from the 1880s the two series are very close. In general for the United Kingdom it would be risky to conclude that seamen came from a less well-educated population than the labouring classes as a whole.

TABLE 15

MARRIAGE SIGNATURES AND CREW LITERACY COMPARED

	Great Britain Marriages	Great Britain Crew	Ireland Marriages	Ireland Crew
1865-69	79%	70%	- %	61%
1870-74	81	75	-	64
1875-79	85	71	-	64
1880-84	87	71	74	67
1885-89	91	86	78	76
1890-94	94	84	81	81

Source: Yarmouth computer files; Carlo Cipolla, *Literacy* (London, 1969) pp. 121-123.

The remaining time series are less suitable for comparison. There are no comparative estimates for Scandinavia as a whole. If the Swedes aged 20-24 are separated out, however, then seventy four per cent were able to sign in the 1870s and a sharply improved ninety five per cent in the 1880s. The literacy rate of the 1880s is compatible with the known high literacy levels of that country in the second half of the century,[22] but the 1870s rate would be below prevailing national literacy levels. In both cases, however, the number of cases in the sample (forty three and thirty nine respectively) is small. With equally small samples, the 20-24 year old Germans were eighty five per cent literate in the 1870s and one hundred per cent literate in the 1890s. Literacy levels among army recruits in the German Empire were comparable with that of the Swedes and so once again the literacy levels appear to be below the national norm in the 1870s and comparable to it in the 1880s. Of twenty seven French seamen of all ages only fifty nine per cent could sign, compared with a rate of eighty per cent for French bridegrooms; but among thirty seamen in the 1880s eighty three per cent could sign compared with eighty seven per cent of bridegrooms, once again repeating the Swedish and German pattern. Americans who joined in the 1870s were seventy nine per cent literate on the basis of a large sample compared with a national literacy rate for the population ten years and older in 1870 of eighty per cent; in the 1880s the seamen's literacy rate was eighty five per cent compared with a national rate of eighty three per cent in 1880.[23] Finally, the appalling low aggregate signing rate indicated for Southern Europe (thirty five per cent) and Newfoundland (forty four per cent) is compatible with what is known about literacy in those places.[24] In Italy, averaged over 1870-1889, only fifty per cent of army recruits were literate and a similar fraction of bridegrooms could sign the register. In 1871 only thirty eight per cent of the male population six years or more could either read or write, rising to forty five per cent in 1881. In Newfoundland in the mid 1870s it has been estimated that only fifty six per cent of the population over ten years had any ability to read and only sixty per cent of the school-age population could read.

It appears that the seamen from Nova Scotia were as literate as the general population of their province, but that the New Brunswickers were less so. Adjusting for class and age profiles, the Irish seamen do not appear to have been drawn from a noticeably less well-educated subpopulation, although there is a greater chance this was the case with the British. The Western European seamen appear to have been less literate than their general populations in the 1870s, but not in the 1880s. The American seamen in both decades enjoyed a literacy level close to that of

the national population. At best it can be said the hypothesis is not proven that in terms of elementary education seamen were recruited from a depressed sub-class of the labouring classes of their national groups.

IV

If a seaman was disadvantaged by illiteracy, then it might be expected he would serve on older ships, perhaps smaller ones, show evidence of different and less satisfactory behaviour and accordingly be paid less than a literate man. Is there evidence to support any of these hypotheses?

There is contradictory evidence that illiterates were disproportionately recruited onto older vessels. Among the Canadian seamen there is a statistically weak indication that illiterates served on older vessels; but among foreign seamen there is a statistically strong indication that they served on newer vessels than their literate comrades. What might account for this difference is the fact that foreign seamen, who were increasingly literate, accounted for a growing fraction of the labour force from the 1880s as the fleet itself was ageing. But in general there is no clear evidence that the possession of an elementary education increased a seaman's chances of serving on a newer, drier and safer vessel.

TABLE 16

AGE OF VESSELS

	$\bar{X}$	S	F	Significance
Canadian	6.9	4.4	-	-
Literates	6.8	4.4	2.8	90%
Illiterates	7.2	4.3	-	-
Foreign	6.9	4.5	-	-
Literates	7.1	4.5	13.5	99%
Illiterates	6.4	4.2	-	-

Note: Excludes officers.

Source: Yarmouth computer files.

There is more consistent evidence that illiterate seamen served on smaller vessels. This was true of both Canadian and foreign seamen, although the difference was not statistically strong in the case of the Canadians. As with the age of vessels, however, this apparent relationship may be illusory since the average size of vessel increased over time in positive correlation with the growth of literacy.

TABLE 17

AVERAGE TONNAGE

	$\bar{X}$	S	F	Significance
Canadian	906.7	310.3	-	-
Literates	913.7	311.4	3.08	92%
Illiterates	885.5	306.2	-	-
Foreign	989.0	353.2	-	-
Literates	1004.4	350.5	14.07	99%
Illiterates	944.5	357.5	-	-

Note: Excludes officers.

Source: Yarmouth computer files.

There is no evidence to indicate that seamen were recruited for voyages to particular destinations at rates which differed significantly for literate and non-literate seamen. This perhaps is not surprising since a very large number of voyages were specified as to region rather than as to a particular port. But even a regional breakdown of destinations does not reveal any interesting differences among the Canadians; and among the foreign seamen none of the differences from the literacy rate for all destinations is significant at the ninety five per cent level of confidence. It is therefore safe to conclude that seamen were not differentially recruited in terms of literacy for voyages to various regional destinations.

TABLE 18

DESTINATION OF VOYAGE

	Canadian				Foreign			
	N	Lits.	Illits.	%	N	Lits.	Illits.	%
Canada	420	311	109	74	379	275	104	73
UK/Europe	272	198	74	73	307	242	65	79
U.S.A.	1089	829	260	76	1419	1035	384	73
South America	106	74	32	70	263	209	54	80
Africa/Asia	36	26	10	72	46	36	10	78
All Destinations	-	-	-	75	-	-	-	74

Note: Excludes officers.

Source: Yarmouth computer files.

This does not mean, however, that there were no differences in literacy rates in respect to the ports at which seamen were recruited. Among the Canadian seamen there was a large variance in literacy rates by port of signing, although only in the cases of Belfast, Bristol and Dublin at one extreme and Philadelphia and New York at the other can it be said with at least ninety five per cent confidence that the literacy rate differed significantly from the average rate. There is a striking pattern, however, in that the more literate Canadian seamen tended to join in the ports of the United Kingdom/Europe and less literate men at the North American ports. How can this be explained? The sample of Canadian seamen is nearly dominated by Nova Scotians — local men from the Yarmouth region — with a high literacy rate. An impression is that many of them in their youth made a passage or two to Europe, but did not pursue a deep sea career. At the United Kingdom/European ports these men might have been looking for a passage back to North America. By contrast, Canadians signing on at the United States ports and Quebec may have been disproportionately the professional Canadian seamen with a lower average literacy rate.

TABLE 19

CANADIAN SEAMEN — JOINING PORTS

	N	Lits.	Illits.	% Lit.
Belfast	43	40	3	93.0
Bristol	34	31	3	91.2
Dublin	64	55	9	85.9
London	76	61	15	80.3
Yarmouth, N.S.	67	53	14	79.1
Havre	67	53	14	79.1
Liverpool	405	316	89	78.0
Antwerp	85	62	23	72.9
Cardiff	62	45	17	72.6
Saint John	148	106	42	71.6
Baltimore	34	24	10	70.6
Philadelphia	126	86	38	68.3
Boston	49	33	16	67.3
Quebec	43	28	15	65.1
New York	144	92	52	63.9
All Ports	2006	1507	499	75.1

Source: Yarmouth computer files

There is certainly no rank order relationship between the literacy rates of Canadians at the ports at which they joined and the literacy rates of foreigners at those same ports, since Spearman's coefficient of rank correlation is only +0.06. There is, however, as wide a range of port literacy rates among the foreign seamen as there was among the Canadian, although it is only possible to establish strong significance from the average rate in the cases of Liverpool and Savannah. In general, however, the ordering tends to reflect the regional and national literacy rates, in that the North European ports rank high and the British and North American ports are ranked in the middle and lower end of the list.

TABLE 20

FOREIGN SEAMEN — JOINING PORTS

	N	Lits.	Illits.	% Lit.
Dunkirk	28	23	5	82.1
Cardiff	91	74	17	81.3
Antwerp	123	100	23	81.3
Rotterdam	35	28	7	80.0
Hamburg	43	34	9	79.1
Belfast	52	41	11	78.9
Penarth	37	29	8	78.4
New York	233	180	53	77.3
Havre	118	91	27	77.1
Saint John	74	56	18	75.7
Boston	41	31	10	75.6
Philadelphia	232	167	65	72.0
Baltimore	76	54	22	71.1
London	96	68	28	70.8
Greenock	34	24	10	70.6
Dublin	80	56	24	70.0
Liverpool	336	229	107	68.2
New Orleans	68	46	22	67.6
Quebec	64	42	22	65.6
Savannah	36	19	17	52.8
All Ports	2545	1890	655	74.3

Source: Yarmouth computer files.

A ship's master, that is, was more likely to sign on a highly literate foreign crew in Northern France, the Low Countries and North Germany and a less literate crew in Dublin, Liverpool, Quebec and the Southern United States of America.

At the ports of discharge there was also a spread of literacy rates, although with both Canadian and foreign seamen it is possible to establish statistical significance from average literacy in only a few extreme cases. In both cases there is some rank order correlation between literacy rates at joining ports and discharge ports. Among the Canadians the Spearman's coefficient of rank correlation is +0.55. With the foreign seamen the correlation is only +0.26, but if the two extreme cases of Savannah and Antwerp are removed it rises to +0.53. That is, as one would expect, where ships discharged more literate (or less literate) seamen is where they were also likely to sign them on. This was of particular significance for the foreign seaman who always and increasingly accounted for the bulk of petty officers and seamen in Yarmouth's vessels. More literate seamen tended to be discharged and signed on at the European side of the North Atlantic and less literate seamen on the North American side. There were two ports where it is possible to establish with ninety five per cent

TABLE 21

CANADIAN SEAMEN — DISCHARGE PORTS

	N	Lits.	Illits.	% Lit.
Hamburg	29	26	3	89.7
Belfast	49	43	6	87.8
Antwerp	71	60	11	84.5
Dublin	64	52	12	81.3
Baltimore	52	42	10	80.8
Cardiff	33	26	7	78.9
Liverpool	264	205	59	77.7
London	58	45	13	77.6
Boston	40	31	9	77.5
New York	149	115	34	77.2
Philadelphia	164	117	47	71.3
Havre	67	46	21	68.7
Quebec	55	36	19	65.5
Saint John	79	47	32	59.5
All Ports	1822	1380	442	75.7

Source: Yarmouth computer files.

confidence that the discharge literacy of crew was significantly different from the literacy of those who joined. At Antwerp masters discharged or lost (from North America) a substantially less literate crew of seamen (sixty nine per cent) than was signed on (eighty one per cent). At Savannah masters discharged a more literate crew (seventy eight per cent) than they signed on (fifty three per cent). Apart from these extreme cases, it cannot be said that masters discharged and signed on crew with significantly different literacy rates. But while statistical significance can only be established in a few cases, it does appear that more and less literate seamen tended to cluster in a few ports around the North Atlantic. Foreign seamen with above average literacy were recruited in the big channel ports of Europe (and perhaps Cardiff and Belfast) while seamen with less than average literacy were recruited in Liverpool, Quebec and the Southern United States of America.

TABLE 22

FOREIGN SEAMEN — DISCHARGE PORTS

	N	Lits.	Illits.	% Lit.
Rotterdam	29	24	5	82.8
Dunkirk	31	25	6	80.6
New York	178	142	36	79.8
Savannah	27	21	6	77.8
Cardiff	48	37	11	77.1
Greenock	30	23	7	76.7
Dublin	80	61	19	76.3
Hamburg	37	28	9	75.7
Belfast	57	43	14	75.4
London	101	76	25	75.2
Liverpool	302	222	80	73.5
Havre	124	91	33	73.4
Philadelphia	173	126	47	72.8
Saint John	66	48	18	72.7
Quebec	45	32	13	71.1
Penarth	31	22	9	71.0
Baltimore	63	44	19	69.8
Antwerp	108	75	33	69.4
New Orleans	40	25	15	62.5
Boston	42	26	16	61.9
All Ports	2250	1668	582	74.1

Source: Yarmouth computer files.

Was there any reason why a master should care if his petty officers and seamen were literate or illiterate? Since literacy was not important to satisfactory performance of most jobs on a ship, there was obviously no technical reason why the master should be interested in whether the seamen had acquired elementary education. But if education was associated with socialization, then literacy might be related to behaviour and in that way related to a more or less satisfactory performance.[25] The only way this can be tested is to observe the distribution of discharges among literates and illiterates. Among the foreign seamen only fifty nine per cent were discharged during the course of the voyage or at its end with a satisfactory record and there was no statistically significant difference between the performance of literates and illiterates. The illiterate Canadian seamen also performed in exactly the same way as the illiterate foreigners. But there was a significant difference between the behaviour of Canadian and foreign seamen, because sixty nine per cent of Canadians were discharged after satisfactory performance compared with the fifty nine per cent for foreign men. This was because the literate Canadians performed at a much more satisfactory level than the literate foreigners. Why would this be so? It is likely that a higher proportion of the Canadian literates were local young men with ambitions for a career as an officer on ships of the local fleet. Thus, if we remove all the petty officers as well as the officers from the Canadian crew, the difference remains striking. Now 32.7 per cent of the literate Canadians perform in an unsatisfactory way and 50.2 per cent of the illiterates, but the essential pattern remains the same. If a master was concerned to have a stable crew, there was strong reason for him to recruit as many literate Canadians as possible.

TABLE 23

DISCHARGE RATES

	Canadian				Foreign			
	Lits.	%	Illits.	%	Lits.	%	Illits.	%
Unsatisfactory	379	25.9	222	45.7	738	40.4	268	42.3
Satisfactory	1084	74.1	264	54.3	1090	59.6	365	57.7
Total	1463		486		1828		633	

Note: Unsatisfactory discharges include: Do not join, desert before sailing, jailed and desert; satisfactory discharges include: remain at end of voyage, discharge at end of voyage, and discharge during voyage by mutual consent.

Source: Yarmouth computer files.

If apart from literate Canadians performance on board was not related to possession of an elementary education, it was associated with the capacity in which a man served and, through that, the earnings which he received for his labour. While literacy was not a requirement for any capacity other than those of the master and the mates, it is striking that, with the exception of the Canadian ordinary seamen, the literacy rate for every other capacity is higher at a statistically significant level than that of the able bodied seamen. A man did not have to be literate to be a bosun,

TABLE 24

LITERACY BY CAPACITY SERVED

	Canadian			Foreign		
	N	Lits.	% Lit.	N	Lits.	% Lit.
Mates	737	728	98.8	133	129	97.0
Bosun	278	256	92.1	52	44	84.6
Carpenter	72	71	98.6	66	58	87.9
Cooks & Stewards	227	184	81.1	182	148	81.3
AB	1150	755	65.6	1982	1425	71.9
OS	207	180	70.0	163	130	79.8
Boy	66	55	83.3	85	75	88.2
All	2737	2229	81.4	2663	2009	75.4

Source: Yarmouth computer files.

TABLE 25

MONTHLY WAGES — ALL CAPACITIES

(DOLLARS)

	N	$\bar{X}$	S	F	Significance
Canadian					
Literates	776	30.94	39.68	4.90	97%
Illiterates	215	24.90	9.31	-	-
Foreign					
Literates	593	26.68	22.63	0.80	63%
Illiterates	190	25.18	7.70	-	-

Source: Yarmouth computer files.

carpenter or a cook/steward and being literate did not assure a career movement up through the ranks; but a young man entering the merchant marine as a boy or an ordinary seaman was much more likely to progress no further than the AB rank if he was illiterate rather than literate.

With respect to earnings, literacy was more valuable to a Canadian than a foreign crewmember. Whereas there was a significant difference in the average wages received by literate Canadians over illiterate, there was no significant difference among the foreigners. This was because the Canadians disproportionately occupied the better paying positions as officers and petty officers, for which literacy was either essential or an advantage. More important in this analysis, however, is to observe the relative ranges of the standard deviations. For both the Canadian and the foreign seamen the range of wages available for the literate crewmember, from entering onto the sea as a boy until eventually getting command of a vessel, was three times as great as for the illiterate crewmember. This characteristic remains striking even when officers and petty officers are eliminated from the analysis. While there was no significant difference in the average wages paid to literate and illiterate seamen, the literates still enjoyed the opportunity for larger differentials in wages than did the illiterates.

TABLE 26

MONTHLY WAGES — EXCLUDING OFFICERS AND PETTY OFFICERS

(DOLLARS)

	N	$\bar{X}$	S	F	Significance
Canadian					
Literates	381	23.45	13.85	0.301	42%
Illiterates	190	24.06	9.06	-	-
Foreign					
Literates	520	25.68	13.87	0.22	36%
Illiterates	180	24.83	7.26	-	-

Source: Yarmouth computer files.

V

What conclusions can we draw from this information on the personal characteristics, performance and behaviour of seamen on Yarmouth vessels? Almost three quarters of the men who served on the vessels between 1863-1899 had been exposed to a primary education and had learned to read and write, or at least to sign their name. Literacy was essential for any man with an ambition to climb out of the forecastle and most had this fundamental requirement for doing so. But for Yarmouth shipowners and masters the most important qualification for promotion was an ascriptive one — birth in the Atlantic provinces, and especially Yarmouth town and its immediate region. It is important to establish for other Canadian ports, and for other countries, how common this local preference was, for it could establish why certain countries maintained a strong maritime tradition and others did not. If in the age of sail, advancement was largely a matter of personal and local connections, if shipowning withered as it did in the United States of America and later in Canada, the incentive to go to sea would diminish and labour recruitment would fall off. Something like this certainly occurred at Yarmouth, for while the participation rate was high, recruitment of local men fell off relatively as the fleet contracted.

The limited opportunities for advancement must also have been a reason why men tended to leave the sea before they were out of their twenties. The low retention rate might be explained by the harshness of the life or the desire among seamen to establish a normal family life,[26] but other explanations need to be considered and tested. Rather than assuming that seamen were a shiftless and irresponsible lot, it might be more appropriate to assume the reverse. If it became apparent after a number of voyages that in an environment of stiff competition a man had little chance of advancement, then it would make sense for him to go ashore before it was too late to reestablish in a different occupation. The possibility should also be considered that the population of young seamen represented a queue — not so much a queue for the few coveted positions on the quarterdeck, but for jobs and assets at home, such as a place on a family fishing crew, or possession of the parental farm, cottage or shop. These explanations can only be established, if at all, by the most complex nominal linkage research; but less difficult work should establish why crews were tending to get older from the 1870s. The fact that this was true of the foreign as well as the Canadian crew rules out the likelihood that it was a purely local phenomenon. It was possible that younger men were being attracted to steamers, leaving a smaller pool of older men to man the sailing vessels. But the educational cohort analysis tends to argue against

this, as the younger men who were recruited were increasingly better educated than their predecessors. It is also possible (as certainly was the case in Atlantic Canada) that the enormous growth in rail transport was eliminating opportunities for men to shift into the coastal trades as they grew older, thus keeping more of them on the deep sea vessels. Or indeed, it may simply be that reform and better conditions made for some men a life at sea into middle age a tolerable option to opportunities on shore.

Literacy was a skill worth having for a seaman because, as we have seen, earnings were higher for literate men and even for deckhands the variance in wage rates was wider than was the case for illiterates. But apart from this there do not appear to be major differences in the experiences and behaviour of the two groups. Illiterates do not appear to have been disproportionately recruited to the older and smaller vessels, or to particular trade routes. There is, however, the confusing data suggesting higher levels of literacy for crew joining and discharging in European ports than in North American ones. Perhaps this tendency reflects relative labour scarcities on either side of the North Atlantic, but the issue needs to be pursued by analysing other fleets and with larger samples, in order to firmly establish a statistical significance for different literacy rates at different ports. At the moment all that can be said is that there is some evidence that more and less literate seamen tended to cluster at different ports.

Apart from prospects of promotion, literacy did not seem to relate in ways that can be measured to a seaman's behaviour. There is no evidence that the seaman who pursued a career at sea into his thirties and beyond did so because he was less literate than the man who went ashore while still in his twenties. Illiteracy, in other words, was not a quality which doomed a man to the discomforts of spending his middle age in a wet and dingy forecastle. Nor did literacy — exposure to the discipline and socialization of the schoolroom — affect the behaviour of seamen (at least foreign ones) in so far as that can be measured by discharge information. The only interesting difference in this respect is among the Canadian crew. Illiterate Canadians secured satisfactory and unsatisfactory discharges at the same rates as the foreigners; but the literate Canadians were significantly more stable in their service than the literate foreigners. The most probable explanation for this is that the literate Canadians, a large proportion of whom were local men, were those with career ambitions focussed on the quarterdeck who, therefore, had a greater incentive to meet the terms of the agreement with the master. Hence, while Yarmouth masters favoured local officers, there was also an incentive for them to crew their ship with local, literate men, scarce though they might be. There was no reason,

however, for a master to pick his foreign crew (in so far as he had much choice) on the basis of their possession of an elementary education.

The final conclusion is that there is no strong evidence that seamen were drawn from a less literate sub-class of the working class of their respective countries. Once again, this needs to be explored further with other fleets, larger samples for some national groups and matched against more refined national literacy studies. But the likelihood is that this conclusion will generally be sustained; and if so, then there is reason to suspect the popular interpretation that 'Jack', while a stout fellow, came from the dregs of his society. 'The dregs' stretched rather widely in the nineteenth century, but the ill-discipline, violence and squalor of working class life was far better documented for life at sea than it was for the life that surrounded the mines, the nail foundries and the textile mills. Unlike ship's captains, the managers of factories did not write memoirs and were able more effectively to isolate themselves socially from the people they employed. While in recent years social historians have made enormous steps in uncovering the texture of working class life, the academic literature is necessarily bloodless when set against the volumes of description of belaying pins laid against skulls. But anyone who reads the autobiography of Francie Nicol of South Shields[27] must begin to doubt that working class life on land was any more disciplined and any less brutal than that experienced on a North Atlantic sailing ship. Sailors, there is reason to believe, were simply working men who got wet.

NOTES

1. Boswell, *Life of Johnson* (Modern Library Edition) p. 585.

2. See Ira Dye, "Early American Merchant Seafarers," *Proceedings of the American Philosophical Society* (Vol. 120, No. 5, 1976) pp. 336 and 339.

3. This data was kindly made available by Mr. Helge Nordvik of the Norwegian Fisheries History Project of the Department of History, University of Bergen.

4. For example the tract by the American, Captain P. Strickland, *A Voice from the Deep* (Boston, 1873).

5. For example, Sir Walter Runciman, *Before the Mast — And After* (London, 1924) and *Collier Brigs and Their Sailors* (London, 1926, New Impression 1971).

6. Judith Fingard, however, provides an important corrective to the typically overdrawn portrait of the wicked crimp and lodging house keeper in "Masters and Friends, Crimps and Abstainers: Agents of Control in 19th century Sailortown", *Acadiensis* (Vol. VIII, No. 1, 1978) pp. 22-46.

7. William C. Paddack, *Life on the Ocean; or Thirty-Five Years at Sea* (Cambridge, Mass., 1893) pp. 2-3.

8. John D. Whidden, *Old Sailing Ship Days* (Boston, 1925) p. 1.

9. Samuel Samuels, *From the Forecastle to the Cabin* (New York, 1970, reprinted from 1877), p. 123.

10. Runciman, *Before the Mast,* p. 44.

11. *Ibid.,* p. 102.

12. Runciman, *Collier Brigs,* p. 129.

13. *Ibid.,* p. 140. He adds, however, that "the form of letter-writing at that time would be fatal to the modern master getting or keeping employment." Educational requirements for the master of a collier might also have been less than was necessary for a deep-sea trader. The correspondence between owner and master reproduced in Clement W. Crowell, Ed., *Novascotiaman* (Halifax, 1979) suggests the need for a master who was both highly literate and numerate.

14. Samuels, *Forecastle to Cabin,* p. 123.

15. Maine Historical Association, *George Bunt Wendell: Clipper Ship Master* (Mystic, Connecticut, 1949) p. 5.

16. Strickland, *Voice from the Deep,* p. 107, and Runciman, *Collier Brigs,* p. 19.

17. Runciman, *Collier Brigs,* p. 135.

18. R.S. Schofield, "Dimensions of Illiteracy, 1750-1850", *Explorations in Economic History* (Vol. 10, No. 4, 1973) pp. 440-441; and Ira Dye, "American Merchant Seafarers", *op. cit.* pp. 340-341.

19. Crowell, *Novascotiaman,* p. 158.

20. For this assumption see Allan Greer, "The Pattern of Literacy in Quebec, 1745-1899", *Social History/Histoire Sociale* (Vol. XI, 1978) p. 327.

21. Carlo Cipolla, *Literacy and Development in the West* (London, 1969) pp. 121-123.

22. From the 1850s only about ten per cent of the adult population could not read. Lars G. Sandberg, "The Case of the Impoverished Sophisticate", *Journal of Economic History* (Vol. XXXIX, No. 1, 1979) p. 230. Cipolla, *Literacy and Development,* Appendix II, shows that in the 1870s ninety eight to ninety nine per cent of all Swedish army recruits could write.

23. Cipolla, *Literacy and Development,* p. 99.

24. For Italy from Cipolla. For Newfoundland from David Alexander, "Literacy and Economic Development in Nineteenth Century Newfoundland" (forthcoming, W.S. MacNutt Lecture, University of New Brunswick, October, 1980).

25. See Harvey J. Graff, *The Literacy Myth* (New York, 1979) pp. 228-233.

26. Work done by Helge Nordvik of the University of Bergen, however, tends to eliminate this as an important explanation among Norwegian seamen at the beginning of the nineteenth century.

27. Joe Robinson, Ed., *The Life and Times of Francie Nichol* (London, 1977).

2. TECHNOLOGY AND SOCIAL CHANGE AT SEA: THE STATUS AND POSITION ON BOARD OF THE SHIP'S ENGINEER, CIRCA 1830-60

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TECHNOLOGY AND SOCIAL CHANGE AT SEA: THE STATUS AND POSITION ON BOARD OF THE SHIP'S ENGINEER, CIRCA 1830-60

H. Campbell McMurray

With the introduction of steam navigation early in the nineteenth century a new class of seafarer emerged, the ship's engineer. In the strong, capable, if oft times dirty hands of this new breed lay the responsibility for the running, maintenance and thorough efficiency of the ship's propelling and other machinery. It cannot be said, however, that these pioneers comprised an altogether indispensable element in the well-being of British maritime commerce, vital as their contribution was to become in due course, for the early steamship was but a modest technical triumph, enjoying at the first only a limited commercial success.

There is no occasion here to rehearse the long, complicated history of steam navigation, but what should not go unnoticed is the fact that the transition from sail to steam in the nineteenth century did not take place abruptly, overnight. Thus, in the 1830s the machine was still hardly more than a jumble of restive horses, the stuttering quality of whose performance was echoed in the strictly limited purposes for which the steamship was employed and in the slow growth, if not in its numbers exactly, in the total amount of steamship tonnage annually being added to the register. In 1820, there were thirty four steamers officially registered, totalling some three thousand tons net; by 1830 the number on the books had risen to around 298, making up a net registered tonnage of just on thirty thousand; in 1841 the number of steam vessels had risen to 793, of a total net tonnage of 96,000 and ten years later the respective figures were 1227 and 187,000. This looks quite impressive till we note that in the same year, 1851, there were owned at British ports 24,816 vessels, totalling some 3.5 million tons net, still reliant wholly upon sail, spar and rigging to get them across the oceans.[1] Only in the 1840s do we encounter anything resembling a successful bulk-carrying steamer; even by 1860 or so the steamship was still largely confined to river, coastal and harbour work and to the shorter sea routes. There, passenger traffic, mails and baggage comprised the largest share of the trade, together with high value, perishable cargoes such as fruit and dairy produce, to whose carriage the steamer introduced a speedy, year-round reliability of service which the sailing ship, tied to the elements could not provide.[2] And to around 1870 or so, it is almost only in the government sponsored mail packet, chiefly pas-

senger, services that we find the steamer making any serious inroads into the monopoly in ocean transport held by the sailing vessel.[3]

I

Given, then, the relatively limited extent of the employment of steam propelled tonnage in ocean commerce almost throughout the years to the 1860s, this paper, in the context of the discussion on the position of the engineers within the shipboard hierarchy during the period, will consider the part that this might have played in the formation among individual engineers of subjective estimates of their worth and of their 'status entitlement' on board. It will also suggest some possible sources of recruitment into what was, in the period, a new occupation.

Obviously, in the early days of steam at sea, up to about 1840 or so, the numbers coming forward with experience of operating any kind of running plant could not have been lavish. The supply of such men as were available, moreover, seems quickly to have become exhausted. As the matter was put by one of the witnesses appearing before the committee investigating steamboat accidents in 1839:

> steam navigation has advanced more rapidly than men of experience and knowledge can be found to conduct it; hence, we often find, in the river packets in particular, men advanced to the post of engineer who are mere automatons, ignorant of the first principles of the machinery over which they preside who, in case of any derangement, do from ignorance of the result the very thing they ought to have avoided, creating rather than averting danger or accident....[4]

Elsewhere it was said to be evident that,

> ...the greater part of the breakages which have occurred of different parts of the machinery in steam boats has been owing to the negligence of the engine keepers; starting the engine without clearing off the water which is formed on the top of the piston, from condensed steam, is one cause of fractures; other accidents have arisen from suffering the bearings upon which the shafts work, and the links connecting the piston with the beam, to get loose; and in some cases from making them so tight, that the bearings heat; and also from not attending carefully to the steam valve when the vessel is exposed to a heavy sea.[5]

Some at least of these early 'engine keepers' and probably a majority of the firemen and trimmers almost certainly came from among the ranks of

the sailors, but in an economy whose principal feature was a great abundance of labour and much under-employment they might have hailed from anywhere. This certainly appears to have been the case with the first railway foot-plate men. The two callings possessed certain obvious features in common and both jobs required from their adherents a degree of technical know-how, or at the least an interest in things mechanical, some reasonable grasp of the basic principles governing the safe operation and working of running machinery and a generally disciplined approach to the work. Both occupations, in short, needed men of "...great activity and ability to get out of a difficulty".[6] The position as it affected railway recruitment in the period has been described thus:

> In the thirties and forties the demand for them was greater than the supply; they could 'dictate their own terms in great degree'. It was difficult to get skillful and reliable men. They were recruited not from blacksmiths, as one member of the Select Committee (on the railways) supposed, but mainly from labourers who showed an aptitude for the work...Brunel considered it an advantage if they were illiterate, and many of them were so....[7]

Railway engine-men as a rule were not expected to display more than a rudimentary knowledge of their engines nor on the whole were they required to carry out running repairs or attend to routine maintenance, whereas ships' engineers had to be so competent. But, at least in the home and coastal trade, where in the very early period of course all steamers were concentrated, the demands of the work were not excessive and the post of engineer could be taken by a man of sober habits and common sense.

> ...it would be preferable that a person appointed to the charge of a steam-engine on board a vessel should have been regularly bred to the business of an engineer; but a man of ordinary understanding and application may, without having been so bred, acquire by experience sufficient knowledge to take charge of an engine, and it is not so necessary in the river-going vessels to have a practical engineer because they are never far from help in case of anything going wrong....[8]

Such men were said to have been 'raised from the shovel' and it has been stated that many were

> ...good, steady fellows who handled well the slow-going machinery of the times, with its low pressures — most of them a good deal better than a chance engineer out of a shop put in

charge of machinery afloat with little or no experience as a sea-going engineer.[9]

Altogether an exceedingly home-spun race yet, who, in default of a ready made supply of more suitable qualified men, in all likelihood answered the purpose well enough in the coasting steamers.

Where however the voyages were of more extended duration, as with the growth from about 1840 of the bigger mail packets, a rather more intimate acquaintance with the construction, maintenance and repair of the marine steam engine was called for. Thus, Blackmore again, "...in our first class steamers, the engineers have, from the start, been hand-picked men":[10] as like as not, men with indeed little experience of the sea and of ships but familiar with engine-building and repair shops ashore, and typically appointed in the first instance on the recommendation of the engine maker. This was reasonable: these man were required to handle with skill and address, for the time, very large pieces of machinery — limping giants of doubtful efficiency and temperamental disposition — and to be responsible for their successful functioning in what would often be isolated and perilous circumstances. Robert Napier told Samuel Cunard exactly what he wanted in this line:

> The Plan I would propose with regard to the whole of the engineer department is: I would endeavour to get a very respectable man, and one thoroughly conversant with his business as an engineer; I would appoint this man to be master engineer, his duty to superintend and direct all the men and operations about the engines and boilers, etc., to be accountable to the captain for his conduct — vis., to be under the captain.[11]

It was Napier's intent that all the other engineers should be tradesmen and all the firemen boilermakers. In this he was probably aiming too high, though it is likely that one boilermaker would have been part of the complement of the engine-room. J.C. Shaw, manager of the City of Dublin Steam Packet Company, suggested that

> ...no engineer should be permitted to act in any steamer without producing testimonials to his capacity, and he should have a license only after examination. His sureties should be in £50 for a river steamer, £100 for a channel or coasting, and £200 for a transatlantic or ocean steamship. There would be no difficulty in finding competent men on these conditions.[12]

Earlier than this there is evidence to suggest that the Post Office Department had met with success in their attempt to man the engine-rooms of their Irish Sea and cross channel packets.

> When the packets were first established, as it was at so great a distance from London, we wanted men, not merely practical engineers, but having a greater portion of science than men of that description generally have, we were obliged to give very high wages, but we certainly got the two best men there were; we were obliged to buy them out of their situations in the river, one for each of those two vessels, the *Meteor* and the *Sovereign*....of course, we shall obtain the best engineer to be procured when a third packet is regularly established...[13]

Almost from the outset then it would appear that the engineers employed in the bigger, foreign-going steamers with whom I am mainly concerned, and in the better run enterprises in general were likely to have been highly skilled craftspeople, although many of them may have been known more familiarly in the period as millwrights, or by some similar designation. Artisans of this stamp were among the best paid and most highly skilled of all groups within the field of engineering at that time, as M. & J.B. Jefferys in their careful analysis of 'the inquiry into the rules and regulations of the trade in all districts of the country' conducted by the Amalgamated Society of Engineers, indicate. In their discussion of weekly earnings in the industry at the time, they point out that these "...ranged from 18/- in Hayle, Cornwall, where 56 engineers were engaged in 'all kinds of steam engine and mill work', to 36/6 paid to members of the Tower Hamlets branch in London, who specialized in marine engine work".[14] Several factors could have accounted for these wage variations but of signal importance was the type of work undertaken.

> The members in the London branches and in the large branches in south eastern England such as Brighton and Ashford were chiefly engaged in marine and locomotive work....Marine engineering and, to a lesser extent, locomotive engineering, were at this date highly skilled trades employing the best tradesmen....[15]

Now it is true these remarks are made in reference to shore-side tradesmen; perhaps it was the duds who went to sea! I think not, however. In any case we can be fairly certain that there was quite a degree of movement between ship and shore employment for engineers. And while as of now I could only bring forward in support of this contention a handful of partial, rather imperfect biographical sketches of a selection of contemporary ships' engineers, my own view is that there was, if nothing more, a good mix, with competent, skilled men in the majority.

II

The second part of this paper offers some speculations on the kind of reception which might have been accorded the first carriers of the new technology into the deep-water ships of the British mercantile marine, on the status and position first assigned these pioneers in the shipboard hierarchy and, by way of inference, on how this might have been perceived by the ships' engineers themselves. The analysis throughout is confined to the commercial marine, space forbidding otherwise.[16] On this question the concept of 'relative deprivation' will be used, an idea first publicly aired by the authors of the study of American combat troops in the Second World War,[17] in an attempt to interpret an odd lack of congruence between certain types of experiences and the reactions thereby engendered. That is to say, the reactions of any group or category of persons to hardships experienced by them will tend to vary in intensity according to the differences between their situation and that of other groups with whom they compare themselves; it varies, in other words, according to their choice of 'reference group'.[18] In fine, relative deprivation denotes the feeling of hardship, grievance or injustice which emerges through the agency of this comparison.[19]

In numerous ways the advent of the steamship meant for the seafarer improved conditions and better employment prospects. At base, ships now carried larger numbers, both engineers and firemen in addition to the deck 'crowd'. In terms of the demand for shipping and so of employment opportunities for the sea-going labour force, the steamer created entirely new trades whilst, paradoxically, the task of providing the carrying space to distribute bunker coal for steamers around the world became the staple trade of a large portion of the sailing ship fleet as the nineteenth century ran on. It may be said also that mail steamers, the predominant overseas steamshipping activity, sailing against time with a regularity often greater than was warranted by the demands of seasonable trade, offered the seafarer the possibility of more continuous employment in larger, better found, stauncher ships. In spite of these gains, however, it can be said that the first ships' engineers did encounter a certain amount of resistance from the sailors.[20] It must be remembered that the first ocean steamers were dirty, noisy, smokey little craft whose wheezing, croaking machinery laboured to produce only a modest and somewhat unpredictable action. So much so that, in the opening years of steam navigation and for long afterwards, steamships were built heavily masted, fully-rigged and with such a suffiency of sail as would permit them to proceed more or less independent of their wretched engines. Add to this the murderous

quarrel taking place between primitive technologies and scientific principles, and its melancholy accompaniment, the sudden and startling thunder of bursting boilers, and there was much to reinforce the obstinately held convictions of those who had determined that steam was out of place at sea. Conceivably on the part of the old sailormen, their assessment of the matter was not a little influenced by their distaste for, and distrust of, any innovation, especially one which some of the more shrewd among them must have grasped as having the potential to appropriate that area of competence which custom and tradition had ordained as peculiarly their own.

For it is clear that the influx of the 'rude mechanicals' posed a complex threat to the orthodox sailor and to the traditional structure of the shipboard social system. In the days of the sailing ship, the master, the mates and the crew always and at all times had perforce to control and propel their vessel in the best way they could by manipulating a vast array of sail and rigging in a variety of devious and ingenious ways. In a sense, therefore, to deprive seamen of this role, as the marine engine even in its earliest manifestation must have looked capable of doing, was to take away the largest part of the individual seaman's *raison d'etre.* In different words, through the enforced obsolescence of skills,

> ...labour saving technology produces acute psychological and social problems for the worker. The difficulty does not lie exclusively in the need for learning new routines of work. The need for discarding acquired skills and, often, the accompanying demotion of status destroys the positive self-image of the worker stemming from the confident use of those skills....[21]

Bearing in mind too the fact that, as has often been suggested,[22] the seaman's work tends to penetrate the inner life of the man to such an extent as may be said to contaminate the personality, making him thus the prisoner of his occupational status to an extraordinary degree, to introduce changes here was to seek, albeit unknowingly, to alter rather more than the mere extent of the proposed change itself. Under such circumstances, the longer a man has been to sea, the greater will tend to be his commitment to the work and to the structure of sentiments arising there from: these largely comprise his universe. Any attempt to revolutionize the character of the work may be seen to constitute a threat not only to the individual occupational identity but, on account of the peculiarly overextended nature of the commitment to the work, to the whole person — to a man's very conception of himself — and was liable therefore, one would surmise, to have been resisted. Perhaps vigorously, for in this context it is

possible that there were instances of 'machine breaking' by the sailors during the early phase of steam navigation.[23] In view of the chronological drift of the innovation, one would suspect not; however if and where such occurrences could be shown to have taken place, the likelihood would be that they were not so much an example of 'collective bargaining by riot' but, rather, owned their provenance to the complex manifold of problems associated with the assault on the sailorman's conception of himself which the new machinery represented.[24]

Possibly on account of these strains, though one is bound to say it is more likely to have been determined by the degree of importance attached to their duties by the old-time nautical autocracy, the carriers of the new technology seem to have been allotted a place in the shipboard hierarchy roughly congruent with that of the other tradesmen on board, the sailmaker and the carpenter. It was said, indeed, that

> ...when steam was first introduced the engineer was considered as a kind of engine-driver or superior stoker, and when it was necessary to consult him he was summoned as one would call in the advice of a plumber or glazier.[25]

This remark was made in reference to engineers in the Royal Navy but has application in the context of the mercantile marine also. The position granted to these early engineers was perhaps some way removed from what their future contribution was to reveal would have been appropriate. Yet, as operators of a new and untried device the long term success of which could not initially be assured, it was by no means an inappropriate one. It might be said in passing that the kinds of evidence from which one is able to appraise the precise dimensions of social standing and status on shipboard at this lower level (except to the extent that something may be deduced from the data on wages, or by reference to ships' plans in which living, dining, sanitary and other arrangements are entered, amplified with a few impressionistic submissions culled from more general sources) can be very difficult to bring forward. Certain interpretations of the evidence would tend to place the engineers more on a footing with the ordinary sailors.

In the event, as the author of the history of the Institute of Marine Engineers was moved to remark, in the early days of mechanical propulsion at sea the machinery had been in the charge of "...artisans with little or no technical education or social qualifications".[26] Arguably, the implications do something less than justice to all the subtleties connoted by the term 'artisan' in the nineteenth century vernacular but his general drift is clear and, intuitively at least, convincing, suggesting that the first engi-

neers to serve at sea were remiss in the sort of personal and professional qualities which might have enabled them to lay claim to a superior status on shipboard. The concept of status in shipboard totemism, it may be noted in passing, in addition to its orthodox components — prestige, social standing, and so on — connotes one further, important element, that of authority and its ensuing prerogatives, such as the right to influence conduct on board. Thus, assuming the estimate to be more or less correct that, at the commencement of steam navigation in the mercantile marine, engineers were granted a type of petty officer status, this position might be argued to have been thought acceptable to the majority of these early mechanics. It was, after all, comparatively elevated within the system of shipboard stratification, somewhat above that of the common sailors but not quite on a par with the navigating officers, and with appropriate privileges. Moreover, it offered them a position roughly corresponding with their contribution to the performance of the ship which, with the faltering success of the innovation at the first, was not always of paramount importance. At the same time, the engineer had charge of the engine-room and was seen as the responsible man there. The first mate, however, was the chief executive officer on board, the representative in almost everything of the master and in law his successor. He had all-embracing duties, such as responsibility for the upkeep of the ship, the working of the crew, the stowage, safe-keeping and delivery of the cargo, and by comparison, the qualified nature of the engineer's duties must, one would submit, have played a significant part in the formation of attitudes among engineers toward their status and right to wield influence on board during this period.

Indeed, they may be thought to have had grounds for some satisfaction with the position as it was, for the majority of engineers serving at sea at this time and in the nineteenth century generally, owing probably to their scarcity of supply, and perhaps also to their better organization ashore, were actually earning rather higher wages than the great number of deck officers. Evidence for this before 1840 is sketchy, but present, although it would of course be unwise to infer too much from isolated comparisons. However, from a generalised examination of the Crew Lists and Articles of Agreement for the period and of the records of one or two mail steamship companies, the general picture which emerges is clear enough. While immense variations are readily discernible, the predominant feature is the markedly and consistently superior earnings of the engineers over all others on board if not, as a rule, over the master or commander himself. One or two examples only must suffice as indication of this trend. Thus, in one of a number of investigations to which the postal

services were subjected in the 1830s, rates of pay in the mail packets were given as follows: Commander, £280 per annum; Chief Mate, £6 per month; Second Mate, £3-14s per month; Engineer, £8-8s per month; Carpenter £3-10s per month; AB, £3-5s per month; Fireman, £4-4s per month. These moneys were quoted in reference to the Irish Sea and cross-channel packets, where provisions were not found. At no point in the Report is it implied that engineers were required to pay their assistants, firemen and oilers, as was often the case in the railways at this time.[27] In the P & O mail steamer *Oriental,* on passage from Southampton to Calcutta, 1847, wage rates for the crew per month included the following: Commander, £33-6s; Chief Officer, £15; Second Officer £12; Third Officer, £9; First Engineer £25; Second Engineer, £14; Third Engineer, £14.[28] This sort of finding would bear out E. Blackmore's well turned remark that

> ...the remuneration of engineers is greatly superior to that of deck officers, as the traditions of their calling have been much in their favour, the competition for employment not having been so severe as that of the sailor.[29]

As the crew lists seem to show, not only were engineers on better money than mates, but even the seamen in steamers averaged a better rate than did those in sail.[30] As Brassey also noted, "...wages were as six in steam to five in sail".[31]

The matter then is a bit difficult to go into in the space permitted, but a working hypothesis is that the deck officers seem to have become in time, and certainly in respect of the question of status on board, the engineers' primary comparative reference group and the focus on their part of aggrieved feelings of status deprivation. However, during the opening decades of steam navigation — from the 1830s until about 1860 — this was probably not the case. Neither in terms of the position occupied by them in the shipboard hierarchy, nor from the viewpoint of earnings taken either relatively or absolutely, can the first engineers to serve at sea be considered to have had grounds for a strong sense of grievance vis-a-vis others on board. What we may call the normative expectations of these early engineers, were not such as to have produced from them aspirations to executive status on board. On the contrary, while engineers may have received little encouragement to do so, neither at the time had they a great deal of reason to identify with, and thus to draw comparisons from, the altogether different situation on board of the deck officers. The more likely possibility is that the first wave of sea-going engineers retained as their principal normative reference group the artisan class in engineering ashore, identified with the range of assumptions, aspirations and grievances of this group, and drew the comparisons accordingly. After all, in view

of the comparatively small number of sea-going engineers at that time, and of their patchy deployment across the handful of large mail packet companies then operating deep water steamers, it may be doubted whether as early as this there could have existed among the engineers a properly developed occupational consciousness of themselves as, specifically, a body of ships' engineers, with all that that implies in terms of work group solidarity, community of outlook and commitment to common action in their own interests. This was a time when the marine prime mover had in no way realized its potential. It perhaps even seemed to many, especially at a time when the deep water sailing ship had attained a new and striking supremacy,[32] as capable of limited application only and of offering engineers, therefore, at best limited career prospects. There might, then, have been a great number who would have considered it expedient to retain their craft ties and other affiliations ashore. Furthermore, sea-going engineers, possessing a set of skills which the orthodox sailorman lacks, have always enjoyed a variety of alternative employment opportunities on shore. Thus by implication they tend to present a much reduced commitment to the shipboard life, and a proportionately reduced incentive to adapt to it and to its at times confusing and complex traditions and customs. It simply does not have to work for them, as it must do for the more occupationally committed deck officers. We can therefore predict with some confidence a great deal of mobility between sea-going and shoreside interludes, men moving freely and frequently between engine shops on shore and engine rooms at sea, some even coming ashore into more responsible positions within the industry. The short point is that the engineer initially came from ashore, ashore lay his chief source of employment and the basis of his economic strength and it was there that he would expect to return, sooner or later. To adapt Professor Phelps-Brown's description of the character and outlook of the craft-based trade unionist of the period, the conditions in which men of his trade were working there, ashore, was likely to have been of rather more interest to the marine engineer of that time than were those of other people doing other jobs alongside him, in what for probably the majority of engineers was only a temporary work-place, on board ship.[33]

III

It has been the aim of the preceding, essentially speculative, discourse to show that the first engineers to serve in the foreign going British mercantile marine in the opening phase of steam navigation would seem, on the face of it, to have had little cause for complaint with their position on

board ship. They probably did not even perceive themselves to be engaged in a comparison with what they imagined to be the situation of others on board, in particular the deck officers. To the extent that they were thus involved with the latter, it would seem unlikely to have been a comparative assessment of situations into which feelings of grievance and inequality can have obtruded in a marked degree. This is not to gainsay the possibility of an emerging sense of relative deprivation among certain numbers of ships' engineers vis-a-vis the executive on deck in particular cases. That is to say, the 'frequency' of relative deprivation, the proportion of the group who feel it, is of course variable and only extensive research will establish, if it is to be done at all, the dimensions of this, and the degree of intensity with which it was felt.[34] If such an interpretation is at all consonant with the reality of the position, it might help to explain why that struggle for a status within the shipboard hierarchy — which was to occupy at such great length a later generation of ships' engineers than the one we have been considering — was, in fact, postponed until the later date.[35] It is, naturally, extremely hard to say and the evidence is far from revealing.

NOTES

1. B.R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics,* 1962, pp. 217-219.

2. The widespread adoption of the steam tug-boat served to repair the basic deficiency of the sailing ship, and to prolong its utility as a cargo carrier.

3. See Charles K. Harley, "The Shift from Sailing Ships to Steamships: A Study of Technological Change and its Diffusion" in *Essays on a Mature Economy,* ed. D. McCloskey, 1972, pp. 215-231, passim; and G.S. Graham, "The Ascendancy of the Sailing Ship", in *Economic History Review,* 2nd Series, Vol. IX, 1956, pp. 74-88. In this context it may also be said that without the mail contracts the new steam packet companies of the 1830s and 1840s — P & O, Cunard, Royal West India Mail and others — could not have continued with their operations. See for example, H.J. Dyos and D.H. Aldcroft, *British Transport: An Economic History from the 17th to the 20th Century,* 1969, Ch. 8 passim.

4. Great Britain Parliament, House of Commons, Sessional Papers (BPP)/1839/XVIII (18) *Report of the Committee on Steamboat Accidents,* from the evidence of Edward Gibson.

5. BPP/1822/VI (417) *Fifth Report from S.C. on Holyhead Roads (Steam Boats, etc.),* p. 124.

6. P.W. Kingsford, *Victorian Railwaymen: The Emergence and Growth of Railway Labour,* 1970, p. 5.

7. Kingsford, *op cit.,* pp. 4-5.

8. BPP/1839/XVIII (18), evidence of Robert Muir, p. 21.

9. Edward Blackmore, *The British Mercantile Marine,* 1897, p. 172.

10. *Idem.*

11. James Napier, *The Life of Robert Napier,* 1904.

12. BPP/1839/XVIII (18), evidence of J.C. Shaw, p. 46 ff.

13. BPP/1822/VI (417) *ibid.*

14. M. & J.B. Jefferys, "The Wages, Hours and Trade Customs of the Skilled Engineer in 1861", in *Economic History Review,* 1st Series, Vol. XVIII pp. 27-44.

15. *Ibid.,* p. 33.

16. See, e.g., Geoffrey Penn, *Up Funnel, Down Screw,* 1955.

17. Samuel A. Stouffer, et al., *The American Soldier, I: Adjustment During Army Life,* 1949, p. 125 ff.

18. Though the organizing principle had been around for several years prior to his formulation, H.H. Hyman, in "The Psychology of Status", in the *Archives of Psychology,* No. 259, 1942, was the first to use the term explicitly.

19. W.G. Runciman, *Relative Deprivation and Social Justice,* 1966.

20. The early radio-operators at sea encountered similar sorts of problems; see Jane C. Record, "The Marine Radio-man's Struggle for Status", in *American Journal of Sociology,* Vol. 63, No. I, 1957.

21. Robert K. Merton, "The Machine, the Worker and the Engineer", in the author's volume of collected papers, *Social Theory and Social Structure,* 3rd edition, 1957, p. 343.

22. "A seaman is what he is and does what he does, ashore as on shipboard, not so much because he is a given type of person but rather because he has a certain kind of job. Few other industries are able to match the merchant marine in terms of its profound effects upon the entire life pattern of its workers, away from work as well as on duty". Elmo P. Hohman, *Seamen Ashore: A Study of the United Seamen's Service and of Merchant Seamen in Port,* 1952, Introduction, p. xv. See also, V. Aubert and O. Arner, "On the Social Structure of the Ship", in *Acta Sociologica,* Vol. 3, 1959, pp. 200-219.

23. cf., E.J. Hobsbawm, "The Machine Breakers", in his, *Labouring Men: Studies in the History of Labour,* 1964 and 1968, pp. 5-22.

24. Aubert and Arner, *loc cit.*

25. Edward Matheson, *Naval Engineers,* 1897.

26. B.C. Curling, *A History of the Institute of Marine Engineers,* 1961, p. 2.

27. BPP/1836/XXVIII, *Report of the Royal Commission on the Management of the Post Office,* Appendix F, No. 2, p. 194.

28. P&O Collection, National Maritime Museum, P&O/3/I. Also of interest in this context: from the Minutes of the Management Committee, Aberdeen Steam Navigation Company, Nov. 1837, "...meeting considered that rate of wages paid to engineers of the steamers as very high; directed (the manager) to make enquiry at Messrs Mathew & Nicol, what they pay those on board their boats". MS 2479/2 in Aberdeen University Library.

29. Blackmore, *op cit.,* p. 172.

30. PRO/BT/98 *Muster Rolls and Articles of Agreement, 1744-1860.*

31. Thomas Brassey, *British Seamen,* 1877, p. 163.

32. G.S. Graham, *op cit.,* passim.

33. E.H. Phelps Brown, *The Growth of British Industrial Relations: A Study from the Standpoint of 1906-1914,* 1959, p. 118 ff.

34. Runciman, *op cit.,* pp. 11-12.

35. See e.g. T.W. Fish, "The Status of Engineers of the Mercantile Marine" in *Transactions of the Institute of Marine Engineers,* Vol. V, No. XLVIII, 1893-1894, pp. 5-22, and succeeding debate.

3. A DERELICTION OF DUTY: THE PROBLEM OF DESERTION ON NINETEENTH CENTURY SAILING VESSELS

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A DERELICTION OF DUTY: THE PROBLEM OF DESERTION ON NINETEENTH CENTURY SAILING VESSELS*

Lewis R. Fischer

"The *Florence* will, I fear, be delayed by several weeks," James Peake wrote apologetically to a Quebec correspondent in June of 1846. The barque, laden with a general cargo, had sailed from Liverpool in early May bound for Portland, Maine. Arriving after a passage of forty six days, eleven crew members immediately jumped ship. For reasons which Peake did not elucidate, the vessel's veteran master, Edward Murchison, was having considerable difficulty in recruiting a suitable crew to sail the craft to Quebec. "How I wish that crews could be found," Peake lamented, "that would not at the first opportunity desert." With an evident air of exasperation, he concluded that "no matter what the master may do sailors seem all too often to prove derelict in their duty."[1]

How accurate was Peake's description of the problem? Data presented in this paper will demonstrate that in fact sailors did desert with great regularity during the half century preceeding the outbreak of the First World War. As well, there were observable temporal and spatial patterns to desertion. 'Limejuicers' deserted most regularly in the 1870s, 1880s and 1890s and they jumped ship more often in North America and Australia than in South America or Asia.

The paper will also offer qualified support for Peake's contention that desertion was a fact of life that simply had to be accepted. Indeed, this is the inescapable conclusion to be drawn from the voluminous literature concerning life at sea.[2] While accounts of the phenomenon are sketchy and do little to advance our understanding of why men desert, there are some general conclusions which clearly emerge. Most often, desertion is dismissed simply as the result of temptations (generally illicit) ashore, the activities of crimps and other denizens of 'sailortowns', or outright laziness on the part of the deserter.[3] Ranking just below this triad in frequency is an argument based upon the brutality of life at sea, most often caused by masters whose alleged 'discipline' frequently bordered upon pathological sadism.[4] The one common thread which unites all of these explanations is the characterization of deserters as men who were not really in control of their own destinies, men who might be described as pawns of forces beyond their control. Peake would likely have had little difficulty subscribing to these views.

Much of this was doubtless correct and in a limited sense the paper will support standard historical argument. However, it is clear from the data that in many instances men who deserted were very much in control of their own destinies, often making what appear to the historian to be extremely astute judgements about the benefits of 'deviant' behaviour such as desertion. Patterns of desertion coincided almost perfectly with economic and occupational opportunities in several ports. It is also not uncommon to find high correlations between prevailing above average wage rates and desertion; as well, the practice of deserting to escape debts to the ship was not unusual.

However, no general 'models' which purport to explain desertion in all places and at all times will be presented. This is not surprising and it should not be disheartening. Despite the vast amount of data now available on crew members, there is an equal amount which it is not possible to know. Some deserters obviously differed in personality or in their ability to accept discipline; some had no intention of pursuing seagoing careers; some doubtless were more prone to 'temptation'. In this sense it will be argued that Peake was correct: desertion was often neither controllable nor predictable.

The purpose of this paper is two-fold. First of all, a preliminary attempt will be made to describe the spatial and temporal patterns of desertion. In the second part of the paper, an attempt will be made to test some hypotheses to explain at least part of the phenomenon. In the process, data on over 54,000 crew who served on board sailing vessels registered in the port of Saint John, New Brunswick will have been analyzed. Saint John was by far the largest port of the region and its vessels participated in virtually every trade route serviced by the British merchant marine.[5] Thus, the results presented should serve as reasonable surrogates for desertion patterns on vessels registered elsewhere in the region.

One final caveat: the results reported here must be regarded as both preliminary and tentative. The file is so large that not all of the relevant questions have yet been asked. As well, some vexing file management problems which may affect the reliability of part of the statistical analysis have not yet been resolved.[6] These cautions notwithstanding, there still are good reasons to believe that the trends observed are representative, particularly on the macro-level.

I

How major was the problem of desertion? The file for Saint John contains data on 54,153 crew members, exclusive of masters, who served on board sailing vessels between 1863 and 1914. Of this number, 12,339

(22.8 percent) deserted at intermediate ports of call on voyages.[7] This compares closely to a study of Prince Edward Island-registered vessels in which it was discovered that just over twenty four percent of all crew below the level of master deserted.[8] But while no reason for discharge which includes almost a quarter of all crew can be discounted, it should be borne in mind that the corollary is that over three quarters of all crew members were not deserters. Indeed, well over half of all crew were honourably discharged after completing their agreements.

To observe how the pattern of desertions changed over time, the phenomenon was first studied temporally (see Table 1). The absolute number of deserters peaked in the 1870s, a decade in which approximately forty five percent of all crew who ever joined Saint John craft served. But what is more significant is that the *percentage* of crew deserting *increased* in each decade through the 1890s. Indeed, in the peak year of 1895 almost two fifths (38.7 percent) of all crew deserted their vessels. The implications of this pattern will be discussed later in the paper.

While such results are doubtless interesting, they both overstate and to a certain degree mask the problem. A much better method of measuring the phenomenon is to calculate the number of *opportunities* that crew had to desert. To do this, the number of 'man/entrances' at intermediate ports of call was tallied. This figure serves as a surrogate for desertion opportunities since it reflects the total number of times that crew members entered port and thus had an opportunity to jump ship. When the desertion rates are recalculated using man/entrances, the 'real' desertion rate is substantially diminished (see Table 2). However, the trends remain similar to those illustrated in Table 1, with the desertion rate growing at an annual rate of +1.3 percent per annum through 1895 and then declining rapidly thereafter. This phenomenon holds true for all ranks with the exception of carpenters, for whom desertion continued to increase through the entire period.

Just as there was a temporal pattern to desertion, so too was there a spatial component (see Table 3). While desertion occurred throughout the world, it was clearly concentrated in certain areas. It should not occasion surprise to note that United States and Australian ports were particular targets for desertion, since by most measures of economic opportunity these were the two most rapidly expanding economies in the period under consideration. British North America was also above the mean, but so too was the United Kingdom, which might not have been expected. All other areas were substantially below the mean world rate of desertion, with the West Indies and the Indian-Asian regions coming as close as any to being 'desertion free'.

TABLE 1

DESERTIONS BY DECADE

Decade	N Desert	N Discharged (All Reasons)	% Desert
1860s	1960	10209	19.2
1870s	4399	20634	21.3
1880s	3849	14189	27.1
1890s	1618	5574	29.0
1900s	363	2226	16.3
1910s	150	1321	11.4
1863-1914	12339	54153	22.8

Source: Saint John Labour Analysis File.

TABLE 2

MAN/ENTRANCES AND DESERTION BY DECADE

Decade	N Desert	N Man/Entrances	% Desert
1860s	1960	12353	15.9
1870s	4399	24967	17.6
1880s	3849	17169	22.4
1890s	1618	6745	24.0
1900s	363	2693	13.5
1910s	150	1648	9.1
1863-1914	12339	65575	18.8

Source: Saint John Labour Analysis File.

Within each of the regions, however, some ports were more desertion-prone than others (see Table 4). Of the twenty ports which were the most frequent sites for desertions, seventeen were in the four regions with above average desertion rates; the other three were in South America. New York was by far the most frequent point of departure for deserters and of the major east coast ports in the United States only Norfolk is absent from the list. Saint John and Quebec are also, not surprisingly, included. The three U.K. ports (Cardiff, Liverpool and London) would rank even higher if desertions at starting or terminal ports were included. Melbourne and Newcastle, the two principal ports for desertion in Australia, rank thirteenth and seventeenth respectively, but notable in its absence is Sydney, where only six crew members ever deserted out of over three hundred who entered the port on Saint John vessels. Only the three South American ports of Buenos Aires, Rio de Janeiro and Callao were situated in regions which did not rank high in desertions.

But even more interesting conclusions can be gained by analyzing the rankings by desertion rates. In particular, it is important to note that two ports in the United Kingdom (Liverpool and London) rank first and third. This may well be explained in large part by a form of reverse migration. Of the 186 deserters in Liverpool, for example, 103 (fifty five percent) deserted on ships whose last port of call was either in the West Indies or India. All but six of this number joined in ports in those regions and eighty four (eighty two percent) listed their birthplace as being in the region in which they joined. The pattern was not quite as clear for London, although forty eight percent of the 121 deserters were born in either the West Indies or India.

New York's desertion rate (forty nine percent) is the highest among the remainder of the ports and ranks second overall. Obviously, New York was a primary gateway into the American market for deserters and this phenomenon will be explored more closely in the next section. No other east coast U.S. port came close to matching New York's desertion rates, although all of the Atlantic ports north of Savannah had desertion rates well above the mean. Of the two British North American ports, Saint John accumulated a desertion rate of the magnitude which might have been expected, but the surprise here is Quebec. Although frequently cited in the literature as a port in which desertions were endemic,[9] the actual desertion rate in the St. Lawrence port was only slightly above the world mean and well below the averages for either British North America or the United States. While the rate of desertion was relatively high in the 1860s (37.3 percent), it declined rapidly thereafter and Quebec became almost desertion-free after the early 1880s.

TABLE 3

REGIONAL MAN/ENTRANCES AT INTERMEDIATE PORTS OF CALL

Region	N Man/Entrances	N Desert	% Desert
British North America	8510	2116	24.9
United Kingdom	7236	1569	21.7
Europe	4440	442	10.0
United States	17595	5823	33.1
West Indies	3862	111	2.9
South America	14020	1565	11.2
Africa	916	82	9.0
India and Asia	7517	182	2.4
Australia*	1479	449	30.4

Note: *Australia includes New Zealand.

Source: Saint John Labour Analysis File.

TABLE 4

MAJOR PORTS OF DESERTION, 1863-1914*

Port	N Rank	N Desert	N Entered	% Desert	% Rank
New York	1	2233	4558	49.0	2
Saint John	2	1254	3337	37.6	7
Baltimore	3	639	1637	39.0	6
Philadelphia	4	587	1668	35.2	8
New Orleans	5	565	1772	31.9	9
Quebec City	6	421	1995	21.1	16
Cardiff	7	399	1782	22.4	15
Rio de Janeiro	8	374	2438	15.3	19
Buenos Aires	9	330	1404	23.5	14
Callao	10	324	3149	10.3	20
San Francisco	11	315	688	45.8	4
Boston	12	279	902	30.9	10
Melbourne	13	240	543	44.2	5
Liverpool	14	186	303	61.4	1
Pensacola	14	186	632	29.4	11
Savannah	16	170	993	17.1	18
Newcastle (NSW)	17	134	479	28.0	12
Charleston	18	133	484	27.5	13
Mobile	19	124	698	17.8	17
London	20	121	259	46.8	3

Note: *Includes all ports with one hundred or more desertions over the period.

Source: Saint John Labour Analysis File.

It is also worth noting that the three South American ports in Table 4 seem less important as entrepôts for desertion when ranked by desertion rates. Buenos Aires was a centre for desertion in the 1880s and 1890s, but relatively desertion-free in all other periods. Rio increased as a target for deserters in every decade between 1880 and 1910. In both cases, as will be noted later, desertion patterns roughly followed some indicators of economic health. Callao is a different matter. It is unlikely, given the voyage patterns for vessels registered elsewhere in Atlantic Canada, that Callao will prove to be a major port of desertion for other fleets in the region.[10] But this is still an interesting port. Most sailing vessels called in twice per voyage, once on their way to the guano islands offshore and again to pick up supplies for the long voyage home around the Horn. Significantly, almost all desertions (92.3 percent) came on the *first* entrance, which leads to the inescapable conclusion that in this port a major proportion of the deserters simply could not bear the thought of four or five months labour along some of the world's least hospitable shores.

II

Although there were indeed temporal and spatial patterns to desertion, by themselves they describe, but do not explain, the phenomenon. In order to comprehend this form of behaviour, it may first be asked whether desertion seems to be related to any gross characteristics of the crew. In other words, were some types of crew more desertion-prone than others? The labour analysis file created for this task contains ninety four variables[11] which reveal a great deal about the characteristics of individual crew members. Tests were run on each variable both to investigate causality and to see whether there were significant differences between the populations of deserters and non-deserters.

The results of this analysis were mixed. In most ways, the two populations were quite similar. For example, the average ages of the two populations were almost identical. The mean age of the deserters for the period was 27.2 years, while non-deserters averaged 27.9 years, a difference which has little statistical significance. If officers are removed, the means of the two populations are even closer: 24.6 years as opposed to 24.9 years. If, however, the two samples are compared by age cohorts, it is found that the population of deserters differs only in that it is much larger in the 20-24 year range (thirty seven percent versus twenty nine percent) and significantly smaller in the over thirty five year range (seventeen percent versus twenty four percent). While there was little statistical relationship between age and desertion (indeed, age appears to explain only

about two percent of the variance between the two populations), it is clear that younger men were more desertion-prone than were their older colleagues on the forecastle.

A number of other variables tested revealed even less about desertion. It might be hypothesized that desertion would be less likely if crew members were related to others on board ship. Family relationships among crew were extremely rare, however, and the comparison of the two populations provides little backing for such an argument. While 1.9 percent of all deserters were related to another crew member (most often to officers), two percent of non-deserters had a similar relationship. David Alexander discovered that literacy might have been related to 'unsatisfactory' discharges, including desertion, so this was also tested. On Saint John vessels, 66.9 percent of all deserters were literate compared to 68.7 percent of non-deserters. While this result does not appear promising, Alexander discovered that literate Canadian crew members below the officer level appeared to be less likely to desert than literate foreigners. But in this sample, the difference was minimal: less than two percent over the period.[12]

It was further hypothesized that perhaps the size of the vessel was related to desertion. At first this seemed like a reasonable hypothesis, because the growth rates of vessel size and similar growth rates of desertion were highly correlated ($r = +0.74$) between 1863 and 1890. But this was simply a function of time: both vessel size and the rate of desertion increased over the period. When the two populations were compared, it was discovered that the distributions were almost identical. The same result was obtained by studying age of vessel.

Having previously discovered that man-ton ratios declined dramatically for Canadian-registered vessels in the later nineteenth century, it seemed reasonable to hypothesize that perhaps the residence of the master and managing owner had something to do with desertion. This proposition looked even more attractive when Eric Sager discovered that for Nova Scotia vessels with Bluenose masters the man-ton ratios were even lower than on those craft on which the master was born elsewhere.[13] It might have been the case, for instance, that Bluenose masters in the process of reducing their complements of crew also enhanced the temptation to desert by working the remaining men harder. If so, there is no evidence to be found in this file. Men deserted from those vessels which had a master born in Saint John, New Brunswick, Nova Scotia, or elsewhere in the Maritimes, at almost identical rates to those on which the master was born elsewhere. And the residence of the managing owner did not change the picture. At least based upon this file, local ownership and operation made little difference.

There were, however, some variables in the files which do appear to be related to desertion. One of these is the capacity in which a crew member served. Almost eighty five percent of all men who deserted were able-bodied seamen, just over eight percent were ordinary seamen and about seven percent were drawn from the officer classes. But despite their numerical superiority, ABs were *less* likely to desert than were OSs (see Table 5). Thirty seven percent of all OSs jumped ship over the period and OSs deserted on just over thirty percent of all opportunities. This is a significantly higher rate than for any other rank. ABs took advantage of just under a quarter of all opportunities to desert, while petty officers (including bosuns)[14] left just under ten percent of the time and officers had an extremely low desertion rate of 3.5 percent.

Obviously, the less skilled personnel tended to desert more frequently. This suggests a couple of hypotheses. First of all, it may have been that OSs were less attracted to the sea than other, more skilled employees. Without the capacity at present to utilize sophisticated nominal linkage procedures, this is not an easy hypothesis to test. But while it has a certain logic, some data in the file tends to cast doubt on its validity. For example, if this were the case one might expect to find that a greater proportion of deserting OSs jumped ship on their first voyages. About two percent of OSs indicated that the voyage on which they deserted was their first experience at sea, which, based on the hypothesis, is a disappointingly low percentage. Further, this rate matches almost exactly the percentage of 'first voyage' deserters of all ranks as well as the percentage of non-deserters who had not previously served at sea. As well, it might be expected that if the hypothesis were correct one would find a lower mean age among OSs who deserted than among the general population of that rank. But, again, this was not the case: the ages of the two populations were almost identical (23.2 years for deserters as opposed to 23.4 years for non-deserters). It should be added that this close proximity was maintained over time.

A second hypothesis worth exploring is that the high desertion rate among OSs was really a form of 'hidden immigration'. This has been suggested elsewhere and it retains a good deal of explanatory appeal.[15] Unfortunately, the Saint John file does not provide much definitive backing. When specific areas of known migration were isolated in specific periods, no general correlation was found. However, as will be seen later in the paper, there is good reason to believe that this hypothesis works for the population of deserters in specific ports.

Place of birth also appears to be related to desertion. Birthplace may, if certain assumptions are made, be related to residence, but at any rate in

TABLE 5

DESERTION BY CAPACITY*

Capacity	N Desert	Total	%	N Man/ Entrances	% Desert
Officers	170	4031	4.2	4878	3.5
Petty Officers	741	7063	10.5	8546	8.7
ABs	10173	37327	27.3	45166	22.5
OSs	1039	2811	37.0	3401	30.5
Others	214	2921	7.3	3584	6.0

Note: *Petty Officers include bosuns (see footnote 14); "others" includes a variety of assorted occupations ranging from painters to apprentices.

Source: Saint John Labour Analysis File.

TABLE 6

BIRTHPLACE OF DESERTERS*

Area	Total Deserters, 1863-1914	N Crew	% Desert
Nova Scotia	374	2449	15.3
New Brunswick	442	2954	15.0
Other B.N.A.	210	659	24.2
England	2119	10961	19.3
Wales	197	976	20.2
Scotland	563	2864	19.7
Ireland	1159	5838	19.9
Scandinavia	2367	7607	31.1
Northern Europe	1980	6869	28.8
Southern Europe	609	2334	26.1
U.S.A.	1280	4123	31.1
West Indies	253	1329	11.5
South America	103	435	23.7
Africa	51	263	20.2
India	17	80	21.3
Asia	125	477	26.2
Australia	56	213	26.3
Unknown and Other	434	1452	29.9

Note: *Northern Europe includes the Low Countries and Germany.

Source: Saint John Labour Analysis File.

this data it is the only surrogate which exists so it must suffice.[16] Table 6 details the distribution of deserters by birthplace and also presents desertion rates for various national and regional groupings. The results are both interesting and complex, and open up a whole new range of possible explanations.

If total desertions are examined, the most likely birthplaces were the United Kingdom, Scandinavia, Northern Europe and the United States. Based upon the rates of desertion, Scandinavia and the United States stand out. Desertions by those born in the United States occurred throughout the entire period with a fair degree of regularity, but spatially they were more concentrated: over ninety percent occurred in ports in the United States. This suggests the hypothesis that a good deal of American desertion was a process of giving up a career at sea for life (and perhaps better opportunities) ashore. This is bolstered by the discovery that there were concentrations of desertions in years in which it can be demonstrated that opportunities for employment were excellent. If number of new jobs created in the U.S. is used as a surrogate for these conditions, desertion by U.S. crew in American ports is highly correlated: +0.87 between 1863 and 1890 and +0.62 thereafter. There is also a moderate negative correlation between desertion rates and the rate of unemployment of -0.47 to 1890 and -0.43 after that date.[17]

The Scandinavians present a slightly different pattern. The majority of Scandinavians deserted in the United States (62.1 percent), but the pattern of desertion in North America fluctuated so widely that it is impossible to obtain a meaningful correlation between desertion and economic indicators no matter what controls are introduced. However, there is a correlation for the entire period of +0.64 between desertions by Scandinavians in the United States and immigration by Scandinavians to America. This suggests that immigration from Scandinavia and Scandinavian desertions from sailing vessels may have been related, perhaps even different expressions of the same phenomenon of 'push' factors at home and 'pull' factors in America operating to produce both standard migration and the 'hidden' migration through crew desertion discussed above.

Another interesting finding concerns Irishmen. Based upon the migration literature one might expect to find Irishmen deserting at rates which were well above the mean.[18] But this was not the case: the Irish desertion rate in most decades was substantially below the mean for the population as a whole and it matched almost exactly the mean rate for those born in the United Kingdom. Of the 1159 Irishmen who deserted during the period, almost eighty four percent deserted in North America. Of the total, almost one quarter deserted in the 'Irish capital' of the nation:

Boston. To see the significance of this, it is important to note that just over three quarters of all deserters who ever jumped ship in Boston were Irish. This suggests that, in at least some instances, desertion in a specific place may well have been related to the possibility of finding a well established immigrant community which presumably could provide a form of socialization and economic integration for the new arrival.[19]

Those born in both northern and southern Europe also had high desertion rates. Those from northern Europe tended to desert in North America with the exception of Germans, who evinced an almost equal preference for South America. Desertion by non-Germans was heavily biased toward the period 1863-1890, while German desertions far outstripped those for other areas in the latter portion of the period. Desertion by southern Europeans was heavily skewed toward the period after the mid 1880s. About sixty percent deserted in North America; most of the remainder went to South America. Based upon the literature, patterns of desertion seem to be related to larger trends in general migration. Europeans, more than any other group, tended to conform in desertion practices to classical descriptions of migration patterns.[20]

Another area which requires some examination is Australia. While the number of Australian-born deserters was low, their rate of desertion was above the mean. Almost two thirds of the Australian-born deserters jumped ship in that country and desertions into Australia were heavily skewed toward the end of the period. The number of desertions by Australians in Australian ports is too low to perform any statistical analysis, but they do tend to cluster around years in which economic indicators, such as the value of Australian exports, were particularly high.[21]

The least likely crew members to desert were those who were born in British North America. Desertion rates for Nova Scotians and New Brunswickers are amazingly consistent throughout the entire period and also retain a close relationship to each other. Crew born in Saint John (N = 2512) match the New Brunswick desertion rate exactly for the entire period. This suggests that masters and owners seeking a stable crew most likely would have sought out local candidates. However, as Rosemary Ommer argues, despite such preferences there may well have been constraints on the availability of local labour for shipboard employment.[22]

Yet another variable which appears to be related to desertion patterns is the place where the crew member joined the vessel. Extremely detailed analysis will be required to understand the relationship precisely and this work has only just begun. However, even at this early stage, some trends are apparent. In the North Atlantic, for example, almost eighty eight percent of all desertions took place on east-west legs of voyages. Of this

total, over three fifths (60.3 percent) occurred when a crew member joined at a European rather than a British port. Interestingly, even for those born in the U.K. who deserted in North America, almost thirty percent joined in European ports.

On the other hand, for those who deserted in South America, the primary place of joining the vessel was the United Kingdom. Cardiff and Newport were favourite cities, regardless of the place where the crew member was born. New York and a few Gulf coast ports were also important places of joining for deserters in South America, especially after 1880. These findings parallel voyage patterns, however, and it is this close relationship which makes analysis both difficult and complex.

Desertion was also related to the wages paid to crew members in particular regions and ports. As was shown earlier, there was a spatial pattern to desertion; by and large, desertions occurred in areas where wages offered to crew were higher than average. Again, because wages are so closely related to other factors, it is premature at this early stage to make much of the explanatory value of wages, but it is possible to offer at least a few examples (see Table 7).

Wages in selected cities in the prime areas for desertion (North America and Australia) were consistently above the mean in every decade. If one is not careful, this would lead to the conclusion that desertion for higher wages was a frequent occurrence. However, it has also been shown that desertions were relatively infrequent in South America, despite the fact that the mean wages in Rio de Janerio were also consistently above the mean.[23] On the other hand, it was noted that desertions in the United Kingdom were more frequent than the norm; yet U.K. wage rates for ABs and OSs were consistently well below the world average. The idea of ascribing desertion to a quest for higher wages is thus fraught with difficulty. At best, it can be suggested that there appears to be a relationship, but the precise nature of that relationship remains problematic.

It is also possible that crew members deserted because they were in debt to the ship. Migrating to elude creditors is a common theme in the literature on migration and so this seemed to be a reasonable hypothesis to test. The resulting analysis does suggest that deserters were more often in debt to the ship than were non-deserters, but it also shows that less than ten percent of all deserters were in debt to the ship. This is fundamentally a problem of data: seldom did masters indicate whether in fact an individual owed money. Further, the crew agreements from which the file was drawn do not tell us much about the pattern of spending at sea. For example, it is impossible to know whether a crew member purchased slops, or what he might have paid for this equipment. Given problems such as this, it is highly unlikely that it will ever be possible to adequately test this particular hypothesis.

TABLE 7

MEAN WAGES FOR SELECTED PORTS, 1863-1914*

Period	New York	Melbourne	Rio	Liverpool	World
1863-69	79.21	84.51	73.26	65.82	72.81
1870-79	81.96	87.23	73.01	63.99	70.32
1880-89	78.43	89.10	72.24	60.84	69.81
1890-99	78.37	86.23	74.13	61.38	69.02
1900-09	75.71	88.75	74.91	61.32	71.30
1910-14	76.30	90.11	73.85	61.85	71.38

Note: *ABs and OSs only. Wages are expressed in shillings and decimals thereof.

Source: Saint John Labour Analysis File.

TABLE 8

DESERTION AND ECONOMIC OPPORTUNITY IN SELECTED U.S. PORTS, 1863-1890*

Port	Jobs Created	Rate of Unemployment	Value Added Production	Net Tonnage
Boston	+.07	+.12	+.23	+.19
New York	+.91	-.73	+.35	+.87
Philadelphia	+.32	-.68	+.19	+.43
Baltimore	-.14	-.13	+.29	+.54
Charleston	-.23	+.08	+.56	+.56
Savannah	-.46	-.15	+.51	+.31
Mobile	+.09	+.19	-.13	+.18
New Orleans	+.58	-.23	+.62	+.49
Galveston	+.29	+.16	+.53	+.23
San Francisco	+.41	-.51	+.22	+.85

Note: *Includes all major U.S. ports of desertion except Pensacola. Results are presented in correlation coefficients.

Source: U.S. Bureau of the Census, *Census of the United States* (1870, 1880, 1890, 1900); Fred J. Guetter and Albert E. McKinley, *Statistical Tables Relating to the Economic Growth of the United States* (Philadelphia, 1924); Everett S. Lee, et. al., *Population Redistribution and Economic Growth: United States, 1870-1950. Volume I: Methodological Considerations and Reference Tables* (Philadelphia, 1957); U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (Washington, 1972), p. 92 ff.; U.S. Bureau of the Census, *Historical Statistics of the United States from Colonial Times to 1957* (Washington, 1960), pp. 759-760.

III

Even though the variables in the labour analysis file do not completely explain desertion, the discussion thus far has pointed in another direction which appears worthy of investigation: was economic opportunity related to desertion? It has already been suggested that this appeared to have been the case in certain ports and regions, but in order to answer the question satisfactorily it is necessary to be more specific.

No adequate definition exists of the term 'economic opportunity' and it is not the intention here to provide an all-inclusive description. However, it has proved feasible to construct time series for four economic variables which together should give some idea of the opportunity structure in each port. These are jobs created per year, rate of unemployment, value added by production and net tonnage capacity of vessels entering and clearing each year. Although it is possible to argue that other time series might be more appropriate (for example, the breakdown of the first two time series into categories for skilled and unskilled workers), data problems have imposed constraints on what could be accomplished. But taken as a package it seems reasonable to argue that these series should give us a good idea of the economic vitality of each city.[24] Only U.S. ports have been included because of the difficulty in obtaining data for other ports at present.

The results are shown in Table 8, which presents a series of correlation coefficients between the rate of desertion in each port and each of the variables listed above. The Table covers the period through 1890; after that date, the low number of desertions in most of the ports makes such an analysis impossible.

Based upon the coefficients obtained, the most defensible conclusion would seem to be that the hypothesis concerning the relationship between desertion and economic opportunity is only partially supported. Of the ten principal U.S. ports, only four follow the pattern which would be expected if this proposition were to be sustained. These are New York (for which the case would appear to be strongly supported), Philadelphia, New Orleans and San Francisco. In all of these ports there is at least moderate confirmation of the hypothesis, but for the remaining six ports, it receives little or no support. At least a partial explanation has already been presented for the desertion rate in Boston: the impact of the Irish entering the Boston community. Unfortunately, no such readily apparent explanation is available for the others. Instead, it seems likely that only a combination of the other factors previously mentioned, or variables such as temptation, chance, master discipline, or the like, will suffice.

IV

This paper has admittedly only scratched the surface of the problem. Inherent in explaining human behaviour are a number of obstacles. It is hoped that more detailed and more sophisticated analysis will result in a fuller comprehension of the problem for which this study provides a start. But for those who expect that desertion patterns will ever be totally explained by rational means, it is useful to bear in mind the response of an old salt who, when asked why he had once deserted, is reported to have replied:

> I would like to say that it was the liquor, but the whiskey was terrible. It wasn't the women either, those....The crimps didn't get me. I guess it must have been...well, you know, damned if I can remember![25]

NOTES

*The author would like to extent his heartfelt thanks to members of the Maritime History Group for assisting in the preparation of this analysis. Rosemary Ommer and Eric Sager were particularly kind in responding to long distance telephone calls requesting pieces of information from computer files, both my own and ones which they prepared. David Alexander helped immensely in clarifying some of the intellectual concepts in the paper, but that was the least of his contributions.

1. James Peake to James Stephenson, 23 June 1846, Peake Letterbooks, Peake-Brecken Collection, Public Archives of Prince Edward Island, Charlottetown.

2. See for example, William C. Paddack, *Life on the Ocean, or Thirty-Five Years at Sea* (Cambridge, Massachusetts, 1893), p. 104 ff; James P. Barker, *The Log of a Limejuicer* (New York, 1933), pp. 26-33; Elliot Huntington, *My Experiences before the Mast* (Baltimore, 1904).

3. These conclusions are neatly summarized in Stan Hugill, *Sailortown* (London, 1967); for some glimpses into Canadian 'sailortowns' which also present a different view of activities there, see Judith Fingard, "Masters and Friends, Crimps and Abstainers: Agents of Control in 19th Century Sailortown," *Acadiensis,* VIII, No. 1 (Spring 1978), pp. 22-46.

4. A good example of this change may be found in Charles Nordhoff, *Nine Years a Sailor* (Cincinnati, 1874), p. 268.

5. For a description of the Saint John fleet, see Lewis R. Fischer, "The Great Mudhole Fleet: The Voyages and Productivity of the Sailing Vessels of Saint John, 1863-1912", in David Alexander and Rosemary Ommer (eds.), *Volumes not Values: Canadian Sailing Ships and World Trades* (St. John's, 1980), pp. 117-155.

6. There appear to be several problems relating to the file, not the least of which is the inability of SPSS to handle files of this size. Until it is possible to redo the analysis using a different statistical package it appears that these problems may well remain.

7. Only intermediate ports of call, that is ports which were entered *during* a voyage, were included in this analysis. Desertion at beginning and terminal ports present different problems and will be handled in a separate paper.

8. See Lewis R. Fischer, *Enterprise in a Maritime Setting: The Shipping Industry of Prince Edward Island, 1787-1914* (forthcoming, St. John's, 1980), pp. 182-190. But note that despite the similarity in overall desertion rates, a number of the particulars appear to differ.

9. See, for example, Hugill, *op. cit.,* pp. 175-176.

10. This point has been sustained for Yarmouth and Halifax at present. On Yarmouth, see David Alexander, "Output and Productivity in the Yarmouth Ocean Fleet, 1863-1900", in Alexander and Ommer (eds.), *Volumes Not Values,* pp. 63-91; for Halifax, see Eric W. Sager, "Sources of Productivity Change in the Halifax Ocean Fleet, 1863-1900", in Alexander and Ommer (eds.), pp. 93-115.

11. There were seventy four variables from the crew agreements plus an additional twenty variables created from the original number for various purposes.

12. See David Alexander, "Literacy among Canadian and Foreign Seamen, 1863-1899", *this volume.*

13. See Eric W. Sager, "Labour Productivity in the Shipping Fleets of Halifax and Yarmouth, Nova Scotia, 1863-1900", *this volume.*

14. Bosuns are sometimes classed with officers and sometimes with petty officers. In this analysis they have been classed with the latter on two grounds. First of all, the qualifications for becoming a bosun are qualitatively different than for officers. Second, after analysis began it became readily apparent that they were a very different group than officers in both their gross characteristics and behaviour, including desertion.

15. See Fischer, *Enterprise in a Maritime Setting,* Chapter IV.

16. This point is argued by Rosemary Ommer in her paper, *this volume.*

17. See the note at bottom of Table 8.

18. Arnold Schreir, *Ireland and the American Immigration, 1850-1900* (Minneapolis, 1958).

19. Terry Colman, *Passage to America: A History of the Emigrants from Great Britain and Ireland to America in the mid-Nineteenth Century* (London, 1972), p. 284.

20. George W. Potter, *To the Golden Door: The Story of the Irish in Ireland and America* (Westport, Connecticut, 1973), p. 241 ff.

21. Data on Australia was obtained from N.G. Butlin, *Australian Domestic Product, Investment and Foreign Borrowing,-1861-1938/39* (Cambridge, England, 1962); Butlin, *Investment in Australian Economic Development, 1861-1900* (Cambridge, England, 1964); Brian McKinley (ed.), *A Documentary History of the Australian Labour Movement, 1850-1975* (Richmond, Australia, 1979); E.A. Boehm, *Prosperity and Depression in Australia, 1887-1897* (Oxford, 1971).

22. See Ommer, *this volume.*

23. For Rio, see Laura Randall, *A Comparative Economic History of Latin America, 1500-1974, vol. III: Brazil* (Ann Arbor, 1977), esp. pp. 191-249. On Buenos Aires, see H.S. Ferns, *Britain and Argentina in the 19th Century* (Oxford, 1960).

24. I would like to acknowledge David Alexander's assistance in devising this method of defining economic opportunity.

25. B. Ogsden, *Reminiscences* (Boston, 1899), p. 40.

4. DISCUSSION FOLLOWING PAPERS BY ALEXANDER, McMURRAY AND FISCHER

CRAIG wondered if desertion was defined to include 'failure to join'.

FISCHER pointed out that it was not clear from the crew lists what the phrase meant. Therefore, the analysis was one of intermediate ports of call and did not include desertion at the end of the voyage. ALEXANDER'S hypothesis about indebtedness to the captain might apply to desertion at the end of the voyage.

CRAIG suggested that three factors helped to determine the level of desertion, one being the actual standard of victualling aboard as against the desired standard.

FISCHER replied that the standard of food on board had not been computerised, but that the literature indicates that it was best on colonial vessels and better on both British and colonial ones than on others. Since a one percent sample of crew lists is being compiled, it will be possible to compare British and colonial desertion rates according to masters. This is probably the only way to get at the question unless some alternative technique can be suggested.

CRAIG said that the second and third factors he was suggesting were (2) conditions in the forecastle and (3) discipline. The official logs can provide the basis for a correlation of the number of disciplinary infractions on board with desertion rates. He asked if any attention had been paid to undermanning? Given that undermanned vessels were harder on the men than fully manned ones, the propensity to desert was probably greater.

FISCHER noted that official logs did not exist for most of the crew agreements he had worked with. He intended to survey the official logs before the 1870s in order to seek a qualitative difference between vessels, based on discipline. No correlation had been found between family connection or friendship and desertion. He pointed out that he had not analyzed crew mixes and places of recruitment. On the matter of undermanning, it depended what was meant. Desertion rates did not seem to be directly related to vessels with below average man-ton ratios or to those for which the actual crew size was smaller than the intended crew size.

CRAIG felt that the number of men who remained with a vessel from previous voyages provided a good surrogate for satisfaction with shipboard conditions.

FISCHER suggested that people with expertise could suggest which

shipping lines should be checked for crew persistence while the one percent sample is being analyzed. The matter of consecutive voyages raises analytical problems since the date of previous discharge is not given after the mid 1870s. Another problem was that nominal linkage was a very tricky analysis for computer programming. People's names and their spellings changed so that criteria were needed for determining whether two different-looking names referred to the same person. Given time constraints, a limited amount of nominal linkage analysis may be possible, but it would be fraught with problems and would provide only a rough surrogate for shipboard conditions.

FINGARD asked if the terms of the crew agreements had been examined. Had anyone considered the relationship between desertions and the seamen's ports of origin?

FISCHER responded that a complex relationship, between desertions and birthplace or place of joining, appeared to exist.

FINGARD noted that, at Saint John, vessels entering from the United Kingdom and from Northern Europe on return voyage articles were those which experienced most desertions.

FISCHER agreed that this applied to those on colonial agreements.

FINGARD emphasized that seamen deserted at the most attractive port. For example, when seamen were aware that their ship was bound for Boston, they did not desert at Saint John but at the latter port.

FISCHER noted that seamen deserted at the first port of call.

FINGARD suggested that sampling the official logs during the 1860s and early 1870s would reveal unsuccessful as well as successful deserters.

FISCHER agreed that some would be revealed and pointed out that in his analysis seamen who were 'left in jail' were included among deserters where they were known as such.

FINGARD thought that seamen in jail were regarded as discharged.

FISCHER called attention to the notation 'left in jail, deserted' and noted that while official logs were often not particularly informative the private logs of the masters could provide some interesting material.

FINGARD noted that on occasion seamen deserted, were jailed and then returned to the ship successfully without being reported as deserters on the crew agreements.

CRAIG suggested that in studying unsuccessful desertions people's motivation for desertion was being considered rather than the actual desertions occurring.

FISCHER voiced the need for source material which would allow an analysis of attempted desertions.

DIXON queried the impact on desertions of the continuous Certificate of Discharge instituted about 1900.

FISCHER noted the precipitous decline in desertion rates after 1895. Was it possible that in the 1860s and 1870s a seaman deserted in a high-wage port like New York knowing that he could get another sailing berth, whereas in the 1890s his chances of employment on a sailing vessel were not high and his skills were not transferable to a steam vessel?

CRAIG suggested that under the new Merchant Shipping Act of 1895, the law became more active in enforcing discipline.

DIXON thought that the Act could not have had much effect because the penalties were not changed.

KNOPPERS asked what constituted an 'unknown' in the figures on desertion.

FISCHER replied that 'unknown' referred to crew whose capacity was not known, to unusual categories such as painters or donkey drivers and to others who appear only in very small numbers.

KNOPPERS called attention to the two main factors mentioned in the paper — hidden immigration and economic opportunity. Was the time of year a factor in desertion? It might be related to economic opportunity in the port or its hinterland which created a need for labour.

FISCHER observed that an analysis of seasonality had not yet been completed. He pointed out that seasonality was important in many things including voyage patterns, except in a port like New York where shipping appeared continuously.

CRAIG said that the Committee on the Merchant Marine (1903) were told that there was a constant interchange between seamen working on land and at sea.

FISCHER was uncertain about how this factor could be analyzed because of its complexity.

KNOPPERS wanted to know when a degree of professionalism appeared among engineers.

McMURRAY replied that about 1862 legislation was brought in requiring engineers to have tickets and thereby necessitating an acceptable level of literacy and technical knowledge and an understanding of engineering principles. In addition, they had first to spend three years in an engine shop ashore followed by a year at sea. But he believed that the critical event was the founding of the Institute of Marine Engineers during the 1880s.

KNOPPERS wondered how far legislation, either demanded by engineers

or required for safety standards, led to a more professional attitude among them.

McMURRAY emphasized that the larger steam packet companies insisted that their ships be run to schedule and this would suggest that the push for professionalism was coming from somewhere other than the engineers, at least initially.

SANGER pointed out that after the 1850s there were few sailing vessels in whaling or sealing because the steam propelled screw had been applied widely in the British northern whale fishery. The role of the engineer being important, he was accepted completely as being an officer.

DIXON observed that in 1865 engineers were first admitted to the Royal Naval Reserve and officially became 'gentlemen'. That was a change in status imposed from outside the engineers themselves.

CRAIG suggested that to an extent professionalizing of the marine engineering occupation was a means of keeping other people out. He noted that up to the 1860s the diversity of engines, boilers and means of propulsion required more skill among engineers than did the typical stylized engines of the 1880s and 1890s.

McMURRAY noted that in a large passenger ship there were more people in the engine room than on deck although the influential positions remained on deck. He argued that the chief engineers of the passenger liners were conscious of their status as a result of their responsibilities as officers rather in terms of their skills.

CRAIG pointed out that when engineers had to be trained to operate a particular engine design, the large engine shops became important as training centres.

WILLIAMS wondered how marine engineers regarded themselves in relation to other engineers?

McMURRAY noted that there was a Marine Engineers' Union for the chief engineers in the tramp trade. He saw the Marine Engineers Institute's function as the transmission of new ideas to the leaders of the profession.

SAGER asked if there was a strong preference among ordinary sailors for sailing vessels rather than steamers.

CRAIG pointed out that in North Wales there was contempt for those who went into 'tin kettles'. Furthermore, in order to enter the highest echelons of the merchant marine, it was necessary to be trained to sail.

McMURRAY confirmed that, up to 1917, Blue Funnel insisted on its captains holding a master's ticket in both steam and sail. The need for this qualification kept a number of sailing ships in existence.

DIXON insisted that the preceding remarks applied to deck officers. The average able seaman during the late nineteenth century preferred steamships because they meant shorter voyages, more money, more living space and more hot water.

McMURRAY agreed that at the end of the century British sailing vessels were crewed by foreigners while British sailors were going into steamships.

PARKER stated that there was a great deal of pride among sailing ship men although the literature tended to overemphasize it.

WILLIAMS thought that there appeared to be almost a reverse pride in the brutality and harshness of the life.

SANGER felt that the development of status among engineers in whaling vessels ran counter to that set out for engineers in general. With the dangers of ice navigation, the application of steam to what were actually sailing vessels made the engineers very important. When these vessels became true steamers, the status of the engineer was downgraded to a position between officers and crew.

McMURRAY agreed that, by the end of the period, engineers may have sensed that they were losing their unique place on board. He believed that the question of engineers and technology had been neglected and his work was essentially speculative. An analogous case was that of the radio officer, who remained peripheral to the ship's company, whereas the engineer did eventually become part of the traditional social structure of the ship.

WILLIAMS suggested that a large number of radio officers were employed by Marconi rather than the vessel owning companies.

McMURRAY agreed that they did not fit any group. They had to seek an identity on board because their peers in other crew categories could achieve promotion while they remained 'Joe Sparks'.

BROOKES turned to ALEXANDER'S paper and the point that literate Canadians performed more satisfactorily than literate foreigners. Was this because the foreigner's performance was affected by a limited command of English?

PANTING suggested that those recruited from Yarmouth County and environs were identifiable as local by their speech. Local patriotism made such a distinction important.

FINGARD observed that illiterate or foreign-speaking sailors would be at a disadvantage in dealing with the masters. She also pointed out that, in big ports, the masters had no choice of crew.

5. RECRUITMENT AND STABILITY OF EMPLOYMENT IN THE BRITISH MERCHANT MARINE: THE CASE OF C.T. BOWRING AND COMPANY

KEITH MATTHEWS

Maritime History Group

RECRUITMENT AND STABILITY OF EMPLOYMENT IN THE BRITISH MERCHANT MARINE: THE CASE OF C.T. BOWRING AND COMPANY

Keith Matthews

The objective of this study is to examine the recruitment and retention of crew in a British company's fleet in order to compare it with the Canadian studies now being carried out by other Project members.[1] The analysis was based upon the fleet of Liverpool ships registered under the ownership of Messrs. C.T. Bowring and Company of Liverpool during the period 1865-1890. *Lloyds Register* was used to identify the vessels and to calculate their statistical profiles; thereafter crew lists were used in order to compile the data on voyages and crews, although a complete run for every vessel could not be obtained owing to the retention of some of the crew lists in United Kingdom archives. However, by calculating the number of vessel months for which there is information as a percentage of the lifetime of each vessel while under Bowring ownership, a satisfactory measurement of the size of the sample was obtained. The results varied from a mere 10.6 per cent for the *Eagle,* which was a sealing screw bark and hence seldom left Newfoundland waters — which meant that hardly any crew lists were deposited in England — to ninety nine per cent for the fully rigged ship *Ophelia* and one hundred per cent for the steamer *Portia* which, since she did not call at a British port, should not have deposited articles with the registrar of shipping at all. The statistics for each vessel can be found in Appendix I.

In general the percentage of voyage months was high, but it is necessary to consider what imperfections may have arisen as a result of the lack of complete statistics. In light of the extremely high turnover of crews, the number of men available for analysis was greatly reduced and the total employment figures for these vessels must therefore have been considerably higher than those reported here. Missing voyage data will also probably have resulted in underestimation of the length of service of some of the personnel but, in view of the fact that the vast majority of men in the sample signed on for only one or two voyages, this problem is not likely to be severe. Finally, the analysis of the birth place of the crews should not be seriously affected since those on the crew lists which are not held by the Maritime History Group (MHG) are hardly likely to have varied greatly from those analysed, given that the same Company was operating the same vessels, in the same general trades.

The study was restricted to officers, petty officers and apprentices, since their retention rate within the Bowring fleet was likely to be higher than that of the lower ranks and since it was felt that these personnel would give a clearer indication of possible regional bias in recruiting. Above all, however, it was necessary to leave out the lower ranks since this partial run of crew lists for thirty two vessels still gave a total of 1123 persons. The study basically sought to answer three questions: first, from what regions of the world did Bowring's draw its senior personnel; second and arising from that, did the firm display any regional bias in recruitment; and third, for how long did these men serve with Bowrings? Whether or not answers to these questions were affected by the rank for which men were recruited was also examined. Each man was analysed in terms of place of birth, age, rank, the vessel(s) upon which he served, the dates of joining and quitting Bowring's service and the voyages in which he was engaged.

I

Two excellent histories of the Bowring empire have been published,[2] but for the purposes of this paper it is useful to trace the origins of the firm and to describe its expansion and general activities in the second half of the nineteenth century. The Company was founded by Benjamin Bowring, an Exeter watchmaker and jeweller, who emigrated to St. John's in 1815. By 1830 his trade had widened to include the importation of a wide variety of dry goods from England and he had established a useful connection with Prince Edward Island, purchasing three thousand acres of land there and importing potatoes and lumber into St. John's. By 1823 he owned two or three Prince Edward Island built schooners and sent one of them, the *Eagle,* across the Atlantic to Bristol. Bowring was blessed with a number of sons and with their coming of age he was able, in 1834, to leave St. John's for Liverpool where the Company, now styled as Benjamin Bowring and Sons, opened a head office in King Street.

During the 1830s, Bowring's main export activities consisted in the shipment of cod and seal oil between Newfoundland and Liverpool in two schooners which he owned, but as yet the firm was not directly engaged in either the great codfish trade or the speculative sealfishery. Benjamin Bowring retired from the Company in 1841 (he died in 1846) and its style changed to Bowring Brothers in St. John's, and C.T. Bowring and Company (his eldest surviving son Charles Tricks) in Liverpool. Benjamin Bowring had created a solid if unspectacular business as a general importer and exporter between Liverpool and Newfoundland, but it was his sons, especially Charles Tricks Bowring, who made the critical and often dangerous decisions which led to a rapid expansion and diversification of

the business. The Company entered the sealfishery for the first time in 1840 and by 1845 had at last become established, if rather small, fish merchants, with the export of a cargo of dried cod to Pernambuco in Brazil.[3] The voyage to Brazil was significant for throughout the rest of the century Bowrings normally sent more fish to the Brazil market than any other Newfoundland merchant, most preferring to ship mainly to the European markets.

As fish exporters the firm expanded rapidly and in many years was amongst the top three firms. In 1855, for example, it was the tenth largest exporter in Newfoundland, dispatching 37,000 quintals of fish from St. John's. In 1866, now third largest exporter, it dispatched 39,000 quintals of fish and by 1873 this figure had risen to 66,000 quintals exported. By 1880 it had become the second largest Newfoundland exporter, dispatching 89,000 quintals of fish in that year. In 1895, immediately following the famous Newfoundland Bank Crash, which left only Bowring's and Harvey's solvent amongst all the merchants of Water Street, Bowring's exported 91,000 quintals and was by far the largest exporter. The firm continued its involvement in the dry cod trade until the 1950s, but by then it formed an extremely insignificant part of Bowring's interests which, as a result of decisions taken in the 1850s and 1860s, had become the huge conglomerate empire which exists today.

During the 1850s Charles Tricks of the Liverpool House began to enter a more general shipping business, sending vessels to South America, the Mediterranean and even once to Australia. In 1850 the Company owned, in addition to a number of Newfoundland coasting and sealing vessels, five deep sea ships registered at Liverpool and in the next decade added eleven more vessels.[4] In 1855 Bowring's inaugurated a direct packet service between Liverpool and Pernambuco which had nothing to do with the Newfoundland trade; two years later the firm was appointed agent in St. John's for the North Atlantic Steam Navigation Company which ran two iron screw steamers between Liverpool, St. John's, Halifax and Portland, Maine. In 1860 the Company opened another packet line between Liverpool and Rio de Janeiro. Bowring's next, and in retrospect extremely fortunate, innovation was to enter Charles Tricks' son William as a partner in the New York import/export business with Brendan, son of Sir Edward Archibald, British consul at New York. This brought the firm into the extensive American export trades, most importantly petroleum. In 1865 Bowring's purchased its first steamer, the *Hawk,* and over the years bought six more, although these were used mainly in the Newfoundland seal hunt. Until 1890, Bowring's stuck with sailing ships for its deep sea ventures which took its vessels into every corner of the globe.[5] By 1900 the firm actually consisted of four separate branches: the Company-

controlled English and American Shipping Company which carried cargoes between England, the Mediterranean and the United States; Bowring Petroleum Company, which handled importation of petroleum; the Agency for Lloyd's Insurance; and finally the tramp fleet of sailing and later steam vessels. It is that tramp fleet which forms the subject of this paper.

II

Lloyds Registers identified thirty two vessels directly owned and registered in Liverpool by C.T. Bowring and Company.[6] In addition, the firm owned seven steamers used mainly in the Newfoundland sealfishery, the general coasting trade of the Island and in commerce with Canada and the United States. The fleet size for Bowring's Liverpool registered vessels over the era is shown in Table 1. Steam tonnage on register is shown in Table 2 but, since all vessels except the *Portia* were primarily engaged in the Newfoundland sealfishery, there are crew lists only for her and for the *Eagle* and *Hawk* in so far as they made voyages to the U.K.

Finally, Bowring's registered a considerable number of vessels in Newfoundland (Table 3) but these, being employed as coasters, sealers or in the short trades to Atlantic Canada, submitted no crew lists to the United Kingdom and in any case their personnel, with the exception of the Newfoundlanders, were no different from those in the deep sea fleet. Thus if Bowring's involvement in other shipping companies and the firm's large scale chartering activity are added to the Liverpool fleet, it is apparent that Bowring's was operating on a very large scale indeed.

Consisting of thirty two vessels, the sample fleet comprised two steamers, one auxiliary steamer, one schooner, eight brigantines, one brig, five barquentines, ten barks and four fully-rigged ships. They ranged in size from the 104 ton barquentine, *Ariel,* to the 1513 ton ship *Othello.* In all, the sample gave information on 369 voyages ranging from only three for the schooner *Dunure* to thirty nine for Bowring's most long lived and active vessel, the bark *Cordelia* (1867-1911). Given the wide variety of trades in which the fleet engaged, the duration of voyages varied tremendously, from perhaps two months for a speedy round trip from Liverpool to St. John's to voyages of twenty six months around the world for the *Othello* and the *Jessica.* However even vessels primarily engaged in the Newfoundland trade could and did make voyages of twenty months duration as they sailed about between Newfoundland and the various fish markets before finally returning to a port in the United Kingdom to complete their voyage.

TABLE 1

BOWRING TONNAGE ON REGISTER (Liverpool Registered)

Year	Vessels on Registry		Gross Additions		Year	Vessels on Registry		Gross Additions	
	No.	Tons	No.	Tons		No.	Tons	No.	Tons
1865	10	4658	—	—	1878	21	13163	3	783
1866	11	4830	1	172	1879	23	13664	2	501
1867	13	6027	2	1197	1880	19	10819	—	—
1868	14	6622	1	595	1881	20	10981	1	162
1869	16	8505	2	1883	1882	20	10523	2	529
1870	16	8505	—	—	1883	18	9853	1	816
1871	17	8848	1	343	1884	19	9882	1	1156
1872	16	8662	—	—	1885	19	9882	—	—
1873	18	9059	3	616	1886	19	9882	—	—
1874	18	9059	—	—	1887	19	9882	—	—
1875	20	11861	3	3116	1888	16	8869	—	—
1876	19	11664	—	—	1889	16	8978	2	399
1877	18	12380	1	1199	1890	18	9164	—	—

TABLE 2

BOWRING STEAM TONNAGE ON REGISTER*

Year	No.	Tons	Year	No.	Tons
1866	1	172	1880	5	1430
1867	1	172	1881	5	1430
1868	1	172	1882	5	1430
1869	1	172	1883	5	1430
1870	1	172	1884	6	2586
1871	2	515	1885	6	2586
1872	2	515	1886	6	2586
1873	2	515	1887	6	2586
1874	2	515	1888	6	2586
1875	2	515	1889	6	2586
1876	2	515	1890	6	2586
1877	2	515			
1878	4	1101			
1879	5	1430			

*Note: These steam vessels were:

Name	Tons	Years of Operation	Description
Falcon	311	1879-n.d.	Scw Bk
Eagle	343	1871-93	Scw Bk
Plover	293	1878-n.d.	Scw Str
Curlew	293	1878-91	Scw Str
Kite	190	1879-90	Scw Bk
Hawk	172	1866-76	Scw
Portia	1156	1884-n.d.	Scw Str

It is possible to divide Bowring's fleet into two parts; an Atlantic fleet (Table 4) where the smaller vessels were usually employed in the Newfoundland carrying trade, whilst the others traded directly to Brazil or carried petroleum and other products from the United States to Europe; and a non-Atlantic fleet (Table 5) which traded around the world and only used Atlantic ports as points of departure and return. Table 6 gives an impression of the general regions used by the non-Atlantic traders.

Before describing the crew of the sample, some technical points need to be addressed. There is a problem with the men's names. Some of them may well have been false — although this should have no particular bearing upon the analysis of recruitment and stability of service. Certainly many names, and almost all foreign names, were misspelt at the time of signing articles and transcription errors are also always possible. Beyond this, there may be some inaccuracy in the given 'Place of Birth' — certainly this was found to be the case to a fair degree in research on Dartmouth muster rolls a century earlier.[7] However this is most likely to occur for two specific reasons. The first is where, for example, a seaman who is merely resident at Liverpool gives that place as his place of birth. The other is less dangerous. Then as now, many people from small and obscure settlements chose to indicate their place of birth as a better known town near to their actual birthplace. The latter problem, while it can render less certain the accuracy of particular places, does not alter the accuracy of the regional basis of birthplace upon which this study of recruitment is based. The accuracy of the age given by the men is also open to question. Once again, the Dartmouth research shows that at different times the stated age could vary by anything up to six or seven years, although that would be an extreme.

It was found that thirty two vessels in the course of 369 voyages were crewed by no fewer than 1123 officers, petty officers and apprentices. The distribution (deducting duplications by promotion) was as follows:

Masters	102
Mates	423
Bosuns	211
Carpenters	186
Sailmakers	73
Engineers	29
Apprentices	398

Table 7 reveals some very interesting biases. The West Country of England, North West England (which is mainly accounted for by men stating Liverpool as their place of birth), Newfoundland and 'Foreign Nations' massively dominate the list. The 'Foreign Nations' category is

TABLE 3

NEW REGISTRATIONS BY BOWRING BROTHERS AT THE PORT OF ST. JOHN'S, NEWFOUNDLAND, BY DECADE IN THE PERIOD 1840-1900

Decade	Number of New Vessels Registered	Tonnage
1840-49	3	232
1850-59	17	1634
1860-69	24	1403
1870-79	23	1430
1880-89	17	729
1890-99	10	1353

TABLE 4

THE ATLANTIC FLEET

Vessel Name	Rig	Life Period	Tonnage
Adamantine	Barquentine	1883-1893	234
Ariel	Barquentine	1873-1891	104
Bianca	Brigantine	1865-1879	138 vessel lost
Dunure	Schooner	1890-1900	186
Eagle	Aux. Steamer	1871-1893	343 sealing vessel
Harriet	Brigantine	1862-1871	186
Imogen (i)	Bark	1863-1875	311 vessel lost
May Cory	Brigantine	1881-1898	162
Portia (i)	Brigantine	1863-1874	197 vessel lost
Silvia	Brigantine	1875-1890	113 vessel lost
Spark	Brigantine	1868-1887	197 vessel lost
Slieve Bloom	Bark	1883-1887	816
Titania (i)	Brig	1862-1871	219
Ulster	Barquentine	1887-1888	290
Vidonia	Brigantine	1889-1900	196
Hawk	Steamer	1866-1868	172 sealing vessel
Harriet	Barquentine	1875-1882	247 vessel lost
Titania (ii)	Barquentine	1875-1879	265 vessel lost
Imogen (ii)	Brigantine	1889-1902	197
Portia (ii)	Steamer	1886-1899	1156 North American Liner
Hermione	Bark	1862-1881	383
Miranda	Bark	1862-1874	314
Cordelia	Bark	1867-1911	598
Viola	Bark	1868-1898	595

TABLE 5

VESSELS EMPLOYED OUTSIDE ATLANTIC WATERS

Name	Rig	Tonnage	Life Period
Britomart	Ship	599	1868-1881
Desdemona	Ship	1490	1876-1900
Jessica	Bark	545	1863-1883
Oberon	Ship	1181	1866-1884
Ophelia	Ship	1184	1866-1893
Othello	Ship	1513	1866-1900
Romeo	Bark	640	1869-1882
Hamlet	Bark	1199	1877-1879

TABLE 6

THE NON ATLANTIC VOYAGE PATTERNS OF BOWRING VESSELS, 1863-1900

Ship's Name	Regions Visited
Britomart	North West America: Australasia: Indian Ocean: Pacific Coast: South America.
Cordelia	Australasia: Pacific Coast South America: Pacific North America: China/Japan, etc.,: Indian Ocean
Desdemona	Australasia: Pacific North America: Indian Ocean.
Hamlet	Australasia: Pacific Islands.
Jessica	Indian Ocean: Pacific Islands: Australasia: Pacific North America: Pacific South America: China, etc.
Miranda	Australasia: Pacific Islands.
Oberon	Indian Ocean: Australasia: Pacific North America.
Ophelia	Australasia: Pacific Coast South America: Indian Ocean: Pacific North America: China/Japan, etc.
Othello	Indian Ocean: Pacific Islands: Pacific North America Pacific South America: Australasia.
Romeo	Pacific North America: Australasia: Indian Ocean: Pacific South America.
Viola	Australasia: Pacific South America: Indian Ocean: Pacific North America: China/Japan, etc.,: Pacific Islands.
Hermione	Indian Ocean: Pacific South America.

TABLE 7

NUMBER OF CREW MEN IN THE BOWRING FLEET BY RANK AND REGION OF BIRTH

	Region	Masters	Mates	Bosuns	Carpenters	Sailmakers	Engineers	Total
1.	West of England	41	78(93)	31(37)	20(21)	8	—	178(200)
2.	S-S.E. England	3	25(27)	10(11)	14(14)	7	3	62(65)
3.	N.E. England	2	11(11)	6(7)	5(5)	2	3	29(30)
4.	East Scotland	5	44(45)	5(5)	24(24)	1	4	83(84)
5.	West Scotland	—	20(20)	9(10)	15(15)	4	7	55(56)
6.	N.W. England	10	65(74)	13(13)	28(29)	15	3	134(144)
7.	Mid-North Wales	4	18(21)	3(4)	5(5)	1	—	31(35)
8.	South Wales	1	9(9)	3(3)	4(4)	1	1	19(19)
9.	Inland England	1	11(12)	4(4)	—	—	—	16(17)
10.	Ireland (Ulster)	1	9(10)	7(7)	4(4)	1	—	22(23)
11.	Ireland South	7	23(24)	5(6)	4(4)	2	5	46(48)
12.	Newfoundland	18	51(54)	73(78)	13(14)	7	—	162(171)
13.	Other Empire	2	14(14)	7(7)	2(2)	3	2	30(30)
14.	Foreign Nations	3	32(33)	30(31)	44(44)	19	2	130(132)
15.	Unknown	4	13(13)	5(5)	4(4)	2	—	28(28)
	Total	102	423(460)	211(228)	186(189)	73	30	1024(1082)
Add Apprentices (there were many more, but they were promoted to other ranks)								98
Total								1123

NOTE: The figures in parentheses after each rank represent what can be termed the 'gross' participation of each region. Many individuals, through promotion, occupied more than one rank. Thus the first column represents the exact regional breakdown by counting each man by the highest rank he reached in Bowring's fleet. The 'gross' figure represents regional representation in each rank.

It is instructive to note that the largest differences between 'Net' and 'Gross' numbers occur for the West of England, followed at some distance by North West England and Newfoundland. Since the difference between 'Net' and 'Gross' figures is caused by individuals serving more than one voyage, and gradually earning promotion within the Company, this alone gives an early indication that these regions not only contributed the largest number of crewmen, but that a significantly higher proportion of men from those regions remained longer in Bowring's employ, and secured more promotion than was the case with those from the rest of the world.

comprised almost completely of what contemporaries knew as 'Dutchmen' or 'Square Heads' who came from that region covering Holland to Denmark, North Germany, Finland and Norway. The relative scarcity of men from Canada is striking, given that Canada operated a huge sailing merchant marine, exported very large numbers of Blue Nose mates and others into the general British merchant fleet and was in close proximity to Newfoundland, a region where some Bowring vessels were bound to call.

If the apprentices (whose place of birth was not usually recorded) are omitted, the West Country, North West England (mainly Liverpool), Newfoundland and 'foreigners' (almost entirely North Europeans) provided 641 out of the 1082 men in the sample, or 59.2 per cent. The West Countrymen, the largest group of all, were obvious candidates for a company like Bowring's. The firm itself had moved to Liverpool from Devonshire via the Newfoundland fish trade and may well (like many other shipowners) have had a bias towards seamen from its home area. Of much greater significance however was the fact that West Countrymen had dominated the Newfoundland trade from its inception. They knew the voyage, were magnificent small vessel men, knew the Newfoundland coast and knew the markets. It was also true that during this period Cornwall, andDevonshire especially, possessed large fleets of small deep sea traders and bred literally thousands of excellent seamen. The high number of men recruited from Liverpool probably reflects the fact that most of Bowring's vessels operated out of that port, but this may be in part an exaggerated count resulting from inaccuracies of the kind discussed earlier.

Given the huge Bowring presence in Newfoundland and the number of its vessels which traded there, the presence of a considerable number of Newfoundlanders is not surprising. However the large number of 'Squareheads' is problematic. Table 8 indicates clearly that men from Devonshire and Cornwall dominated the officers since those two counties alone provided eighty five per cent of all the masters in Bowring's fleet. With regard to 'foreigners', Table 9 indicates not only the dominance of North Europe, but of Germany, Sweden and Norway in particular, with Finland specialising in carpenters. Indeed that position was apparently a key specialisation amongst Scandinavians. It is not surprising, given the relative population of the countries involved, to find Germany at the top of the list, but perhaps more surprising to find that Sweden rather than Norway came second. The One Percent Sample study to be carried out on the total MHG Archive of crew lists will indicate whether or not these figures concur with the general pattern for the British Empire fleet.[8]

In Table 10, the regional distribution shown in Table 7 has been changed into the percentage share which the regions held in each rank,

TABLE 8

WEST OF ENGLAND RANK DISTRIBUTION BY UNIT

Unit	Master	Mate	Bosun	Carpenter	Sailmaker	Engineer	Total
Devonshire	21	35	12	3	5	—	76
Cornwall	14	24	5	13	—	—	56
Dorset	5	4	5	—	—	—	14
Bristol	—	7	4	1	1	—	13
Gloucester	1	4	—	—	—	—	5
Somerset	—	1	4	—	—	—	5
Channel Isles	—	3	1	3	2	—	9
Total	41	78	31	20	8	—	178

TABLE 9

'FOREIGNERS' DISTRIBUTION BY COUNTRY AND RANK

Country	Master	Mate	Bosun	Carpenter	Sailmaker	Engineer	Total
Germany	1	7	10	10	4	—	32
Sweden	—	3	7	14	7	—	31
Norway	—	5	2	8	4	1	20
Finland	—	1	3	7	—	—	11
Denmark	—	2	2	4	1	—	9
Baltic Area	—	3	1	1	1	—	6
Holland	—	1	—	—	—	—	1
Belgium	—	—	—	—	1	1	2
France	—	1	—	—	—	—	1
Russia	—	1	—	—	—	—	1
Switzerland	—	1	—	—	—	—	1
French Colony	—	1	—	—	—	—	1
United States	2	4	5	—	—	—	11
Pernambuco	—	1	—	—	—	—	1
Foreign	—	1	—	—	—	2	3
Total	3	32	30	44	18	4	131

by calculating from the 'gross participation' figures in parentheses. Extracting data from this column to compile a list of the top four regions in each rank, the following result appears:

	MASTERS	MATES	BOSUNS	CARPENTERS
1	West of England	West of England	Newfoundland	Northern Europe
2	Newfoundland	N.W. England	West of England	N.W. England
3	N.W. England	Newfoundland	Foreigners	East Scotland
4	South Ireland	East Scotland	N.W. England	West of England

	SAILMAKER	ENGINEER	TOTAL FOR ENTIRE SAMPLE
1	North Europe	West Scotland	West of England
2	N.W. England	East Scotland	Newfoundland
3	West of England	N.W. England	N.W. England
4	S.S.E. England	S.S.E. England & N.E. England	Foreign Nations

Table 10 shows the pre-eminent position of West Countrymen in Bowring's fleet. The higher the rank, the greater the share the West Countrymen had of it and nearly two thirds of all West Countrymen were officers. Their sheer numbers ensured representation amongst the top four regions in all categories except for engineers, but they occupied fourth position in carpenters and third in sailmakers.

Newfoundlanders were seafarers *par excellence;* they had their fair share of officers, but rather fewer mates than might have been expected; above all they dominated the skilled professional but non-officer seamen, as their first position (by quite a percentage lead) in the rank of bosun shows. They are not represented in the top four positions in any of the technical trades. A picture appears of a society with a small educated elite fit for command of large vessels, both steam and sail, floating on top of a vast number of ill-educated and technically untrained men whose only possible position at sea was to work as common seamen with the hope of making bosun, or if one was extremely favoured, mate of one of the smaller vessels.

'Foreigners', who were shown by Table 9 to have been overwhelmingly Northern European, were not in any great favour as officers, at least in Bowring's employ. Their fifteen per cent share and third position in the bosun's league may well reflect the importance of North European seamen as a source of labour for the British Merchant Marine of that era; the results of the One Percent Sample study should clarify this issue. However the importance of foreigners as carpenters and sailmakers — they topped

the league in both categories — is the most interesting feature of this group and may reflect a standard feature of the British fleet. If so, reasons must be found for this bias. Were Scandinavians and Germans better sailmakers and ships' carpenters than most of their British counterparts, or were these perhaps dying trades as far as industrialised Britain was concerned? That is, the problem may not have been one of the quality of British craftsmen (after all, English and Scottish regions occupy the next three ranks in both categories), but the simple fact that not enough Britishers were interested in becoming sailmakers or ships' carpenters to satisfy the demand for these trades on sailing vessels. Perhaps, except for officers, the British merchant fleet had simply grown to such a scale that, rather like the Greeks today, they had badly outrun their labour supply.

North West England, the third largest numerical group in the sample, produced people in satisfactory numbers throughout every rank. Indeed this is the only region to appear amongst the top four ratings for all of the ranks. However, they appear to have specialised in mates to a much greater extent than in masters, provided comparatively few bosuns and led the rest of the British Isles in supplying carpenters and sailmakers. This pattern may reflect a Bowring's preference for West Country and Newfoundland masters, or there may have been available in Liverpool a vast pool of 'floating' mates who moved from ship to ship and from company to company. These hypotheses could be tested by comparing the length of service of each rank in terms of the region of birth, but some clues may emerge when the problem of crew retention is discussed later in the paper. With respect to less important regions, several questions may be posed. Why were there more men from Eastern than from Western Scotland and why did Eastern Scotland supply such a comparatively high proportion of mates and carpenters? The importance of the Scottish engineers to Bowring's would merely seem to confirm the traditional view of that nation's role in the history of the steam engine. Only seven per cent of the engineers came from Southern Ireland whilst none at all came from Belfast. Of course in the engineering category there are only twenty nine cases which may therefore lack any comparative significance. The lack of Irishmen seems surprising in the light of Irish overpopulation and emigration. Contrary to the popular perception is the officer distribution for the Southern Irish: seven masters, twenty three mates and five engineers out of a total of only forty six men. Equally striking is the paucity of Welshmen, especially of North Welshmen, despite the fact that North Wales was part of Liverpool's hinterland and during this period was heavily involved in shipping. This would have led to the existence of large numbers of personnel who in terms of experience and skills would be

similar to the West Countrymen who, like the North Welsh, came from an area with an extensive small vessel fleet and a lack of alternative employment. Whatever the explanation, few Welshmen served on Bowring vessels and again the results of analysis of the One Percent Sample will show how typical this was and whether, perhaps, Welshmen preferred to work for a Welsh owner, sailing out of a Welsh port. At any rate, it would appear that Bowring's liked to employ West Country officers, Newfoundland bosuns and 'Squareheaded' craftsmen, and seem to have taken the rest of their crews as they found them.

III

It was stated earlier that thirty two vessels in the course of 369 voyages employed for varying periods of time 1123 officers, petty officers and apprentices which would mean, had each man made only one voyage, that Bowring's could operate a fleet ranging from brigantines to fully rigged ships with an average of 3.04 senior persons per voyage. The small brigantines did normally operate on a complement of master, mate and bosun, but a fully rigged vessel such as the *Oberon* required a master, sometimes three mates, carpenter, bosun, sailmaker and from two to four apprentices. Obviously a fleet operation of this size must have involved the employment of a large number of men, but the exact number of individuals depends upon how successful Bowring's was in retaining their officers and petty officers.

As Table 11 shows, the crew lists recorded 835 officers who failed to complete voyages. Since the total number of men employed was only 1123, then, providing each individual made only one incomplete voyage, it would appear that seventy four per cent of all officers and petty officers employed failed, at some time or other, to make a complete voyage, either through leaving after the voyage had commenced or by signing on as a replacement during the voyage. Obviously, the statistic cannot be taken to mean exactly that — for example some men may have joined half way through one voyage and then sailed for an additional voyage thereafter. Others may have transferred in mid voyage from one of Bowring's vessels to another. Moreover, since this would mean that more bosuns and engineers were recorded as making incomplete voyages than had ever been employed by Bowring's in the first place (211 bosuns and twenty nine engineers), many of these signings on and off must have represented transfers from one vessel to another. It may be concluded therefore that many incomplete voyages did not result in the individual quitting Bowring's service. This conclusion is strengthened somewhat if we examine the reasons recorded for leaving.

TABLE 10

THE SHARE OF EACH REGION BY RANK EXPRESSED IN PERCENTAGES

Region	1	2	3	4	5	6	7
West England	40.19	18.44	17.53	11.17	10.96	—	18.48
S.-S.E. England	2.94	5.87	5.21	7.45	9.59	10.34	6.00
N.E. England	1.96	2.39	3.32	2.66	2.74	10.34	2.77
East Scotland	4.90	9.78	2.37	12.77	1.37	13.80	7.86
West Scotland	4.35	4.35	4.74	7.98	5.48	24.14	5.17
N.W. England	9.80	16.09	6.16	15.43	20.55	10.44	13.30
Mid-North Wales	3.92	4.57	1.90	2.66	1.37	—	3.29
South Wales	0.98	1.96	1.42	2.13	1.37	4.35	1.75
Inland England	0.98	2.61	1.90	—	—	—	1.57
Ulster	0.98	2.17	3.32	2.13	1.37	—	2.12
Ireland (South)	6.86	5.22	2.84	2.13	2.74	6.85	4.43
Newfoundland	17.64	11.74	36.97	7.45	9.59	—	15.79
Other Empire	1.96	3.04	3.32	1.06	4.11	8.70	2.77
Foreign Nations	2.94	7.17	14.69	23.40	26.02	8.70	12.19
Unknown	3.92	2.83	2.37	2.13	5.48	—	2.59

Note: 1 = Master, 2 = Mate, 3 = Bosun, 4 = Carpenter, 5 = Sailmaker, 6 = Engineer, 7 = total for region.

TABLE 11

OFFICERS WHO FAILED TO COMPLETE VOYAGES*

Masters	35
Mates	318
Bosuns	231
Carpenters	89
Sailmakers	48
Engineers	40
Apprentices	74
Total	835

*The number of times that individuals left the ship before the voyage was completed or signed on after the voyage had commenced.

Fourteen masters were superceded during the course of the voyage and two masters retired. Forty seven men were shipwrecked and subsequently either drowned or were paid off. Twenty seven men died, eight were left in port through sickness and eighty seven deserted including, surprisingly, one master and seven mates. One man was left in gaol and the time of seven apprentices expired. This comes to a total of 193 men who definitely left Bowring's employ in mid voyage, leaving a remainder of 642 men who either joined or left in mid voyage.

It is safe to assume that, except for the forty seven men who were shipwrecked and the seven apprentices whose time expired, a large proportion of the other 139 were (if they were not promoted from within the vessel) replaced by men from the 642 unknowns. If all 139 were replaced by new hirings (which would be something of an exaggeration) that still leaves 503 men who either joined or left a vessel in mid career through the simple process of half of them being paid off and the other half being hired to replace them. Some of those paid off may have immediately joined another Bowring vessel.

The desertion rate, with the exception of that for apprentices, was very slight and a large number of men were apparently paid off amicably in mid voyage. Not all of these men can have transferred immediately to other Bowring vessels. Perhaps Bowring's (unlike the ruthless merchants and captains of legend) were often amenable to paying off an officer or petty officer should he wish to quit the voyage.

It would have been useful to have been able to analyse not only broken voyages but also the entire question of crew retention in relation to the length of voyages involved, since in Bowring's case the durations certainly varied tremendously. Unfortunately this particular question must be left for later analysis. However, the retention rate amongst Bowring's senior personnel has been measured and is shown in Table 12. The statistics tell us that more than two thirds of all Bowring employees made only one voyage and that ninety three per cent made less than five voyages. Interpretation of these statistics depends upon whether one is an optimist or a pessimist. It is likely that Bowring's, like all other owners, paid off their crews (with the possible exception of the master) when the voyage terminated. Since this left the crew with the option of taking out their money until another Bowring voyage offered, or taking employment with another owner, the fact that almost one third of the men who signed articles made more than one voyage might seem to indicate a comparatively high retention rate. Once again much wider studies of British shipping are needed before it will be known whether Bowring's were average or worse than average in keeping their men on the books. However, some comparison should be possible with the Canadian fleets.

At first sight an attempt to measure crew retention purely through an analysis of the number of voyages undertaken by the crews might seem fatally flawed. After all, amongst those voyages are short two month hauls, from Liverpool to Newfoundland and back, all the way up to the twenty six month epics of such vessels as the *Othello* and one complete voyage of the latter can be argued to be worth thirteen of the former. If crew retention is judged purely in terms of the number of months served this is undoubtedly true, but it must be remembered that at the termination of every voyage, no matter how short or long, the crew were paid off and might have to hang around for quite a while to find another Bowring vessel. Thus the man who served, say, three voyages with Bowring's over a period of, say, eighteen months, could be considered as far more committed to the company than one man who made one voyage of the same duration.

Since it could be argued that rank might have some effect upon the number of voyages an employee might make, voyages were analysed in terms of the rank of crew members (Table 13). All 'one voyage men' being written off in terms of retention, it was considered that for a man to make even two voyages (almost invariably consecutively) indicated some element of retention. The net total of all ranks who served with the fleet was known and the figures could thus be expressed as a percentage of the total who signed articles for each rank. Even these figures reveal that except for those who, eventually, became masters, Bowring's found that the vast majority of men, even officers, would never sign for more than one voyage. By the time nine voyages had taken place then, a very small hard core indeed remained who may, with some modification, be classified as Bowring's career men. Of those who served ten or more voyages with Bowring's, twenty one were masters (twenty one per cent of all masters), five were mates (one per cent of all mates) and the remainder (two men) were bosuns (one per cent of all bosuns). An examination of this elite may throw some light on exactly who was likely to remain for a long period with the company. Table 14 lists these men showing their place of birth, complete career with Bowring's, the number of voyages they made, the period of time served and the number of years of service.

Sixteen, or fifty nine per cent, were West Countrymen, four were Newfoundlanders and the rest scattered from the rest of the world. Seventeen of them (sixty three per cent) had been promoted into the positions they eventually held and had thus literally grown up with the Bowring Company. Obviously, Bowring's repaid steady men not only with steady employment but also with promotion — two of the masters had commenced their Bowring careers as bosuns and may well have been uncertificated. The difficulty of correlating number of voyages with time served is

TABLE 12

NUMBER OF MEN WHO MADE FROM ONE TO TWENTY ONE (THE GREATEST NUMBER) OF VOYAGES AS RECORDED IN THE CREW LISTS

Number of Voyages	Number of Men	Percentage of the Whole
1	758	67.5
2	167	14.9
3	72	6.4
4	41	3.7
5	15	1.3
6	17	1.5
7	9	0.8
8	7	0.6
9	7	0.6
10	6	0.5
11	6	0.5
12	3	0.3
13	4	0.4
14	nil	0.0
15	2	0.2
16	3	0.3
17	2	0.2
18	3	0.3
21	1	0.1
Total	1123	100.0

TABLE 13

ANALYSIS OF THE NUMBER OF VOYAGES IN RELATIONSHIP TO RANK*

Voyages	1	2	3	4	5	6	7	8
2	15	54	23	23	11	7	35	168
3	12	22	11	7	2	2	17	73
4	8	12	7	2	1	1	12	43
5	9	2	3	—	—	1	—	15
6	6	9	1	—	1	—	—	17
7	5	2	—	2	—	—	—	9
8	3	1	1	1	1	—	—	7
9	4	1	1	—	—	1	—	7
10-21	21	5	2	—	—	—	—	28
TOTAL	83	108	49	35	16	12	64	367

*Note: 1 = Master, 2 = Mate, 3 = Bosun, 4 = Carpenter, 5 = Sailmaker, 6 = Engineer, 7 = Apprentice and 8 = total for the year.

TABLE 14

THE LONG SERVICEMEN IN BOWRING'S FLEET (TEN AND MORE VOYAGES)

Name	Rank(s)*	Birthplace	Number of Voyages	Period	Number of Years
Joseph Baron	Master (10) Mate (4) Bosun (2)	Cornwall	16	1869-1892	24
Joseph Clark	Master	Huntingdon	11	1876-1891	16
John Congdon	Master	Fowey, Cornwall	15	1863-1882	20
Thomas Cruthers	Master (8) Mate (2)	Cornwall	10	1892-1895	5
Daniel Down	Master	Plymouth, Devon	10	1864-1874	11
James French	Master (3) Mate (7)	Teignmouth, Devon	10	1868-1876	9
Emanual Gale	Master (1) Mate (8) Apprentice (1)	Bridport, Dorset	12	1867-1888/ 1911	23
Joseph Goss	Master	St. John's, Nfld.	11	1883-1896	14
John Gregory	Master (11) Mate (2)	Devonshire	13	1863-1870	8
Richard Harvey	Master (17) Mate (5)	Teignmouth, Devon	22	1864-1890	27
George Hill	Master (3) Mate (8) Bosun (5)	Perth, Scotland	16	1863-1873	11
William Lavers	Master (7) Mate (10)	Brixham, Devon	17	1864-1881	18
Richard McNab	Master (10) Mate (1)	Belfast, Ireland	11	1867-1872	6

TABLE 14 (CONTINUED)

THE LONG SERVICEMEN IN BOWRING'S FLEET (TEN AND MORE VOYAGES)

Owen Owen	Master	Holyhead, Wales	13	1886-1899	14
John Price	Master (16) Mate (2)	Liverpool	18	1876-1900	25
James Shekel	Master (10) Mate (7)	Bridport, Dorset	17	1868-1888	21 drowned
Thomas Sterling	Master (4) Mate (6)	Liverpool	10	1869-1879	11
R.H. Taylor	Master (14) Mate (2) Apprentice (1)	Newfoundland	17	1898-1911	14
Samuel Thompson	Master (10) Mate (5)	Fleet, Dorset	15	1863-1873	11
Henry Towill	Master	Devonshire	13	1863-1882	20
James Wilson	Master	Cornwall	16	1876-1907	32
John Baig	Mate (9) Purser (1)	Barbados	10	1869-1885	17
Francis Bridden	Mate	Derby, U.K.	11	1880-3/1893	5
Robert Cruthers	Mate (16) Bosun (2)	Belfast, Ireland	18	1863-1887	25
Daniel Scanlon	Mate	St. John's, Nfld.	12	1871-1874/ 1897-98	6
John Small	Mate (2) Bosun (12)	Devonshire	14	1867-1877	11
Charles Mezers	Bosun	Germany	12	1886-1890/ 1899	6
Timothy Quigley	Bosun	St. John's, Nfld.	13	1890-1893	4

*Note: Totals = 21 Masters, 5 Mates, 2 Bosuns.

well illustrated. Compare the German bosun Charles Mezer's twelve voyages and six years of service with John Baig's ten voyages and seventeen years of service. Prize for the man with the least number of voyages and the longest period of service must go to the Cornishman, James Wilson, who served the company from 1876-1907 or thirty two years, but made only sixteen voyages as recorded on the crew lists.

Another way of looking at crew persistence is to see how many men served on more than one Bowring vessel. There were forty five masters, forty four mates, eighteen bosuns, seven carpenters, four sailmakers and five apprentices in this category, making a total of 123 men, or eleven per cent of the total sample given in Table 7, including apprentices. Thirty one per cent of them (thirty eight persons) were West Countrymen. The West Country share of the total sample as given in Table 7 and excluding apprentices (since no place of birth is given for them) was seventeen per cent, but of these twenty one per cent served on more than one vessel. The only other group to come anywhere near this level of persistence was the Newfoundland contingent who provided sixteen per cent of the total sample but of whom only twelve per cent (nineteen persons) served on more than one vessel. They were followed by men from Liverpool at thirteen per cent of the total sample of whom eleven per cent (fifteen persons) served on more than one vessel. That is, statistically speaking, Bowring's favoured West Countrymen as officers and in return obtained much longer service from them as a group than from any other region. Second in this ranking were the Newfoundlanders and third were the men from Liverpool. That is, Bowring's New World centre of business ranked second and its United Kingdom fleet headquarters ranked third.

Without comparative data on other owners and fleets it is impossible to reach many useful conclusions concerning the retention rate on Bowring's vessels. This paper has essayed a rudimentary description of the retention rate and process, and can tentatively identify a small group of reasonably regular employees against a vastly larger group of wandering officers and petty officers. If it is somewhat arbitrarily assumed that for a sailing shipowner of the nineteenth century to employ a man on more than one vessel for at least three years constitutes some kind of successful 'retention', then Bowring's retained about one hundred men or less than ten per cent of their total complement of officers and petty officers. It is difficult to believe that the record of other large and diversified shipping companies would be much worse. But who can tell?

NOTES

1. *This volume,* papers by D. Alexander, L. Fischer, E. Sager and R. Ommer; also current research in progress by members of the Atlantic Canada Shipping Project.

2. David Keir, *The Bowring Story* (London, 1962) and Arthur C. Wardle, *Benjamin Bowring and his Descendants, a Record of Mercantile Achievement* (London, 1938).

3. "The Newfoundlander", December 23, 1945 in "Bowring Name File", (Maritime History Group, M.U.N.).

4. David Keir, *op. cit.,* p. 107.

5. Information contained in this paper on the crews and voyages of Bowring vessels is taken from the Agreements and Account of Crew held at the Maritime History Group Archive.

6. *Lloyds Register of Shipping* for the years 1865, 1870, 1875, 1880, 1885 and 1890 were used to identify vessels owned directly by C.T. Bowring and Co. registered in Liverpool. Vessels whose ownership is listed under the name of Bowring subsidiary companies have not been included in this study.

7. Manuscript index of crew from Dartmouth Muster Rolls, (P.R.O. BT. 98), used in compilation of the "Name Files", (Maritime History Group Archive).

8. The One Percent Sample is in progress at the present time. This sample provides a data set comprising one percent of the vessels of the British Empire for which crew lists are held in the Maritime History Group Archive.

APPENDIX I

32 VESSELS WITH CREW

Vessel Name	Rig	Tonnage	Years Owned	No. Years Owned	No. Months Crew Lists	Months of Crew List as % of Time Owned	No. of Voyages	Average Length of Voyage in Months	Year of First Crew List	No. of Crew	Year of Last Crew List	No. of Crew	Average No. of Crew
Adamantine	Bktn	234	1882-1893	10	69	57.5	8	8.6	1883	10	1893	11	9.8
Ariel	Bktn	104	1873-1891	17	175	85.8	14	12.5	1873	8	1891	5	7.8
Bianca	Bne	138	1863-1879	16	121	63.0	16	8.0	1865	9	1879	8	8.6
Britomart	Bk	599	1867-1881	14	98	58.3	8	12.25	1868	16	1881	17	16.1
Cordelia	Bk	598	1867-1911	44	389	73.6	39	10.25	1867	18	1911	14	14.4
Desdemona	S	1490	1875-1900	25	125	41.6	10	12.5	1876	29	1900	22	24.9
Denure	Sr	186	1890-1900	10	50	41.6	3	16.6	1890	12	1900	12	10.03
Eagle	St. Bk	343	1871-1893	22	28	10.6	6	4.6	1871	19	1874	18	19.0
Hamlet	Bk	1199	1877-1879	2	17	70.8	2	17.0	1877	24	1879	19	21.5
Harriet	Bne	186	1860-1871	11	93	76.8	10	9.3	1862	13	1871	9	10.02
Harriet	Bktn	247	1873-1882	9	76	70.3	6	12.6	1875	11	1882	12	10.8
Hawk	Stmr	172	1866-1876	10	—	—	—	—	—	—	—	—	—
Hermione	Bk	383	1855-1881	26	135	62.5	20	6.75	1862	16	1881	12	14.2
Imogen	Bk	311	1857-1876	19	104	66.6	16	6.9	1863	13	1876	13	12.8
Imogen	Bne	197	1889-	—	14	—	3	4.6	1889	8	1900	11	9.0
Jessica	Bk	545	1863-1882	19	202	88.5	15	13.4	1863	20	1883	13	14.8
May Cory	Bne	162	1881-1898	17	145	71.0	13	12.0	1881	7	1898	8	8.0
Miranda	Bk	314	1854-1874	20	74	61.1	14	5.3	1862	14	1874	13	13.14
Oberon	S	1181	1864-1884	20	143	59.4	14	11.0	1866	28	1884	20	23.4
Ophelia	S	1184	1863-1891	18	214	99.0	15	14.25	1866	30	1891	17	24.4

APPENDIX I (CONTINUED)

32 VESSELS WITH CREW

Vessel Name	Rig	Tonnage	Years Owned	No. Years Owned	No. Months Crew Lists	Months of Crew List as % of Time Owned	No. of Voyages	Average Length of Voyage in Months	Year of First Crew List	No. of Crew	Year of Last Crew List	No. of Crew	Average No. of Crew
Othello	S	1513	1875-1900	25	88	29.3	6	14.7	1886	25	1900	22	23.5
Portia	Bne	197	1863-1874	11	95	71.9	12	7.9	1863	11	1874	11	10.15
Portia	Stmr	1156	1884-1911	—	42	100.0	6	7.0	1887	31	1911	32	30.6
Romeo	Bk	640	1869-1882	13	97	62.2	8	12.0	1869	18	1881	14	17.0
Silvia	Bne	113	1875-1901	26	237	75.9	32	7.6	1875	8	1901	5	8.3
Slieve Bloom	Bk	816	1883-1887	4	33	68.7	8	4.0	1883	16	1887	14	15.3
Spark	Bne	197	1878-1887	9	98	90.7	13	7.5	1868	9	1887	7	8.9
Titania	Bg	219	1850-1872	22	72	69.6	11	6.5	1862	12	1871	12	11.7
Titania	Bktn	265	1873-1879	7	32	38.0	4	8.0	1875	10	1879	10	10.25
Ulster	Bktn	290	1882-1888	6	13	18.1	2	6.5	1887	12	1888	11	11.5
Vidonia	Bne	196	1889-1900	11	127	96.2	10	12.7	1889	8	1900	9	8.6
Viola	Bk	595	1868-1898	30	287	79.7	25	12.5	1868	10	1898	14	13.5

6. CREW SIZE IN TRANS-ATLANTIC TRADES IN THE MID NINETEENTH CENTURY

DAVID M. WILLIAMS

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CREW SIZE IN TRANS-ATLANTIC TRADES IN THE MID NINETEENTH CENTURY[1]

David M. Williams

I

There can be no doubt that the great research project which you are engaged on here at St. John's has already started, and will continue, to dramatically refashion the maritime history of the North Atlantic. Not the least of the benefits emanating from the pioneering work you are undertaking is that it has fired the imagination of maritime historians elsewhere, prompting them to address themselves to issues but cursorily examined and sometimes almost ignored in the past. One such issue is that of crew size, a crucial element in any discussion of shipping efficiency, for as the late Professor Davis observed, "In the days of sail, the cost of sea transport was principally the cost of feeding and paying the crew."[2] Professor Davis in virtually his last published work pointed to crew size as an area demanding research[3] and it reflects no credit on the art of maritime history in Britain that so little attention has been paid to, and virtually nothing published on, this important aspect of shipping operation. Such an omission appears all the more surprising when one learns that the celebrated G.R. Porter of the Board of Trade was applying himself to the calculation, albeit crudely, of men per hundred tons ratios (man-ton ratios) as early as 1846.[4]

This paper presents some preliminary findings of an examination of crew size in trans-Atlantic trades in the mid nineteenth century and is particularly concerned with considering the influence of tonnage, trade and rig on crew size. It is appreciated that a whole range of other factors influenced crew size such as the nature of the cargo, official regulations, the season and, in troubled times or waters, the need to arm and defend the vessel. Again, at the level of the individual vessel in port preparing for sailing, the master, owners or ship's agents responsible for crewing would take into account the particular sailing characteristics and ease of working of their vessel, the quality of crew members engaged, the need or otherwise for a speedy departure. They would at all times endeavour to strike a balance between minimum crew costs and their view of the number of men needed to effectively work the vessel commensurate with a certain degree of safety. The factors influencing crew size, then, were many and varied and subject to variation in incidence and influence as

market circumstances and needs changed, but it seemed reasonable to assume at the outset of the investigation that the size of a vessel, its rig and the trade in which it was engaged were likely to have been among the factors most regularly exerting influence on crew size.

The source used for this study of crew size in the mid nineteenth century was that of the "Customs Bills of Entry".[5] The Bills were a daily publication produced by the Customs for the convenience of the mercantile community. Bills relating to London first appeared in the mid seventeenth century but it was not until the nineteenth century that they were generally produced for the main outports. The earliest set of Bills for Liverpool held in the Customs Library is dated 1820 but the Library's holdings are incomplete until 1852 when a full sequence commences. The information contained in the Bills changed over time but basically they provide a comprehensive picture of the trade and shipping of the port. Each Bill commenced with 'Ships Reports' which detailed the arrival of each vessel in port and there followed summaries of imports and exports and lists of vessels 'cleared for loading', 'loading' and 'cleared outwards'. Of special importance are the Ships Reports which listed the vessel's name, port of registration, master and tonnage, port of origin, dock and ship's agent in port, together with a full account of cargo and consignees. In the course of the mid century additional information was introduced into the Ships Reports, distinguishing, for example, between sail and steam powered vessels and indicating the date of sailing from the port of origin. Most interesting in this context was the inclusion from February 1832 of the numbers of men on vessels entering the port. From the same date such data was also provided for vessels clearing the port. The inclusion in the Bills from the early 1830s of data on crew size is particularly opportune, for the other potential sources for the study of crews in the eighteenth and early nineteenth century, the "Seamen's Sixpences Accounts" and "Mediterranean Passes",[6] both come to an end in the 1820s. Moreover, the information contained in the Bills has the advantage of relating to all voyages, inward and outward, and all vessels, both British and foreign.

The statistical survey undertaken for this paper comprises an analysis of data on crew size extracted from the "Customs Bills of Entry" for Liverpool in two years, 1832 and 1853. The period embraced by these dates is especially interesting for it witnessed a dramatic increase in both the scale of trans-Atlantic trade and the size of vessels engaged in such trade. The year 1832 was chosen as the first year available, while the choice of a year in the early 1850s stemmed from a desire to achieve some spread in the period examined and also to select a year after the repeal of the Naviga-

tion Laws. The availability of source material and the need to overcome problems associated with changes in tonnage measurement determined the selection of 1853. Even with only two years the number of vessels engaged in trans-Atlantic trade to and from Liverpool was very considerable. Around three thousand trans-Atlantic passages to and from Liverpool were made in 1832, and around four thousand in 1853. Because of this it was decided to take a six-month sample from each year. To lessen the risk of distortion and bias arising from the seasonal character of so many Atlantic trades, the six-month sample was taken bi-monthly, comprising February, April, June, August, October and December. The resulting sample, covering 1400 vessels in 1832 and 1945 vessels in 1853, appeared to be fully representative of the Atlantic commerce of Liverpool which was Britain's, and indeed Europe's, foremost Atlantic trading port. Each vessel in the sample was then classified into tonnage ranges of one hundred tons, according to trade and where possible rig, and for each such category the man-ton ratio was calculated. The full results of this analysis are to be found in Appendices 1 to 4. In calculating man-ton ratios account had to be taken of the tonnage problem which inevitably occurs in any examination of mid nineteenth century British shipping. The difficulty arises from changes in the basis of assessing registered tonnage introduced in the 1830s. In the early 1830s registered tonnage in both Britain and America was calculated on a similar basis: the Carpenter's Measure or Old Customs House Measurement, which continued to be applied in the United States until 1865. In Britain a new tonnage law was introduced in 1836 but the new law was wholly optional until 1855. In consequence the registered tonnage of British vessels between 1836 and 1855 is a confusing mixture of old and new measurement systems.[7] In order to ensure a meaningful analysis in 1853 and to permit comparison between 1853 and 1832 every effort has been made to use old measure tonnage when calculating man-ton ratios. Contemporary eighteenth and nineteenth century manning statistics always separated masters from men but in the calculation of man-ton ratios it was felt to be more logical to include the master with the men, as on very small vessels masters must have taken some active part in the working of the vessel and not merely acted in a supervisory capacity. Such practice is not likely to have been common in trans-Atlantic trades other than perhaps in the Newfoundland and Caribbean trades where small vessels were employed, but as a general principle it was thought desirable to include masters with the men in the man-ton ratios.

In presenting the findings of the survey outlined above it is proposed to look first at the relationship between tonnage and rig on the one hand

and crew size on the other. Secondly, crew ratios in the different Atlantic trades will be considered and thirdly, trends in man-ton ratios in the mid century period will be examined. It must be stressed that in each section the aim is merely to point to apparent trends. The analysis is a sample survey based on only two years and while in total around fifteen hundred voyages are being dealt with in each year, the more the aggregate is broken down by categorising vessels into tonnage ranges and according to rig and trade, the more the scope for meaningful assessment and comparison is reduced. Even so, it is hoped that some findings of interest emerge.

II

Table I focusses on the relationship between crew size and tonnage. It provides details of vessels, tonnages, men and man-ton ratios in trans-Atlantic trades to and from Liverpool, arranged in one hundred ton ranges for the six-month samples from 1832 and 1835. This Table and all others that follow relate only to British and American sailing vessels. Steamships and foreign sailing vessels which were present in the 1853 sample regrettably had to be excluded due to difficulties associated with tonnage comparisons.[8] Two observations can be made from the Table. First, and most apparent, is the growth in the tonnage of vessels engaged in Atlantic trade. In 1832 there were few vessels over five hundred tons and the largest was an isolated 723 tons. In 1853 vessels up to fifteen hundred tons were quite common and the largest exceeded two thousand tons. It must be emphasized that such growth in vessel size occurred almost exclusively in the North Atlantic trades and was associated with the huge expansion of the bulk carrying trades of cotton and timber and the rise of American and British North American shipbuilding. This is fully borne out in Table 4 and the Appendices which show that large vessels were concentrated in the United States and British North American trades. Elsewhere in 1853, in the Caribbean and South Atlantic trades, vessels over five hundred tons were still infrequent.

A second feature to emerge from Table 1 is that of a direct relationship between vessel size and man-ton ratios, with the largest vessels requiring the fewest number of men per one hundred tons. Such a trend is of course to be expected. From the mid eighteenth century the relative efficiency of large vessels in terms of crew size per ton was increasing and becoming considerably greater than that of smaller vessels. It has been observed for as early as the 1760s that the wages and victualling costs per ton of a large

TABLE 1

VESSELS, TONS, MEN AND MAN-TON RATIOS* ON VESSELS ENGAGED IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

Tonnage Class	1832				1853			
	Vessels	Tons	Men	Man-ton	Vessels	Tons	Men	Man-ton
0- 99	20	1751	138	7.89	15	1241	100	8.06
100-199	223	33760	2179	6.46	214	33389	1986	5.87
200-299	438	111891	5785	5.17	292	72736	3600	4.95
300-399	467	163230	7424	4.55	170	59155	2783	4.71
400-499	169	73755	3285	4.46	117	52552	2007	3.82
500-599	62	33871	1521	4.49	129	70908	2367	3.34
600-699	21	13273	581	4.38	137	89555	2873	3.15
700-799	1	723	30	4.15	125	94148	2702	2.87
800-899					128	108421	3047	2.81
900-999					90	85628	2342	2.74
1000-1099					72	75376	1978	2.62
1100-1199					75	86241	2177	2.52
1200-1299					60	75073	1807	2.41
1300-1399					42	56207	1356	2.41
1400-1499					41	59207	1388	2.34
1500-1599					19	29060	659	2.27
1600-1699					13	21172	497	2.35
1700-1799					6	10610	243	2.29
1800-1899					6	10872	292	2.69
1900-1999					1	1956	51	2.61
2000-2099					3	6026	111	1.84
2100-2199					4	8400	194	2.31
TOTAL	1401	432254	20943	4.85	1759	1108383	34510	3.11

*Including Master.

Source: compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December).

ship might be only two thirds those of a ship half the size.[9] Shipowners recognized this and the movement into larger vessels, certainly in the North Atlantic where competition was fierce, was in part to avail themselves of these efficiencies. The table shows that man-ton ratios decline quite dramatically as one moves through the lower tonnage ranges. While in both years, once one moves into the tonnage ranges of larger vessels

(over four hundred tons in 1832 and over eight hundred tons in 1853) there was a distinct tendency to diminishing marginal returns, what is remarkable is the way improvements in man-ton ratios were regularly maintained as tonnage increased. In 1853 there was a successive improvement in each one hundred ton range right up to sixteen hundred tons. From this point the numbers of vessels in each tonnage band become too small for any significance to be attached to them.

Turning to the influence of rig, Table 2 shows vessels, tons, men and man-ton ratios in trans-Atlantic trades classified according to rig. The table does not cover all vessels enumerated in Table 1 due to lack of data. Unfortunately, details of rig are not included in the Bills of Entry and it was therefore necessary to identify rigs from other sources.[10] This did not prove possible in all cases but some ninety six percent of vessels in 1832 and ninety percent in 1853 are covered in Table 2. While this shortfall and the nature of the sample would advise caution against laying too much stress on the number of vessels in each category of rig, certain trends are

TABLE 2

VESSELS, TONS, MEN AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

Rig	Vessels	Tons	Men	Man-ton
1832				
Schooner	52	6238	441	7.07
Brig	409	91675	4996	5.42
Snow	141	36252	1842	5.09
Barque	231	79417	3632	4.58
Ship	524	206429	9443	4.58
1853				
Schooner	58	8051	477	5.93
Brig**	202	40500	2180	5.38
Snow	54	13039	602	4.62
Barque	319	114294	4880	4.27
Ship	949	874218	23892	2.73

*Including Master

**Including Brigantines

Source: Compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December); *Lloyd's Register of Shipping* 1832-34, 1851-55; and H.J. Rogers, *Marine Telegraph List of Merchant Vessels* (N. York 1855)

clearly visible.[11] The table shows that only five types of rig were present in any number in trans-Atlantic trades in the mid century and suggests some quite significant changes in the incidence of rigs in the mid century period.[12] Comparing 1832 with 1853 the most noticeable feature is the large and increasing number of ships and the decline in importance of the brig and the snow. A glance at Tables 4 and 5 or the appendices reveals the chief explanation of this shift, namely the increasing size of vessels in the North Atlantic trades and the consequent replacement of the smaller brig and snow by much larger ships. This is not the sole explanation, however, for it would appear that in Atlantic trades generally the brig and snow were losing ground to the barque. Also apparent from Table 2 is the rapid demise of the snow which to all intents and purposes was to disappear as a distinctive rig in Atlantic trades by the 1860s.

The man-ton ratios in Table 2 suggest that rig exerted an influence on manning. In 1832 the schooner was the least efficient rig, followed by the brig and the snow. Barques and ships were the most efficient and curiously had identical man-ton ratios. A similar situation prevailed in 1853 with the exception that the ship had forged ahead of the barque. This pattern of efficiency amongst different rigs closely matches those produced by Eric Sager and Lewis Fischer for the Halifax and Saint John fleets in the 1860s and 1870s.[13] Both found ships and barques the most efficient, and schooners, brigs and barquentines the least so. However while such observations are entirely correct (in Atlantic trades schooners did have higher manning levels than brigs and barques had higher manning levels than ships), it would be wrong to imply from this that certain rigs were inherently more or less efficient than others. Aggregate figures such as those in Table 2 take no account of differences in tonnage between, say, vessels normally rigged as schooners compared with barques and ships. When tonnages are taken into account, a somewhat modified picture of the influence of rig on manning emerges.

Table 3 introduces the element of tonnage into the aggregate material provided in Table 2 and shows how rigs were closely aligned to particular tonnage ranges. In both periods, schooners were invariably below two hundred tons; brigs and snows ranged between one hundred and four hundred tons; barques from two hundred to six hundred tons and ships had the widest range of tonnage from two hundred to seven hundred tons in 1832 and from three hundred to two thousand tons in 1853. The existence of definite tonnage ranges associated with particular rigs, bearing in mind the earlier finding of a clear relationship between tonnage and man-ton ratios (which incidentally is borne out by each rig in both years), means that aggregate assessments of man-ton ratios for rigs are of

TABLE 3

NUMBER OF VESSELS AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

1832	SCHOONER		BRIG		SNOW		BARQUE		SHIP	
Tonnage Class	Vsls.	Man-Ton	Vsls.	Man-Ton	Vsls.	Man-Ton	Vsls.	Man-Ton	Vsls.	Man-Ton
0-99	12	7.93	8	7.82						
100-199	40	6.91	137	6.35	25	6.33	11	6.19		
200-299			208	5.24	79	5.19	68	5.29	68	4.88
300-399			56	4.76	33	4.47	104	4.73	259	4.55
400-499					4	4.83	32	4.13	129	4.53
500-599							16	3.97	46	4.68
600-699									21	4.38
700-799									1	4.15
TOTAL	52	7.07	409	5.42	141	5.09	231	4.58	524	4.58

1853	SCHOONER		BRIG**		SNOW		BARQUE		SHIP	
Tonnage Class	Vsls.	Man-Ton	Vsls.	Man-Ton	Vsls.	Man-Ton	Vsls.	Man-Ton	Vsls.	Man-Ton
0-99	9	8.04	1	6.45						
100-199	45	5.96	110	5.74	8	5.45	3	6.00		
200-299	4	4.04	86	5.13	42	4.54	120	5.02	5	5.50
300-399			5	4.52	4	4.29	109	4.58	26	4.67
400-499							46	3.60	40	4.31
500-599							23	3.41	81	3.29
600-699							12	3.15	119	3.15
700-799							5	3.08	119	2.86
800-899									128	2.81
900-999							1	2.89	89	2.73
1000 +									342	2.44
TOTAL	58	5.93	202	5.38	54	4.62	319	4.27	949	2.73

*Including Master

**Including brigantines

Source: Calculated by the author from tables compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December); *Lloyd's Register of Shipping* 1832-4, 1851-5; and H.J. Rogers, *Marine Telegraph List of Merchant Vessels* (N. York, 1855).

limited value especially for comparison. Once tonnage is taken into account and vessels of similar tonnage are compared, the difference in man-ton ratios between rigs shown in Table 2 shrinks in significance. For example, in the aggregate figures for 1832 in Table 2, the barque is shown as far superior to the snow which in turn was more efficient than the brig. However if one looks at these three rigs in the one hundred, two hundred and three hundred tonnage ranges the differences in crew ratios can hardly be deemed to be very significant. In the three hundred ton range the manning ratios of brigs, snows, barques and ships all fall within a relatively narrow range. Even the apparent inefficiency of the schooner is put into a new perspective when compared with other rigs in the low tonnage ranges. In 1853, the changing incidence of rigs and the upward shift in tonnages of barques and ships reduces the scope for comparison, but those comparisons that can be made suggest that the superiority of the barque over the brig, visible in Table 2, is not borne out when vessels in the one hundred, two hundred and three hundred tonnage ranges are compared. Likewise the superior efficiency of the ship does not emerge from comparison with other rigs at the two hundred and three hundred ton levels and the superiority of the ship over the barque is certainly not demonstrated when barques and ships between three hundred and eight hundred tons are compared.

Two conclusions can be drawn from Table 3. First, the inherent superiority of one rig over another was perhaps not as marked as has sometimes been supposed. Second, and of more specific relevance to the theme of this paper, rig had little direct influence on crew ratios, except indirectly through certain rigs being associated with certain sizes of vessel.

III

Taking the analysis of tonnage and rig a stage further by introducing the factor of trade, Table 4 breaks down into trades the aggregate data on tonnage and crew ratios presented in Table 1. Table 5 does the same for the aggregate data on rig which appeared in Table 2.[14] Both Tables 4 and 5 bear out comments and observations already made. Table 4 shows that the great increase of vessel size in the mid century occurred exclusively on the North Atlantic routes of the United States trade and the British North America trade. In other trades the size of vessel employed did not significantly change between 1832 and 1853, other than perhaps in the Chile/Peru branch of the South American trade. Table 4 further emphasizes the relationship between tonnage and crew ratio. With an occasional exception, the pattern of falling man-ton ratios as tonnage increases,

TABLE 4

NUMBER OF VESSELS AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

1832

West Indies		Central America		South America (Brazil/ Argentine)		South America (Chile, Peru, etc.)		United States (cotton ports)		United States (Eastern seaboard excl. cotton ports)		British North America		Newfoundland		Trade
Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Tonnage class
2	6.55							1	8.08			2	9.93	15	7.84	0-99
66	6.66	33	6.34	41	6.33	10	6.94	3	6.09	7	6.16	23	5.99	40	6.61	100-199
86	6.00	14	5.29	77	5.33	8	6.09	80	4.54	49	4.71	119	5.05	5	5.72	200-299
41	5.49	3	5.36	19	4.83			180	4.33	77	4.57	146	4.52	1	3.50	300-399
15	6.30	1	4.60	1	4.61			55	4.11	53	4.60	44	4.09			400-499
1	5.97							7	4.06	36	4.79	18	4.01			500-599
								1	3.90	18	4.49	2	3.69			600-699
										1	4.15					700-799
																800-899
																900-999
																1000-1099
																1100-1199
																1200-1299
																1300-1399
																1400-1499
																1500-1599
																1600-1699
																1700-1799
																1800-1899
																1900-1999
																2000-2099
																2100+
211	6.02	51	5.81	138	5.42	18	6.51	327	4.32	241	4.64	354	4.59	61	6.56	TOTAL

*Including Master

Source: Compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December)

TABLE 4 (continued)

1853

West Indies		Central America		South America (Brazil/ Argentine)		South America (Chile, Peru, etc.)		United States (cotton ports)		United States (Eastern seaboard excl. cotton ports)		United States (Western sea board California)		British North America		Newfoundland		Trade
Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Vsls.	Man-Tons	Tonnage Class
2	8 15			2	10 32					1	6 45			8	7 69	2	8 22	0-99
38	5 66	35	5 88	32	5 94	7	6 28	1	6 04	12	5 51			37	5 74	52	6 11	100-199
76	5 06	26	4 86	82	5 08	37	5 08	7	4 33	10	4 83			42	4 35	12	5 80	200-299
18	5 88	3	4 65	48	4 85	29	4 89	15	4 09	13	3 92	2	4 69	41	4 39	1	4 95	300-399
12	5 20	3	3 27	12	4 43	13	4 29	28	3 41	16	3 17	4	4 27	29	3 57			400-499
2	4 67			1	3 79	6	3 93	58	3 23	34	3 30	1	4 43	27	3 33			500-599
				6	3 55	3	3 51	62	2 97	30	3 38	2	3 24	34	3 18			600-699
1	3 76			2	2 99			56	2 88	46	2 94			20	2 63			700-799
3	2 99							57	2 83	35	2 82			33	2 76			800-899
						3	2 45	29	2 67	36	2 76			22	2 83			900-999
								18	2 62	35	2 71			19	2 46			1000-1099
								21	2 53	40	2 55			14	2 45			1100-1199
								12	2 44	33	2 55			15	2 07			1200-1299
						1	3 90	8	2 07	25	2 53	1	2 68	7	2 14			1300-1399
								4	2 25	34	2 37			3	2 24			1400-1499
								2	2 19	15	2 27			2	2 32			1500-1599
								2	2 33	10	2 37			1	2 17			1600-1699
								1	2 23	5	2 30							1700-1799
										4	2 79			2	2 48			1800-1899
										1	2 61							1900-1999
										2	1 94			1	1 64			2000-2099
										3	2 43			1	1 95			2100+
152	5 15	67	5 07	185	4 87	99	4 50	381	2 83	440	2 70	10	3 71	358	2 98	67	6 02	TOTAL

TABLE 5

NUMBER OF VESSELS AND MAN-TO.. RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

	SCHOONER		BRIG**		SNOW		BARQUE		SHIP	
1832	Vessels	Man-Ton	Vessels	Man-Ton	Vessels	Man-Ton	Vessels	Man-Ton	Vessels	Man-Ton
West Indies	12	6.70	85	6.22	26	6.26	25	5.60	57	5.89
Central America	12	6.79	22	5.64	5	5.97	6	5.63	3	5.02
South America (Brazil/Argentine)	6	7.24	75	5.44	18	5.56	22	5.34	14	4.86
South America (Chile, Peru, etc.)	4	7.53	7	6.48	1	6.46	5	6.10	1	5.89
United States (cotton ports)			54	4.72	28	4.65	42	4.57	194	4.16
United States (Eastern Seaboard excl. cotton ports)	1	6.90	18	4.89	14	4.82	21	4.36	179	4.63
British North America	2	9.93	112	5.09	44	4.63	110	4.28	75	4.49
Newfoundland	15	7.24	36	6.67	5	5.99				
TOTAL	52	7.07	409	5.42	141	5.09	231	4.58	524	4.58
1853										
West Indies	9	5.80	51	5.35	13	4.64	49	5.28	14	4.36
Central America	13	5.82	23	5.69	9	4.63	17	4.60	1	4.62
South America (Brazil/Argentine)	15	5.39	43	5.47	14	4.81	83	4.78	18	4.25
South America (Peru/Chile)			11	5.65	3	5.31	43	4.68	31	4.01
United States (cotton ports)	1	6.04	2	4.20	1	4.33	44	3.36	307	2.75
United States (Eastern Seaboard excl. cotton ports)			7	5.31	3	4.16	17	3.63	382	2.64
United States (Western Seaboard, California)							5	3.98	3	3.52
British North America	9	6.57	35	4.77	8	3.94	58	3.81	193	2.65
Newfoundland	11	6.69	30	5.83	3	5.58	3	5.54		
TOTAL	58	5.93	202	5.38	54	4.62	319	4.27	949	2.73

*Including Master

**Including Brigantines in 1853

Source: Compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December). *Lloyd's Register of Shipping* 1832-34, 1851-55, and H.J. Rogers, *Marine Telegraph List of Merchant Vessels* (N. York, 1855).

together with the tendency for diminishing returns, is displayed, often unerringly, in every trade in both 1832 and 1853. In the case of rig, Table 5 indicates the increasing dominance of the ship in Anglo-United States trade and the decline of the brig and the snow. The barque too appears to have been under pressure in the North Atlantic but it seems to have become more widely used in the Caribbean and South American trades. The pattern, which was revealed in Table 2, showing the ship as most efficient, followed by the barque, snow, brig and schooner in descending order, is broadly displayed in most trades. It is, however, less marked in 1832 and in the Caribbean and South American trades where the range of tonnage of vessels employed was much narrower than in the North Atlantic trades.

The differences in the size of vessels employed in particular trades help to explain the difference in man-ton ratios between trades. The bottom line of Table 4 provides total figures of crew ratios in each trade and reveals quite substantial variations. In 1832, the highest man-ton ratios were to be found in the Newfoundland, Chile/Peru and West Indies trades and the lowest in the North Atlantic trades, with the middle orders being occupied by the Brazilian and Central American trades. In 1853, the picture was essentially the same, with the highest ratio again in the Newfoundland trade. Somewhat lower were the West Indies, Central and South American trades, while very much lower were the North Atlantic trades. Many of these discrepancies can simply be explained by the size of vessels in each trade. It was the larger vessels of the cotton and timber trades which gave the United States and British North American trades their superior ratios, while the position of the Newfoundland trade reflected the small vessels employed therein. However, the factor of vessel size does not fully account for variations in crew ratios between trades, for if one examines the crew ratios of vessels of similar tonnage in different trades the discrepancy is still visible. Thus if one examines the tonnage ranges between one hundred and four hundred tons in 1832 and between two hundred and five hundred tons in 1853, it will be noted that where the number of vessels in each classification is sufficient for meaningful comparison, the North Atlantic trades consistently present superior man-ton ratios compared with other trades. Of the latter, the West Indies and Chile/Peru trades possessed the worst ratios in 1832. In 1853, the West Indies trade was again poorly placed but the Chile/Peru trade was now more on a par with the Brazilian and Central American trades.[15]

Various factors can be suggested in explanation of the differences in crew ratios between trades irrespective of the tonnage element. Distance

and ease of passage without doubt exerted some influence. In these respects trans-Atlantic trades varied enormously, from the relatively short voyage of the North Atlantic trades to the protracted voyage and extreme climatic conditions, so testing of vessels and men, encountered in the Chile/Peru trade. The special characteristics of particular trades may also have had a bearing on crew size. The use of crew members for the discharging and loading of cargoes, such as in the Chilean trade[16] or certain branches of the West Indies trade,[17] may have served to push crew size upwards. Again, the likely toll of tropical disease, a risk widespread in Central and South American ports,[18] may have encouraged some allowance to be made in crews for possible casualties and losses. The nature of the trade being followed was, then, of some significance and this perhaps has to be borne in mind when contrasting the man-ton ratios of North and South Atlantic trades.

Any consideration of the level of manning in Atlantic trades in the mid nineteenth century needs to take account of the involvement of American vessels in the United States trade. The existence of this competitive element, with its stimulus to reduce costs and therefore manning, gave a unique character to the Anglo-United States trade, since elsewhere in Atlantic trade British shipping faced no competition before the repeal of the Navigation Laws. Even after 1849 when American and foreign competition did appear elsewhere, and the sample in 1853 showed foreign competition in the Cuban, Central American and Brazilian trades, it nowhere assumed the dimensions of the American presence. In the mid century, United States vessels enjoyed around a two thirds share of Anglo-United States trade. This proportion is borne out in the sample, as is shown in Table 6 which represents all trade between Liverpool and United States Atlantic ports for British and American vessels. Contemporaries attributed the United States' dominant position to a variety of factors: the higher quality of United States vessels, the preference of American shippers of British goods for their own nation's vessels and the superior operating efficiency which they claimed was revealed in faster passages and lower manning figures. While examples of comparative British and American manning levels quoted before Select Committees were often exaggerated, it is certain that United States vessels did have lower man-ton ratios. As is shown in Table 6, United States vessels' man-ton ratios were superior by 0.25 in 1832 and 0.52 in 1853. At the latter date, on a one thousand ton vessel, this represented a saving of five men on an American vessel compared with a British vessel. It must be stressed, however, that the lower man-ton ratios in United States vessels which appear in this paper were simply enhanced by, and not dependent on, the

presence of large numbers of American vessels with their greater efficiency. The man-ton ratios for British vessels in Table 6 show that even if United States vessels were excluded from the analysis, the United States trade would still possess man-ton ratios far superior to other Atlantic trades. Moreover, it should be noted that, compared with elsewhere in the Atlantic, British vessels achieved very good levels of manning and made considerable improvement between 1832 and 1853.

TABLE 6

VESSELS, TONS, MEN AND MAN-TON RATIOS* ON BRITISH AND AMERICAN VESSELS ENGAGED IN ANGLO-UNITED STATES TRADES TO AND FROM LIVERPOOL

	Vessels	Tons	Men	Man-ton
1832				
British	198	66029	3058	4.64
American	370	144206	6331	4.39
Total	568	210235	9389	4.47
1853				
British	266	188817	5933	3.14
American	555	531689	13907	2.62
Total	821	720506	19840	2.75

*Including Master

Source: Compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December).

Nevertheless, the fact remains that United States vessels did operate on lower man-ton ratios than British vessels and increased their superiority over the period. The tendency for American vessels to be of a larger tonnage only partially explains this, for lower United States man-ton ratios are still present when vessels of a similar tonnage are compared. Also important may have been improvements in the design and equipment of American vessels, a matter to be discussed in the next section. Apart from more efficient vessels, crews on United States vessels were claimed to be superior. Select Committee witnesses stated that American vessels carried a higher proportion of able seamen than British vessels which, until the ending of the apprenticeship regulations in 1849, were legally required to carry a specified number of boys. "They have more able seamen on board, but we have useless boys," bitterly remarked

William Coulbourn, the Liverpool shipowner.[19] There was a general feeling also that men were made to work harder on American vessels, though opinion was divided as to whether masters achieved this by "superior management and quickness" or by more brutal methods.[20] Overall, in terms of ship design and use of men, American operators would appear to have been more innovatory and enterprising than their British counterparts and this probably accounts for the better level of manning efficiency of United States shipping.

Before completing this section, mention must be made of differences in man-ton ratios between Eastbound and Westbound passages. All the figures discussed so far in this paper are a combination of voyages to and from Liverpool. However, if Eastbound and Westbound passages are separated, some difference in manning levels between the two is apparent. Table 7 distinguishes between Eastbound and Westbound voyages in trans-Atlantic trades for 1832 and 1853. It shows that Westbound passages, that is passages from Liverpool, consistently had higher man-ton ratios than Eastbound passages. No particular significance should be attached to the two cases in 1853 where this trend is not apparent. In seeking to explain these higher man-ton ratios of vessels travelling from East to West, one consideration was whether some feature of the data might induce this bias. Perhaps the figures of crews on vessels entering Liverpool excluded fatalities en route, or perhaps crew figures for vessels leaving the port might include men who absented themselves at the last minute. However, it was thought unlikely that such elements, even if present, could fully account for the differential. Moreover, the findings confirmed those of Fischer, who, in the case of Saint John vessels in the second half of the nineteenth century, found that vessels travelling from East to West in North Atlantic trades almost always had higher man-ton ratios than those operating in the opposite direction.[21] The most likely explanation of this difference is that of winds and current. The direction of the prevailing winds in the North Atlantic and the influence of the Gulf Stream served to give vessels an easier and shorter passage when travelling in an easterly direction.[22] Going West was harder and it may be, as Fischer suggests, that "the higher number of crew on Westbound voyages is a reflection of the need for more men to work the sails on these legs."[23] A further explanation sometimes advanced is that of hidden emigration, that is, joining the crew of a sailing vessel in order to obtain a passage to the New World. This is somewhat less satisfactory as a general explanation, for the Eastbound/Westbound variation is visible in all Atlantic trades including the West Indies and Central and South America, but it may have been a relevant factor in the British North American trade which

interestingly had the second highest differential between West and East-bound voyages in 1832 and the highest in 1853.

TABLE 7

NUMBER OF VESSELS AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

	1832				1853			
	Westbound		Eastbound		Westbound		Eastbound	
Trade	Vsls	Man-ton	Vsls	Man ton	Vsls	Man-ton	Vsls	Man-ton
West Indies	107	6.14	104	5.91	83	5.17	69	5.13
Central America	19	6.32	32	5.52	32	5.43	35	4.77
South America (Brazil/Argentine)	82	5.63	56	5.08	106	4.86	79	4.88
South America (Peru, Chile, etc.)	12	6.64	6	6.25	54	4.54	45	4.44
United States (cotton ports)	94	4.74	233	4.16	140	2.96	241	2.75
United States (Eastern seaboard, excl. cotton ports)	167	4.67	74	4.59	306	2.78	134	2.54
United States (Western Seaboard, California)	167				10	3.71		
British North America	156	4.95	198	4.34	157	3.38	201	2.71
Newfoundland	45	6.68	16	6.17	51	5.94	16	6.36
Total (All Atlantic trades)	682	5.15	719	4.59	939	3.27	820	2.94

*Including Master

Source: compiled from "Customs Bills of Entry" for Liverpool (1832 and 1853, months of February, April, June, August, October and December).

The trade in which a vessel was engaged thus had some influence on crew size and man-ton ratios. Trade exerted an indirect influence through the fact that the bulk of shipping in each trade tended to be in a particular range of tonnage determined by the requirements and conditions of the trade. The Newfoundland trade, with its vessels clustered between one hundred and two hundred tons, is the clearest example of this. More directly, trade affected crew size through the elements of distance, winds, weather and seas to be encountered, and special practices or hazards

associated with the trade being followed. Different levels of competition within trades may also have influenced manning levels. However, irrespective of tonnage, special characteristics and competition, the Westbound passage required additional hands in all Atlantic trades.

IV

One feature which emerges from all the tables presented in this paper is that of some reduction in man-ton ratios between 1832 and 1853. An improvement in manning levels can be seen in almost every range of tonnage, in all rigs and in all trades, and is detectable too in most of the subcategories produced by breaking down aggregate tonnage and rig figures into trades. However, the pattern of improvement was very unequal, as can be seen in Table 8 which compares 1832 and 1853 figures of man-ton ratios and calculates the percentage improvement over the twenty year period. With regard to the size of vessel, it was only in vessels above four hundred and more particularly five hundred tons that a substantial improvement in man-ton ratios occurred. In rigs, the schooner excepted, only the ship showed significant improvement, and a spectacular advance it was. In the various Atlantic trades very considerable gains were made in the United States and British North American trades, but elsewhere only modest improvement occurred apart from the Peru/Chile trade where gains approached North Atlantic proportions. The overall picture which emerges is that significant improvements in man-ton ratios between 1832 and 1853 occurred only in larger vessels, five hundred tons and upwards, chiefly ship rigged and operating on North Atlantic trade routes. In contrast, smaller vessels with alternative rigs, engaged in the Caribbean and South American trades, improved man-ton ratios only slightly in the period.

Explaining these differing trends in man-ton ratios can perhaps best be approached by examining, in North Atlantic and South Atlantic trades, the factors which influenced movements in man-ton ratios over time — changes in vessels, changes in men and the way they were worked by masters and mates, and changes in the conditions of the trade being followed. Changes in these factors in South Atlantic trades were generally slight between 1832 and 1853 and those changes which occurred took place only at the end of the period. As shown earlier, vessels displayed no significant increase in tonnage and while there may have been a swing to the barque rig this would have had no direct influence on manning. Nor is there any evidence to suggest that the quality of seamen and the man-management skills of masters improved. The makeup of crews, however,

TABLE 8

COMPARISON OF MAN-TON RATIOS FOR 1832 AND 1853 INDICATING PERCENTAGE IMPROVEMENTS

	1832	1853	% Gain
(a) By tonnage range			
0-99	7.89	8.06	-2.16
100-199	6.46	5.87	9.13
200-299	5.17	4.95	4.26
300-399	4.55	4.71	-3.52
400-499	4.46	3.82	14.35
500-599	4.49	3.34	25.61
600-699	4.38	3.15	28.08
(b) By rig			
Schooner	7.07	5.93	16.12
Brig	5.42	5.38	.74
Snow	5.09	4.62	9.23
Barque	4.58	4.27	6.77
Ship	4.58	2.73	40.39
(c) By trade			
West Indies	6.02	5.15	14.45
Central America	5.81	5.07	12.74
South America (Brazil/Argentine)	5.42	4.87	10.15
South America (Peru/Chile)	6.51	4.50	30.88
United States (cotton ports)	4.32	2.83	34.49
United States (eastern seaboard excl. cotton ports)	4.64	2.70	41.81
British North America	4.59	2.98	35.08
Newfoundland	6.56	6.02	8.23

Source: Compiled from data assembled from "Customs Bills of Entry" for Liverpool 1832, 1853; *Lloyd's Register of Shipping* 1832-4, 1851-5 and H.J. Rogers, *Marine Telegraph List of Merchant Vessels* (New York, 1855).

may have been improved at the end of the period by the repeal of the apprenticeship regulations in 1849 which removed the obligation to carry a specified number of boys in proportion to the tonnage of the vessel. The apprenticeship regulations, which had a long history and had been strengthened by Graham's Act of 1835, were a constant source of irrita-

tion to British shipowners before 1849. They certainly led to some overmanning, as the fall in the number of apprenticeship enrolments after 1849 showed, but as deceit and evasion were common, their impact in different trades cannot be accurately assessed.[24] The other great legislative change of 1849 — the repeal of the Navigation Laws — may also have had some effect through introducing foreign competition. However, in other respects the conditions of operation in South Atlantic trades changed little. The one exception was the Chile/Peru trade which expanded rapidly with the stimulus of the guano boom. Here, some increase in vessel size and the greater experience of a demanding voyage served to produce a quite substantial improvement in man-ton ratios as the trade became more regular and organised.

Explaining the marked improvement in man-ton ratios in North Atlantic trades would, at first sight, appear to require no more than a reiteration of earlier comments about vessel size. The increased tonnage of vessels was clearly the major factor but it is likely that features of the new vessels, other than mere size, also made a contribution to reducing manning ratios. Advances in ship design development by American shipbuilders were discussed in a number of mid nineteenth century official enquiries. Robert B. Minturn, a New York merchant and shipowner, appearing before a Select Committee in 1847, described the object of the new designs as being "to increase capacity without diminishing sailing quality." This, he said, "was achieved by building the ships long and very flat, sharp at each end." He went on to comment that "as the ships increase in size, the spars, sails and rigging were not increased in the ratio of the increase of tonnage. The greater buoyancy of the models now used render less canvas necessary."[25] Such comments were echoed by Captain Sulivan, one of the Professional Officers of the Board of Trade in 1860 before a further Select Committee. The fall in the number of men per ton was explained, he said, "by the fact that the class of ship now being a long and narrow ship, is not masted in the same proportion to her tonnage in as large a degree as the old class of ships were, so that a ship with four men per one hundred tons is as well manned as an old class of ship would be with five."[26] Savings in manning were attributed to improved equipment as well as design. Minturn, when asked, "have any alterations been made in building the larger ships, for the purpose of facilitating the navigation of them with a fewer number of hands?" replied, "In arranging the ships great attention is paid to facilitating labour by capstans and winches and other contrivances," and he went on to speak of "striking" savings in this respect. Other Select Committee witnesses substantiated these remarks. G.R. Porter referred to "numberless contrivances...for economising

labour,"[27] and Charles Wigram, a London shipowner, more specifically pointed to improved winches and blocks and to much lighter ground tackle, anchors and chains.[28]

All the evidence on ship design and equipment quoted above relates to American vessels, but it is hard to believe that such innovations remained the prerogative of United States shipbuilders for long. Both Canadian and British shipbuilders were constructing larger vessels and improvements pioneered in American vessels were certainly copied. Wigram, in 1847, actually referred to "men at work, making patterns of some of their (American) mechanical arrangements."[29] Far more research is necessary on ship design, hull shape and equipment, and on the pace and scale of technical innovation and imitation, before we can speak with full confidence on these matters, but it seems reasonable to suppose that improvements in design and in the arrangements for working ship contributed to falls in man-ton ratios in North Atlantic trades.

Apart from increases in the size of vessels and advances in design and equipment, other possible factors which might have improved man-ton ratios are changes in masters and men and in the conditions of trade. On the former, one can but speculate; masters may have developed improved techniques of utilising manpower as they acquired more experience of large vessels and new equipment, but whether there was any change in the calibre of the seamen they commanded is impossible to ascertain. The makeup of crews on British vessels, however, may have changed in the early 1850s as apprentices were no longer obligatory. More definite comments can be made about trading conditions. In the mid century shipowners and masters on North Atlantic trading routes operated in a rapidly expanding but highly competitive market. Competition had long been intense in the United States trades and operators in the British North American trade were exposed to new pressures as the timber duties were relaxed and, later, the Navigation Laws repealed. Steam too was beginning to make some impact at the end of the period. This competitive environment necessitated a more rigorous approach to costs and efficiency especially as the growing size of vessels represented an increased capital outlay. There was, therefore, a real stimulus, and some urgency, to increase efficiency and to cut running costs. Such a situation encouraged and promoted the use of smaller crews. Increased vessel size, improved technology and competitive operating conditions, thus underlay the improvements in man-ton ratios in North Atlantic trades over the period examined in the survey.

V

The main conclusions to be drawn from this preliminary survey of crew size in trans-Atlantic trades in the mid nineteenth century can be summarised as follows: First, there was a direct relationship between vessel size and man-ton ratios. This is especially significant since the range of tonnage of vessels operating on trans-Atlantic routes extended dramatically in the mid century. Second, rig had little direct influence on man-ton ratios, but only influenced them indirectly through certain rigs being associated with certain sizes of vessel. Thus the increasing use of the ship rig in the North Atlantic was significant only in that ships were generally of far greater tonnage than vessels rigged in other fashions. Third, the trade in which a vessel was engaged had both a direct and indirect influence on man-ton ratios. Indirectly, trade exerted influence through the tendency for the bulk of shipping in any one trade to be of a particular range of tonnage. Trade exerted a more direct influence through the factors of distance, climatic and sea conditions on the route, patterns of organisation and the level of competition. Fourth, man-ton ratios in North Atlantic trades were substantially lower than in Central and South Atlantic trades and became progressively more so in the mid century, due to the influence of increased vessel size, technological advance and greater competitive pressure. Finally, American vessels set the standard for manning efficiency in trans-Atlantic shipping and were enhancing their superiority in the mid century period.

NOTES

1. The material for this paper was obtained chiefly from the "Customs Bills of Entry" for Liverpool which are stored in the Customs House Library in London. I am grateful to the Librarian for permission to consult the Bills and for assistance and facilities at the Customs House. I must also gratefully acknowledge a research grant from the Research Board of the University of Leicester.

2. Ralph Davis, *The Rise of the English Shipping Industry* (London, 1962), p. 58.

3. Ralph Davis, "Maritime History: Progress and Problems," in Sheila Marriner, (ed), *Business and Businessmen* (Liverpool, 1978), pp. 169-97.

4. *Select Committee on the Navigation Laws,* 1847-1848 (431) XX, Pt. II, pp. 856-9.

5. E. Carson, "Customs Bills of Entry," *Maritime History,* I (1971), pp. 176-90.

6. Ralph Davis, "Seamen's Sixpences, an index of commercial activity 1697-1828," *Economica,* XXIII (1956), p. 328 ff.

7. On the complex issue of registered tonnage measurement see G.S. Graham, "The Ascendancy of the Sailing Ship, 1850-85," *Economic History Review,* IX (1956-57); R. 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), pp. 109-55. Rice's essay cites the main literature on the issue.

8. Data on the nationality of foreign vessels was not provided in the Bills. It was therefore impossible to check and assess their tonnages.

9. Davis, *The Rise of the English Shipping Industry, op. cit.,* p. 73.

10. Details of rig were obtained from *Lloyd's Register of Shipping* 1832-4, 1851-55, and H.J. Rogers, *Marine Telegraph List of Merchant Vessels,* (New York, 1855).

11. As it was safe to assume that vessels over 750 tons were rigged as ships, those vessels which are excluded from Table 2 all fall below this figure. Many were in the lower tonnage ranges and rigged accordingly. Thus no significance should be attached to the actual number of vessels in each category.

12. A few brigantines were present in 1853 but these were insufficient to merit a separate category. They were included with brigs.

13. Eric W. Sager, "Sources of Productivity Change in the Halifax Ocean Fleet, 1863-1901," in David Alexander and Rosemary Ommer, (eds.) *Volumes not Values: Canadian Sailing Ships and World Trades* (St. John's, 1979), pp. 104-5; Lewis R. Fischer, "The Great Mudhole Fleet: The Voyages and Productivity of the Sailing Vessels of Saint John, 1863-1912," in Alexander and Ommer, *op. cit.,* p. 145.

14. Where the Bills listed more than one port of origin, the last port of call was taken. Where more than one port was listed in the declared destination, the port assumed to be the first port of call was taken. Most trans-Atlantic trades to and from Liverpool were direct other than the long distance Chile/Peru trade. In this latter case no account could be taken of changes in crew numbers before the final destination was reached.

15. A similar pattern of man-ton ratios differing between trades is shown in the rig data in Table 5. In 1832 man-ton ratios for brigs, snows, barques and ships were considerably lower in North Atlantic trades than elsewhere, and North Atlantic superiority was visible in barques and ships in 1853.

16. Robin Craig, "The Copper Ore Trade," in Alexander and Ommer, *op cit.,* p. 289.

17. *Select Committee on the Navigation Laws,* 1847-1848 (431), XX, Pt. II, Q. 250.

18. Notably the yellow fever hazards of Cuba and Venezuela. See Robert G. Greenhill, "Latin America's Export Trades and British Shipping, 1850-1914," in Alexander and Ommer, *op. cit.,* p. 251; Craig, "The Copper Ore Trade", *Ibid,* p. 289.

19. *Select Committee on the Navigation Laws,* 1847-1848 (431), XX, Pt. II, Q. 6349.

20. *Ibid,* Q. 6085.

21. Fischer, "The Great Mudhole Fleet", in Alexander and Ommer, *op. cit.,* p. 149.

22. R.G. Albion, *Square Riggers on Schedule* (Princeton, 1938), p. 5.

23. Fischer, "The Great Mudhole Fleet", in Alexander and Ommer, *op. cit.,* p. 149.

24. *Select Committee on British Shipping,* 1844 (545) VIII, Qs. 506-7, 831-2, 1050-4, 1074-6; *Select Committee on the Navigation Laws,* 1847, (232), X, Qs. 5318-21; J.H. Clapham, "The Last Years of the Navigation Acts," in E.M. Carus-Wilson, (ed.), *Essays in Economic History,* III, pp. 164-5.

25. *Select Committee on the Navigation Laws,* 1847-1848 (431), XX, Pt. II, Qs. 8546-8599.

26. *Select Committee on Merchant Shipping,* 1860 (530) XIII, Qs. 6582-3.

27. *Select Committee on the Navigation Laws,* 1847-1848 (431), XX, Pt. II, Q. 187.
28. *Ibid,* Q. 6071; *Select Committee on Merchant Shipping,* 1860 (530), XIII, Qs. 169-173.
29. *Select Committee on the Navigation Laws,* 1847-1848 (431) XX, Pt. II, Q. 607.

APPENDIX 1 (a)

VESSELS, TONS, MEN AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

Tonnage Class		0-99				100-199			
Trade		Vessels	Tons	Men	Man-Ton	Vessels	Tons	Men	Man-Ton
West Indies	Eastbound	2	168	11	6.55	30	4375	283	6.47
	Westbound					36	5554	378	6.81
	Total	2	168	11	6.55	66	9929	661	6.66
Central America	Eastbound					19	2896	171	5.91
	Westbound					14	1982	138	6.96
	Total					33	4878	309	6.34
South America	Eastbound					21	3268	192	5.88
(Brazil/Argentine)	Westbound					20	3138	213	6.79
	Total					41	6406	405	6.33
South America	Eastbound					5	921	60	6.51
(Chile, Peru, etc.)	Westbound					5	837	62	7.41
	Total					10	1758	122	6.94
United States	Eastbound					2	336	21	6.25
(cotton ports)	Westbound	1	99	8	8.08	1	173	10	5.78
	Total	1	99	8	8.08	3	509	31	6.09
United States	Eastbound					2	332	17	5.12
(Eastern seaboard	Westbound					5	708	47	6.64
excl. cotton ports)	Total					7	1040	64	6.16
British North	Eastbound	1	60	6	10.00	6	952	51	5.36
America	Westbound	1	71	7	9.86	17	2825	175	6.20
	Total	2	131	13	9.93	23	3777	226	5.99
Newfoundland	Eastbound	4	350	27	7.71	11	1337	87	6.51
	Westbound	11	1003	79	7.88	29	4126	274	6.64
	Total	15	1353	106	7.84	40	5463	361	6.61
TOTAL	Eastbound	7	578	44	7.62	96	14417	882	6.12
(all Atlantic	Westbound	13	1173	94	8.02	127	19343	1297	6.71
trades)	Total	20	1751	138	7.89	223	33760	2179	6.46

*Including Master.

Source: Compiled from "Customs Bills of Entry" for Liverpool (1832, months of February, April, June, August, October and December)

APPENDIX 1 (b)

Tonnage Class		200-299				300-399			
Trade		Vessels	Tons	Men	Man-Ton	Vessels	Tons	Men	Man-Ton
West Indies	Eastbound	39	9679	570	5.89	25	8662	474	5.47
	Westbound	47	11848	720	6.08	16	5619	310	5.52
	Total	86	21527	1290	6.00	41	14281	784	5.49
Central America	Eastbound	12	2745	144	5.25				
	Westbound	2	452	25	5.53	3	952	51	5.36
	Total	14	3197	169	5.29	3	952	51	5.36
South America	Eastbound	27	6833	335	4.90	8	2681	122	4.55
(Brazil/Argentine)	Westbound	50	12339	687	5.57	11	3846	193	5.02
	Total	77	19172	1022	5.33	19	6527	315	4.83
South America	Eastbound	1	263	14	5.32				
(Chile, Peru, etc.)	Westbound	7	1513	94	6.21				
	Total	8	1776	108	6.09				
United States	Eastbound	57	15411	666	4.32	128	45425	1895	4.17
(cotton ports)	Westbound	23	6233	316	5.07	52	18279	859	4.70
	Total	80	21644	982	4.54	180	63704	2754	4.33
United States	Eastbound	12	3104	145	4.68	19	6750	311	4.61
(Eastern seaboard	Westbound	37	9837	464	4.72	58	20485	932	4.55
excl. cotton ports)	Total	49	12941	609	4.71	77	27235	1243	4.57
British North	Eastbound	58	15070	712	4.73	90	31046	1356	4.37
America	Westbound	61	15479	831	5.37	56	19113	908	4.75
	Total	119	30549	1543	5.05	146	50159	2264	4.52
Newfoundland	Eastbound					1	372	13	3.50
	Westbound	5	1085	62	5.72				
	Total	5	1085	62	5.72	1	372	13	3.50
TOTAL	Eastbound	206	53105	2586	4.87	271	94936	4171	4.40
(all Atlantic	Westbound	232	58786	3199	5.53	196	68294	3253	4.77
trades)	Total	438	111891	5785	5.17	467	163230	7424	4.55

APPENDIX 1 (c)

Tonnage Class		400-499				500-599			
Trade		Vessels	Tons	Men	Man-Ton	Vessels	Tons	Men	Man-Ton
West Indies	Eastbound	8	3421	216	6.32				
	Westbound	7	3023	190	6.29	1	520	31	5.97
	Total	15	6444	406	6.30	1	520	31	5.97
Central America	Eastbound	1	413	19	4.60				
	Westbound								
	Total	1	413	19	4.60				
South America	Eastbound								
(Brazil/Argentine)	Westbound	1	499	23	4.61				
	Total	1	499	23	4.61				
South America	Eastbound								
(Chile, Peru, etc.)	Westbound								
	Total								
United States	Eastbound	38	16373	645	3.94	7	3748	152	4.06
(cotton ports)	Westbound	17	7397	332	4.49				
	Total	55	23770	977	4.11	7	3748	152	4.06
United States	Eastbound	17	7339	329	4.48	16	8721	414	4.75
(Eastern seaboard	Westbound	36	15908	739	4.65	20	10935	526	4.81
excl. cotton ports)	Total	53	23247	1068	4.60	36	19656	940	4.79
British North	Eastbound	29	12767	505	3.96	13	7287	287	3.94
America	Westbound	15	6615	287	4.34	5	2660	111	4.17
	Total	44	19382	792	4.09	18	9947	398	4.01
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	93	40313	1714	4.26	36	19756	853	4.32
(all Atlantic	Westbound	76	33442	1571	4.70	26	14115	668	4.74
trades)	Total	169	73755	3285	4.46	62	33871	1521	4.49

APPENDIX 1 (d)

Tonnage Class		600-699				700-799			
Trade		Vessels	Tons	Men	Man-Ton	Vessels	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/ Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru, etc.)	Westbound								
	Total								
United States	Eastbound	1	641	25	3.90				
(cotton ports)	Westbound								
	Total	1	641	25	3.90				
United States	Eastbound	7	4361	190	4.36	1	723	30	4.15
(Eastern seaboard	Westbound	11	6917	316	4.57				
excl. cotton ports)	Total	18	11278	506	4.49	1	723	30	4.15
British North	Eastbound	1	687	25	3.64				
America	Westbound	1	667	25	3.75				
	Total	2	1354	50	3.69				
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	9	5689	240	4.22	1	723	30	4.15
(all Atlantic	Westbound	12	7584	341	4.50				
trades)	Total	21	13273	581	4.38	1	723	30	4.15

APPENDIX 1(e)

Tonnage Class — Total

Trade		Vessels	Tons	Men	Man-Ton
West Indies	Eastbound	104	26305	1554	5.91
	Westbound	107	26564	1629	6.14
	Total	211	52869	3183	6.02
Central America	Eastbound	32	6054	334	5.52
	Westbound	19	3386	214	6.32
	Total	51	9440	548	5.81
South America	Eastbound	56	12782	649	5.08
(Brazil/	Westbound	82	19822	1116	5.63
Argentine)	Total	138	32604	1765	5.42
South America	Eastbound	6	1184	74	6.25
(Child, Peru,	Westbound	12	2350	156	6.64
etc.)	Total	18	3534	230	6.51
United States	Eastbound	233	81934	3404	4.16
(cotton ports)	Westbound	94	32181	1525	4.74
	Total	327	114115	4929	4.32
United States	Eastbound	74	31330	1436	4.59
(Eastern seaboard	Westbound	167	64790	3024	4.67
excl. cotton ports)	Total	241	96120	4460	4.64
British North	Eastbound	198	67869	2942	4.34
America	Westbound	156	47430	2344	4.95
	Total	354	115299	5286	4.59
Newfoundland	Eastbound	16	2059	127	6.17
	Westbound	45	6214	415	6.68
	Total	61	8273	542	6.56
TOTAL	Eastbound	719	229517	10520	4.59
(all Atlantic	Westbound	682	202737	10423	5.15
trades)	Total	1401	432254	20943	4.85

APPENDIX 2(a)

VESSELS, TONS, MEN AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

Rig		Schooner				Brig			
Trade		Vessels	Tons	Men	Man-Ton	Vessels	Tons	Men	Man-Ton
West Indies	Eastbound	7	843	53	6.29	41	8094	491	6.07
	Westbound	5	651	47	7.22	44	8935	567	6.35
	Total	12	1494	100	6.70	85	17029	1058	6.22
Central America	Eastbound	7	978	60	6.14	14	2890	154	5.33
	Westbound	5	629	49	7.79	8	1224	78	6.37
	Total	12	1607	109	6.79	22	4114	232	5.64
South America	Eastbound	3	367	24	6.54	34	7523	382	5.08
(Brazil/Argentine)	Westbound	3	379	30	7.92	41	8979	515	5.74
	Total	6	746	54	7.24	75	16502	897	5.44
South America	Eastbound	2	350	23	6.58	2	372	25	6.72
(Chile, Peru, etc.)	Westbound	2	288	25	8.68	5	1002	64	6.39
	Total	4	638	48	7.53	7	1374	89	6.48
United States	Eastbound					30	8429	372	4.41
(cotton ports)	Westbound					24	6705	342	5.10
	Total					54	15134	714	4.72
United States	Eastbound					5	1179	55	4.67
(Eastern seaboard	Westbound	1	116	8	6.90	13	3239	161	4.97
excl. cotton ports)	Total	1	116	8	6.90	18	4418	216	4.89
British North	Eastbound	1	60	6	10.00	49	13072	603	4.61
America	Westbound	1	71	7	9.86	63	15232	837	5.50
	Total	2	131	13	9.93	112	28304	1440	5.09
Newfoundland	Eastbound	6	595	43	7.23	9	1092	71	6.50
	Westbound	9	911	66	7.25	27	3708	249	6.72
	Total	15	1506	109	7.24	36	4800	320	6.67
TOTAL	Eastbound	26	3193	209	6.55	184	42651	2153	5.05
(all Atlantic	Westbound	26	3045	232	7.62	225	49024	2813	5.74
trades)	Total	52	6238	441	7.07	409	91675	4966	5.42

*Including Master

Source: Compiled from "Customs Bills of Entry" for Liverpool (1832, months of February, April, June, August, October and December), and *Lloyd's Register of Shipping* 1832-4

APPENDIX 2(b)

Rig		Snow				Barque			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	8	1606	104	6.48	12	3176	179	5.64
	Westbound	18	3814	235	6.16	13	3594	200	5.57
	Total	26	5420	339	6.26	25	6770	379	5.60
Central America	Eastbound	3	493	29	5.88	4	776	42	5.41
	Westbound	2	462	28	5.63	2	504	30	5.95
	Total	5	955	57	5.97	6	1280	72	5.63
South America	Eastbound	5	1047	54	5.16	6	1460	75	5.14
(Brazil/Argentine)	Westbound	13	3111	177	5.69	16	4372	236	5.46
	Total	18	4158	231	5.56	22	5832	311	5.34
South America	Eastbound					2	462	26	5.63
(Chile, Peru, etc.)	Westbound	1	217	14	6.46	3	588	38	6.47
	Total	1	217	14	6.46	5	1050	64	6.10
United States	Eastbound	18	4983	222	4.46	24	7989	353	4.42
(cotton ports)	Westbound	10	3167	157	4.96	18	6307	300	4.76
	Total	28	8150	379	4.65	42	14296	653	4.57
United States	Eastbound	5	1172	55	4.69	6	2023	82	4.05
(Eastern seaboard	Westbound	9	2195	107	4.88	15	5441	243	4.47
excl. cotton ports)	Total	14	3367	162	4.82	21	7464	325	4.36
British North	Eastbound	22	6563	289	4.40	70	27355	1139	4.16
America	Westbound	22	6503	316	4.86	40	15370	689	4.48
	Total	44	13066	605	4.63	110	42725	1828	4.28
Newfoundland	Eastbound								
	Westbound	5	919	55	5.99				
	Total	5	919	55	5.99				
TOTAL	Eastbound	61	15864	753	4.75	124	43241	1896	4.39
(all Atlantic trades)	Westbound	80	20388	1089	5.35	107	36176	1736	4.80
	Total	141	36252	1842	5.09	231	79417	3632	4.58

APPENDIX 2(c)

Rig		Ship			
Trade		Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	32	11532	668	5.79
	Westbound	25	9169	550	6.00
	Total	57	20701	1218	5.89
Central America	Eastbound	2	615	31	5.04
	Westbound	1	322	16	4.97
	Total	3	937	47	5.02
South America	Eastbound	7	2233	105	4.70
(Brazil/Argentine)	Westbound	7	2543	127	4.99
	Total	14	4776	232	4.86
South America	Eastbound				
(Chile, Peru, etc.)	Westbound	1	255	15	5.89
	Total	1	255	15	5.89
United States	Eastbound	155	58343	2367	4.06
(cotton ports)	Westbound	39	14886	676	4.54
	Total	194	73229	3043	4.16
United States	Eastbound	54	25705	1180	4.59
(Eastern seaboard	Westbound	125	52680	2449	4.65
excl. cotton ports)	Total	179	78385	3629	4.63
British North	Eastbound	51	19062	831	4.36
America	Westbound	24	8712	415	4.76
	Total	75	27774	1246	4.49
Newfoundland	Eastbound	1	372	13	3.50
	Westbound				
	Total	1	372	13	3.50
TOTAL	Eastbound	302	117862	5195	4.41
(all Atlantic trades)	Westbound	222	88567	4248	4.80
	Total	524	206429	9443	4.58

APPENDIX 3(a)

VESSELS, TONS, MEN AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

Tonnage Class		0-99				100-199			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	2	184	15	8.15	17	2903	152	5.24
	Westbound					21	3680	221	6.01
	Total	2	184	15	8.15	38	6583	373	5.66
Central America	Eastbound					18	2754	156	5.67
	Westbound					17	2539	155	6.11
	Total					35	5293	311	5.88
South America	Eastbound					20	3308	193	5.83
(Brazil/Argentine)	Westbound	2	155	16	10.32	12	2012	123	6.11
	Total	2	155	16	10.32	32	5320	316	5.94
South America	Eastbound					3	530	32	6.04
(Chile, Peru, etc.)	Westbound					4	680	44	6.47
	Total					7	1210	76	6.28
United States	Eastbound								
(cotton ports)	Westbound					1	116	7	6.04
	Total					1	116	7	6.04
United States	Eastbound	1	93	6	6.45	6	954	49	5.14
(Eastern seaboard	Westbound					6	1008	59	5.85
excl. cotton ports)	Total	1	93	6	6.45	12	1962	108	5.51
United States	Eastbound								
(Western seaboard,	Westbound								
California)	Total								
British North	Eastbound	7	566	42	7.42	19	2674	148	5.54
America	Westbound	1	97	9	9.28	18	2798	166	5.93
	Total	8	663	51	7.69	37	5472	314	5.74
Newfoundland	Eastbound					16	2217	141	6.36
	Westbound	2	146	12	8.22	36	5666	340	6.01
	Total	2	146	12	8.22	52	7883	481	6.11
TOTAL	Eastbound	10	843	63	7.47	99	15340	871	5.68
(All Atlantic trades)	Westbound	5	398	37	9.30	115	18499	1115	6.03
	Total	15	1241	100	8.06	214	33839	1986	5.87

*Including Master

Source: Compiled from "Customs Bills of Entry" for Liverpool (1853, months of February, April, June, August, October and December).

APPENDIX 3(b)

Tonnage Class		200-299				300-399			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	38	9339	451	4.83	9	3076	177	5.75
	Westbound	38	9346	495	5.30	9	3123	188	6.02
	Total	76	18685	946	5.06	18	6199	365	5.88
Central America	Eastbound	12	2939	137	4.66	2	712	33	4.64
	Westbound	14	3681	185	5.03	1	320	15	4.68
	Total	26	6620	322	4.86	3	1032	48	4.65
South America	Eastbound	34	8146	407	5.00	19	6424	307	4.78
(Brazil/Argentine)	Westbound	48	11975	615	5.14	29	9736	476	4.89
	Total	82	20121	1022	5.08	48	16160	783	4.85
South America	Eastbound	19	4950	245	4.95	12	4151	197	4.75
(Chile, Peru, etc.)	Westbound	18	4735	247	5.22	17	5991	299	4.99
	Total	37	9685	492	5.08	29	10142	496	4.89
United States	Eastbound	7	1801	78	4.33	10	3642	146	4.01
(cotton ports)	Westbound					5	1685	72	4.27
	Total	7	1801	78	4.33	15	5327	218	4.09
United States	Eastbound	4	994	44	4.43	4	1418	57	4.02
(Eastern seaboard	Westbound	6	1447	74	5.11	9	3255	126	3.87
excl. cotton ports)	Total	10	2441	118	4.83	13	4673	183	3.92
United States	Eastbound								
(Western seaboard,	Westbound					2	683	32	4.69
California)	Total					2	683	32	4.69
British North	Eastbound	22	5454	219	4.02	20	7140	292	4.09
America	Westbound	20	5152	242	4.70	21	7496	351	4.68
	Total	42	10606	461	4.35	41	14636	643	4.39
Newfoundland	Eastbound								
	Westbound	12	2777	161	5.80	1	303	15	4.95
	Total	12	2777	161	5.80	1	303	15	4.95
TOTAL	Eastbound	136	33623	1581	4.70	76	26563	1209	4.55
(All Atlantic trades)	Westbound	156	39113	2019	5.16	94	32592	1574	4.83
	Total	292	72736	3600	4.95	170	59155	2783	4.71

APPENDIX 3(c)

Tonnage Class		400-499				500-599			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	3	1287	66	5.13				
	Westbound	9	3925	205	5.22	2	1029	48	4.67
	Total	12	5212	271	5.20	2	1029	48	4.67
Central America	Eastbound	3	1378	45	3.27				
	Westbound								
	Total	3	1378	45	3.27				
South America	Eastbound	3	1372	66	4.81				
(Brazil/Argentine)	Westbound	9	3980	171	4.30	1	501	19	3.79
	Total	12	5352	237	4.43	1	501	19	3.79
South America	Eastbound	7	3024	120	3.97	1	581	20	3.44
Chile, Peru, etc.)	Westbound	6	2595	121	4.66	5	2806	113	4.03
	Total	13	5619	241	4.29	6	3387	133	3.93
United States	Eastbound	22	10243	341	3.33	40	22178	697	3.14
(cotton ports)	Westbound	6	2778	103	3.71	18	10007	344	3.44
	Total	28	13021	444	3.41	58	32185	1041	3.23
United States	Eastbound	3	1251	41	3.28	2	1086	32	2.95
(Eastern seaboard	Westbound	13	5775	182	3.15	32	17419	578	3.32
excl. cotton ports)	Total	16	7026	223	3.17	34	18505	610	3.30
United States	Eastbound								
(Western seaboard,	Westbound	4	1733	74	4.27	1	542	24	4.43
California)	Total	4	1733	74	4.27	1	542	24	4.43
British North	Eastbound	17	7724	270	3.50	11	5992	184	3.07
America	Westbound	12	5487	202	3.68	16	8767	308	3.51
	Total	29	13211	472	3.57	27	14759	492	3.33
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	58	26279	949	3.61	54	29837	933	3.13
(All Atlantic trades)	Westbound	59	26273	1058	4.03	75	41071	1434	3.49
	Total	117	52552	2007	3.82	129	70908	2367	3.34

APPENDIX 3(d)

Tonnage Class		600-699				700-799			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound					1	797	30	3.76
	Total					1	797	30	3.76
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound	2	1279	43	3.36	1	737	21	2.91
(Brazil/Argentine)	Westbound	4	2495	91	3.65	1	737	23	3.12
	Total	6	3774	134	3.55	2	1474	44	2.99
South America	Eastbound	2	1331	46	3.46				
(Chile, Peru, etc.)	Westbound	1	608	22	3.62				
	Total	3	1939	68	3.51				
United States	Eastbound	41	26740	777	2.91	36	27323	757	2.77
(cotton ports)	Westbound	21	13567	420	3.10	20	15056	963	3.08
	Total	62	40307	1197	2.97	56	42379	1220	2.88
United States	Eastbound	7	4531	136	3.00	8	6102	166	2.72
(Eastern seaboard	Westbound	23	15451	539	3.49	38	28324	845	2.98
excl. cotton ports)	Total	30	19982	675	3.38	46	34426	1011	2.94
United States	Eastbound								
(Western seaboard	Westbound	2	1234	40	3.24				
California)	Total	2	1234	40	3.24				
British North	Eastbound	16	10552	304	2.88	8	6067	174	2.87
America	Westbound	18	11767	405	3.44	12	9005	223	2.48
	Total	34	22319	709	3.18	20	15072	397	2.63
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	68	44433	1306	2.94	53	40229	1118	2.78
(All Atlantic trades)	Westbound	69	45122	1517	3.36	72	53919	1584	2.94
	Total	137	89555	2823	3.15	125	94148	2702	2.87

APPENDIX 3(e)

Tonnage Class		800-899				900-999			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound	3	2574	77	2.99				
	Total	3	2574	77	2.99				
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound					1	924	28	3.03
(Chile, Peru, etc.)	Westbound					2	1937	42	2.17
	Total					3	2861	70	2.45
United States	Eastbound	27	23062	631	2.74	14	13532	343	2.54
(cotton ports)	Westbound	30	25197	734	2.91	15	14269	400	2.80
	Total	57	48259	1365	2.83	29	27801	743	2.67
United States	Eastbound	9	7740	203	2.62	15	14357	385	2.68
(Eastern seaboard	Westbound	26	21640	624	2.88	21	19946	560	2.81
excl. cotton ports)	Total	35	29380	827	2.82	36	34303	945	2.76
United States	Eastbound								
(Western Seaboard,	Westbound								
California)	Total								
British North	Eastbound	19	16399	426	2.60	13	12167	323	2.66
America	Westbound	14	11809	352	2.98	9	8496	261	3.07
	Total	33	28208	778	2.76	22	20663	584	2.83
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	55	47201	1260	2.67	43	40980	1079	2.63
(All Atlantic trades)	Westbound	73	61220	1787	2.92	47	44648	1263	2.83
	Total	128	108421	3047	2.81	90	85628	2342	2.74

APPENDIX 3(f)

Tonnage Class		1000-1099				1100-1199			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru etc.)	Westbound								
	Total								
United States	Eastbound	10	10518	268	2.55	10	11414	269	2.36
(cotton ports)	Westbound	8	8265	224	2.71	11	12508	336	2.69
	Total	18	18783	492	2.62	21	23922	605	2.53
United States	Eastbound	11	11544	317	2.75	10	11439	284	2.48
(Eastern seaboard	Westbound	24	25121	678	2.70	30	34604	889	2.57
excl. cotton ports)	Total	35	36665	995	2.71	40	46043	1173	2.55
United States	Eastbound								
(Western seaboard,	Westbound								
California)	Total								
British North	Eastbound	11	11629	274	2.36	12	13914	325	2.34
America	Westbound	8	8299	217	2.62	2	2362	74	3.13
	Total	19	19928	491	2.46	14	16276	399	2.45
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	32	33691	859	2.55	32	36767	878	2.39
(All Atlantic trades)	Westbound	40	41685	1119	2.68	43	49474	1299	2.63
	Total	72	75376	1978	2.62	75	86241	2177	2.52

APPENDIX 3(g)

Tonnage Class		1200-1299				1300-1399			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru etc.)	Westbound					1	1309	51	3.90
	Total					1	1309	51	3.90
United States	Eastbound	11	13631	327	2.40	5	6645	138	2.08
(cotton ports)	Westbound	1	1278	36	2.82	3	3982	82	2.06
	Total	12	14909	363	2.44	8	10627	220	2.07
United States	Eastbound	13	16539	399	2.41	10	13577	331	2.44
(Eastern seaboard	Westbound	20	24903	658	2.64	15	20028	518	2.59
excl. cotton ports)	Total	33	41442	1057	2.55	25	33605	849	2.53
United States	Eastbound								
(Western seaboard,	Westbound					1	1383	37	2.68
California)	Total					1	1383	37	2.68
British North	Eastbound	11	13653	242	1.77	5	6669	135	2.02
America	Westbound	4	5069	145	2.86	2	2614	64	2.45
	Total	15	18722	387	2.07	7	9283	199	2.14
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	35	43823	968	2.21	20	26891	604	2.25
(All Atlantic trades)	Westbound	25	31250	839	2.69	22	29316	752	2.57
	Total	60	75073	1807	2.41	42	56207	1356	2.41

APPENDIX 3(h)

Tonnage Class		1400-1499				1500-1599			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru etc.)	Westbound								
	Total								
United States	Eastbound	3	4372	88	2.01	2	3062	67	2.19
(cotton ports)	Westbound	1	1457	43	2.95				
	Total	4	5829	131	2.25	2	3062	67	2.19
United States	Eastbound	16	23060	534	2.32	6	9249	207	2.24
(Eastern seaboard	Westbound	18	25996	626	2.41	9	13694	314	2.29
excl. cotton ports)	Total	34	49056	1160	2.37	15	22943	521	2.27
United States	Eastbound								
Western seaboard,	Westbound								
California)	Total								
British North	Eastbound	3	4322	97	2.24	2	3055	71	2.32
America	Westbound								
	Total	3	4322	97	2.24	2	3055	71	2.32
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	22	31754	719	2.26	10	15366	345	2.25
(All Atlantic trades)	Westbound	19	27453	699	2.44	9	13694	314	2.29
	Total	41	59207	1388	2.34	19	29060	659	2.27

APPENDIX 3(i)

Tonnage Class		1600-1699				1700-1799			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru, etc.)	Westbound								
	Total								
United States	Eastbound	2	3269	76	2.33	1	1791	40	2.23
(cotton ports)	Westbound								
	Total	2	3269	76	2.33	1	1791	40	2.23
United States	Eastbound	7	11373	262	2.30	2	3533	71	2.01
(Eastern seaboard	Westbound	3	4874	123	2.52	3	5286	132	2.50
excl. cotton ports)	Total	10	16247	385	2.37	5	8819	203	2.30
United States	Eastbound								
(Western seaboard,	Westbound								
California)	Total								
British North	Eastbound	1	1656	36	2.17				
America	Westbound								
	Total	1	1656	36	2.17				
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	10	16298	374	2.30	3	5324	111	2.09
(All Atlantic trades)	Westbound	3	4874	123	2.52	3	5286	132	2.50
	Total	13	21172	497	2.35	6	10610	243	2.29

APPENDIX 3(j)

Tonnage Class		1800-1899				1900-1999			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru, etc.)	Westbound								
	Total								
United States	Eastbound								
(cotton ports)	Westbound								
	Total								
United States	Eastbound								
(Eastern seaboard	Westbound	4	7238	202	2.79	1	1956	51	2.61
excl. cotton ports)	Total	4	7238	202	2.79	1	1956	51	2.61
United States	Eastbound								
(Western seaboard,	Westbound								
California)	Total								
British North	Eastbound	2	3634	90	2.48				
America	Westbound								
	Total	2	3634	90	2.48				
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	2	3634	90	2.48				
(All Atlantic trades)	Westbound	4	7238	202	2.79	1	1956	51	2.61
	Total	6	10872	292	2.69	1	1956	51	2.61

APPENDIX 3(k)

Tonnage Class		2000-2099				2100			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound								
	Westbound								
	Total								
Central America	Eastbound								
	Westbound								
	Total								
South America	Eastbound								
(Brazil/Argentine)	Westbound								
	Total								
South America	Eastbound								
(Chile, Peru, etc.)	Westbound								
	Total								
United States	Eastbound								
(cotton ports)	Westbound								
	Total								
United States	Eastbound								
(Eastern seaboard	Westbound	2	4013	78	1.94	3	6300	153	2.43
excl. cotton ports)	Total	2	4013	78	1.94	3	6300	153	2.43
United States	Eastbound								
(Western seaboard,	Westbound								
California)	Total								
British North	Eastbound	1	2013	33	1.64	1	2100	41	1.95
America	Westbound								
	Total	1	2013	33	1.64	1	2100	41	1.95
Newfoundland	Eastbound								
	Westbound								
	Total								
TOTAL	Eastbound	1	2013	33	1.64	1	2100	41	1.95
(All Atlantic trades)	Westbound	2	4013	78	1.94	3	6300	153	2.43
	Total	3	6026	111	1.84	4	8400	194	2.31

APPENDIX 3(1)

Tonnage Class: Total

Trade		Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	69	16789	861	5.13
	Westbound	83	24474	1264	5.17
	Total	152	41263	2125	5.15
Central America	Eastbound	35	7783	371	4.77
	Westbound	32	6540	355	5.43
	Total	67	14323	726	5.07
South America	Eastbound	79	21266	1037	4.88
(Brazil/Argentine)	Westbound	106	31591	1534	4.86
	Total	185	52857	2571	4.87
South America	Eastbound	45	15491	688	4.44
(Chile, Peru, etc.)	Westbound	54	20661	939	4.54
	Total	99	36152	1627	4.50
United States	Eastbound	241	183223	5043	2.75
(cotton ports)	Westbound	140	110165	3264	2.96
	Total	381	293388	8307	2.83
United States	Eastbound	134	138840	3524	2.54
(Eastern seaboard	Westbound	306	288278	8009	2.78
excl. cotton ports)	Total	440	427118	11533	2.70
United States	Eastbound				
(Western seaboard,	Westbound	10	5575	207	3.71
California)	Total	10	5575	207	3.71
British North	Eastbound	201	137380	3726	2.71
America	Westbound	157	89218	3019	3.38
	Total	358	226598	6745	2.98
Newfoundland	Eastbound	16	2217	141	6.36
	Westbound	51	8892	528	5.94
	Total	67	11109	669	6.02
TOTAL	Eastbound	820	522389	15391	2.94
(All Atlantic trades)	Westbound	939	585394	19119	3.27
	Total	1759	1108383	34510	3.11

APPENDIX 4(a)

VESSELS, TONS, MEN AND MAN-TON RATIOS* IN TRANS-ATLANTIC TRADES TO AND FROM LIVERPOOL

Rig		Schooner				Brig			
Trade		Vessels	Tons	Men	Man-Ton	Vessels	Tons	Men	Man-Ton
West Indies	Eastbound	4	471	32	6.79	29	6492	329	5.07
	Westbound	5	909	48	5.28	22	4365	252	5.77
	Total	9	1380	80	5.80	51	10857	581	5.35
Central America	Eastbound	6	775	41	5.29	15	2803	156	5.57
	Westbound	7	1011	63	6.23	8	1422	84	5.91
	Total	13	1786	104	5.82	23	4225	240	5.69
South America	Eastbound	10	1683	87	5.17	26	5390	292	5.42
(Brazil/Argentine)	Westbound	5	766	45	5.88	17	3574	198	5.54
	Total	15	2449	132	5.39	43	8964	490	5.47
South America	Eastbound					5	1134	64	5.64
(Chile, Peru, etc.)	Westbound					6	1381	78	5.65
	Total					11	2515	142	5.65
United States	Eastbound					2	452	19	4.20
(cotton ports)	Westbound	1	116	7	6.04				
	Total	1	116	7	6.04	2	452	19	4.20
United States	Eastbound					4	727	37	5.09
(Eastern sea-	Westbound					3	498	28	5.62
board excl.	Total					7	1225	65	5.31
cotton ports)									
United States	Eastbound								
(Western sea-	Westbound								
board, California)	Total								
British North	Eastbound	7	753	48	6.38	19	3819	160	4.19
America	Westbound	2	251	18	7.17	16	2955	163	5.52
	Total	9	1004	66	6.57	35	6774	323	4.77
Newfoundland	Eastbound	5	617	41	6.65	1	199	13	6.53
	Westbound	6	699	47	6.72	29	5289	307	5.81
	Total	11	1316	88	6.69	30	5488	320	5.83
TOTAL	Eastbound	32	4299	249	5.79	101	21016	1070	5.09
(All Atlantic	Westbound	26	3752	228	6.08	101	19484	1110	5.70
trades)	Total	58	8051	477	5.93	202	40500	2180	5.38

*Including Master

Source: Compiled from "Customs Bills of Entry" for Liverpool (1853, months of February, April, June, August, October and December); *Lloyd's Register of Shipping* 1851-55, and H.J. Rogers, *Marine Telegraph List of Merchant Vessels*, New York 1855.

APPENDIX 4(b)

Rig		Snow				Barque			
Trade		Vsls.	Tons	Men	Man-Ton	Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	7	1726	78	4.52	19	5278	278	5.27
	Westbound	6	1444	69	4.78	30	8619	456	5.29
	Total	13	3170	147	4.64	49	13897	734	5.28
Central America	Eastbound	5	1127	51	4.53	7	2262	93	4.11
	Westbound	4	946	45	4.76	10	2736	137	5.01
	Total	9	2073	96	4.63	17	4998	230	4.60
South America	Eastbound	3	701	35	4.99	26	7867	362	4.60
(Brazil/Argentine)	Westbound	11	2500	119	4.76	57	18333	890	4.86
	Total	14	3201	154	4.81	83	26200	1252	4.78
South America	Eastbound	1	169	10	5.92	23	7257	334	4.60
(Chile, Peru, etc.)	Westbound	2	490	25	5.10	20	6600	314	4.76
	Total	3	659	35	5.31	43	13857	648	4.68
United States	Eastbound					34	16174	535	3.31
(cotton ports)	Westbound	1	323	14	4.33	10	5183	183	3.53
	Total	1	323	14	4.33	44	21357	718	3.36
United States	Eastbound	2	417	17	4.08	5	1861	69	3.71
(Eastern seaboard	Westbound	1	328	14	4.27	12	5019	181	3.61
excl. cotton ports)	Total	3	745	31	4.16	17	6880	250	3.63
United States	Eastbound								
(Western seaboard,	Westbound					5	2214	88	3.98
California)	Total					5	2214	88	3.98
British North	Eastbound	3	762	29	3.81	25	10320	373	3.61
America	Westbound	5	1371	55	4.01	33	13867	548	3.95
	Total	8	2133	84	3.94	58	24187	921	3.81
Newfoundland	Eastbound								
	Westbound	3	735	41	5.58	3	704	39	5.54
	Total	3	735	41	5.58	3	704	39	5.54
TOTAL	Eastbound	21	4902	220	4.49	139	51019	2044	4.01
(All Atlantic trades)	Westbound	33	8137	382	4.70	180	63275	2836	4.48
	Total	54	13039	602	4.62	319	114294	4880	4.27

APPENDIX 4(c)

Rig		Ship			
Trade		Vsls.	Tons	Men	Man-Ton
West Indies	Eastbound	2	838	41	4.89
	Westbound	12	6638	285	4.29
	Total	14	7476	326	4.36
Central America	Eastbound	1	346	16	4.62
	Westbound				
	Total	1	346	16	4.62
South America	Eastbound	9	4183	184	4.40
(Brazil/Argentine)	Westbound	9	4616	190	4.12
	Total	18	8799	374	4.25
South America	Eastbound	11	5311	205	3.86
(Chile, Peru, etc.)	Westbound	20	10591	432	4.08
	Total	31	15902	637	4.01
United States	Eastbound	188	157631	4180	2.65
(cotton ports)	Westbound	119	99958	2893	2.89
	Total	307	257589	7073	2.75
United States	Eastbound	116	133947	3324	2.48
(Eastern seaboard	Westbound	266	273316	7434	2.72
excl. cotton ports)	Total	382	407263	10758	2.64
United States	Eastbound				
(Western seaboard,	Westbound	3	2329	82	3.52
California)	Total	3	2329	82	3.52
British North	Eastbound	116	111806	2756	2.47
America	Westbound	77	62708	1870	2.98
	Total	193	174514	4626	2.65
Newfoundland	Eastbound				
	Westbound				
	Total				
TOTAL	Eastbound	443	414062	10706	2.59
(All Atlantic trades)	Westbound	506	460156	13186	2.87
	Total	949	874218	23892	2.73

7. LABOUR PRODUCTIVITY IN THE SHIPPING FLEETS OF HALIFAX AND YARMOUTH, NOVA SCOTIA, 1863-1900

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LABOUR PRODUCTIVITY IN THE SHIPPING FLEETS OF HALIFAX AND YARMOUTH, NOVA SCOTIA, 1863-1900*

Eric W. Sager

The last half of the nineteenth century saw the beginning of that sustained growth in labour productivity which has become a principal characteristic of modern industrial economies. In Britain national output in relation to man-hours of labour grew by slightly over two per cent per annum by the last decades of the century, and in the United States productivity grew even more quickly.[1] In the past it was often assumed that this growth in labour productivity, like the industrial revolution itself, resulted primarily from the application of machinery to the process of production. In recent decades economists have seized upon less tangible contributors to labour productivity, and they tell us that productivity is a function of three things: the quantity and quality of capital and technological inputs; efficiency in the allocation of resources and the management of factors of production; and the quality of labour itself, measured by the level of skills and education in the labour force.[2] Difficult as it may be for economists to estimate the relative importance of such tangible and intangible factors, they should not envy the historian who would tackle the question of productivity in a pre-industrial enterprise when his portrait of that enterprise remains incomplete. Among the sailing ships of the nineteenth century the well-oiled models of the economist founder upon shoals of ignorance: we do not even know whether output per man increased or decreased, let alone what models to apply as explanatory tools.[3] We are determined, however, to explain the growth and decline of one of Canada's great industries, and perhaps to estimate what that industry contributed to the economy of Atlantic Canada in the nineteenth century. If we are to succeed we must refine our portrait of the Bluenose skipper and his crew: it was their use of the physical asset which they sailed, and their use of less tangible factors of skill and organization, which guaranteed high returns in ocean shipping and so contributed to the remarkable growth of the industry.

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If the legends about the Bluenose master and his sailors were true, any discussion of productivity would seem otiose. Apart from the limits to technological change in the sailing ship, any change in capital inputs would be nullified by a total failure to meet the other two criteria for labour productivity. Concerning the quality of labour, "they had to take what they could get...fakers of the Paddy West school, jail-birds anxious to get out of the country, and degenerates whom no master or mate would take for ballast."

In this industry incompetent workers could not be dismissed immediately, and "the few genuine Able Seamen had to do all the skilled work". Labour management was entrusted to "a species of seagoing pugilist with a roaring voice" whose disciplinary tools consisted of belaying pins and fists.[4] Legend attributes great success to the Bluenose skipper in the face of these disadvantages; but we should be forgiven for assuming that improvements in labour productivity must have been severely limited, either by the nature of the labour force or by the limits to technological change in the industry.

Given these apparent limitations the rate of productivity growth in this industry after 1863 seems at first sight astonishing. The ratio of capital to labour in shipping has often been expressed by its inverse, the number of men per hundred tons of shipping, and this custom is adopted here. As a measure of capital stock tonnage has certain disadvantages, but it may be taken as a fairly accurate measure of the size of physical capital employed, and as a rough surrogate for carrying capacity. By this measure the labour force was growing much less quickly than were capital inputs: the man-ton ratio in the Halifax-registered fleet fell by slightly over two per cent per annum between 1863 and 1899 (Table 1). In the much larger ocean fleet registered in Yarmouth the ratio fell by 2.4 per cent per annum to 1899, and by a remarkable 2.8 per cent per annum to 1895.[5] The difference between crew size at the beginning and the end of voyages was very slight, as the similar growth rates suggest. Comparing ratios at the beginning and the end of voyages for each tonnage class, and taking the mean difference for all classes, we discover that crews were smaller at the end of the voyage, but the overall difference was less than half of one per cent. The most impressive growth rates appear to be concentrated in the 1860s and 1870s, when the growth of shipping tonnage was most rapid and the average size of vessels was increasing most rapidly. But the change in the capital-labour ratio was not due entirely to the growth of the average unit of production, as we shall see: even when vessel size is held constant there remains a considerable saving in labour over the period. The productivity of labour in terms of

output per man-hours or man-days is extremely difficult to estimate, but even by this measure there can be little doubt that productivity growth occurred at rates comparable to those in major industrial nations.

This was a remarkable achievement by the standards of any pre-industrial enterprise. Fortunately the achievement does not entirely defy analysis. First, what determined the labour requirement on a sailing ship? The most important factor was vessel size: each increase in the size of a vessel required an increment of labour, as the task of rigging sails and navigating became more complex.[6] Figure 1 is a scattergram of average tonnage and average numbers of men employed in each year in the ocean fleets of Halifax and Yarmouth. There is clearly a strong relationship between the size of a vessel and the number of men required. The strength of the relationship is confirmed by the correlation between logarithms of men and tonnage for all vessels in both fleets: the correlation coefficient for the Halifax fleet is +0.87, which suggests that, if all other factors are constant, 75 per cent of the increments in labour were due to increases in vessel size. In the Yarmouth fleet the coefficient is lower (+0.58) because Yarmouth shipowners were more successful in reducing their labour force regardless of vessel size. In the Halifax fleet an increase of one hundred tons was accompanied by an average increase of 8.6 per cent in the labour requirement.

TABLE 1

ANNUAL GROWTH RATES OF MAN-TON RATIOS, 1863-1899

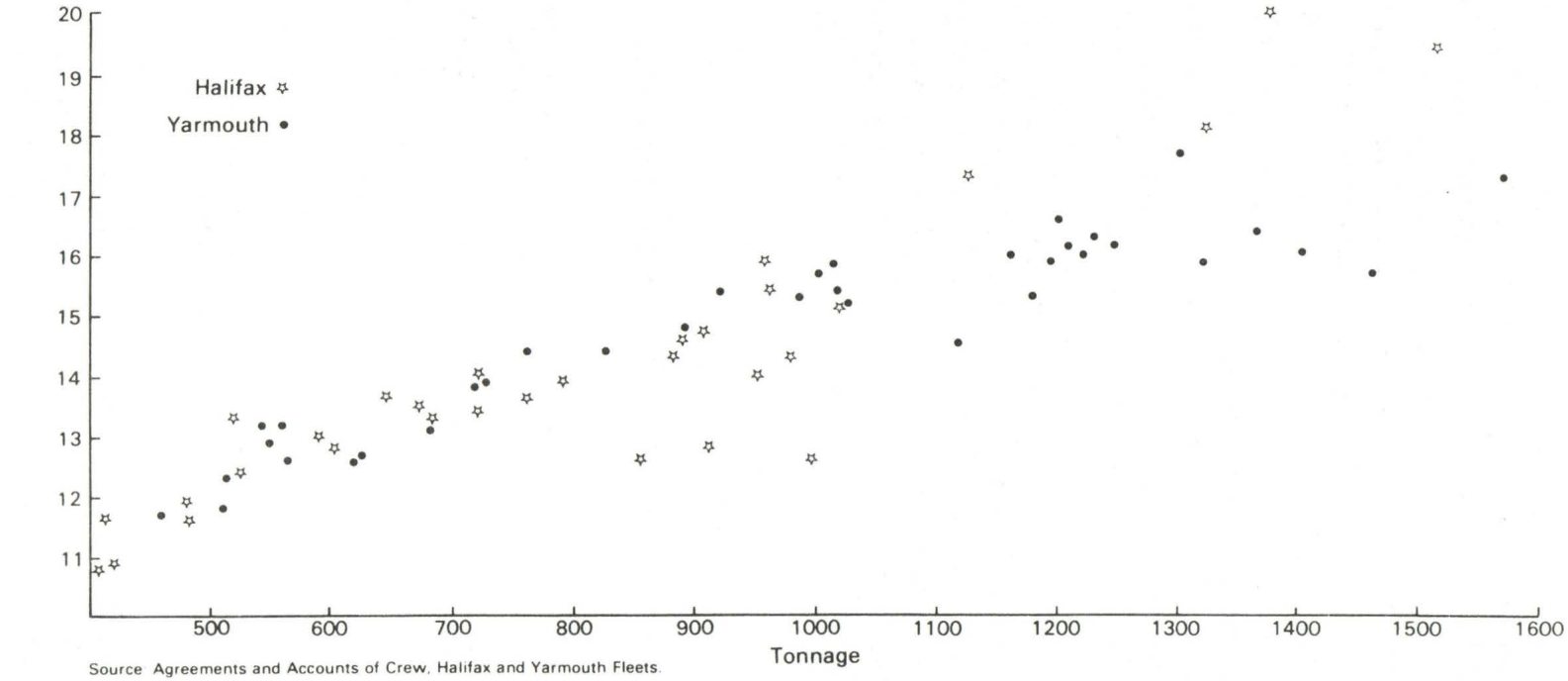
	Yarmouth Fleet	Halifax Fleet (Crew at Voyage Start)	Halifax Fleet (Crew at Voyage End)
1863-69	-1.55%	-3.71%	-2.84%
1870-79	-3.06	-2.49	-2.46
1880-89	-2.11	-0.92	+0.03
1890-99	+0.89	-1.57	-6.39
1863-99	-2.43	-2.05	-2.08

Source: Agreements and Account of Crew, Halifax and Yarmouth fleets. All growth rates in this paper are estimated by regression equations of the form Log Y = a + bt applied to three-year running means.

What is most important about Figure 1, however, is that the relationship is not linear. As vessels increased in size the increments of men became smaller. This is true even for the Halifax fleet: below seven hundred tons each additional one hundred tons required a twelve per cent

FIGURE 1

Annual Averages of Number of Men Per Voyage and Tonnage Per Voyage, Halifax and Yarmouth Ocean Fleets, 1863-1895



Source: Agreements and Accounts of Crew, Halifax and Yarmouth Fleets.

increase in labour, whereas above seven hundred tons the average increase in labour was only five per cent for every one hundred tons. Thus the fourteen hundred ton vessel usually required only one man more than the one thousand ton vessel, and a forty per cent increase in carrying capacity could be achieved with a mere seven per cent increase in labour. The attempt to increase output per unit of labour was undoubtedly a major reason for the rapid increase in average vessel size during the period.[7] Among the ocean going vessels in our voyage sample mean tonnage per voyage grew by over four per cent a year during the period, and this was the major reason for the improvement in the capital-labour ratio. It takes little imagination to understand why great efficiencies in labour could be realized, particularly in larger vessels. Since the operation of sails was the main task for the crew, and since the number of masts did not increase in vessels above five hundred tons, it was possible to increase the size of vessels without adding significantly to the labour required.

This conclusion does not settle the question of labour productivity growth, however. There was a very high correlation between tonnage and either numbers of men or the man-ton ratio; but the strong negative correlation ($r = -0.87$) between tonnage and man-ton ratio does not mean that tonnage growth explains seventy six per cent of the decline in man-ton ratio. Included within that proportion of the decline were other factors and the most important of these was the passage of time. We can begin to see the effect of time if we examine the man-ton ratio within tonnage classes (Table 2). With the exception of Halifax vessels between 250 and 499 tons in the 1880s and 1890s, there was a consistent decline in the man-ton ratio across decades. In fourteen of twenty cells the ratio for Yarmouth was slightly lower than the ratio for Halifax, but part of this difference was due to the slightly higher mean tonnage for Yarmouth vessels within tonnage classes. In general the two fleets were very similar in their deployment of labour. Within the larger tonnage classes the man-ton ratio declined at a rate of over one per cent per annum over thirty seven years, and only part of this decline may be attributed to the growth of mean vessel size within tonnage classes. It is possible to control for tonnage change more precisely by breaking down the fleet into one hundred ton classes and examining the change in labour ratio across decades. In this analysis rig is also held constant, so that changes for each rig and each tonnage class may be observed over time. The percentage changes for each rig and tonnage class from one decade to the next have been calculated, and these changes were then weighted by the number of voyages in each category. The result is an estimate of mean decadal change due, not to changes in tonnage or rig, but to other influences

operating over time. Mean decadal change for the Halifax fleet was -8.3 per cent, which is thirty nine per cent of the mean decadal change for all voyages. Thus almost forty per cent of the impressive decline in man-ton ratio was due not to the growth of capital assets at all, but to a number of other influences subsumed under the passage of time.

TABLE 2

MAN-TON RATIOS BY TONNAGE CLASS

	150-249		250-499		500-999		1000-1499		1500+	
	Yar.	Hal.	Yar.	Hal.	Yar.	Hal.	Yar.	Hal.	Yar.	Hal.
1862-69	3.76	3.87	2.95	2.82	2.16	2.21	1.73	1.90	—	—
1870-74	3.74	3.81	2.90	2.66	1.89	1.99	1.72	1.71	—	—
1875-79	3.38	3.76	2.48	2.51	1.76	1.85	1.54	1.59	1.38	—
1880-89	3.08	3.18	2.41	2.75	1.63	1.69	1.42	1.41	1.21	—
1890-99	—	—	2.30	2.81	1.49	1.44	1.30	1.22	1.16	1.53

Source: Agreements and Account of Crew, Halifax and Yarmouth fleets.

This result is surprising and its importance needs emphasizing. In the Halifax fleet a twelve hundred ton ship operating in the 1860s required twenty two and one half men; in the 1890s a vessel of the same tonnage and the same rig required eight fewer men. Among smaller classes of vessel the change could be almost as impressive: the eight hundred ton barque lost eighteen per cent of its crew between the early 1870s and the 1890s; even the four hundred ton barque shed two men, or a similar proportion of its crew, over the same period. Before attempting to explain such a remarkable growth in labour productivity, it is necessary to be as precise as possible about the proportion of labour productivity growth which may be explained neither by tonnage nor by rig. The previous estimate of thirty nine per cent may overestimate the rate of change, and by estimating decadal changes it does not situate precisely the growth of productivity within time. In order to control firmly for tonnage and rig, all vessels with ten or more voyages were selected from the Halifax file and the changes in each vessel's ratio were estimated on an annual basis. The 692 voyages in this sample were almost sixty four per cent of all voyages in the Halifax labour file. The advantage of this method is that changes in the ratio for unique vessels cannot be due to changes in tonnage; and although some vessels may have been re-rigged during their careers, such changes probably occurred in a minority of vessels.[8] The disadvantage of this method is that some of the regression lines used to

estimate growth rates were poorly correlated with the annual ratios; but estimating growth rates from three-year running means allowed more precise estimates and for twenty nine of the forty one vessels there was a consistent decline in the ratio, which meant that the trend line fitted well.[9] For these vessels the overall man-ton ratio was slightly less than that for the whole fleet, but the overall annual decline in the ratio (-2.03 per cent) was almost the same as for the whole fleet. The rate of change for each vessel was weighted by the number of voyages for each vessel and the resulting weighted annual change in the labour-capital ratio was -0.57 per cent, or twenty eight per cent of the decline for all vessels. This is probably our most accurate estimate of changes in labour productivity due to all other factors but rig and tonnage. Since tonnage and time together explain seventy five per cent of the changes in the labour-capital ratio, it is likely that changes in tonnage alone (at least for the Halifax fleet) explain slightly less than fifty per cent of the decline in the man-ton ratio. Within the residual there remains a number of factors which must have affected labour productivity. Clearly the growth of mean vessel size was the most important single factor determining labour productivity growth, but it was not the only influence.

This analysis of changes in labour on unique vessels also allows us to situate within time the residual effects upon labour productivity. The vessels in this sample operated between 1863 and 1891. Those vessels experiencing no growth in labour productivity were concentrated in the 1860s and vessels with rapid declines in their labour ratio were concentrated in the 1880s. By averaging the rates of decline for vessels in service in each year we obtain a rough index of the growing effect of factors other than tonnage and rig. The average rate of change was positive for most years in the 1860s, which suggests that the growth in labour productivity in this decade must have been due very largely to the rapid growth of mean vessel size (and in this decade mean tonnage per voyage in the fleet grew by 4.6 per cent per annum while the man-ton ratio fell by 3.7 per cent). In 1869 and 1870 the average rate of change for these selected vessels suddenly turned negative and the mean rate of change for vessels operating in the 1870s was -0.7 per cent. Clearly a growing proportion of the continued decline in the man-ton ratio resulted from influences other than growth in tonnage (and in this decade tonnage grew by only 2.2 per cent per annum). In the 1880s there was almost no growth in mean tonnage, but the man-ton ratio for the whole fleet continued to fall by almost one per cent per annum. Among the vessels with ten voyages or more operating in the 1880s, the mean annual decline was also one per cent.[10] If these vessels reflect what was happening in the fleet as a whole — and since they are so large a sample of the labour analysis file there is no

reason to believe them unrepresentative — then very little if any of the continued decline in the labour force could be due to growth in mean vessel size.

What caused the continued decline in the man-ton ratio, when increasing vessel size was no longer the critical factor? It is likely that the most important influence was pressure by owners and masters to reduce the wage bill in their fleets, regardless of the size of vessel employed. The residual effects other than tonnage became more important as freight rates declined and as competition from steam increased; these effects became the main influence in the 1880s when diminishing returns forced shipowners to reduce the size of their fleets, particularly in the North Atlantic. But before we consider this possibility it is necessary to deal with other possible influences upon the change in man-ton ratio. The first and perhaps the most complex of these possible influences was change in the rigging of vessels. The major change over time in both fleets was from two mainsails to three: in the 1860s the three-masted barques and ships accounted for only sixty per cent of all voyages, but this proportion increased to ninety per cent by the 1880s. In both fleets the barque was the preferred rig, accounting for fifty six per cent of voyages in the Yarmouth file and sixty one per cent in the Halifax file. The shift to three masts increased the number of men required: if we compare brigantines and barques, for instance, it is clear that a significant increase in men was required for the operation of the additional square sail. If we hold tonnage constant by comparing brigantines and barques within one hundred ton ranges, and if we control for time by comparing rigs within decades, the average increase in men for barque voyages, weighted by the number of voyages in each class, was 16.3 per cent. There were too few brigs and ships in the same one hundred ton classes for the comparison between these rigs to be meaningful, but we can compare the brig with the barque. The addition of a fore-and-aft sail resulted in a mere five per cent increase in men for vessels of similar tonnage. An even more striking comparison was between the brigantine and the barquentine: here the additional fore-and-aft sail was accompanied by virtually no increase in labour (+0.3 per cent). All of these comparisons apply only to vessels under six hundred tons, however. The barque was not more costly in labour than the brigantine, because relatively few barques were under six hundred tons and as tonnage increased the man-ton ratio declined. It is also possible that the difference between the square and fore-and-aft sail was minimized as tonnage increased.

A more detailed analysis of rig produces a few surprising and contradictory results (Table 3). It is a surprise to find that the brigantine was less labour efficient than the brig, since the mean tonnage per voyage

TABLE 3

DEVIATIONS FROM AVERAGE MAN-TON RATIO IN EACH TONNAGE CLASS

	Schooner	Brigantine	Brig	Barquentine	Barque	Ship
150-249 tons:						
Halifax	—	+1.9%	-9.6%	—	—	—
Yarmouth	—	+1.0%	—	—	—	—
250-499 tons:						
Halifax	—	+2.0%	+7.6%	-12.0%	-4.0%	—
Yarmouth	—	-17.4%	+9.4%	—	-1.3%	—
500-999 tons:						
Halifax	—	-1.3%	—	+1.8%	-1.0%	+13.5%
Yarmouth	—	—	—	—	+0.1%	-0.3%
1000-1499 tons:						
Halifax	—	—	—	—	+3.7%	-1.0%
Yarmouth	—	—	—	—	-2.7%	+1.6%
Overall Man-Ton Ratio:						
Halifax	6.81	3.23	2.96	2.14	1.95	1.61
Yarmouth	—	3.82	3.14	1.94	1.94	1.58

Source: Agreements and Account of Crew, Halifax and Yarmouth fleets.

was almost the same for both rigs. It would seem that efficiencies associated with the brigantine and its fore-and-aft sail applied only when compared with brigs above 250 tons. The barquentine was almost as labour efficient as the barque in spite of its much lower mean tonnage, which would tend to reconfirm the relative efficiency of the fore-and-aft sail; but above five hundred tons there appears to have been little incentive to rig vessels as barquentines, probably because the advantage of labour efficiency was outweighed by the loss of speed in ocean crossings (although Halifax owners did use most of their barquentines in competition with barques and ships on North Atlantic crossings and on voyages to the East Coast of South America). The comparison between barques and ships produces contradictory results: in the larger Yarmouth fleet the ship was more efficient than the barque under one thousand tons; above one thousand tons the barque was more efficient; in spite of its smaller mean tonnage. If the barques and ships of Halifax had been considered in isolation then it would be possible to conclude that the growing relative efficiency of the ship was due to the residual effects of time or the growing pressure to reduce labour costs in the 1880s, since a

growing proportion of voyages in this decade were by the larger ships rather than barques, and so these pressures must have affected ships more than they affected barques. But the same argument clearly does not apply to the Yarmouth fleet. Taken together these results tend to suggest that rig is a poor predictor of labour efficiency and that other influences, operating differently in the two fleets, were of prime importance. Certainly the lower overall ratio for the ship was largely due to its greater mean tonnage in both fleets.

What we require is a means of testing the effects of rig, tonnage and time upon changes in the man-ton ratio for the whole fleet. In other circumstances it would be possible to solve such a problem by using multiple regression. But regression analysis requires that the degree of correlation between the independent variables be negligible. In this case the independent variables are highly correlated: in spite of the very high deviation from the mean tonnage for each rig, rig is a good predictor of tonnage and the collinearity between these variables means that regression analysis is unacceptable. There are partial solutions to this problem, however. Within certain tonnage classes in the Halifax fleet the collinearity between rig and tonnage almost disappears and it is possible to test the separate effects of rig and tonnage upon number of men employed. Thus if we select only brigs and brigantines between 150 and 499 tons the mean tonnage of both rigs is very similar; the regression of tonnage upon these two rigs as dummy variables produces an $r^2 = 0.03$ with a large standard error of 78.5, which suggests that within this tonnage range rig is a very poor predictor of tonnage. With this class of vessel, regression analysis is legitimate and the regression of number of men upon rig and tonnage produces a multiple r^2 for rig of +0.024 with a small standard error. This suggests that a mere 2.4 per cent of the variance in labour requirement can be explained by the vessels' rig, which is smaller than expected given the alleged efficiency of the fore-and-aft sail, but not smaller than the contradictory results of Table 3 suggest. Among the larger classes of vessel this type of analysis becomes more risky: between 500 and 1499 tons the regression of tonnage upon rig produces an r^2 of +0.49 (but the standard error is a large 170.0). In spite of the correlation between rig and tonnage here, it is remarkable to find that rig (barque and ship together) seem to explain no more than 6.7 per cent of the variance in man-ton ratio, while tonnage explains thirty seven per cent of the variance.[11] This would seem to be a reasonable measure of the relative effects of rig and tonnage for barques and ships. Since most of these vessels operated in the later decades, when pressure from owners and other effects appear to have been critical, we should expect the

unexplained effects other than tonnage to loom large. But the independent effect of rig remains unclear.

There is only one way to control properly for tonnage so as to remove the collinearity between rig and tonnage, and that is to select an equal number of voyages for barques and ships of approximately equal tonnage. In order to control for time it is also necessary to select voyages in similar time periods for each matched pair of barques and ships. The advantage of this method is that rig does not predict tonnage and the two may be treated as independent variables in classical analysis of variance. The disadvantage is that the inevitably small sample may produce unrepresentative results; but for the Halifax fleet this matching exercise produced 180 voyages, or twenty per cent of all voyages by barques and ships in the file. The sample is probably large enough to permit a tentative conclusion, which is that neither rig nor tonnage explain much of the variance in the dependent variable, whether that variable is man-ton ratio or number of men. With number of men as the dependent variable, the eta^2 for rig is +0.05 and the eta^2 for tonnage is +0.04; with man-ton ratio as the dependent variable, the eta^2 for rig remains at +0.05 while the eta^2 for tonnage rises to +0.29.[12] Rig explains only five per cent of the variance in labour requirement and tonnage explains only twenty nine per cent of the change in man-ton ratio. These results suggest two things: first, changes in rig explain very little of the changes in labour requirement within tonnage classes; and second, among larger barques and ships operating predominantly after the 1860s the critical factor affecting labour requirements was neither rig nor tonnage, but the residual effects within which decisions by owners and masters, and the behaviour of crew, were of primary importance.

We cannot dismiss even a five per cent effect, however. It could be that this effect was due entirely to the greater efficiency of one rig over the other. This was indeed the case: the man-ton ratio for barques among our sample of matched barques and ships was 5.4 per cent lower than the ratio for ships. This difference should not be discounted: it represented a saving of almost one man per one thousand ton vessel. If the man saved were an able-bodied seaman the saving in wages, given the prevailing wage for ABs in the 1870s, would be £34 per annum, which over the life-time of the average vessel would amount to about four per cent of the original capital cost of a one thousand ton vessel.[13] This suggests that the advantage of the fore-and-aft sail in larger vessels existed and should not be discounted as a reason for the investment in vessels of this type.

As a final means of testing the relative efficiency of different rigs, while controlling for tonnage and time, the fleet has been broken down into one hundred ton classes and the percentage by which each rig

TABLE 4

INDEX OF LABOUR PRODUCTIVITY BY RIG (HALIFAX)

Rig	Weighted Deviation From Mean No. of Men*	No. of Cases
Schooner	-8.9%	4
Brigantine	-2.9%	150
Brig	+1.1%	49
Barquentine	-8.2%	11
Barque	+0.1%	631
Ship	+1.8%	158
Auxiliary Sail	+3.0%	33

Note: *The percentages here are the averages by which the number of men for each rig deviated from the average number of men for all vessels in each 100 ton class and each decade; these averages are weighted by the number of voyages for each rig in each tonnage class and each decade, to yield the overall weighted deviations given here.

Source: Agreements and Account of Crew, Halifax fleet.

deviated from the average number of men for each tonnage class in each decade has been calculated. These deviations from the mean labour requirement have been weighted by the number of voyages in each cell and the result is a measure of the relative labour efficiency of each rig compared to all other rigs of similar tonnage. The results in Table 4 confirm that the relative efficiencies attributable to rig were very slight. The only vessels with a very large relative efficiency were the vessels with two fore-and-aft sails — the schooner and the barquentine. The small but consistent advantage of the fore-and-aft sail is once again clear (and if barques below seven hundred tons are ignored the percentage for barque falls to -1.7 per cent). Finally, how much of the overall decline in man-ton ratio can be attributed to changes in rig? Table 4 suggests at least a tentative answer to the problem which regression analysis cannot solve. Changes in rig could affect the overall man-ton ratio only if there were a substantial shift from less efficient to more efficient rigs over time. In fact this shift did not occur in either fleet: in the Halifax fleet, for instance, the proportion of voyages by brigantines, barquentines and barques increased by a mere eight per cent between the 1860s and 1870s, and fell by eight per cent in the 1880s and seven per cent in the 1890s. Even if we allow the barque rig a five per cent margin of efficiency compared to the ship, the overall contribution to labour productivity occasioned by an eight per cent increase in fore-and-aft sails must have been much less than

one per cent. In the 1880s and 1890s the growing preference for the ship could only have retarded, rather than assisted, the overall decline in man-ton ratio. We must conclude that the changing composition of rigs within the fleet had virtually no effect on labour productivity over the period from 1863 to 1899.

Another variable which might have affected labour requirements was trade route. It is possible that favourable conditions in particular trades allowed a saving in labour, regardless of tonnage class or time period. If vessels were moved into such trades over time this could have contributed to the decline in man-ton ratio. Unfortunately the effect of trade route cannot be analyzed by regression techniques, again because of the problem of collinearity with tonnage, and we must use other methods. This analysis has been carrried out on the Yarmouth fleet because it has a larger number of voyages in all trades; there is no reason to suppose that the results for the Halifax fleet would be very different.[14] The first column in Table 5 indicates that the man-ton ratio declined on all major trade routes, both in the period of growth in fleet size and in the period of decline from 1879. In the second column growth rates in the man-ton ratio are weighted by the region's annual share of the world traffic to yield a regionally weighted growth rate. From this it is possible to estimate each region's contribution to the net decline in the man-ton ratio. All regions contributed positively to the decline and in both periods their contribution was roughly proportionate to their share of all voyages. This suggests that whatever the influences contributing to labour productivity, they operated with similar effect on all major trade routes. If there is a weakness in this analysis, it is that tonnage is not controlled: it is possible that some trade routes required more labour, in spite of an impressive decline in man-ton ratio, and that the man-ton ratio was higher than one might expect given the tonnage class of vessels being employed. A partial solution to this problem is presented in Table 6. Here man-ton ratios on fifteen major passages are presented by decade, including passages outward from the United Kingdom or Europe and also return passages. In order to ensure that there are sufficient cases, use is made of passages from voyage start to first port of call, and from last port of call to terminal port. The resulting sample includes over seventy per cent of all such passages in each decade (passages not included were usually those which began and ended in the same region; on most of these passages the man-ton ratio was below average). The decline in the ratio on every trade route is clear enough, but it is also clear that on some trade routes the ratio was much higher than on others. This is not always because vessels of smaller tonnage were being used. Voyages to the East Coast of South

TABLE 5

REGIONAL CONTRIBUTIONS TO LABOUR PRODUCTIVITY (YARMOUTH FLEET)

Trade Area	Growth Rate (%)	Weighted Growth	% Contribution	% of Total Voyages
	1863-79			
All Voyages	-2.80	-2.80	—	—
North Atlantic	-2.81	-2.20	78.6	78.2
West Indies	-1.92	-0.17	6.0	7.4
Mediterranean	-1.11	-0.01	0.4	0.6
South America	-3.20	-0.18	6.4	5.6
Europe/U.K.	-2.92	-0.10	3.6	1.8
U.S. Gulf	-0.60	-0.04	1.4	4.4
Indian/Pacific/Other	-2.03	-0.10	3.6	2.0
	1879-95			
All Voyages	-2.09	-2.09	—	—
North Atlantic	-1.79	-1.23	58.7	63.2
West Indies	-4.16	-0.06	2.7	1.4
Mediterranean	-8.06	-0.09	4.3	1.4
South America	-2.93	-0.31	14.8	13.2
Europe/U.K.	-2.33	-0.10	4.8	4.8
U.S. Gulf	-1.66	-0.13	6.2	8.1
Indian/Pacific/Other	-2.32	-0.18	8.6	7.9

Source: Agreements and Account of Crew, Yarmouth fleet.

America, for instance, involved vessels of 250-499 tons in the 1860s, 500 tons in the 1870s, and 1000 tons in the 1880s and 1890s. A comparison of the ratios in Table 6 with those in Table 2 suggests that ratios on this route were consistently above the average for the class of vessel employed, despite the steep decline in the ratio over time. The ratios on passages to the West Coast of South America and to the Indian or Pacific Oceans were also slightly above average.

How many extra men did vessels on these routes require compared to vessels on other routes? The last column of Table 6 indicates how far labour requirements in each trade departed from the mean for vessels of similar tonnage. The fleet has been broken down into 150 ton classes, and the percentage by which the number of men in each class and each trade

TABLE 6

MAN-TON RATIOS BY TRADE ROUTE AND DECADE (YARMOUTH FLEET)

	1860s	1870s	1880s	1890s	1862-1900	% Deviation From Average No. of Men Per Tonnage Class and Decade
Overall Ratio	2.60	1.89	1.51	1.32	1.88	—
U.K./Europe-U.S.A.	2.49	1.85	1.54	1.31	1.82	+2.3
U.S.A.-U.K./Europe	2.55	1.83	1.51	1.29	1.78	+0.4
U.K./Europe-B.N.A.	2.17	1.87	1.55	1.34	1.76	+1.2
B.N.A.-U.K./Europe	2.25	1.83	1.45	1.33	1.77	-1.4
U.K./Europe/U.S.A.-Mediterranean	2.83	2.97	1.62	—	2.48	-1.9
Mediterranean-U.K./Europe/U.S.A.	3.35	3.09	1.58	—	2.43	-1.3
U.K./Europe-West Indies	2.89	2.58	1.50	—	2.61	+2.0
West Indies-U.K./Europe	2.84	2.42	—	—	2.75	+1.0
U.K./Europe/U.S.A.-East South Am.	3.00	2.94	1.45	1.40	1.93	+4.1
East South Am.-U.K./Europe/U.S.A.	3.16	3.05	1.53	1.42	2.33	+4.3
U.K./Europe/U.S.A.-West South Am.	—	1.81	1.58	—	1.78	+11.6
West South Am.-U.K./Europe/U.S.A.	2.75	1.58	1.40	—	1.68	+8.2
U.K./Europe/U.S.-Indian/Pacific	2.08	1.69	1.48	—	1.63	+5.9
Indian/Pacific-U.K./Europe/U.S.A.	2.04	1.77	1.58	1.31	1.62	+2.1
U.K./Europe-U.K./Europe	2.57	1.92	1.34	1.15	1.88	-7.2

Source: Agreements and Account of Crew, Yarmouth fleet.

differed from the mean for all vessels in that class has been calculated. In order to control for time this exercise is repeated for each decade. Deviations from the mean labour requirement are weighted by the number of voyages in each cell and the result is a measure of the relative costliness in labour of each trade. It is clear that voyages outside the North Atlantic required more men than did vessels which remained in the North Atlantic. Even those vessels going to and from the East Coast of South America required four per cent more men than the average for vessels of the same size in the fleet as a whole. Vessels requiring fewer men than the average, regardless of vessel size, were not necessarily operating on routes with the lowest man-ton ratios: they operated from British North America to the U.K. or Europe, or in European-U.K. voyages, or on passages beginning and ending in the same region (those not included in Table 6). Clearly masters were taking care to hire a full crew, regardless of the size of their vessel, when undertaking longer voyages and particularly when venturing outside the Atlantic around either the Horn or the Cape of Good Hope. Thus a thirteen hundred ton vessel going to the West Coast of South America took two more men than the same vessel operating in the North Atlantic. The owner who sent his vessels into the Pacific was doing so at the risk of higher costs: at the wage rate prevailing for ABs in the 1880s, two extra men a year could cost £70 per annum, or almost eight per cent of the original capital cost of a thirteen hundred ton vessel over the lifetime of that vessel. The extra labour requirement associated with longer voyages could only have inhibited the decline in man-ton ratio, since more vessels were deployed in longer voyages as time passed. The proportion of all voyages to South America, for instance, increased from 5.6 per cent before 1879 to over thirteen per cent after 1879, and the proportion of voyages to the Indian or Pacific Oceans increased from two per cent to eight per cent. Considerable efforts were made to save labour costs on these routes, as the growth rates in Table 5 indicate. But the movement into these trades meant that the growth of labour productivity was slower than it would have been if the same vessels had remained in the North Atlantic. It is impossible to be precise about the effect of the shift in trading patterns, but if we deflate the numbers of men in South American and Indian/Pacific voyages to the mean for each tonnage class and recalculate the growth rates for man-ton ratios, we have a rough measure of the retarding effect of these trades. In the period to 1879 the man-ton ratio would have fallen at a rate of three per cent per annum instead of 2.8 per cent, and after 1879 the annual rate of decline would have been 2.2 per cent instead of 2.09 per cent. Thus the shift into longer voyages might have retarded the growth in labour productivity by as much as five per cent in both periods.

In order to explain the growth of labour productivity we are forced to consider other, less easily quantifiable, factors which operated over time. The growth of tonnage explains about half of the change in the capital-labour ratio, but it explains much less of the change as time passed. Changes in rig and trade route tell us less than we might have expected. Among other factors affecting the man-ton ratio seasonality must be mentioned: voyages beginning between November and February had a ratio slightly higher than the mean when tonnage class is constant, but the number of clearances in winter did not diminish significantly over time. It is possible that masters were having difficulty finding crew in some ports by the 1880s and 1890s. The rapid decline in the man-ton ratio on the last leg of voyages in the 1890s suggests that this might have been happening. A large proportion of final ports of call were in Canada or the United States, and in relatively high-wage ports it must have been difficult to find crew for sailing ships at the wages owners were willing to pay. Even before the 1890s vessels usually returned from Canada and the United States wth fewer men than they carried on the outward voyage from Britain or Europe. But the difficulty in finding crew in some ports probably does not explain much of the long-term decline in man-ton ratio, since the decline was steep in all trade routes, and the ratio for vessels clearing from Canada and the United States was not substantially lower than the ratio for clearances from Britain and Europe (Table 6).

There are a number of factors which might have affected the quality of labour at sea. It is very likely that crews were more experienced as time passed, since sailors were aging over time. As more crew acquired experience and literacy the level of skill undoubtedly rose, even though skilled labour was not attracted into this industry by high wages or other rewards. David Alexander has found evidence that literate Canadian crews were better behaved than non-literate Canadians.[15] Masters were also aging over time, and they were more experienced in the management of larger crews as vessel size increased. Yarmouth and Halifax shipowners preferred Nova Scotian masters and usually allowed them a long term of service on the same vessel. While it is impossible to measure precisely the effect of age and experience upon labour productivity, it is possible to show that older masters and crew were partly responsible for the decline in man-ton ratios. The man-ton ratios on all vessels whose crew had an average age of twenty seven years or less have been compared with ratios on vessels with crews averaging twenty eight years or more. In order to control for time and tonnage the comparison has been made between vessels in 150 ton classes operating in the same decade. The percentage difference between man-ton ratios for older and for younger crews, weighted by the number of voyages in each cell, was almost two per

cent with the older crews having the lower ratios, particularly among larger classes of vessel. This suggests that masters often expected an older crew to work more effectively, and the increasing age of crews undoubtedly assisted the decline in man-ton ratios (in the 1860s only twenty eight per cent of crews averaged twenty eight years or more, compared to eighty one per cent in the 1890s). The same exercise when applied to masters above and below thirty years of age, produces a less significant result, but masters above thirty years of age carried almost one per cent fewer men per one hundred tons than did younger masters. Although it is impossible to measure precisely the effects of age and experience, these must be included among the factors which permitted the growth of labour productivity.[16]

As masters came to know their vessels and their trade routes they were able to judge more carefully the number of men required to sail without risking disaster. It is surprising to find that, in the Yarmouth fleet at least, the number of vessels lost at sea did not increase significantly as the man-ton ratio fell: the proportion of vessels lost by marine disaster remained constant between the 1850s and 1880s. In the Halifax fleet, however, the proportion of ocean going vessels lost by marine disaster increased from twenty four per cent for those registered in the 1860s to thirty four per cent for those registered in the 1870s and remained at that level in the 1880s and 1890s.[17] Among vessels in the labour analysis files those vessels with the lowest man-ton ratios were not more likely to be lost at sea (the ratio for those which did suffer a marine disaster was above average in all tonnage classes above 250 tons). It remains possible that the rate of loss would have been lower had more men been employed and that vessel depreciation would have been slower. But the mean age of vessels, including those involved in marine disasters, increased over time. Owners were able, it seems, to decrease the size of their crews without risking an unacceptable increase in the rate of vessel depreciation. Not only did fewer men sail the same vessels without risking unacceptable losses, but they also sailed the same vessels more quickly between ports, since passage times improved on all major trade routes.

Labour productivity increased because of some combination of longer working hours, improved skills and technological changes. There was no major technological transformation in the shipping industry in the mid nineteenth century, but there were a series of changes occurring over several decades which allowed a continuous decline in man-ton ratios in all British shipping. Such changes included the increasing use of wire rigging, the change from double to single topsails, the use of patent reefing gear, the advent of the canvas windmill pump and of the donkey engine. These changes eased the task of handling sails and contributed to

the long-term decline in man-ton ratio. We do not know how many of these changes had been applied to Canadian vessels by the 1860s, but we do know that some (such as the use of engines) were being applied in the 1870s and 1880s. It is impossible to be precise about the saving in labour effected by these means, but they were of some importance even if there was no major technological change.

Apart from the growth of mean tonnage of vessels, few other factors explain much of the growth of labour productivity in these fleets. More experienced crews and the use of donkey engines must figure largely among the residual effects other than tonnage. But by excluding other possibilities, and by situating the residual effects so clearly in the 1880s and 1890s, we are forced to conclude that declining man-ton ratios resulted largely from the influence of managing owners and masters. There must have been considerable pressure upon masters and owners to reduce the wage bill in their fleets when freight rates were collapsing and profit margins dwindling. This pressure was felt by all shipowners, but the response of Canadian shipowners may have been a peculiarly intense effort to cut costs in their industry. Owners of large fleets in Britain might have concentrated their efforts and their capital in new iron-hulled steamers, but Canadian shipowners rejected this option and so concentrated their energies and their shipping investments in sailing fleets whose competitive position soon deteriorated. While profits in the industry may have been substantial in the 1870s, the competitive advantages of steamers were well known and there were no grounds for complacency. Speculative investments in landward industries did not yield such rapid returns that the shipowner could treat his vessels with a benign neglect. A stream of instructions went forth from the owner to his master, and as means of communication improved the owner was able to exercise strict control over his vessel at long distances.[18] In these circumstances the Nova Scotian master acquired his reputation for parsimony and for ruthless discipline. The reputation was not undeserved. In both fleets, one of the variables which helps explain the growth of labour productivity was the birthplace of the master. This was a factor more important than rig, trade route, age of crew or age of master. In the Halifax fleet the Nova Scotian master sailed with a smaller crew in every tonnage class under fifteen hundred tons and his man-ton ratio was on average 5.3 per cent lower than the ratio for non-Nova Scotian masters, when time and tonnage class are constant. In the period of declining freight rates from 1879 to 1895, the man-ton ratio for vessels with Nova Scotian masters declined at an annual rate of 1.86 per cent, which was no less than eighty six per cent faster than the decline for the whole fleet. In the Yarmouth fleet the decline in man-ton ratio for Nova Scotian masters

was the same as for the fleet as a whole, but this was because Nova Scotian masters were eighty one per cent of all masters and so their presence coincides with the overall decline which they helped to effect.

Of equal importance with the master was the managing owner. Managing owners resident in Nova Scotia accounted for sixty seven per cent of all voyages in the Halifax file, and in the Yarmouth file ownership was even more concentrated since eighty per cent of all voyages were conducted under the managing ownership of men resident in the town of Yarmouth. The ratio for Nova Scotian managing owners has been compared to the ratio for non-Nova Scotians, controlling for 150 ton classes and decade. The ratios for Nova Scotian owners in the Halifax file were on average 5.7 per cent lower; in the Yarmouth file the ratios for Yarmouth owners were 4.3 per cent lower than those for non-Nova Scotian owners. An equally impressive result is obtained when we link Nova Scotian owners with Nova Scotian masters. In the Halifax file, fifty nine per cent of voyages were undertaken by vessels whose managing owner and master were both Nova Scotians; in the Yarmouth file, seventy one per cent of voyages were by vessels with a Yarmouth-resident owner and a Yarmouth-born master. In the Yarmouth file, the Yarmouth owners and masters ensured that their overall man-ton ratio was six per cent lower than for all other cases, in spite of both groups having almost the same mean tonnage; Yarmouth owners and masters secured a lower average man-ton ratio in twenty five out of thirty five years. When they shared a vested interest in voyages by Halifax vessels, Nova Scotian owners and Nova Scotian masters were a ruthless combination of cost-saving talents: their average man-ton ratio was thirteen per cent below that of the others, and this difference was not due to a faster increase in the tonnage of vessels deployed by Nova Scotians. When freight rates began to fall in the mid 1870s Nova Scotian owners and masters must have made particularly intense efforts to cut wage costs, and they effectively determined the overall rate of decline in man-ton ratios: between 1875 and 1895 vessels owned and captained by Nova Scotians cut their labour force at an astonishing rate — no less than 193 per cent faster than did all other vessels in the fleet (the annual rates of decline in man-ton ratios were -2.17 per cent for Nova Scotians and -0.74 per cent for others).

We may eventually be able to compare labour productivity between these fleets and others. But this evidence does suggest that the Nova Scotian owner and his master felt strongly the need to decrease labour costs and acted upon that need with a peculiarly ruthless efficiency. When increasing size of vessels no longer explains the declining ratio of men to tonnage, the pressure of owners and masters to decrease the numbers of men employed was the primary reason for this growth in labour

productivity. This was a remarkable feat of labour management, but it was much more than that. When fourteen men sailed the same vessel which was once sailed by twenty two men, and when they sailed that vessel more quickly across the Atlantic, we are observing the skills and endurance of men who worked harder and took greater risks for no increase in the wages they were paid.

This analysis of labour productivity has concentrated upon one measure of productivity, the amount of labour required to sail a given volume of shipping. It is no less important, but even more difficult, to measure productivity in terms of output. Was output per unit of labour increasing, and if so at what rate? If we can answer this question we will know a great deal more about the returns on investment in this industry. The two major costs in this industry were the capital cost of the vessel and wages paid; the former remained constant and then declined during the period under study. To the extent that output per man-hour was increasing, and to the extent that the total wage bill declined, the returns to investors in shipping must have been increasing. Fortunately David Alexander has given us an estimate of the rate of growth of output for the Yarmouth fleet. Tentative as he may consider this estimate to be, it is constructed from reasonably accurate measures of known trends: the tonnage of vessels in the Yarmouth fleet and the number of times they entered port; the known rate of change in freight rates; and the trend in prices in the North Atlantic economy. We are now able to estimate total wage costs for the same fleet over time, and so to compare the growth of output with changes in the major cost factor in the industry.

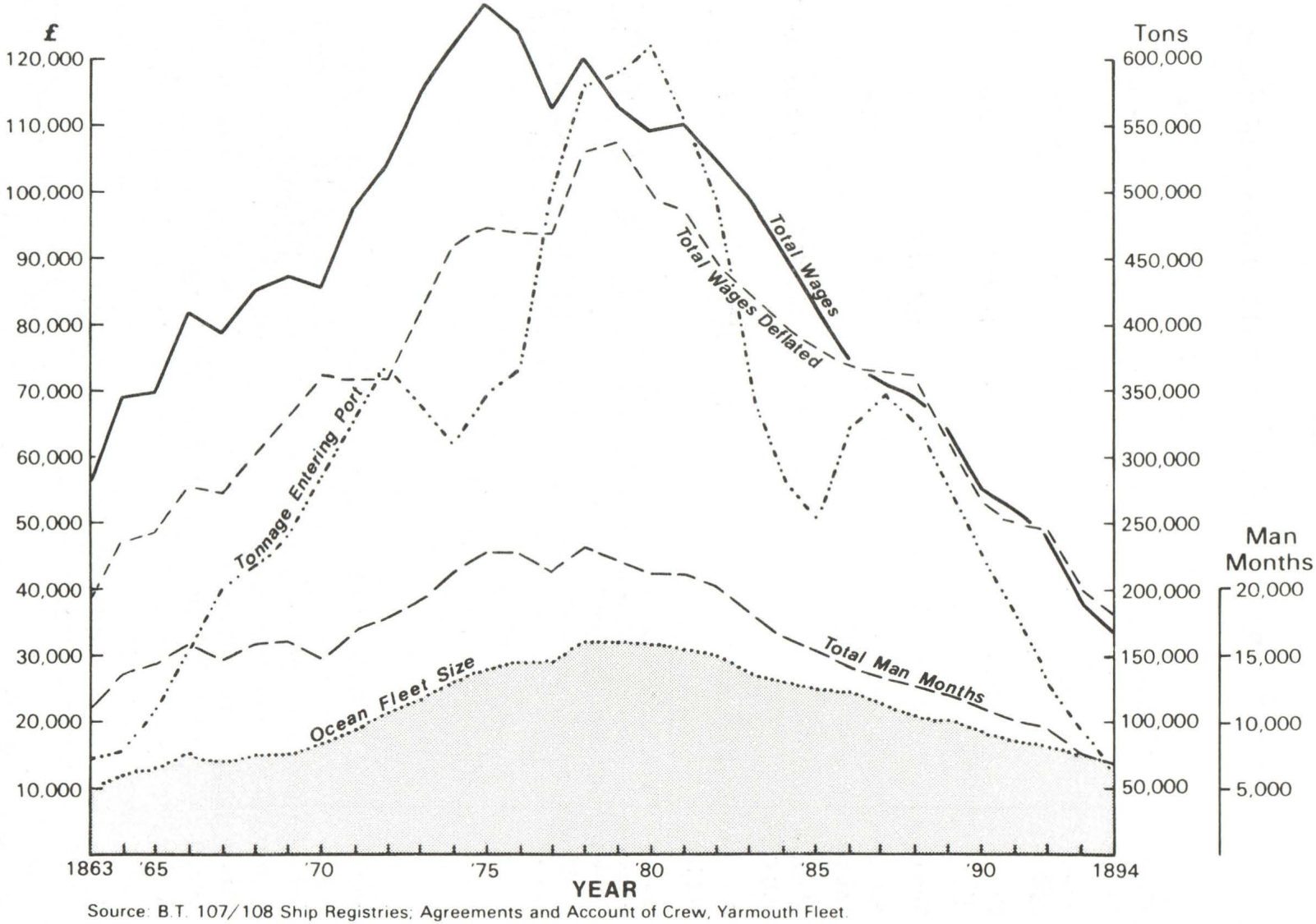
This estimate of total wages paid in the Yarmouth fleet derives from a lengthy procedure which will be described very briefly. We know the total tonnage of ocean going vessels on registry in Yarmouth, and we have a fairly precise picture of their trading activities over time, since our Crew List master file is likely to contain no less than 70 per cent of all voyages undertaken by these vessels. It is assumed here that all vessels followed the pattern of those in the Crew List master file. Total tonnage has been divided into eight major trade routes on an annual basis, according to the proportion of tonnage in each trade route indicated by vessels in the master file. The man-ton ratio in each trade has been multiplied by tonnage in each trade to estimate the total number of men serving in each trade and in each year. The proportion of crews in each trade consisting of OSs, ABs, officers and others is known from the Crew List data, and so we estimate the number of men in each trade by capacity. We can estimate with reasonable accuracy the proportion of each year in which vessels were at sea; our estimates of days per voyage per year reflect the increasing amounts of time served per year on longer routes, and the

decrease in port times from one decade to the next.[19] From this we may estimate the total man-days or man-months served in each trade in each year. Average wages are computed by trade and by capacity (OS, AB, etc.) on an annual basis, or for as short a period of time as the data will allow. Dollar wages (much less common than payment in sterling) are converted to sterling at the standard rate and, in computing the mean wage, dollars and wages are weighted by the number of voyages for which each currency was used (this is necessary because dollar wages were much higher than sterling wages). The mean wage is also the weighted average of wages at the beginning and at the end of voyages in each trade. The master has been included since he was a wage-paid employee, or because he had to be considered part of the owners' costs even if he were paid in shares. The Crew Lists rarely give the wages of masters, but we know that masters were paid between $60 and $75 a month, and we know that their wages tended to increase on larger vessels.[20] The master's wage is estimated at £12 to £20 sterling, increasing in equal annual increments from 1863 to 1894 (this is an annual increase of 1.7 per cent, which is much faster than the increase for the rest of the crew). From the estimated man-months for trade and capacity and from the mean wages by trade and capacity we may estimate the total wage bill, as well as total and mean wages paid to ABs, OSs, officers and others. There may be more accurate ways to estimate total wages, and eventually to incorporate advances and other inducements, but for the moment an estimate by these methods is accurate enough for our purposes.

Figure 2 presents the estimate of total wages from 1863 to 1894 and total wages deflated by the Taylor Canadian import price index. The justification for using this index is as follows: first, Canadian shipowners would presumably assess costs and returns in terms of prices in the Canadian economy, and so a Canadian index is appropriate; second, the import index reflects prices in the international economy where costs were incurred, and its general trend is very close to that of British price indices for the period.[21] It is readily apparent that up to the peak in 1879 tonnage on registry and tonnage entering port were growing more rapidly than either total wages or total man-months served. Total wages increased quite rapidly until 1879, and then declined almost as rapidly as they had previously risen (Table 7). The decline in total wages was even more rapid than we might have expected: it was faster than the decline in fleet size, and much faster than the decline in man-ton ratios after 1879. How was this accomplished? Only part of the decline is accounted for by the ruthless shedding of labour from vessels regardless of tonnage class. Much of the decline is explained by the shift in proportions of crew: as time passed there were more ABs and OSs relative to officers and masters in the

FIGURE 2

Total Wages, Fleet Size and Entrances Into Port 1863-1894 (Yarmouth)



Source: B.T. 107/108 Ship Registries; Agreements and Account of Crew, Yarmouth Fleet.

TABLE 7

ANNUAL GROWTH RATES OF OUTPUT AND WAGES (YARMOUTH)

	1863-79		1879-90	
Ocean-Going Tonnage on Registry	+7.6%		-4.3%	
Tonnage of Entrances[1] ($\overline{EN}$ + $\overline{SV}$)	+12.3		-8.5	
Estimated Gross Output[2] ($\overline{REV}$ + $\overline{SV}$ + $\overline{FRW}$)	+7.4	(1869-79)	-1.6	
Total Wages (Deflated)[3]	+5.1	(1869-79)	-4.6	
Estimated Man-Months of Labour Employed	+4.1		-5.8	
Mean Monthly Wage (All Crew)	+1.6	(1863-75)	+0.02	(1876-90)
Estimated Real Monthly[3] Wage	+2.3	(1863-75)	+1.5	(1876-90)

Note: 1. $\overline{EN}$ is the rate of growth of world entrances; $\overline{SV}$ is the rate of growth of average vessel size; see Alexander, "Output and Productivity in the Yarmouth Ocean Fleet, 1863-1901", in Alexander and Ommer, *Volumes Not Values* (St. John's, 1979).

2. $\overline{REV}$ is the rate of growth of world entrances deflated to account for the growing volume of ballast being carried; $\overline{FRW}$ is the rate of growth of freight rates deflated by the Taylor Canadian import price index.

3. Wages are deflated by the Taylor Canadian import price index.

Source: Agreements and Account of Crew, Yarmouth fleet.

fleet. In the 1860s, 53.2 per cent of man-days were served by ABs and 8.5 per cent by OSs; by the early 1890s these proportions had risen to 59.5 per cent and 13.0 per cent respectively. Thus the proportion of low wage-earners in the fleet increased over time and the total wage bill was thereby reduced. At the same time mean wages, having increased for all capacities until 1875, declined for ABs (at 0.6 per cent a year) and for OSs (at 0.7 per cent a year) while the wages of officers increased slightly. There was a modest growth in real wages after 1875, but it is difficult to know which price index to use and wages were certainly increasing less fast than in industry in Britain or Europe; much of the growth in real wages in Table 7 was accounted for by the wages of petty officers. The growing proportion of ABs and OSs, and their relatively constant wages, partly

accounts for the unexpectedly rapid decline in total wages after 1878. The growing proportion of ABs and OSs was the result of the growing size of vessels, and also the result of decisions by owners or masters that masters and petty officers should manage an increasing number of sailors.

The estimate of growth in total wages allows us to measure the growth of productivity in terms of output per man. This is necessarily a tentative estimate, but it is based upon a solid empirical foundation and it can be stated with some confidence. Output per man-month was increasing by about 3.3 per cent per annum to 1879, and by a remarkable 4.2 per cent for the diminishing number of vessels in service after 1879 (Table 7). Gross output was growing faster than wage costs by about 2.3 per cent per annum in the first period, and by 3 per cent per annum in the second period. Such a sustained growth in labour productivity was a remarkable achievement by the standards of any industry; in an industry which was not experiencing a technological transformation it is astonishing. We cannot estimate the growth of real profits in this industry from these figures. But the estimates of output do take into account the rise and decline of freight rates and the growing proportion of ballast being carried; we know also that wages were the largest operating cost in the industry, and we know that the original capital cost of vessels was constant or declining. We know that returns in this industry were already substantial in the 1860s; in some fleets the annual rate of return (net earnings as a percentage of the depreciated value of the fleet) was as high as twenty per cent.[22] If gross output grew more quickly than wage costs, as it did in the 1870s, and if other costs did not increase substantially, then this rate of return must have been increasing by more than two per cent per annum in the 1870s. Net returns must have continued to increase for those vessels retained in service in the 1880s.

In the 1960s a student of the New Brunswick economy argued that shipping and shipbuilding were a source of economic weakness, since investment in obsolete wooden sailing vessels was a drain of capital and entrepreneurial talent from more productive industrial sectors.[23] If the shipowners of Halifax and Yarmouth are representative, then this view of the shipping industry in Atlantic Canada must be rejected. The shipowners studied here may have been cautious and conservative businessmen, but there is no evidence here of poor judgment or lack of foresight. There is evidence of parsimony, ruthlessness and shrewd calculation. Whatever may have happened to the Canadian shipping industry, it did not decline because Nova Scotian shipowners went bankrupt. It is no surprise that these shipowners continued to invest in wooden sailing vessels in the 1860s and 1870s. For a relatively small initial investment a high rate of return was to be expected. When freight

rates fell and profit margins seemed to be threatened, it was possible to retain vessels in profitable employment by replacing fewer depreciated vessels, by diverting vessels into new trades, by cutting costs and by raising to unprecedented levels the productivity of both capital and labour. In these circumstances it made little sense to invest in iron-hulled steamers, since the initial capital cost was relatively high and the rapid amortization of the investment was uncertain. It made little sense to shift investments out of shipping altogether when the capital cost of sailing vessels was rapidly amortized and when profits could be made. Far from draining capital from other sectors, shipping must have contributed a net flow of capital into other sectors, and it continued to do so in the 1880s when profits were still being made and when reinvestment in shipping dwindled rapidly.

Those who prospered least from this industry were the diminishing number of older 'hands' in the forecastle, the men and women who agreed to serve on the Nova Scotian vessel in spite of the reputation of its master and mate. Long ago Frederick William Wallace described these workers and much of what he says has stood the test of time. The drunks and the degenerates appeared less often on the decks of Nova Scotian vessels than in the tales of retired masters, as Wallace well knew. The master paid close attention to the labour he hired, he looked for men of experience and increasingly he found them. No man who set foot on a Nova Scotian vessel expected an easy time of it. The owner was niggardly and the master, at once both employee and employer, had a vested interest in a clean vessel, a speedy voyage and no claims upon insurers. There was often no afternoon watch below, says Wallace, but constant demands for full rigging even in poor weather and the inevitable burden of repairs which followed.[24] We know now that fewer men were performing these tasks, and they could only have done so by working for longer hours and fewer rewards. By this labour the master and his crew guaranteed the value of investments in wooden sailing vessels. To this extent they were responsible for the rise of our shipping industry. They were not responsible for its decline.

NOTES

1. Phyllis Deane and W.A. Cole, *British Economic Growth, 1688-1959* (Cambridge, 1967), p. 283.

2. Solomon Fabricant, *A Primer on Productivity* (New York, 1969), pp. 43-85.

3. Some preliminary results on man-ton ratios appear, however, in Lewis R. Fischer, "The Great Mudhole Fleet: the Voyages and Productivity of the Sailing Vessels of Saint John, 1863-1912" and Eric W. Sager, "Sources of Productivity Change in the Halifax Ocean Fleet, 1863-1900" in David Alexander and Rosemary Ommer (eds.), *Volumes Not Values: Canadian Sailing Ships and World Trades* (St. John's, 1979).

4. Frederick William Wallace, *Wooden Ships and Iron Men* (Boston, 1937), pp. 174-8.

5. The analysis in this paper is based on computerized files of data taken from the Agreements and Account of Crew for vessels registered in Halifax and Yarmouth. These 'Crew Lists' are contained in the archive of the Maritime History Group at Memorial University. The completed master file for Halifax contains 1844 voyages, which is likely to be forty per cent of all voyages ever undertaken by Halifax-registered vessels of 250 tons or more. Data on crew has been coded for 1086 of these voyages, or 58.9 per cent of the total, and the SPSS labour analysis file used in this paper is based on these 1086 cases. The Yarmouth master file contains 4172 voyages, and the SPSS labour analysis file contains 2029 cases, or 48.6 per cent of all cases in the master file. In all calculations of man-ton ratio the master is included because he was a wage-paid employee, or because he was part of the costs of vessel operation even if he were paid in shares. Analysis of the voyages of these fleets is contained in David Alexander, "Output and Productivity in the Yarmouth Ocean Fleet, 1863-1901" and Eric Sager, "Sources of Productivity Change in the Halifax Ocean Fleet, 1863-1900" in Alexander and Ommer, *Volumes Not Values*.

6. Auxiliary steamers appeared so rarely in either fleet that removing them makes virtually no difference to the decline in man-ton ratios. These vessels were concentrated in the 1890s and their overall ratio was similar to the ratio for sailing vessels above one thousand tons. The auxiliary steamers have therefore been included in this analysis.

7. In the Yarmouth fleet newly-registered barques increased from 522 tons in the 1860s to 1198 tons in the 1880s; ships increased from 858 to 1555 tons over the same period. 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, 1978), p. 83.

8. An example of a re-rigged vessel was the *Republic*, a ship re-rigged as a barque in 1884: Clement W. Crowell, *Novascotiaman* (Nova Scotia Museum, 1979), p. 35 ff. We do not know how many vessels were re-rigged, but the analysis of *de novo* registries suggests that it was a fairly rare occurrence.

9. All growth rates in this paper are estimated from regression equations of the form Log Y = a + bt applied to three-year running means.

10. The mean annual decline for vessels with ten or more voyages was in fact slightly higher than for the whole fleet. We should expect this to be the case: the masters of vessels with longer service lives, if they served on several voyages, would presumably be able to judge more carefully the minimal number of crew required to operate their vessels.

11. In analysis of covariance with tonnage as covariate and ratio as dependent variable rig yields $eta^2 = 0.067$ with an $F = 83.4$; tonnage yields $eta^2 = 0.37$ with an $F = 458.2$.

12. With number of men as dependent variable $F = 6.33$ with significance = 0.013 (for covariate tonnage); $F = 7.51$ with significance = 0.007 (rig). With ratio as dependent variable $F = 59.3$ (tonnage) and $F = 9.26$ with significance of 0.003 (rig).

13. The average life was about ten years and the original cost was about £7 per ton.

14. But compare the results in Lewis R. Fischer, "The Great Mudhole Fleet", in Alexander and Ommer, *Volumes Not Values*, pp. 117-156.

15. On the literacy of seamen see David Alexander, *this volume*.

16. For the Halifax fleet the correlation coefficient between man-ton ratio and mean age of crew was an uninteresting -0.15.

17. See Alexander, "The Port of Yarmouth" in Matthews and Panting, *Ships and Shipbuilding,* p. 99; Alexander and Panting, "The Mercantile Fleet and its Owners: Yarmouth, Nova Scotia, 1840-1889," *Acadiensis* (Spring 1978), pp. 15-16.

18. See for instance Clement Crowell, *Novascotiaman* (1979). One of the best descriptions of the legendary pistol-carrying Bluenose master appears in Samlet av Svein Molaug, *Sjofolk forteller; therdagshistorien fra seilskutetiden* (Oslo, 1977), pp. 33-40. This is a collection of sailors' reminiscences. I am grateful to Captain Lew Parker for this reference.

19. The total man-months served has been reduced slightly to account for men discharged during a voyage; no wages would be paid until these men were replaced. I assume an average of three ports of call per annum; we know that 15 per cent of all crew would be replaced at each, and that twenty four days per man and port of call must be deducted from total man-months served per annum. This is the formula used for calculating total man-months:

$$T_t = N_t \times M_t - \left(N_t \times 3 \times 0.15 \times \frac{24}{30} \right)$$

where T is total man-months per year for trade t, N_t is the total number of men in trade t, and M_t is the total man-months served in trade t before the deduction is made. Only a small deduction is made for deserters, since we assume that most were in debt to the ship when they deserted.

20. Captain Gullison was paid $65 per month as master of the 843 ton *Republic* in 1883; in 1890, as master of the 1328 ton *N.B. Lewis* he was paid $75 per month; Crowell, *Novascotiaman,* pp. 36, 385.

21. David Alexander, "Output and Productivity", *Volumes Not Values,* p. 88.

22. The twenty per cent rate of return was calculated for vessels in the Moran fleet, Saint John, N.B., using data from Peter D. McClelland, "The New Brunswick Economy in the Nineteenth Century" (unpublished Ph.D. thesis, Harvard University, 1966); see Eric W. Sager, "Wooden Ships and Iron Men Revisited: The Canadian Shipping Industry in the Nineteenth Century," a paper presented to the Economic History Society, Liverpool, April 1980.

23. McClelland, "The New Brunswick Economy".

24. Wallace, *Wooden Ships and Iron Men,* pp. 152-191. We know that the proportion of crew deserting increased over time (see Lewis Fischer, *this volume)* but there appears to be only a small relationship between growth of deserters as a proportion of all crew and decline in the man-ton ratio. Correlating proportion of crew deserting with man-ton ratio yields $r^2 = 0.03$.

8. DISCUSSION FOLLOWING PAPERS BY MATTHEWS, WILLIAMS AND SAGER

JANNASCH noted that changes from single to double topsails and hemp and manila to wire rigging were not discussed. He was puzzled about the connection between the larger rigging of larger vessels and their buoyancy.

WILLIAMS, on the latter point, said that he was quoting contemporary literature.

SAGER inquired about the importance of the donkey engine.

CRAIG felt that it was not important in North America.

JANNASCH pointed out that it was used in loading cargo and raising the anchors and, on large American schooners, in the handling of large gaff sails.

PARKER explained that donkey engines handled cargo in Boston and New York harbours. About 1800, large American schooners in the coal trade acquired steam hoisting engines to work lower sails, pumps and windlasses. Gasoline hoisting engines were used on medium and smaller vessels after 1900, thereby making the schooner a very efficient sailing vessel. He placed crew size at double the number of masts, plus two or three additional men, depending upon the nature of the voyage. Therefore a six master, carrying almost six thousand tons of coal, could be sailed with fifteen men, one of whom handled the steam hoisting engine. This meant about four hundred tons of cargo per crew member.

CRAIG added that American running and standing rigging became easier to adjust with better blocks and light cotton sails. He referred to the use of canvas windmill pumps as a means of saving labour.

JANNASCH expressed a preference for flax sails, regarding the adoption of cotton ones on American vessels as a dubious improvement. He and CRAIG agreed that cotton sails were difficult to handle when wet.

CRAIG explained that the North American vessels, being soft wood, were more buoyant than British oak vessels. He then opined that cargoes could be ranked according to the speed required for their delivery. Perishables like citrus fruit demanded speed while coal, railway iron and timber did not. Owners and charterers could see an advantage in having more men for a quick trip. There was a trade-off between the speed at which cargo was delivered and the associated costs. Again, the depth of water in a port determined the size of the vessels calling there for certain commodities. So there are a number of variables that might modify or even explain some of the differing man-ton ratios.

SAGER wondered whether cargoes would help to account for the relatively large number of men on vessels of the same tonnage plying South American routes.

CRAIG asserted that a particular time required to cross the Atlantic in a sailing vessel led to assumptions about the size of crew needed. A voyage of two hundred to three hundred days is a different proposition from one lasting thirty to forty days.

FISCHER noted low man-ton ratios on Pacific voyages out of Saint John. Figures for Windsor were obtainable but not for Halifax and Yarmouth. While accepting the trade off between time and costs, he could offer no way to determine it.

BATTICK suggested that freight rates were important because they could make possible the hiring of a few more crew in order to increase the speed of the vessel.

FISCHER noted the relative decline of the American fleet after the middle of the nineteenth century and observed that the rise of the Scandinavians and others did not occur until the end of the century. This left the British unchallenged for a time. Would anything, other than competition, explain innovation in British shipping during this period?

CRAIG noted that innovations and standardizations were both common at this time and pointed out that they were all associated with greater economy rather than greater speed, since it was possible to exhaust the gains to be made by increasing speed. Productivity, however, could be profoundly increased by properly understanding the physical geography of the sea. An American, Captain Mallory, in his work on hydrography, showed how productivity could be increased, not by greater speed, but by considering optimum routes, wind direction and the like.

SAGER asked whether masters were familiar with Mallory's work.

CRAIG indicated that Admiral Fitzroy had studied the use of winds, tides, currents and weather in order to further productivity in shipping. Many owners differentiated between masters who sometimes delivered cargo late so as to conserve the vessel and those who wore out crew and rigging by cracking on sail. The competition of the steamship increasingly made speed for sailing ships immaterial. He believed that voyage accounts might provide some quantification of the trade-off between increasing speed and conservation of vessels. It is possible to establish that some masters were kept by an owner for twenty or twenty five years because they always delivered cargo in good condition. Often, such masters were the ones who really made money for owners.

SAGER noted that such masters could be identified and then their man-ton ratios, speed of passage and other variables could be examined. There appears to have been no relationship between a low man-ton ratio and the likelihood of a marine disaster. The life expectancy of Yarmouth and Halifax vessels rose over time and, in the 1870s and 1880s, there was no significant increase in the rate of marine disaster.

CRAIG advised the use of Lloyd's *Captains Register* here rather than the crew lists as a starting point for such an investigation.

DIXON thought that it would be useful to distinguish masters holding certificates of service from those with certificates of competency because the latter, qualified by examination, understood the new navigation while the former did not.

JANNASCH pointed out that few voyage accounts still exist.

VERNEY wondered how much thought was given to port detention during the nineteenth century when speed was an important consideration. He asserted that it was crucial during the twentieth century. The American Grace Line equipped its ships with gear that allowed all five cargo hatches to be worked simultaneously. Along the coast of the Americas, from San Antonio to Valparaiso, extra crewmen were used for this purpose.

CRAIG stated that, in the nineteenth century, port time was decreased as larger hatches were made possible by the greater length and strength in the iron and steel hulls. In addition, wooden and early iron sailing ships did not carry water ballast until steam pumps were installed. Unlike steam ships, the nineteenth century sailing vessels required low capital costs and, therefore, relatively low demurrage rates. Despite the differences between steam and sail, better cargo-handling equipment, speedier assembly of cargo and the use of warehouses, grain silos and iron ore terminals were considered.

SAGER inquired whether men were added to the crews in particular trades in order to unload cargo where port facilities were adequate.

CRAIG gave the example of the South Carolina phosphate trade.

SAGER wondered whether the South American ports required such an arrangement.

CRAIG believed that cheap labour could be found in these ports so that larger crews were rather the result of longer voyages. Off the coasts of Chile and West Africa, cargo was moved to vessels in craft the size of a canoe. In the case of the River Plate, warehousing and assembly of cargo were the problem.

KNOPPERS believed that between 1832 and 1852 steam assisted vessels might have replaced labour intensive sailing vessels. Did such

vessels then disappear from man-ton computations? Between 1700 and the 1750s, East Indiamen carried twice the number of crew required because of anticipated deaths. Did a similar arrangement take place on other trade routes? Studies of wage costs per ton, taking into account the composition of the crew, are required. Were there changes in the average size of vessel within each tonnage class over time?

WILLIAMS asked if, in the Baltic trades, larger vessels were replaced by smaller ones with more efficient man-ton ratios.

KNOPPERS agreed and indicated that he could supply notes on man-ton ratios, cost of construction, changes of rigging, efficiencies in handling and getting in and out of port.

WILLIAMS wondered if these vessels were owned by the masters.

KNOPPERS replied that there were small groups of owners rather than large groups and that the master tended to own a larger share in the vessel.

WILLIAMS noted that ranges of one hundred tons may have been too broad for 1832. In the 1830s and 1840s, vessel owners complained about the obligation to carry a number of boys proportionate to vessel tonnage. After 1849 there may have been changes in British crews. Agreeing that crew costs were needed, he pointed out that no crew agreements exist from before 1864.

JONES suggested that crew costs might be estimated from a port by port breakdown of "Seamen's Sixpences".

WILLIAMS indicated that such returns applied only to vessels coming into port and did not take into account those seamen who jumped ship.

CRAIG cast doubt upon arbitrary tonnage categories because some vessels were built specifically to weigh one ton under the level where higher dock and pilotage dues were charged.

WILLIAMS felt that a vessel operating regularly on a particular route in a particular trade under a particular master would have a lower man-ton ratio. About mid century, ships' agents could provide faster turn-around times in port (for regular trading vessels) especially in the case where a number of vessels carrying the same cargo arrived at the same time.

BATTICK explained that sailing vessels were driven out of New York because steamers obtained precedence over them. So the custom of the port could help to determine this factor.

WILLIAMS noted that inclement winds could cause a bottleneck for vessels at a port like Liverpool.

FINGARD stated that, in Saint John, desertion rates were increasing throughout the 1890s. She wondered whether there was a relationship between low man-ton ratios and work stoppages.

SAGER stated that there was no correlation between the proportion of deserters and man-ton ratios. What is required is to compare rates of desertion with very low man-ton ratios for various tonnage classes.

FINGARD noted that undermanning was one factor in seaworthiness tested in legal cases between sailors and captains. Was the number of required hands being reflected in the agreements? From 1873 to 1893 legislation made it difficult for sailors to appeal to higher courts. In the House of Commons, vessel owners argued that they did not want to spend money on safety apparatus in the ocean trades.

WILLIAMS stated that the undermanning of vessels, especially those under government contract, was resisted by crewmen.

FISCHER indicated that only 4.5 per cent of vessels sailed with crews smaller than required by the agreements. Some objective criteria are needed in order to make an analysis possible.

JONES asserted that, according to the Whitby muster rolls for the 1830s and 1840s, the size of the vessel had little impact on the man-ton ratio.

WILLIAMS revealed that he had tried to work out the minimum size of crew required for operating efficiency and then applied criteria based upon differences in crews, vessels and trades.

CRAIG pointed out that the Bryce Commission could find no scientific way to determine whether a vessel was under- or over-manned. Of course, masters themselves complained to owners about undermanning.

SAGER raised the question of quality of labour. Did not the Nova Scotian master, trying to get experienced seamen, ask questions of those men supplied by the crimps? How much discretion did the master have in choosing the crew?

FINGARD replied that, because British North American seamen were in short supply, in Saint John masters accepted what the Saint John boarding housekeepers' association provided and in Quebec landsmen shipped out as ABs. However, this does not seem to have been the case in Halifax.

SAGER asked about the British ports.

DIXON explained that masters recruited at three levels, being selective in hard times; approaching the shipping office in easier times; and resorting regularly to the crimps only in the face of dire shortages.

FINGARD asserted that Quebec had a shipping office from 1848, Saint John from 1850 and Halifax from 1873 but that the crimps controlled the supply of labour in any case.

DIXON opined that, in the British experience, when there was an oversupply of labour, the crimps had no role to play.

FINGARD stated that only during years of commercial depression were the British North American crimps out of the picture during the nineteenth century.

JANNASCH pointed out that the captain of the *N.B. Lewis (The Novascotiaman)* had to take the men that he was offered.

SAGER cited F.W. Wallace on the point that captains only occasionally had an opportunity to get a better crew. He wondered about the eastern American ports.

FISCHER could not see any reason why the situation in American ports would differ from that in British North American ports.

9. "COMPOSED OF ALL NATIONALITIES": THE CREWS OF WINDSOR VESSELS, 1862-1899

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"COMPOSED OF ALL NATIONALITIES": THE CREWS OF WINDSOR VESSELS, 1862-1899

Rosemary E. Ommer

"The crews of the deep-water ships and barques", said Frederick William Wallace of the British North American merchant marine, "were composed of all nationalities" — and he went on to explain that such crews were hired as, when and where the vessel required them. Seafaring, that is, was the profession of a mobile international pool of labour who boarded vessels and were discharged from them according to the shifting patterns of international trade which dictated the voyages of the tall ships. The local Nova Scotian lad who wished to gain employment at sea, Wallace argued, would have to find his place as crew on fishing or coastal schooners, or perhaps on the small to medium range vessels that plied the West Indies trade.[1]

Conventional wisdom has it, then, that the opportunities for local employment on the international carrying trade fleets of the Fundy rim were slight; particularly in view of the fact that those fleets, while they might be owned in Windsor or Yarmouth or Saint John, were generally operated from the United Kingdom and particularly out of Liverpool.[2] Indeed, even the folk mythology that has come down to us in song and story bears out this international flavour of the sailing ship crews:

> There were Dutchmen, Germans and Russians,
> There were jolly sailors just across from France,
> And not one of them could speak a word of English,
> And they answered to the name of Month's Advance,

while the chorus starts, "Paddy lay back, Take in your slack...."[3] But perhaps this verse, with its specific reference to the nationalities of crew on the Valparaiso run, conceals more than it reveals of crew composition. Frenchmen, Dutchmen, Russians and Germans might be lumped together as 'foreigners' by the English-speaking sailors who sang the shanty, but they are actually a rather tight-knit set of nationalities from North and West Europe: from regions, moreover, where population pressure was severe and whence the emigration tides that comprised the 'great migrations' of the nineteenth century were flowing.[4] It is, therefore, reasonable to speculate that seafaring might well have fulfilled the function of providing an alternative to emigration which, while it drew people away from their homeland, could be used to do so on a temporary basis which neither

entailed the uprooting of home and family nor demanded a commitment to total removal.

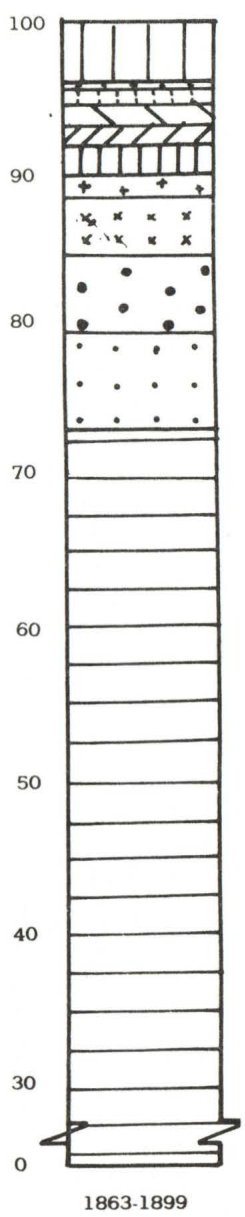
The Windsor voyage-and-crew file can be used as a laboratory to test something of the employment contribution of the port's shipping fleet not only in terms of the employment of Windsor men on their own vessels, but also Nova Scotians, Maritimers and even, to a degree, the European 'populations under stress'. It also allows us to look at these groups within the context of the specific voyages undertaken by the Windsor fleet. Covering a period from 1862 through the first decade of the twentieth century, the file contains a twenty five per cent sample of all crew and all voyages, being in total 2127 voyages and 51,600 men. What questions can be asked of such a data set in order to test the international flavour of this crew? Obviously, whence they came and in what proportions, must be established and the voyage patterns of the vessels on which they crewed should also be ascertained. Beyond this, it must be asked whether or not there was a relationship between these two factors of trade route and national crew composition.

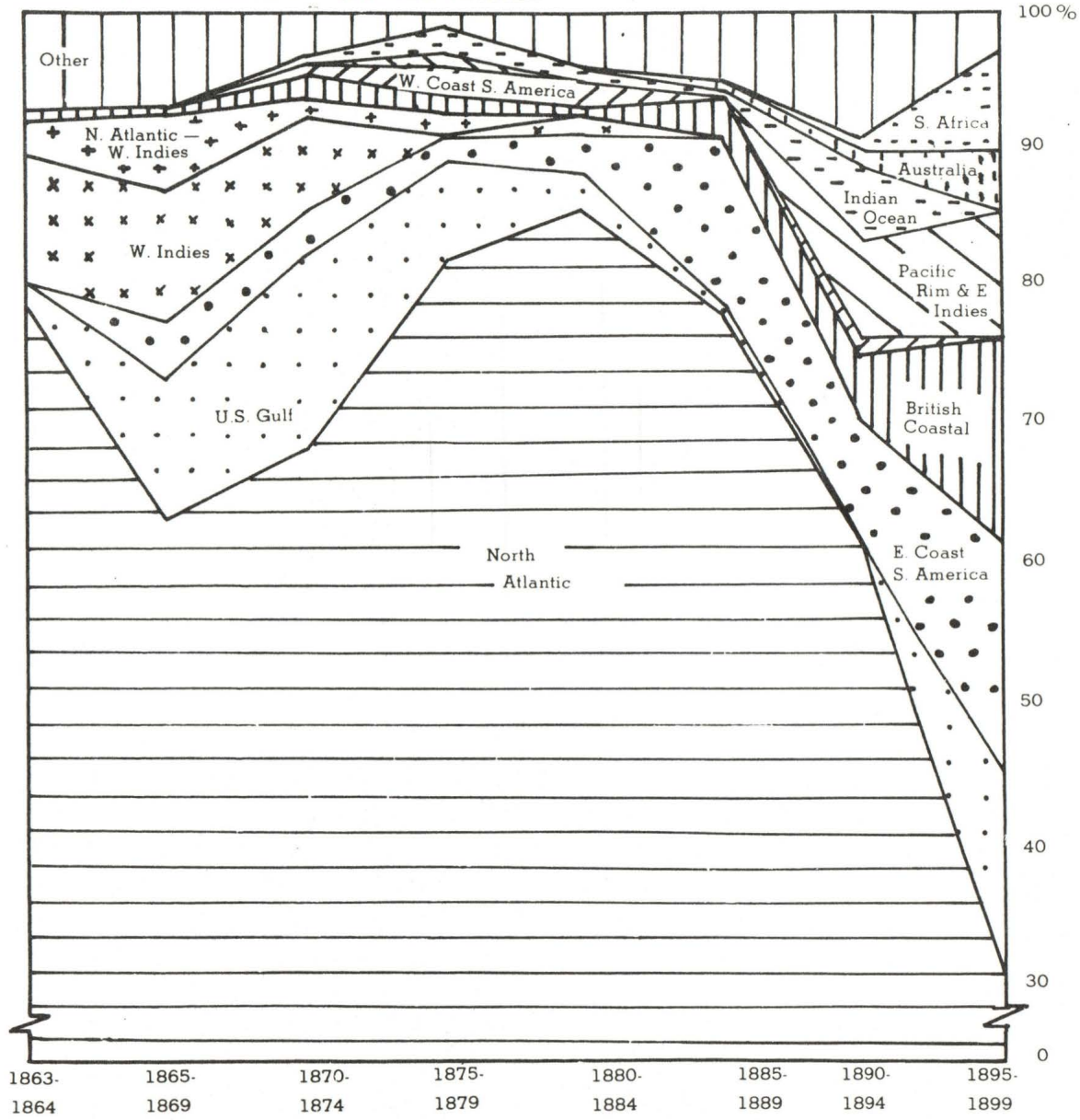
If a poor relationship is found, along with an even distribution of crew nationality, then it is reasonably certain that the crew was truly international, always remembering that relative population size in different countries must be taken into account. If, however, a relationship between crew nationality and voyage pattern is found, then bias must be suspected to the extent that vessels on given trade routes would draw their crews preferentially according to ports entered, though they might still do this within the context of a generally international hiring pool. But if crew nationality is found to be unequally distributed and a poor relationship is also found between place or region of entrance and place or region of birth of crew, then it will have to be assumed that a bias is operating which is based on factors over and above (although not necessarily excluding) voyage/trade route influence. These considerations will have to be tested among the different ranks on board ship, from the Ordinary Seaman to the Master, since it is well known that local bias did tend to operate in the selection of masters and among some officers as well.

Looking first, then, at the voyage patterns of these Windsor vessels from 1862-1899, twenty three per cent of all voyages took place in the decade 1861-1869, thirty three per cent in the 1870s and again in the 1880s, ten per cent in the 1890s while a meagre 0.7 per cent, or fifteen voyages, occurred in the first decade of the twentieth century. Windsor vessels in the second half of the nineteenth century concentrated on the North Atlantic run, as Figure I shows, and that component was greater than fifty per cent right up until the last quinquennium (1895-1899). If total voyage distribution over the whole time period is considered, this

FIGURE I

THE VOYAGE PATTERNS OF WINDSOR VESSELS





North Atlantic emphasis was greater than seventy per cent, followed by the U.S. Gulf, East Coast South America and West Indies voyages to make a total of ninety per cent of all Windsor voyages. Despite some concentration on the West Indies and U.S. Gulf runs in the early period, and an explosion into a variety of trade routes after 1890-1894, the dominant feature of Windsor vessels' voyages was an extremely strong commitment to the North Atlantic.[5] Given this geographic concentration of trade route, then, Windsor vessels would be manned by crews drawn to a large degree from the countries of the North Atlantic rim if crew selection were biased by trade route. Moreover, considering the increasing concentration on the North Atlantic up to the 1890s, and the rapid dispersion into other trades at the end of the century, it would then be further expected that the nationality of crews would become increasingly concentrated up to 1890 and more dispersed thereafter. One would not necessarily expect a bias towards Windsormen, however, unless Windsor were a major port of entrance on the North Atlantic run.

A preliminary glance at the place of birth statistics for Windsor crews shows that, at least on the surface, Wallace was right and the ordinary crew were indeed not biased towards Windsormen. The highest percentage of OS/ABs that were born in Windsor was found in the first decade and amounted to no more than a meagre 2.49 per cent. By the 1870s, this had shrunk to 1.41 per cent, fell to 0.8 per cent by the 1880s and by the end of the century lay at a pathetic 0.4 per cent. The crew did indeed appear to be drawn from those countries bordering the North Atlantic, with a few from farther afield. The major ports of the North Atlantic run — Liverpool, London and New York — figured prominently, with 5.6 per cent of all OS/ABs coming from Liverpool, 3.3 per cent from London and 2.8 per cent from New York.

Figure II shows the percentage contribution of selected ports as birthplace of crew (OS/AB) along with the percentage contribution of entrances into those ports for the whole time period. Liverpool contributed the largest number of crew to the Windsor fleet, but did not draw the greatest number of port entrances — that honour went to New York, by a considerable margin. New York, however, ranked third as a birthplace for crew, after Liverpool and London. Between them these three major ports of the North Atlantic shared the top three places for birthplace of crew and number of entrances. Moreover, from the perspective of both entrances and place of birth, Figure II shows a real dominance of North Atlantic places for the whole study period and the likelihood that trade route influenced crew nationality at this gross level is at least superficially supported by these statistics.[6]

Some idiosyncracies do, however, appear on the graphs that cannot

FIGURE II

(A) PERCENTAGE OF ENTRANCES
New York
Liverpool
London
Antwerp
Philadelphia
St. John
Cardiff
Boston
Baltimore
Rotterdam
New Orleans
Le Havre
Bremen
Rio de Janeiro
Halifax
Dublin
Quebec City
Bristol
Montevideo
Newport
Savannah
Hamburg
Dunkirk
Parrsboro
Charleston
Malaga
Buenos Aires
Penarth
Amsterdam
Bahia
Pensacola
Greenock
Barcelona
Havana
Barbados
Cork
Windsor
15%
10%
5%
(B) PERCENTAGE OF PLACE OF BIRTH OF CREW
Liverpool
London
New York
Shelland
Dublin
St. John
Bellast
Boston
Glasgow
Windsor
Hamburg
Philadelphia
Bristol
Cork
Antwerp
Waterford
Baltimore
Plymouth
Rotterdam
Wexford
Manchester
Amsterdam
Londonderry
Dundee
Trieste
Greenock
Copenhagen
Londonderry
Yarmouth
Stockholm
Jersey
Gothenburg
Le Havre
St. John's
Hantsport
Pictou
6
5
4
3
2
1

be explained by voyage pattern. Such, for example, is the incredibly large presence of Shetlanders in the Windsor fleet, ranking next after New York. It should also be noted that Windsormen ranked surprisingly high at tenth position overall and ahead of such important ports of call as Hamburg and Philadelphia even though Philadelphia ranked fourth in entrances while Windsor contributed less than 0.5 per cent of all entrances. However, the periodicity of such phenomena should be considered before pursuing the inquiry any further.

The place of birth of OS/ABs by region and decade is shown in Figure III. The importance of the United Kingdom in general and Englishmen in particular can be seen here, although Europeans increased in importance over the four decades, especially Norwegians, Swedes and Germans with the Dutch also contributing significantly in the last decade. Americans were never of great importance, contributing mostly in the earlier period. Shetlanders were tremendously important in the 1860s, but dropped immediately thereafter to a position of relative insignificance. By the 1890s, however, crew born outside the North Atlantic region had increased to a significant extent and here the rapid expansion of Windsor trade routes beyond the Capes in the last decade of the century should be recalled. Canadians, whether examined by province or at the local level of the Windsor area (roughly the mouth of the River Avon), maintained a picture of steady decline over the whole study period.

When these place of birth statistics are compared with port entrances by region and decade, as shown in Figure IV, it begins to look as though only a poor relationship exists between voyage pattern and crew nationality. Although Englishmen were a significant crew component in the Windsor fleet, for example, entrances were dominated by New York State — never itself particularly significant as a place of origin of crew, even in the 1880s. Moreover, entrances into Scandinavian countries were extremely rare, although Norwegians and Swedes were an increasingly significant component of the Windsor crews. And when the huge number of Shetlanders in the fleet in the 1860s is set against only one entrance into those Islands, it must be concluded that the relationship between birthplace and entrances at the regional level is a very weak one.

Checking this at the level of the individual port, as in Figures V and VI, it is possible to become more precise. Excluding the dramatic dominance of Shetlanders (Figure V), which will be returned to later, Liverpool dominated the crew throughout, despite the take-over of New York entrances from Liverpool's supremacy in the 1860s (Figure VI). However, as entrances into London increased, so did the participation of London-born crew. The 1870s and 1880s saw the rise in entrances in the ports of North

FIGURE III

PLACE OF BIRTH OF CREW BY REGION AND DECADE

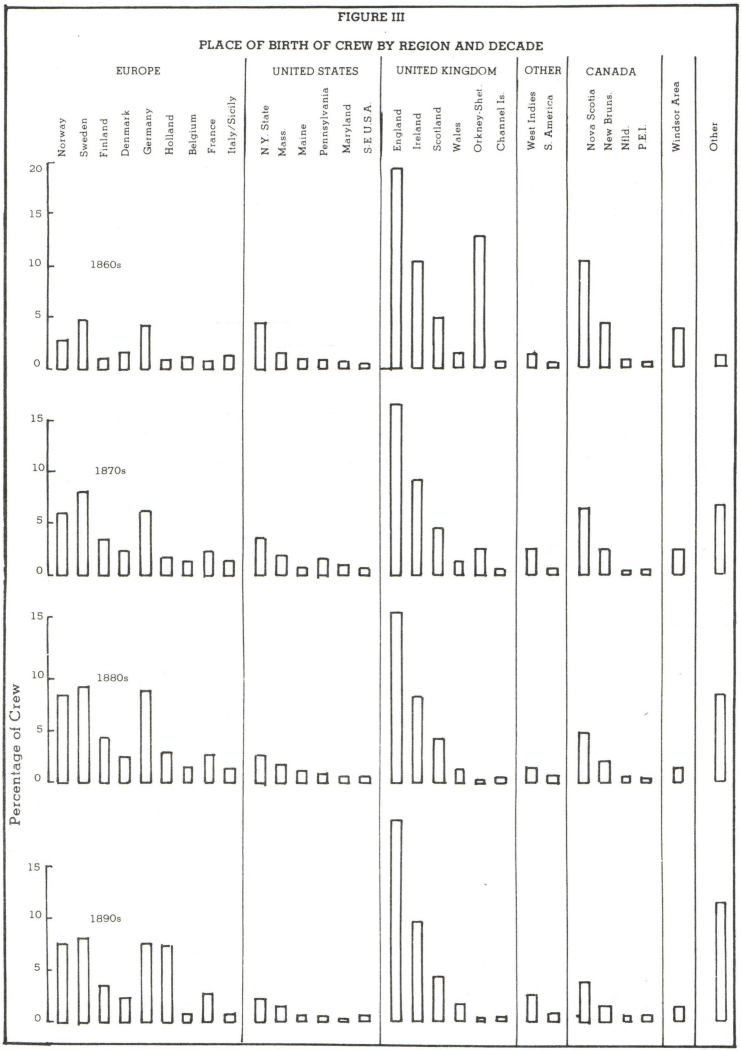


FIGURE IV

ENTRANCES BY REGION AND DECADE

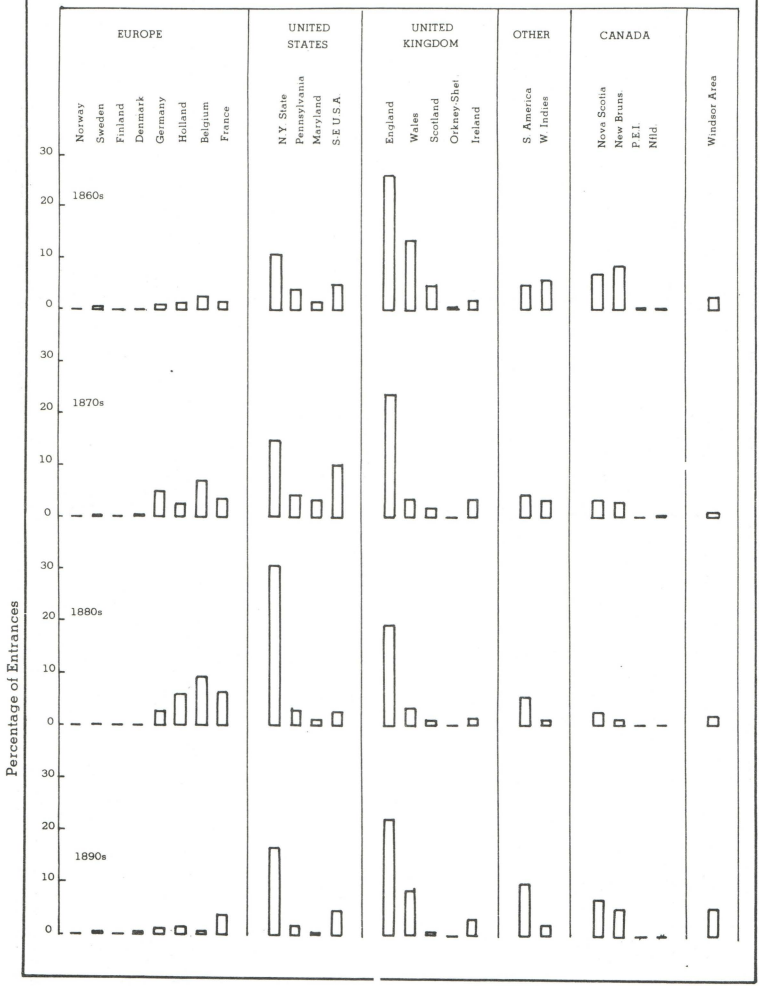


FIGURE V

PLACE OF BIRTH OF CREW BY DECADE

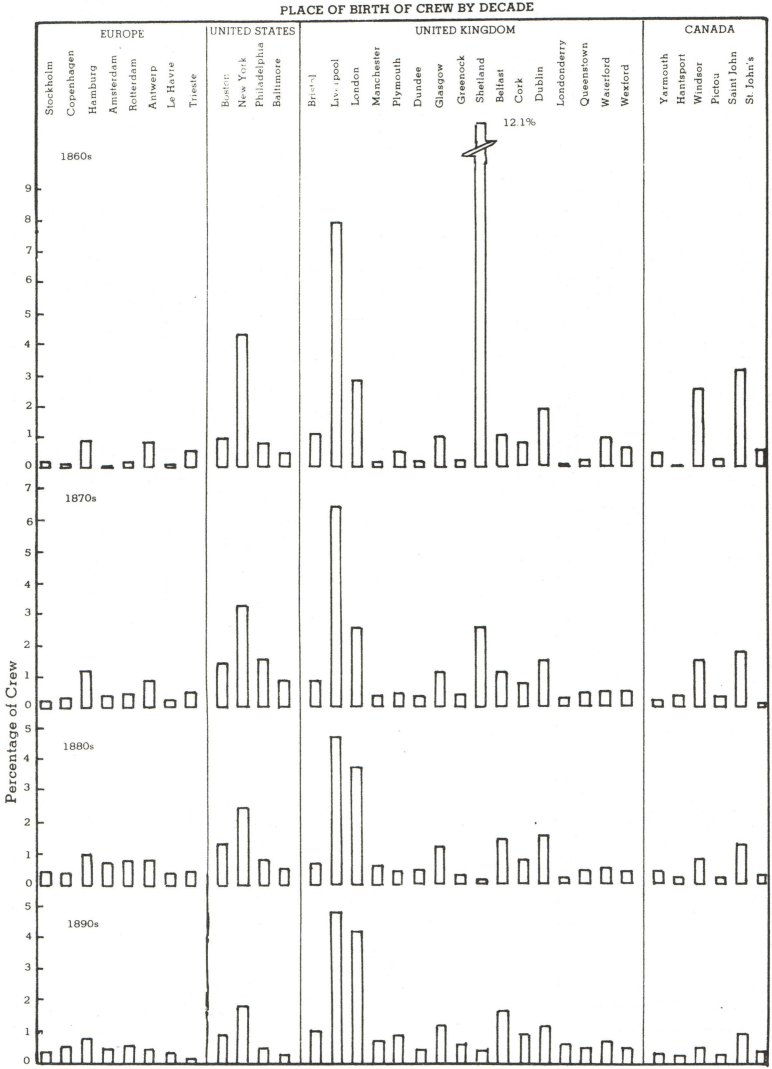
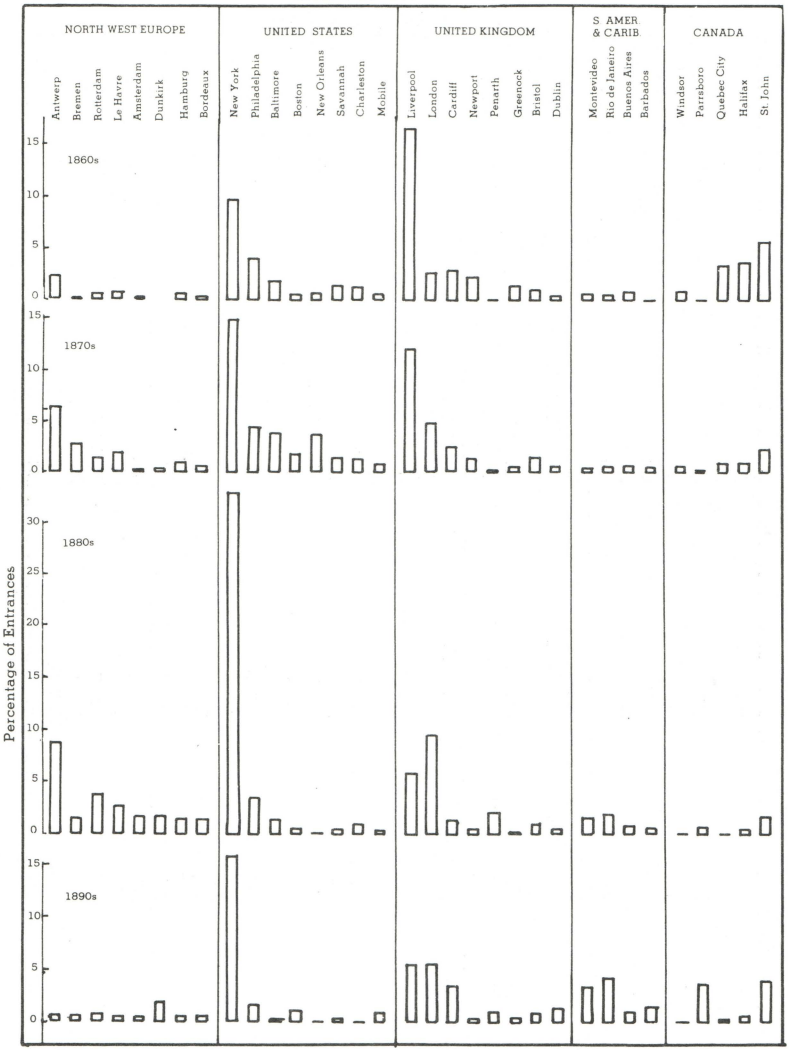


FIGURE VI

ENTRANCES BY PLACE BY DECADE



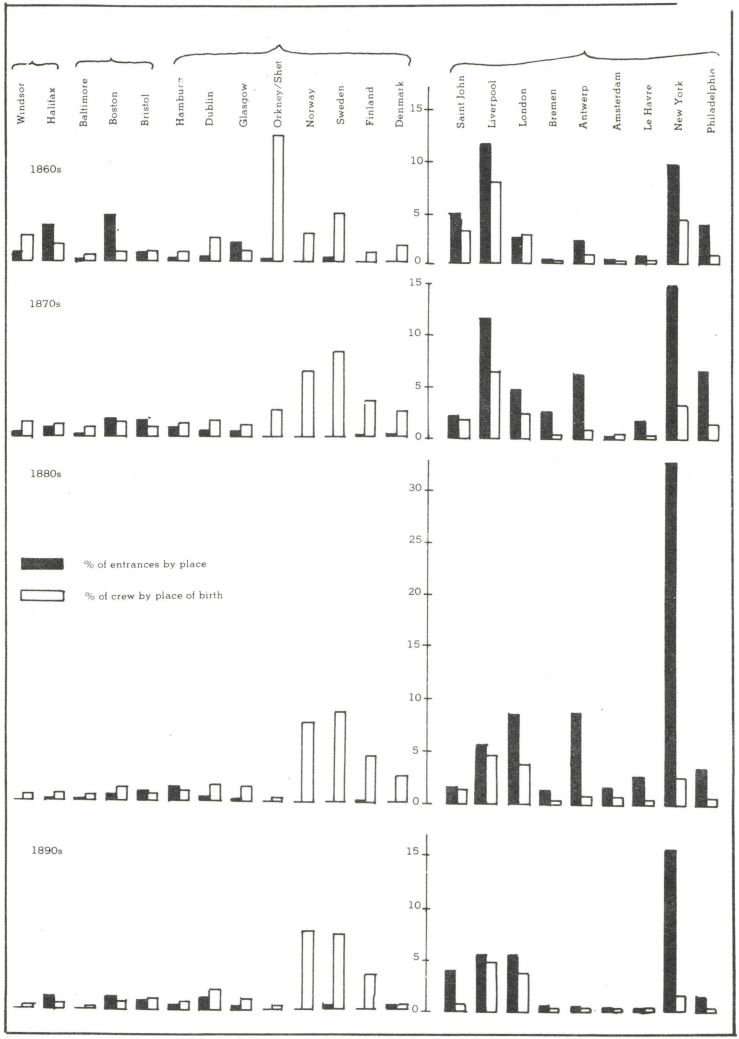
West Europe, but entrance and birthplace of crew do not seem to have been very closely linked: Hamburg crew were relatively important, for example, but entrances into Hamburg were not. On the other hand, some slight degree of relationship appears to have existed: Antwerp-born crew were second among the Europeans who can be tested by place of birth,[7] while Antwerp ranked first among European entrances. Canadian crews were drawn from Saint John first and Windsor second, with the percentage of crew participation decreasing over time, as did entrances.

What appears to have been uncovered, then, is a situation in which taken overall, crew nationality does not seem to be evenly distributed and a poor relationship has been established between place/region of entrance and place/region of birth, except within the very wide confines of the North Atlantic context. However, if the birthplace and entrance information for some selected ports is put together by percentage, as in Figure VII, an underlying pattern of positive and negative relationships can be distinguished.[8] In the 1860s, for example, Windsormen were over-represented given the number of entrances into that port. The same was also true of the Shetlands, Dublin, Hamburg and Havre (very slightly) and also Baltimore, though the figures are very small. On the other hand, Liverpool-born crew were under-represented relative to the number of entrances into that port and the same was true for New Yorkers, Philadelphians, Bostonians and sailors from Saint John. In the 1870s, Windsormen remained over-represented and Haligonians joined that category, while Shetlanders per force remained over-represented since there were no entrances into the Shetlands. Dubliners too remained in this category and were joined by Glaswegians, sailors from Hamburg and from Baltimore, these to a slight degree. Liverpool sailors, New Yorkers and Philadelphians remained under-represented and were joined by Antwerp sailors while Londoners, who were previously 'in balance' also became under-represented in this decade. In the 1880s, the most striking feature is the massive under-representation of New Yorkers, while Liverpool achieved something closer to balance. In both the 1880s and the 1890s, Windsormen remained over-represented. The Scandinavians were extremely over-represented during the whole time period.

Looked at from the perspective of relative over- or under-representation, it appears that a pattern of crew nationality can be discerned. The really large centres of shipping seem to have possessed something approximating an international hiring pool, which would inevitably have operated against the selection of local men (even though in absolute terms they would be a very large number), because of the considerable competition they would experience from sailors of other

FIGURE VII

PERCENTAGE PLACE OF BIRTH COMPARED TO PERCENTAGE ENTRANCES



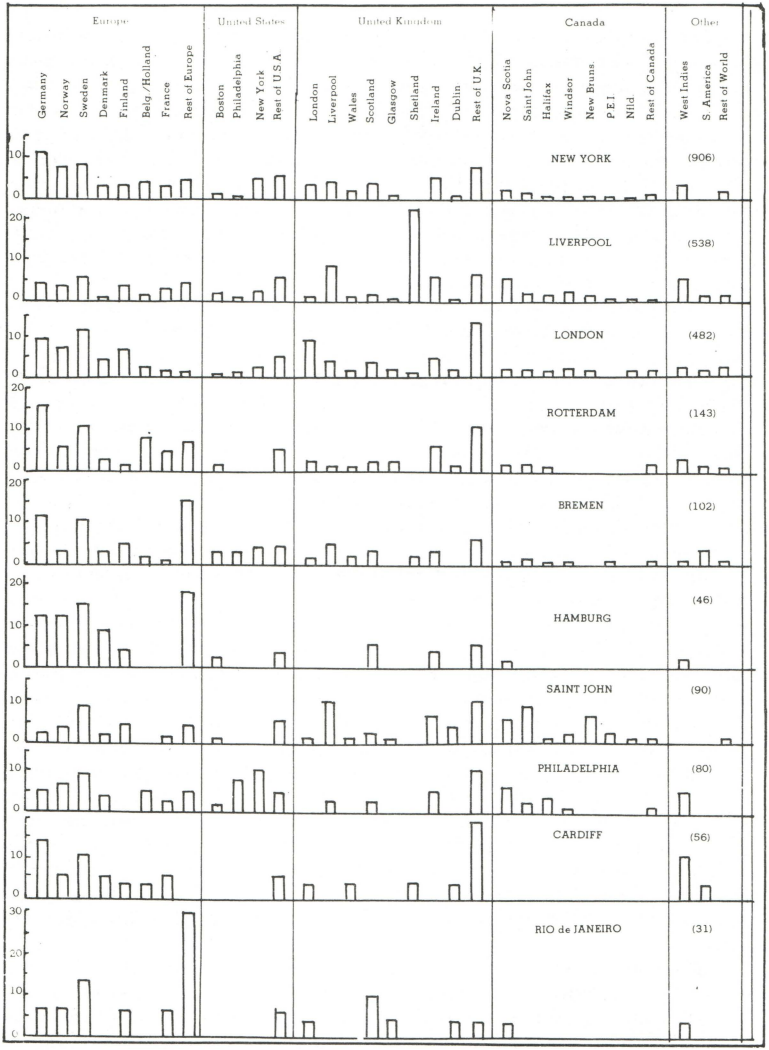
origins. Smaller ports, on the other hand, would necessarily be less 'international'. The home port of Windsor, by virtue of the size of the labour pool alone, would tend to over-represent its own people. Shetlanders, like the Scandinavians and probably the Irish, would appear by virtue of their large over-representation relative to very small numbers of entrances to have been particularly prominent in the labour force. This is evidence which perhaps supports the thesis that seafaring should be considered as an alternative to emigration, since it is these regions which suffered heavily from population pressure and which, although they did not all have their own ports of entrance into the Windsor employment pool, nevertheless gained entrance in relatively large numbers.

Can these proposals be tested more precisely? Figure VIII develops the concept of the 'hiring range of a port' to try to assess the breadth or narrowness of choice of nationality that a master would encounter in different ports where he sought to take on crew. The top three ports — New York, Liverpool and London, in that order — demonstrated a wide and therefore international range of labour, drawing on all the countries of the North Atlantic rim and even a few beyond. In all three ports, United Kingdom and North West European origins dominated and one is tempted to speculate about regions of professional seamen: perhaps Scandinavia and England. Little advantage accrued to New Yorkers in New York, to Liverpudlians in Liverpool or to Londoners in London and the smaller 'international' ports of North West Europe showed a similar lack of bias, but a smaller range of nationalities or much smaller numbers. Rotterdam, for example, drew from the U.S., but from a narrower range of places— and these smaller European ports drew a larger percentage of their crew pool from Europe. Saint John is interesting: it does appear to have had a truly international range of labour, though Saint John-born crew did have a measure of dominance and Canadians were more prominent here, as Europeans were in Rotterdam. By contrast, the U.S. port of Philadelphia was not truly international, having a U.S. bias, then a European bias, then a Canadian bias. Cardiff likewise had gaps — no Canadians, but many Europeans, like an English version of Philadelphia. Rio reflected the essential non-involvement of this port in the trade routes of the North Atlantic. There was a significant labour component here from southern Europe, perhaps more representative of the South American-Mediterranean trading pattern, which was not a Canadian (or Windsor) specialty.

The concept of the hiring range of a port, then, offers some insights into what constitutes an 'international' port and also into the biases that are introduced into the labour pool when a port has a restricted range of trades in which it functions as a port of entrance. Is there a similar kind of

FIGURE VIII

THE HIRING RANGE OF A PORT

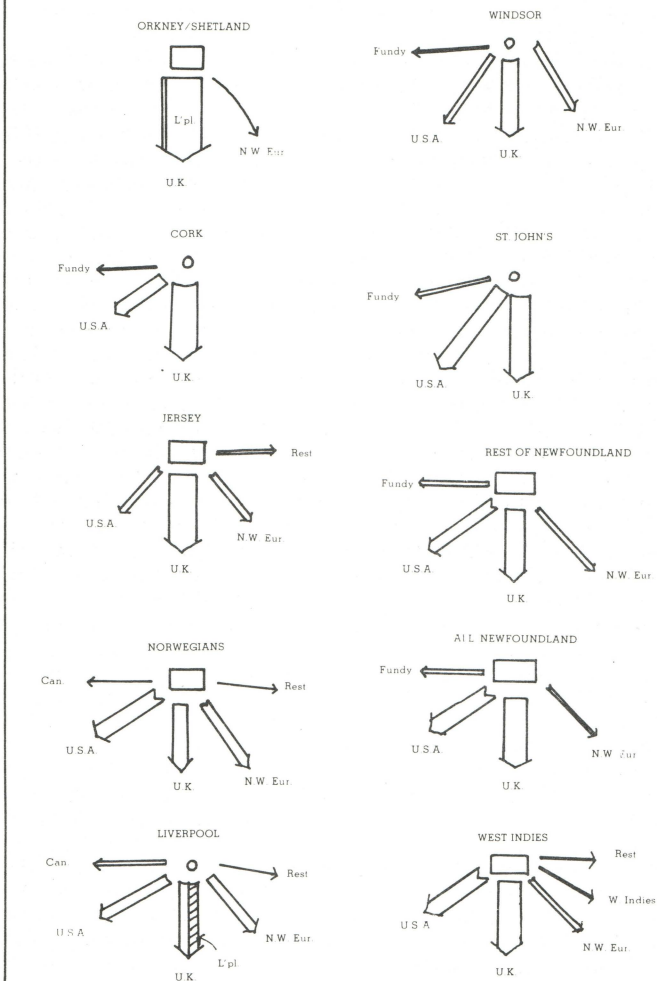


selectivity to be found with places of birth? That is, the focus is changed to ask the question, "to what ports did a man born in Windsor go, if he wanted to gain employment at sea"? This is the concept of the 'joining range of a birthplace'.

Figure IX shows some selected examples. Starting with Windsor itself, it is clear that Windsormen were to be found primarily in U.K. ports — sixty one per cent, reflecting the dominance for Windsor vessels of the North Atlantic trades centered on the U.K. Fourteen per cent were found in U.S. ports, again reflecting the North Atlantic trade routes, as does the fourteen per cent found in North West Europe at the other end of the North Atlantic run. Eight per cent were in Fundy ports, reflecting the relative volume of traffic there and therefore relative opportunity of entrance into seafaring. Here it becomes possible to start speculating on how rootless the ordinary seaman actually was — the Windsor example certainly would tend to suggest that he stayed very much within the major trading orbit of his home area, thus being able to get back home readily if he so desired.

The Orkneys and Shetlands make this point even more strongly. This is perhaps the most classic example of limited joining range of a birthplace, being totally restricted to the home trade ports and streamed intensively (eighty nine per cent) towards Liverpool. Shetland has already been noted as an aberration in the crew composition of the Windsor fleet — what was it that drew these Islanders to Liverpool in such numbers and in such a restricted period of time? Lee[9] has noted that a high degree of streaming in the migration of people indicates a strong likelihood of 'push' factors operating to propel them away from home, and for these Islands the early decades of the nineteenth century had been a time of rapid population growth which peaked at the beginning of the 1860s.[10] But this population rise could not be accommodated by a traditional crofting (farming and fishing) economy which operated within a restricted land base. At the beginning of the nineteenth century, many Islanders had been impressed into the Royal Navy, there acquiring considerable seafaring skills and, as the century wore on, many men turned to the merchant marine or to emigration as a means of survival.[11] This picture was complicated by a failure in the lucrative herring fishery in the early 1840s,[12] while a slight recovery in the 1850s faltered as the 1860s approached. Over the same twenty year period, 'clearances' took place as landlords turned to larger farm units for sheepfaring, and inevitably the population was displaced: "Eviction", commented a local authority of the time, "was generally the first step in this progressive movement".[13] It was in this decade that Orkneymen and Shetlanders appeared so massively in the Windsor fleet, joining largely at Liverpool, almost certainly as a result of the institution of regular sailings from Stromness to Liverpool.[14] Fifteen years later, the

FIGURE IX
THE JOINING RANGE OF A BIRTHPLACE



1 mm = 10% of crew born in place join at specified places

Islanders' herring fishery entered an enormous boom period, resulting in a rejection of "the traditional haf and cod fisheries and the whaling and merchant Navy, and all possible competitors for labour".[15] Shetlanders virtually disappeared from the Windsor fleet.

These Islanders, then, are one clear case of seafaring as an alternative to emigration. The Scandinavians were most likely another — their pattern of joining also shows heavy streaming towards the North Atlantic routes and in particular towards the ports of North West Europe, whence they could easily return home (25.4 per cent, compared to 18.8 per cent to North West Europe by Liverpool-born, fifteen per cent for Jerseymen or five per cent for Newfoundlanders). Indeed, this bias towards nearby major ports is a feature of almost all birthplaces examined — except the Canadian ports, perhaps because relative opportunity was inadequate to provide a guaranteed position on board ship.

Combining, then, these two concepts of the hiring range of a port and the joining range of a birthplace, understanding of the labour force at sea can be refined. The truly international ports (New York, London, Liverpool) had in place a pool of labour drawn from a very wide range of nationalities, while the range of smaller ports was limited. Indeed, it may be possible to create a typology of ports ranging from the major international port (such as Liverpool) through the minor international port (Saint John or Rotterdam) to the major outport (Cardiff or Philadelphia) down to the local port (Windsor). Sailors born in an international port had accessible to them a wide range of opportunities: 8.8 per cent Liverpool-born, for example, joined Windsor vessels in Canada, twenty three per cent in Liverpool, 10.5 per cent in London, 12.7 per cent elsewhere in the U.K., 18.8 per cent in North West Europe, twenty four per cent in the U.S. and 2.2 per cent in the rest of the world. But if a man from Shetland wished to go to sea, he had to maximise his opportunities by going to a place such as Liverpool in order to secure a sufficient range of opportunities. Equally, if he wished to return home and not become rootless, then he had to confine his selection of vessels such that he remained within sailing reach of home — and those Shetlanders who did not appear in Liverpool all joined at Amsterdam, Antwerp or Dunkirk (3.6 per cent) or in the West of England (7 per cent). Shetlanders were not hired at any other ports at all.

At the level of the OS/AB, then, some elements of hiring pattern based on home port, or nearby centre, or trade route, or alternative employment or some combination of these, can be discerned. At the level of the officer class, the pattern is much clearer and the bias towards home port much greater. Table 1 shows the percentage of Windsor-born crews by decade for officers and non-officers. Two obvious features of the Table are the

immediate bias to home, even in absolute numbers, as soon as the crew reached officer class and the decreasing bias at all levels except the master as the century drew on. If the officer class is broken down by region and decade (Table 2), Nova Scotian dominance occurred in all cases, followed by the U.K. and then the U.S. The range of places from which the officer class was drawn broadened slightly over time (the sub-totals for the categories in Table 2 sum to ninety per cent in the 1860s and 1870s, but drop to around the low eighties per cent in the 1880s and 1890s) and Second Mate seems to have been a more broadly based position than either First Mate or Bosun. It is also the one rank where the U.S.-born officers consistently ranked second to Nova Scotians. No reason for this bias can be offered, but it clearly and consistently existed on Windsor vessels.

TABLE 1

PERCENTAGE OF WINDSOR-BORN CREW

	1860s	1870s	1880s	1890s
Masters	36.08	41.48	30.90	32.60
1st Mate	20.00	17.60	10.30	6.57
2nd Mate	22.10	10.30	7.80	1.30
Bosun	23.20	12.80	7.50	4.76
OS/AB	2.49	1.41	0.80	0.40

Source: Windsor computer file.

Turning to masters, the bias towards home port becomes very pronounced (Table 3). It is interesting, in the light of what is now known, to find no Shetland masters in the 1860s when the Island OS/ABs dominated the forecastle. Table 4 looks at place of birth of masters, emphasising the importance of the local region, especially the very limited area around the mouth of the River Avon.

How, then, can these findings be put into perspective? It is now known that a truly international labour pool at the OS/AB level could be found only in the three major ports of the North Atlantic run. The caveat has also been made that the size of the population from which crew were drawn had to be taken into consideration before judgement could be made about distribution of crew. If crew participation is weighted by population (as David Alexander did for Yarmouth) it is found that the crew participation rate for Nova Scotians, excluding officers, is 42.2 per 10,000 — much lower than for the Yarmouth crews, which had a rate of 61.2 per 10,000,

TABLE 2

OFFICERS — REGION OF BIRTH BY DECADE (PERCENT)

	1860s			1870s			1880s			1890s		
	First Mate	Second Mate	Bosun	First Mate	Second Mate	Bosun	First Mate	Second Mate	Bosun	First Mate	Second Mate	Bosun
Nova Scotia	37.90	49.18	38.40	44.07	30.50	35.70	53.30	29.65	34.90	45.07	22.10	27.70
England	19.30	11.47	20.50	16.66	12.46	14.77	8.59	9.20	10.27	11.04	16.77	10.70
Scotland	7.70	4.10	2.10	6.20	5.00	2.20	3.90	5.40	2.57	3.90	4.69	2.38
Shetland	7.00	3.30	11.05	4.40	4.20	5.98	1.30	1.80	3.90	2.70	1.30	0.79
Ireland	6.70	2.46	4.20	6.30	7.40	6.78	6.60	5.00	7.40	10.14	6.04	11.50
New Brunswick	5.96	4.90	5.78	4.54	5.30	5.98	7.50	10.02	5.30	11.60	5.36	4.36
U.S.	4.90	9.00	9.47	3.99	19.10	10.97	3.97	18.20	13.35	3.88	18.79	21.03
Germany	0.70	—	0.50	3.58	3.97	5.58	2.47	3.80	3.25	2.08	4.00	2.77
Norway	—	0.80	0.50	0.96	1.59	1.60	1.07	2.60	4.28	1.19	4.69	3.17
Total	90.16	85.21	92.50	90.64	89.52	89.56	88.70	85.67	85.22	91.60	83.74	84.40
Windsor	20.00	22.10	23.20	17.60	10.30	12.80	10.31	7.80	7.50	6.57	1.30	4.76

Source: Windsor computer file.

TABLE 3

BIRTHPLACE OF MASTERS BY REGION (PERCENT)

	1860s	1870s	1880s	1890s
Nova Scotia	89.48	84.68	83.56	87.00
Windsor Area	71.13	63.21	53.89	63.59
Windsor	36.08	42.04	30.78	32.60
New Brunswick	2.88	1.65	2.22	9.60
P.E.I.	0.20	0.15	—	—
Newfoundland	0.20	0.30	1.53	1.67
England/Wales	3.70	3.15	0.83	—
Ireland	1.20	2.85	2.92	—
Scotland	0.40	2.25	2.78	—
Orkney/Shetland	—	2.70	3.89	0.80
U.S.	1.00	1.65	1.80	—
Scandinavia	0.60	0.45	—	0.80

Source: Windsor computer file.

for the years 1870-1889. This gives a more realistic perspective on crew participation and shows that, even at the OS/AB level, Nova Scotian participation was not insignificant. It was, however, less significant than in Yarmouth at OS/AB and officer ranks, as Table 5 shows, and Scandinavian crew were more important in Windsor. However, this participation rate does not take into account the impact of relative opportunity for entrance into a fleet's labour pool, and some way has to be found to build in such an 'opportunity factor'. What follows is a preliminary attempt to achieve such an assessment.

TABLE 4

BIRTHPLACE OF MASTERS BY DECADE

	Total	%	1860s	1870s	1880s	1890s
Canning	48	(2.25)	—	14	27	7
Horton	103	(4.83)	21	36	36	10
Falmouth	37	(1.74)	23	7	1	6
Hantsport	156	(7.32)	28	44	49	35
Maitland	44	(2.06)	23	5	12	4
Newport	126	(5.91)	74	22	20	10
Windsor	764	(35.85)	175	280	221	78
Advocate	18	(0.08)	1	6	11	0
Parrsboro	19	(0.89)	0	7	10	2
Halifax	61	(2.86)	7	24	20	10
Yarmouth	49	(2.30)	5	6	36	2
Cornwallis	49	(2.30)	2	8	35	4
Saint John	27	(1.27)	10	4	9	4
Liverpool	6	(0.28)	4	2	0	0
London	14	(0.66)	7	7	0	0
Creetown	28	(1.31)	0	10	18	0
Orkney and Shetland	48	(2.25)	0	18	28	2
Maine State	25	(1.17)	3	8	14	0

Source: Windsor computer file.

TABLE 5

CREW PARTICIPATION RATE/10,000 AVERAGE POPULATION, 1870-1889

	Including Officers		Excluding Officers	
	Yarmouth	Windsor	Yarmouth	Windsor
Nova Scotia	92.1	77.5	61.2	42.2
New Brunswick	38.8	30.4	33.4	22.6
Scandinavia	9.1	30.2	8.9	28.7
U.K.	3.4	9.5	3.1	8.8

Source: Windsor computer file.

The relative participation of any community labour force in the employment offerings of Windsor ships is simply the standard labour quotient:

$$LQ = \frac{S_i/S}{R_i/R}$$

where S_i = number of seamen employed from community i
S = number of seamen employed from the 'world'
R_i = number in the population of community i
R = number in 'world' population.

However, if one wants to weight the LQ by the relative opportunity among communities for participation in Windsor vessels as affected by the number of appearances[16] of Windsor ships in various world ports, then these entrances should be built into the LQ. That is, if Windsor ships entered Liverpool (for example) twice as often as they did Baltimore, then the Liverpool-based labour force would have twice the opportunity for gaining employment on Windsor ships. The weighted LQ, then, becomes:

$$WLQ = \log \left[\left(\frac{S_i/S}{R_i/R} \right) \Big/ \left(\frac{E_i}{E_w} \right) \right]$$

where E_i = entries into port i
E_w = entries into 'world'.

and the natural log is obtained to reduce the range of the Index. That is, the LQ is weighted by the port's share of entrances relative to the total number of entrances. For example, if the simple LQ for Liverpool was 24.0 and for Baltimore 12.0, this would indicate that Liverpool's relative participation was twice as important as that for Baltimore. But since, out of a total of 100 entrances, Liverpool had ten and Baltimore five (that is, there were twice as many opportunities for Liverpool labour to join), the Index must be weighted so that it would yield as follows:

Liverpool: $(24.0) \Big/ \left(\frac{10}{100} \right) = 240$

Baltimore: $(12.0) \Big/ \left(\frac{5}{100} \right) = 240$

Thus, the weighted participation for each port becomes identical. It should be noted, however, that this paper is considering only participation on Windsor vessels — that is, it deals with a closed system in the sense that no account is taken of how crew got to the port at which they were hired by a Windsor vessel. On this basis the Index is necessarily restricted. It is also assumed that persons born in port i remain part of the labour force of port i, even though this labour force, by virtue of the nature of employment at sea, is spatially very extended. If the Index is restricted to those born in port i who join in port i, it becomes unrealistically deflated, since it then becomes even more restricted, measuring only the labour participation by natives of that community who happen to be in residence and therefore able to join there at the time of a Windsor vessel's entrance. Since the crew lists do not give residence of crew, but only place of birth, one must operate on the assumption that it is possible to equate place of birth with residence, since to do otherwise is to overestimate the 'floating' nature of the population at sea, assuming a rootlessness for which there is not adequate evidence and indeed against which there is some evidence, given the earlier analysis of the joining range of a birthplace. It is not desirable to measure only the participation of (for example) Windsormen joining at Windsor, since this is a different statistic from the WLQ which is a measure of a community's employment in the Windsor fleet, regardless of where that employment is taken up.

Two points, therefore, must be made. First, note that it must be decided whether or not a Windsorman (for example) who joins at Liverpool should be measured against Liverpool's population or that of Windsor — that is, did he constitute part of the Windsor, or part of the Liverpool, labour force at that point in time? If the argument is used that he was part of Windsor's extended labour force which had to be mobile but not rootless in its search for employment,[17] then we need not adjust the WLQ since it is giving us a measure of a spatially-extended Windsor participation rate in the pool of labour from which Windsor vessels drew their crew.

Second, it must be decided whether a Windsorman, for example, who gets on at Liverpool should be measured against the number of entrances into Windsor or into Liverpool. This is more problematic. However, it should be remembered that a Windsorman entering the labour force for the first time would be constrained by the number of entrances into Windsor. Now, if he is not weighted against Windsor entrances, then the restricted nature of his entry into the labour pool is not taken into account and the bias towards Windsormen is therefore deflated unrealistically. That is, there is not built into the Index the decreased opportunities for a Windsorman, relative to a Liverpudlian for example, to enter the seafaring com-

munity, and thus an unrealistic picture is presented of the likelihood of his being able to achieve initial access to employment. The point becomes even more apparent if Shetlanders, and the initial effort of moving to Liverpool which they had to undertake in order to achieve access to Windsor vessels, are considered.

However, it could be the case that a Windsorman's initial entrance into the labour force took place within the local region rather than Windsor itself, and this is why the WLQ has been calculated for region as well. The dominance of Windsormen, whether calculated by local region or specific place, which will be shown shortly, validates the use of the number of entrances into Windsor. Finally, it is to be noted that in any case it is not the specific statistical value of the WLQ finding that is important, but rather its range and relative ranking.

Table 6 shows the rank order for OS/AB participation by region and Table 7 gives the same information by place. Appendix I and II give the raw values from which these Tables were derived. Note that in all cases where no entrances occur, the results are starred (*) and should be considered relative to one another, but not relative to the other cases, since a constant arbitrary figure of 0.1 (that is, approaching zero) is used in all these cases. Dealing first with these starred cases which have been kept separate in Table 6, the continuing over-representation of Orkneymen and Shetlanders in the 1870s, 1880s and 1890s, together with that of all Scandinavians despite the absence of Windsor ships in Scandinavian ports, would support the thesis that these are either professional seamen, or avoiding the pressure to emigrate, or of course both — since they are far from mutually exclusive. In this respect, the importance of Newfoundlanders and Prince Edward Islanders must also be noted.

Within those regions where entrances do occur, in all but the first decade (where it ranks second) the Windsor area ranks first. When the meagre percentage of participation presented for Windsormen at the beginning of this paper is considered, the importance of the Index becomes apparent. Despite a performance of less than 2.5 per cent participation based on absolute figures, it can now be said that Windsormen were hired preferentially above almost all other crew nationalities in the 1860s, relative to the small size of the labour force from which they were drawn and relative to the employment opportunities presented to them by Windsor vessels entering home port. In the 1870s, 1880s and 1890s it is possible to go further and say that they were hired preferentially above all other regions. After the Windsor area, in those cases where entrances exist, Newfoundland and P.E.I. are next in rank, followed by the Scandinavian countries: an ordering that is highly suggestive of the 'alternative to emigration' thesis proposed in this paper. At the other end of the scale the

TABLE 6

W.L.Q. — REGION: CREW, BY DECADE, RANK ORDER

	1860s	1870s	1880s	1890s
***No Entrances**				
Orkney/Shetland	—	1	1	1
Newfoundland	—	—	2	4
Prince Edward Island	—	2	3	2
Norway	1	3	6	3
Sweden	—	—	4	—
Denmark	2	—	—	—
Finland	3	—	5	5
Entrances				
Orkney/Shetland	1	*	*	*
Windsor Area	2	1	1	1
Newfoundland	4	2	*	*
Prince Edward Island	3	*	*	*
Norway	*	*	*	*
Sweden	6	4	*	2
Denmark	*	6	3	3
Finland	*	3	*	*
Nova Scotia	5	5	4	6
New Brunswick	7	7	5	7
Ireland	8	13	7	8
Maryland	9	10	8	5
Scotland	10	9	6	4
Holland	11	8	9	10
New York State	12	12	14	14
Germany	13	15	10	11
Belgium	14	14	13	9
Pennsylvania	15	11	11	12
England and Wales	16	16	12	13
France	17	17	15	15
Note: Range of Values+ :	(12.0 to 0.5)	(8.71 to 0.99)	(10.20 to 0.66)	(8.8 to 1.1)

+Excluding 'no entrance' values.

Source: Calculated from the Windsor computer file.

TABLE 7

W.L.Q. — PLACE: CREW, BY DECADE, RANK ORDER

	1860s	1870s	1880s	1890s
Shetland	2	1*	3*	3*
Parrsboro	1*	2*	6	8
Windsor	3	4	1*	1*
Hantsport	5	3	4	5
St. John's	4	5	2*	4*
Cork	6	10	9	2*
Belfast	7	11	13	13
Saint John	8	7	11	11
Halifax	9	6	8	9
Hamburg	10	12	16	12
Bordeaux	11	22	24	22
Bristol	12	15	15	14
Bremen	13	27	23	23
Rotterdam	14	18	20	15
Antwerp	15	23	26	19
Cardiff	16	21	17	24
Quebec	17	13	5*	6*
Baltimore	18	24	21.5	7*
Glasgow	19	14	10	10
Montreal	20.5	17	12	17
Savannah	20.5	19.5	18	16
Boston	22	16	14	20
Amsterdam	26	9	21.5	18
Mobile	23	19.5	7*	29
Liverpool	24	25	19	21
Rio de Janerio	25	31	31	30
New York	27	28	30	28
Philadelphia	28	26	28	25
London	29	29	29	27
Havana	30	30	27	—
Melbourne	—	8*	25	26
Note: Range of Values:	(16.4 to 0.7)	(12.6 to 0.2)	(14.5 to -0.8)	(12.7 to -1.5)

Source: Calculated from the Windsor computer file.

relative under-representation of the major 'international' shipping regions of England and the U.S. should be noted. These points are reinforced at the level of individual places as shown in Table 7.

The importance of local Windsor places is indisputable throughout the period, as is (in relative terms) the unimportance of the major ports. In the 1870s and 1880s particularly the local and then the Maritimes ports are highly over-represented, as are ports like Cork, Glasgow and even Belfast — areas of high emigration. Note that the grouping of these places parallels the groupings by region shown in Table 6. The North West European ports rank approximately together in a middle range and Liverpool ranks consistently between nineteenth and twenty fourth. Rio is under-represented after the 1860s and, with Havana and Melbourne, ranks among the lowest ports. Since entrance, and therefore voyage (opportunity) effects have been removed from this statistic, it follows that the bias against such ports must have lain along lines other than accessibility to the region. The reasons for this bias are unknown, but perhaps a limited or unskilled labour force might provide one explanation, just as a skilled and experienced labour force might explain a preferential hiring of Bostonians. On the other hand, the low ranking of Liverpudlians, New Yorkers, Philadelphians and Londoners is related to the international flavour of the labour pool found in their home ports.

The last Table (Table 8) shows the rank order for masters, calculated by region. Appendix III gives the raw values from which the Table was derived. Again, the Shetlanders dominate, but the lack of entrances in the 1870s, 1880s and 1890s prevents any real comparison. Beyond that, the dominance of Windsor is undisputed, as it is in the raw figures. Ranking is interesting, with the bias (especially in the 1870s and 1880s) towards Nova Scotians followed by Newfoundlanders and then other Maritimers. These in turn are followed by the Scandinavian and then the U.K. masters. The pattern is consistent, not only with the pattern suggested by the 'participation rate by 10,000 average population' used earlier, but also with the rankings of the W.L.Qs. for crew by region, with the exception of the preferential hiring of Nova Scotian masters.

What, then, can be concluded about crew participation and nationality in the Windsor fleet? First of all, that the absolute figures present, at least superficially, a picture that agrees with the conventional wisdom that the OS/AB component of the Canadian fleets was indeed international while the officer class, especially the master, was strongly biased towards a local component. Analysis of voyage by place of birth of crew, however, demonstrated that different nationalities were unequally distributed over the OS/AB component of the fleet and a poor relationship

TABLE 8

W.L.Q. — MASTERS, BY DECADE, RANK ORDER

	1860s	1870s	1880s	1890s
Orkney/Shetland	12	1*	1*	2*
Windsor Area	1	2	2	1
Newfoundland	6	5	3*	3*
Prince Edward Island	2	3*	12	12
Norway	5*	12	12	4*
Sweden	8	8	12	12
Denmark	4*	7	5*	12
Finland	12	12	12	12
Nova Scotia	3	4	4	5
New Brunswick	7	6	6	6
Ireland	9	10	8	12
Maryland	12	12	12	12
Scotland	10	9	7	12
Holland	12	12	12	12
New York State	12	12	12	12
Germany	12	12	12	12
Belgium	12	12	12	12
Pennsylvania	12	12	12	12
England and Wales	11	11	9	12
France	12	12	12	12
Note: Range of Values:	(12.2 to -2.3)	(11.9 to -2.6)	(11.5 to -6.3)	(7.9 to 2.1)

*No entrances

Where there were no masters, an arbitrary bottom ranking of 12 has been used.

Source: Calculated from the Windsor computer file.

between entrance place and birthplace existed except at the level of the total North Atlantic context. Crew nationality therefore was biased over and above that which could be explained by voyage pattern. In relative terms, however, an underlying pattern of over- or under-representation of various birthplaces relative to number of entrances was identified, and a way had therefore to be found to refine the analysis in order to seek explanation of these imbalances.

The Weighted Labour Quotient, weighting the distribution of crew nationality for both population size and relative opportunity for entrance into the employment offerings of the Windsor fleet, revealed that Windsor

and the Windsor area were dominant at all levels of the crew. This demonstrated that bias was indeed operating in crew participation, and it also served to identify the clustering of ranked places which would help to suggest reasons for such bias. At the general level, the Index suggests that preference existed in the Windsor vessel crews towards those persons from areas of known population pressure. This pattern may reflect an absolute bias in the nineteenth century seafaring community at large or it may be idiosyncratic to the Windsor case study — although this is unlikely. At the regional (Nova Scotian) and local (Windsor) levels, crew participation was found to operate in favour of local employment.

What are the implications of these findings? At the general level, the idea that seafaring should be considered as an alternative to emigration is supported by the results presented here. At the regional and local level, two implications are worth considering. Local preference towards masters and officers must have meant economic benefits for the local area, since it can be argued that financial advantage must have accrued to the general income of Windsor from such employment. Final demand, that is, must have risen. Moreover, if Captain Gullison of Yarmouth proves to be typical,[18] then local investment, at least by masters, would also have benefitted the area. With respect to the ordinary seaman or able-bodied seaman, however, very little can be said about financial returns, because there is as yet no way of ascertaining how much, if any, money came back to the area — the OS/ABs of the merchant marine often left ship either without cash or in debt to the ship. What can be said is that the preferential bias towards these Windsor crewmen that this paper has uncovered means that the contribution of the Windsor fleet to the employment of the local people of the Windsor area was significantly more important than the absolute figures would lead us to expect. There were indeed Dutchmen, Germans and Russians on these Windsor vessels; there were jolly seamen just across from France — however, a surprising number of the crew not only spoke English, but they spoke it with a Nova Scotian twang.

NOTES

1. F.W. Wallace, *Wooden Ships and Iron Men,* (Boston, 1937) pp. 161-188 and especially pp. 186-187.

2. See the papers by Alexander, Sager and Fischer in D. Alexander and R. Ommer (eds.), *Volumes Not Values: Canadian Sailing Ships and World Trades,* (St. John's, 1979) pp. 63-162.

3. S. Hugill, *Shanties From the Seven Seas: Shipboard Work-songs and Songs Used as Work-songs From the Great Days of Sail,* (London and New York, 1961) pp. 321-327. The main title for the shanty quoted here is given as "Paddy, Lay Back" and alternative titles include "Val-a-pa-raiso Round the Horn". A large range of sailor nationalities is given in various versions of the shanty, including Chinese, Indians and 'squareheads'.

4. See U.S. Bureau of the Census statistics on the origins of U.S. migrants from Europe, 1821-1920, quoted in J.O.M. Broek and J.W. Webb, *A Geography of Mankind,* (New York, 1968) p. 464. Between1861 and 1870, 787,000 Germans, 607,000 Britons, 436,000 Irish and 72,000 Norwegians entered the U.S.; 1871-1880 saw 116,000 Swedes added to a steady migrant stream of 718,000 Germans, 548,000 Britons and 437,000 Irish. By 1881-1890, German migrants had reached 1,453,000, Britons, 807,000, Irish, 655,000 and Swedes 392,000 and in the last decade of the century 505,000 Russians joined 505,000 Germans, 652,000 Italians and 593,000 Central Europeans. Until 1890, the British Isles and Germany and, post 1860, Scandinavia, provided the greatest number of migrants.

5. The voyage distribution described here is based on a frequency count of the variable 'geographic description' contained in the computer file. This variable is a generalised description of the trade route covered by a vessel. Because of this, the variable cannot be used to analyse voyage patterns in the precise manner done by other Project members in D. Alexander and R. Ommer (eds.), *Volumes Not Values* (see footnote 2). The purpose here is not to provide a precise analysis of voyage pattern but to offer a general picture of the geographic areas in which Windsor vessels were involved, in order to obtain a descriptive framework within which to start an analysis of crew nationality. Precision in this respect is obtained later in the paper with the matching of vessel appearances in specific ports/regions against crew place of birth by port/region.

6. When the number of crew born in the top thirty ports was regressed against the number of entrances into those ports, an r value of 0.7 was found. However, when Liverpool, London, New York and Saint John were removed, the r value dropped to 0.25. On the basis of these calculations it was concluded that this statistical technique should not be used to test the strength of the relationship between place of birth and entrances, since the influence of the four large ports was such as to render the statistic meaningless. Entrances were calculated by counting both the number of times a vessel entered a specific port and the number of times it cleared that same port and then taking whichever of those two was the larger figure, thereby avoiding double counting while finding maximum number of appearances in that port.

7. Because of the serious imprecision of place of birth of crew for Scandinavians as given in the crew lists, Scandinavian crews are presented only by country. The problem was not so serious for Antwerp, Rotterdam, Amsterdam and other North West European ports — probably because vessels entered these ports with some regularity, while Scandinavian entrances were rare.

8. The selection here is based on representative ports for each region, and Scandinavian countries are used for reasons explained earlier.

9. E.S. Lee, "A Theory of Migration", *Demography,* Vol. 3, 1966, p. 55.

10. C.A. Goodlad *Shetland Fishing Saga,* (Shetland 1971); Patrick Bailey, *Orkney,* (Newton Abbot, 1971); J.R. Nicolson, *Shetland,* (Newton Abbot, 1972).

11. Goodlad, *op. cit.,* p. 148. In 1862, a boatload of Shetlanders (148 persons) migrated *en masse* to Saint John, New Brunswick, in whose fleet Shetlanders appear in the ensuing years.

12. These years were disastrous both for catches and markets — the fishery was virtually abandoned: Goodlad, *op. cit.,* p. 175.

13. Nicolson, *op. cit.,* p. 75. For Orkney, see Bailey, *op. cit.,* p. 120 — the picture is identical.

14. Bailey, *op. cit.,* p. 122.

15. Goodlad, *op. cit.*, p. 196. In 1874, only 1100 barrels of herring were cured ashore in Shetland, and the fleet was 50 boats. By 1881, the cure was 59,586 barrels, and the fleet 276 vessels. Three years later, the cure was 300,117 barrels, the fleet 932 vessels — *Ibid*, p. 177.

16. See footnote 5 for the calculation of appearances or 'entrances'.

17. Consider here the Shetlanders and the thesis of an alternative to emigration.

18. C.W. Crowell, *The Novascotiaman*, (Halifax, 1979).

APPENDIX I(a)

STANDARD LABOUR QUOTIENT

$$LQ = \frac{S_i / S}{R_i / R}$$

where S_i = number of seamen employed from community i

S = number of seamen employed from the 'world'

R_i = number in the population of community i

R = number in the 'world' population

Weighted Labour Quotient

$$WLQ = \log \left[\left(\frac{S_i / S}{R_i / R} \right) \Big/ \left(\frac{E_i}{E_w} \right) \right]$$

where E_i = entries into port i

and E_w = entries into the 'world'

Note: The natural log is obtained to reduce the range of the Index.

APPENDIX I(b)

W.L.Q. — REGION: CREW, BY DECADE, RAW VALUES

	1860s	1870s	1880s	1890s
*No Entrances				
Orkney/Shetland	—	13.8	11.6	11.0
Newfoundland	—	—	11.4	10.2
Prince Edward Island	—	11.6	11.1	10.7
Norway	10.3	11.3	9.3	10.5
Sweden	—	—	10.9	—
Denmark	9.6	—	—	—
Finland	9.1	—	10.8	—
Entrances				
Orkney/Shetland	11.9	*	*	*
Windsor Area	10.7	8.7	10.2	8.8
Newfoundland	8.5	8.3	*	*
Prince Edward Island	9.3	*	*	*
Norway	*	*	*	*
Sweden	6.2	7.7	*	6.32
Denmark	*	6.5	*	6.3
Finland	*	7.7	*	*
Nova Scotia	6.3	6.8	6.5	5.3
New Brunswick	5.6	6.1	6.45	4.9
Ireland	4.7	1.8	5.0	4.5
Maryland	4.3	3.6	4.6	5.8
Scotland	3.8	4.6	5.3	5.8
Holland	3.1	5.5	2.9	3.4
New York State	2.6	2.0	1.1	1.1
Germany	2.5	1.5	2.5	2.9
Belgium	2.46	1.6	1.5	3.4
Pennsylvania	2.1	2.8	2.5	2.3
England and Wales	1.2	1.4	1.6	1.3
France	0.5	0.9	0.7	1.06

Note: * No entrances

Source: Calculated from the Windsor computer file.

APPENDIX II

W.L.Q. — PLACE: CREW, BY DECADE, RAW VALUES

	1860s	1870s	1880s	1890s
Shetland	11.0	12.6*	10.7*	10.1*
Parrsboro	16.4*	12.3*	8.9	6.9
Windsor	9.5	10.0	14.5*	12.7*
Hantsport	7.3	10.5	10.6	8.6
St. John's	7.6	7.6	11.0*	9.8*
Cork	6.6	5.8	7.7	10.2*
Belfast	6.1	5.5	5.9	5.0
Saint John	5.5	6.4	6.7	5.2
Halifax	5.4	6.7	8.1	6.6
Hamburg	5.4	4.7	4.6	5.2
Bordeaux	4.5	3.6	3.1	3.8
Bristol	4.4	4.2	4.8	4.89
Bremen	3.9	2.4	3.5	3.7
Rotterdam	3.8	4.0	3.9	4.85
Antwerp	3.75	3.2	3.0	4.7
Cardiff	3.5	3.8	4.5	3.3
Quebec	2.9	4.4	9.7*	8.1*
Baltimore	2.8	3.0	3.87	7.1*
Glasgow	2.73	4.42	7.1	6.0
Montreal	2.7	4.1	6.4	4.76
Savannah	2.7	3.9	4.2	4.79
Boston	2.69	4.1	5.4	4.2
Amsterdam	2.5	6.1	3.87	4.7
Mobile	2.6	3.9	8.7*	-0.1
Liverpool	2.6	2.5	4.0	3.9
Rio de Janeiro	2.5	0.2	-0.8	-1.5
New York	1.9	1.6	0.8	1.0
Philadelphia	1.5	2.4	2.3	2.27
London	1.4	1.1	1.2	1.5
Havana	0.7	0.4	2.8	—
Melbourne	—	6.4*	2.96	2.26

Note: * No entrances

Source: Calculated from the Windsor computer file.

APPENDIX III

W.L.Q. — MASTERS, BY DECADE, RAW VALUES

	1860s	1870s	1880s	1890s
Orkney/Shetland	—	11.9*	11.5*	7.2*
Windsor Area	12.2	9.8	11.3	7.9
Newfoundland	5.5	5.9	9.7*	6.7*
Prince Edward Island	6.9	9.2*	—	—
Norway	6.1*	—	—	3.7*
Sweden	1.4	1.8	—	—
Denmark	6.2*	2.4	6.0*	—
Finland	—	—	—	—
Nova Scotia	6.8	6.9	6.7	3.7
New Brunswick	3.5	3.5	3.9	2.1
Ireland	1.0	0.8	1.3	—
Maryland	—	—	—	—
Scotland	-0.4	1.7	2.3	—
Holland	—	—	—	—
New York State	—	—	—	—
Germany	—	—	—	—
Belgium	—	—	—	—
Pennsylvania	—	—	—	—
England and Wales	-2.3	-2.6	-6.3	—
France	—	—	—	—

Note: * No entrances

Source: Calculated from the Windsor computer file.

10. A STUDY OF THE DEMOGRAPHIC HISTORY OF THE SEAFARING POPULATION OF BELFAST AND SEARSPORT, MAINE, 1850-1900

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A STUDY OF THE DEMOGRAPHIC HISTORY OF THE SEAFARING POPULATION OF BELFAST AND SEARSPORT, MAINE, 1850-1900[1]

John F. Battick

The City of Belfast, Maine, began as a settlement in 1770, taking its name from that city in Ireland. Three years later it became incorporated as a town, but was broken up in 1779 by royal forces which seized the Penobscot Bay region during the War for Independence. Restored in 1784, the town and surrounding area, once part of the Waldo estate, came into the possession of Washington's artillery commander, General Henry Knox. Upon Knox's death in 1806, lands in the Waldo Patent fell to Israel Thorndike, David Sears and William Prescott. In the War of 1812 the area was again occupied by British troops. Upon separation from Massachusetts, Belfast became the shire town of the newly created Waldo County and adopted a city charter in 1853. Meanwhile, just to the east, the tenants of David Sears's portion of the old Waldo Patent petitioned for, and in 1845 received, incorporation as the town of Searsport within boundaries formed from a cession of land from the townships of Belfast and Prospect. The building and sailing of vessels from this stretch of coast had begun about 1806 but accelerated in the 1840s. The resulting prosperity of the area led to further subdivision and in 1857 the southern portion of Prospect was incorporated as Stockton (changed to Stockton Springs in 1889).

Today, Searsport is the second most active seaport in the state,[2] and it is the boast of its residents that, in the nineteenth century, Searsport placed more captains in American merchant vessels than any other community. It was in Belfast, however, that the commercial and manufacturing life of the county centered, in the nineteenth century as today. Railhead by 1870, the city was also the port of entry for the Belfast customs district which comprised all points on the west bank of the Penobscot River up to Winterport and the western side of Penobscot Bay as far south as Camden in Knox County, including the three large islands in the Bay, Islesboro, North Haven and Vinalhaven.[3]

Stockton, Searsport and Belfast were highly active in shipbuilding and seafaring into the 1870s, though Stockton began to fall behind due to the shallowness of its harbour as vessel size increased. The Belfast customs district was far outstripped in tonnage launched and operated by the Bath, Waldoboro and Portland customs districts to the south and west.[4] Today, except for the activity at Mack Point in Searsport, the operations of

an ancillary facility at Winterport and the presence of a small tugboat operation at Belfast, Waldo County and its coastal communities are noted chiefly for the numerous establishments catering to the tourists who care to venture east of Camden on their way to Bar Harbor; for the substantial captains' homes which grace the higher parts of the towns (most of these houses sheltering medical doctors and antique dealers now); the quiet vistas over their harbours; and the fierce pride in the accomplishments of their ancestors held by the members of each community's historical society.

Popular articles in *Down East Magazine,* published in Camden, and the excellent displays in one of the country's finer small museums, the Penobscot Maritime Museum in Searsport, keep alive the memory and the rivalry of those times when the Waldo County communities shared in that late survival of the wooden ship building and heyday of commercial sail noted by John Hutchins as unique to the State of Maine. For a variety of reasons, the building of large wooden sailing vessels persisted in Maine while in general the national shipbuilding and shipping activities declined or collapsed in the second half of the century.[5] This present study, however, concentrates on the demographic history of the seafarers of the neighboring communities of Belfast and Searsport as the 'core' of a regional study of the seafaring and shipbuilding folk of Penobscot Bay and River. When the paradigm and computer methods used in this study have been subjected to analysis and correction, the research tools will be applied to other Maine coastal regions and other localities for purposes of comparative study.

At the beginning of the federal system, interests from the eastern seaboard states had cultivated national policies supportive of foreign trade, shipping, shipbuilding and fishing industries. By the 1850s however, government policy had turned away from the seaboard interests.

American maritime industries began to decline shortly before the Civil War. Westward expansion, railway development, the beginnings of industrialization in the mid coast states and inland, exploitation of mineral and agricultural resources in the Middle West, and the ever advancing standard of living of Americans, with the concomittant rise in the cost of American labour: all are cited as reasons for the decline of American shipping and shipbuilding activities. Internal development and westward expansion were now the goals of emerging industrial interests in the Middle Atlantic and Middle Western states. Foreign competition at sea, chiefly British, was cutting deeply into American shipping interests. With the coming of the War Between the States, the peak of American shipping had passed, though this was not apparent at the time. Losses to Confeder-

ate raiders merely accelerated the decline as the 'flight from the flag' began that cycle repeated twice more in the twentieth century.

Boston, Philadelphia, Savannah and Charleston never quite recovered their maritime roles during the second half of the nineteenth century. New York, Norfolk, New Orleans and San Francisco leaped into predominance as seaports, but foreign trade was carried on through these ports in ever increasing numbers of non-American bottoms. In the Atlantic and Gulf ports steamship interests came to dominate foreign trade. Yet for another thirty years Maine towns managed to hang onto a sizeable share of domestic shipping in the Atlantic and of foreign shipping into the Pacific, to write the closing chapters of commercial sail in wooden vessels while Ferdinand Laeisz, Gustav Erickson et al. were closing the saga of steel-hulled windships.

How did the Waldo County communities fare in the survival and precipitate decline of American sail? They responded as in general Maine people always have to economic change. Never expecting a great deal of material comfort from life, they curtailed extravagance learning to "use it up, wear it out, make it do, or do without," for the most part. Those who could or would not accommodate left the region.[6] But having formed an economic cranny bypassed in the pursuit of progress elsewhere, the 'downeasters' turned their considerable improvisational talents, their relative frugality and their community cohesiveness to benefit in maintaining occupational pursuits whose viability and productivity lagged behind the national norms: a seeming provincialism that parallels that of the Jersey Islanders described by Rosemary Ommer.[7] But Maine suffers from two natural disadvantages, geography and climate, which set it apart from the rest of the United States and place it in a category with some of the Canadian Maritime Provinces. Geographically, Maine is an outer fringe of the United States and it is blessed with both limited natural resources and a relatively short growing season.[8] Also, although major arteries of commerce pass to the North and to the South, nothing passes through Maine.[9] Once the Middle West and Prairie States and the 'Golden West' were opened by railroads, Maine agriculture lost its competitive advantage of nearness to the eastern seaboard metropolitan market. And once the trees were felled and shipped out as lumber, the larger stands of western timber and the faster growing southern pine resources supplanted the fabled broad arrow white pine growth of Maine.

The sea remained. Even after the best ship timber had been stripped from the rocky hills of Knox, Waldo and Hancock Counties, and timber had to be brought in from elsewhere, Maine hands fashioned schooners, barks and ships to be sailed by seamen and master mariners born by the

upper reaches of Penobscot Bay. Many of these seafarers were following family traditions. Others went to sea while waiting for the family farm to pass on to them by inheritance. Still others perceived the sea as a way out of the seeming dead end of eastern Maine. Census figures for the nation, state, county and towns illustrate the trend (Table 1).[10] The outmigration from Waldo County runs counter to the growth of the country and the state. Belfast managed to maintain its population until the end of the period (correlation of Waldo County with Belfast = +0.3507) while Searsport experienced something very like the county shrinkage (+0.7239). In light of what is discussed below, it is reasonable to consider that the experience of Belfast might have been due to a better accommodation to altered economic circumstances while Searsport held on too long to a failing industry.

Seafaring before the mast in the age of sail required a high level of physical strength, agility, endurance and courage, all qualities to be found in abundance among young males of the century past. Thus it is to be expected that, lacking alternative economic opportunities, the youth of Maine coastal communities then, as now, turned to the sea as a provider of income and, in the nineteenth century, as a route to the bigger world.

TABLE 1

POPULATION TOTALS, NATION, STATE, COUNTY AND COMMUNITIES, 1850-1900

	1850	1860	1870	1880	1890	1900
U.S.A.*	23,192	31,443	39,818	50,156	62,948	75,995
Maine*	583	628	625	649	661	694
Waldo Cty.	47,230	38,447	34,522	32,463	27,759	24,185
Belfast	5,052	5,520	5,278	5,308	5,298	4,615
Searsport	2,208	2,355	2,282	2,322	1,695	1,349

*Figures in thousands for U.S.A. and Maine.

Source: See footnote 11.

Examination of raw census data provides material for the many tables given in the appendices.[11] The study is limited to the period 1850 to 1900 because, until the Seventh U.S. Census of 1850, no information on individuals' occupations was returned and because census schedules later than that of 1900 have not yet been made public. There is a gap in the series occasioned by the loss to fire of the 1890 schedules. The scheduled information has been transcribed for every resident of a dwelling unit in

which any individual in a maritime related occupation was found. There was a total of 8,651 entries for Belfast and 5,491 for Searsport in the five censuses searched.[12]

Counts of individual seafarers were made and these figures are compared with the total populations of the two towns in Table 2. The greater importance of seafaring to Searsport is clearly shown as is what may have been the more ready response of the Belfast population to the decline of the U.S. merchant marine. In both communities the peak in both absolute and relative terms of employment at sea occurred at around 1860-1870, the period cited by R.G. Albion, W.A. Baker and B.W. Labaree as the transition from the 'Golden Age' to the 'Dark Age' of New England shipping.[13]

TABLE 2

TABULATION OF SEAFARERS AND TOTAL POPULATION WITH PERCENTAGE OF THE FORMER

	Belfast			Searsport		
	Tot. Pop.	Seafarers	%	Tot. Pop.	Seafarers	%
1850	5,052	330	6.53	2,208	218	9.87
1860	5,520	421	7.63	2,355	275	11.68
1870	5,278	395	7.48	2,282	244	10.69
1880	5,308	249	4.69	2,322	245	10.55
1900	4,615	57	1.24	1,349	66	4.89

Source: Computer files.

Next, age distribution and basic statistical runs were made for seafarers by municipality and census. These are abridged in Tables 11 through 22 (end of Paper) and histograms were created to illustrate the age cohort percentages graphically. A separate computer run was used to verify the first runs and the statistics of the later run are summarized in Table 3.

The extreme youth of some of the seafarers reported was noted with interest. There were as yet no child labour laws in America at mid century. Furthermore, enumerators were directed to enter an occupation for each male fifteen or older.[14] Individual scrutiny of entries for those under fifteen was made and revealed the following: ten at fourteen years, three at thirteen, two at twelve and one at eleven, yielding a total of sixteen or about one half of one per cent of all seafarers. All but one of these were found in Belfast, with seven instances occurring in the 1870 census. Three

of this group of seven were sons of widows, two of active seamen, one of a master mariner and one resided with very old but not indigent grandparents.

Tenth percentile ages show a very narrow range (sixteen through twenty). Together with the next percentile, the twenty fifth, a range of nineteen through twenty four for seamen indicates, as do figures referred to below, the persistence of an entry into service age from the late 'teens into the mid twenties. At the opposite end of the scale, the ninetieth percentile figures, with the exception of that for Belfast in 1900 (sixty six), sweep a broad range of from forty two through forty eight. Thus, while

TABLE 3

STATISTICAL SUMMARY OF AGE DISTRIBUTIONS

	Group		N	Mean	Percentile Ages					Lowest Highest
					10	25	50*	75	90	
Belfast	1850	Sailors	330	28.61	18	20	26	35	44	14-66
	1860	Sailors	329	27.02	17	20	23	31	42	12-66
		M.M.	92	41.03	28	34	39	48	59	21-74
		Total	421	30.14						
	1870	Sailors	298	28.26	17	20	26	32	44	11-74
		M.M.	97	40.98	29	34	40	47	51	21-61
		Total	395	31.38						
	1880	Sailors	187	32.71	19	23	28	40	51	14-77
		M.M.	62	47.03	32	38	48	55	60	25-69
		Total	249	36.27						
	1900	Sailors	31	43.03	20	24	38	56	66	20-83
		M.M.	26	57.27	37	53	57	66	68	24-78
		Total	57	49.53						
Searsport	1850	Sailors	218	27.23	16	19	25	32	43	15-66
	1860	Sailors	275	29.39	18	21	27	35	46	16-65
	1870	Sailors	244	31.59	19	22	30	39	46	14-83
	1880	Sailors	140	28.59	19	21	26	33	43	16-76
		M.M.	105	41.03	29	34	41	48	53	21-73
		Total	245	33.92						
	1900	Sailors	30	34.50	20	23	32	44	48	16-63
		M.M.	36	44.92	30	39	44	51	59	21-64
		Total	66	40.18						

*50 percentile is the median age.

Source: computer files.

beardless boys might be found before the mast, the grizzled 'old salt' of legend was a comparative rarity in this sample area.

The steady upward progression of the median (fiftieth percentile) age for seamen is also indicative. The distinction between common seaman and master mariner began in the 1860 census for Belfast, but was not made in Searsport before 1880. It is assumed that, when the distinction was not made, the median for seamen was as it occurred consistently later, that is, significantly lower than that for master mariners. Assuming an 1850 median of twenty two or lower for both places, the 1900 high figure of thirty eight gives an upward progression of sixteen years for the median over the fifty year period with the greatest increase occurring between 1880 and 1900. At the same time, the number of seamen fell from 327 in 1880 to sixty one in 1900, an ample illustration of the collapse of a local tradition.

Comparable figures for master mariners[15] confirm that not only were masters older by a considerable margin, but that the range of ages was greater. The youngest age found was twenty one. As licensing of ships' officers was not required in the U.S. until 1898, the most likely operative factor in setting this minimum age must have been the legal requirement of majority for the master as attorney for the owners. The tenth percentile figure for masters indicates that there were very few who had just attained majority. While the upper limit figures indicate the contrary, the ninetieth percentile figures demonstrate that masters continued at sea significantly longer than seamen, except for the Belfast 1900 group. It is, of course, possible that respondents gave as their occupations activities from which they had retired and that frequently the honorific 'Captain' was bestowed on the superannuated out of deference to years. The careers of 186 master mariners have been traced in the listings of the sample group. Of these, only thirteen were found to have declared any other title in their last listed response and eight of these called themselves 'mariner,' 'retired mariner' or merely 'sailor.'

Attention is now directed to the histograms (Figures I through X) developed from the age distribution tables. These represent graphically the age cohort percentages of the total seafaring population, distinguishing where possible those designated master mariners from others and displaying for comparison the cognate percentage levels of the entire male population eleven years and older.

Significant 'breaks,' or declines of five percent or more, in the distributions occur as listed in Table 4.

TABLE 4

INCIDENCE OF 'BREAKS' OF FIVE PERCENTAGE POINTS OR MORE IN AGE COHORT DISTRIBUTIONS

Census	Belfast	Searsport
1850	31-35	21-25
	41-45	36-40
1860	26-30	26-30
	31-35	31-35
		41-45
1870	31-35	26-30
		46-50
1880	26-30	31-35
1900	26-30	51-55
	71-75	

Source: Computer files.

The twenty one through twenty five year break in Searsport in 1850 correlates with the decline in the general population cohort and may merely reflect that anomaly. The absolute numbers involved in the 1900 samples, and the condition of the industry by that date, reduce the validity of generalizations which may be drawn from that distribution. Those four 'breaks' are therefore disregarded in this part of the analysis.

Many factors may account for the 'breaks' which occur, but for this analysis it is assumed that the major factor was choice on the part of the individual seafarer. The frequency distribution of the 'breaks' is as follows:

26-30	4	41-45	2
31-35	5	46-50	1
36-40	1		

In five instances, breaks occur immediately after peak percentages in the census populations. In two others, a second break follows the first. All seven occurrences are in the age cohorts between twenty six and thirty five. It therefore appears that the critical time for a seafarer, that in which the decision to go ashore was made, occurs between those ages. It also appears that it is during those same years of age that the transition to master mariner most frequently takes place. Hence, the choice of whether or not to continue going to sea may have been heavily determined by the prospect of passing into the stern cabin.

In the absence of direct testimony from the seafarers, one can only speculate that the rigors of sailing before the mast exercised physical and psychological deterrence upon many. Nimbleness and physical courage (more properly, foolhardiness) beginning to diminish, the aches of joints strained, sprained, subjected to cold and damp too long, intimations of mortality, desire for settled habits and for the comforts of home and family, must have exerted powerful influences at around age thirty. Perhaps also by then the seafarer may have found a better place to dwell than on the shores of Penobscot Bay and have gone ashore elsewhere. Gold rushes, the lure of western lands, experiences of the Civil War must also have entered the picture.[16]

Fluctuations in the national economy must also have borne upon the decision making. The 'Panic of 1857', the prolonged depression of 1874-1879 and the economic gyrations of the turbulent 'Silver Crisis' nineties, could and should have affected the very sensitive carrying trades which occupied most of the 'Down-Easters.'[17] It will require the expertise of an American economic history specialist to relate these findings to the national scene. But the effect of foreign competition on the U.S. merchant marine, the steady shrinkage of tonnage under the American flag, must have accounted heavily for the decline in the numbers of seafarers from Belfast and Searsport.[18] Conditions on board U.S. vessels were proverbially at their lowest by the 'eighties and 'nineties and crews were increasingly drawn from among non-citizens: Andrew Furuseth is both typical and atypical.

For those who made the transition to the after cabin, however, income and conditions of employment were decidedly more attractive and the old tradition of the master as part owner of the vessel must have provided continued incentive to remain active. Until a detailed case-by-case study of individuals has been completed it is not possible to give a precise figure for those who made the transition. Preliminary counts reveal at least 150 whose occupational listing went from sailor/seaman/mariner to master mariner. It is obvious that those who achieved the higher status remained active in, or at least identified themselves with, seafaring in greater number than those who did not. The numerical and graphic examples for 1900 show virtual parity, while the 'flattening' of the distribution attests to the decadence of the industry.

Yet another factor in the persistence and longevity of the masters as a group in seafaring is the consideration that some individuals or age cohorts may have become 'locked into' the profession. Of those approximately 150 individuals mentioned above, only three are known to have changed their occupational title by last citation. One became master of a

TABLE 5

OCCURRENCE OF BIRTH COHORT MEMBERS IN SUCCESSIVE CENSUSES

BELFAST

	Birth Cohorts															
Census Year	1785-94	% dec.	1795-04	% dec.	1805-14	% dec.	1815-24	% dec.	1825-34	% dec.	1835-44	% dec.	1845-54	% dec.	1855-64	% dec.
1850	7		22		47		94		156		3		—		—	
		43		9		34		27		40		—		—		
1860	4		20		31		69		94		195		8		—	
				70		58		43		26		40		—		
1870	0		6		13		39		70		117		134		16	
				83		69		46		36		63		52		
1880	—		1		4		21		45		43		64		69	
								86		87		72		86		93
1900	—		—		0		3		6		12		9		5	

Source: Computer files.

TABLE 6

OCCURRENCE OF BIRTH COHORT MEMBERS IN SUCCESSIVE CENSUSES

SEARSPORT

	Birth Cohorts															
Census Year	1785-94	% dec.	1795-04	% dec.	1805-14	% dec.	1815-24	% dec.	1825-34	% dec.	1835-44	% dec.	1845-54	% dec.	1855-64	% dec.
1850	3		10		25		68		104		7		—		—	
		100		30		8		46		19		—		—		
1860	0		7		23		37		84		124		0		—	
		—		71		72		54		31		45		—		
1870	1		2		5		17		58		68		90		3	
						80		65		36		26		10		—
1880			0		1		6		37		50		81		69	
												84		81		71
1900					0		0		0		8		15		20	

Source: Computer files.

steamboat, another became agent for a steamboat line and a third became a ship chandler. More precise statistics await further study, but through the use of birth cohorts it is possible to discern which groups appear to have become entrenched (or imprisoned) in seafaring and which groups were able to better make the transition out of the declining industry.

Tables 5 through 8 display summarized data on the seafarers, rearranged into ten year cohorts according to birth from 1785 through 1864.[19] Taking ages sixteen through twenty five as the entry level of the vast majority of seafarers, the birth cohorts of 1825-34 and 1835-44 exhibit the greatest number of entrants within the period for which there is full data, with combined totals for both towns of 260 and 319 respectively. Their calendar years of entry were 1841 and 1869. The size of entering cohorts at earlier census years cannot be determined with the same degree of accuracy. However, by comparing those cohorts' numbers at ten year earlier stages of their history, the 1815-24 cohort figures can be seen to match up fairly well with those of the next younger group. The 1805-14 group's figures correlate almost as well with those of the 1815-24 cohort, so that it can be assumed that, up through the 1825-34 cohort, entry and attrition rates were quite parallel. The figures for the largest entry group in the sample, 1835-44, show an accelerating rate of attrition. Again, Belfast's experience is more indicative of the decline than Searsport's.

TABLE 7

AGE COHORT DISTRIBUTION IN SUCCESSIVE CENSUSES OF BELFAST, CONSOLIDATED

(ten year cohorts)

Circled is 1825-34 Birth Cohort

Census Year	Age Cohort ≤ 15	16-25	26-35	36-45	46-55	56-65	66-75	≥76
1850	3	156	94	47	22	7	1	0
1860	8	195	94	69	31	20	4	0
1870	16	134	117	70	39	13	6	0
1880	2	69	64	43	45	21	4	1
1900	—	5	3	5	9	12	(6)	3

Source: Computer files.

TABLE 8

AGE COHORT DISTRIBUTION IN SUCCESSIVE CENSUSES OF SEARSPORT, CONSOLIDATED

(ten year cohorts)

Census Year	Age Cohorts							
	≤15	16-25	26-35	36-45	46-55	56-65	66-75	≥76
1850	7	104	68	25	10	3	1	—
1860	—	124	84	37	23	7	—	—
1870	3	90	68	58	17	5	2	1
1880	—	69	81	50	37	6	1	1
1900	—	9	14	20	15	8	—	—

Source: Computer files.

Those seafarers born before 1834 appear to have been fortunate in entering the profession during times of relative prosperity and a relatively low level of foreign competition. The 'Panic of 1857' seems to have winnowed out a few of the younger seafarers who were in that critical decision making period of twenty six through thirty five. Few of these probably responded to Lincoln's calls for volunteers because they were near or in their thirties or older when the Civil War began. While Confederate raiders' depredations and the closing of southern ports during hostilities definitely injured established shipping interests, post war recovery in the coastal trade and that to the Far West saw the by then over thirty seafarers in restored circumstances. By the time of the 1874-1879 depression, the members of the 1825-34 birth cohort were in their early forties to mid fifties. The rate of attrition accelerated, yet a third of their original number at entry thirty years before were still at sea. These, then, appear to have been locked into the profession, for better or for worse, with rather more from Searsport than from Belfast. And of the Searsport segment, the greater number were master mariners.

The birth cohort 1835-44, despite its great numbers at entry, was better able to respond to the decline of the industry. By 1870, ten years after entry, half its numbers no longer went to sea. These, most likely, were people who went to war, died in service or emigrated. By 1880, only twenty eight percent were still going to sea, and again, the Searsport contingent was the greater.

As the city of Belfast had a much larger population than Searsport, it is

tempting to assert that the higher attrition of seafarers from the former was due to the availability in Belfast of iron foundries, saw mills, shoe and clothing factories, cardboard and leatherboard mills, sash-and-blind-makers shops and shipyards offering employment to erstwhile seamen. Searsport had fewer establishments. Its shipyards were the major employers, but these were feeling the pinch of competition. A few small shoemaking and straw-working shops, and a limited retail trade, offered fewer shoreside employment possibilities. Searsport men went to sea of necessity, or moved away entirely.

Further research is in process in an attempt to reveal the later occupations of ex-seafarers. Also to be undertaken is investigation into age of marriage, family size, relationships of fathers' and sons' occupational choices, as well as the matrimonial and entrepreneurial linkages of seafaring and shipbuilding families. In the heraldry of the State of Maine, the pine tree shield is supported on the left by a farmer with his plough and on the right by a sailor with an anchor. The long term goal of this researcher is to present a more complete description, a clearer picture, of the man by the anchor.

NOTES

1. This study received partial support from the Faculty Research Fund Committee of the University of Maine at Orono, Prof. Herbert Maccoby, committee chairman, Dr. Fred Hutchinson, Vice-President for Research and Public Service, fund director. The author wishes to acknowledge that support, as well as the assistance of the following individuals. The list is by no means all encompassing and for those not mentioned, the author's apologies. Student assistants Michael Bowen, William Dolley, Ann Goodell, Theresa Manning, Maridee Worcester and especially Jill Duncan; in Fogler Library, Dr. James MacCampbell, Barbara MacCampbell, Eric Flower, Jeanne Blake, and Phyliss Collins; at the Computer Center, Wayne Persons, Mert Nickerson, Patricia LaBree, Thomas Byther and Prudence Kennedy, and all the keypunch operators, and of course my wife, Nancy, who had to cope with my frustrations at having to learn statistics, demography and computers together and in application.

2. Maine Department of Transportation, "Sears Island Marine Terminal Development," Augusta, Maine, October 13, 1978, presents figures purporting to show Searsport the "most active" port in Maine, but does so only by excluding petroleum cargoes landed at Portland for pipeline transfer to Canada.

3. *The Maine Bicentennial Atlas, An Historical Survey,* Gerald E. Morris, editor, (Portland, Me., 1976), plates 27 and 29.

4. *Ibid,* p. 27.

5. John G.B. Hutchins, *The American Maritime Industries and Public Policy, 1789-1914, An Economic History* (N.Y., 1969) pp. 281-86, 383-86. The author is presently pursuing a study parallel to this one on the demographic history of the segment of the population involved in the ship building activities of the Waldo County communities.

6. Local historian Alice V. Ellis, looking over the author's computer printouts of lists of seafarers, remarked how few of the old families are still represented in the vicinity. Searsport's Carver Memorial Library was given by a descendent living "out of state."

7. Rosemary Ommer, "The Trade and Navigation of the Island," in David Alexander and Rosemary Ommer, eds. *Volumes Not Values, Canadian Sailing Ships and World Trades* (St. John's, 1979), pp. 33-55.

8. The Climate History Group at the University of Maine at Orono has discovered that the growing season in Maine was longer between 1850 and 1880 than it is today. Remarks at a History Faculty Symposium by Dr. David C. Smith, October 24, 1979.

9. The CN rail line from Saint John and Fredericton traverses the state but serves only to connect New Brunswick and the Maritimes to Ontario. It carries no appreciable volume of Maine traffic. The Grand Trunk rail line does provide way service from Portland and the southern parts of the state to Montreal and western U.S. points but appears to serve chiefly York county, an outcropping of the Boston-Manchester, New Hampshire concentration.

10. The next phase of this current demographic study is to determine the occupational and residential patterns of seafarers of the area, their antecedents and pre- and post-seafaring periods. Partial results of research indicate a very high percentage of seafarers' sons, a considerable number of farmers' sons, and a scattering of other paternal occupations. After-leaving patterns have not yet been searched.

11. The basic data sources are microfilms of the U.S. *Census* schedules published by the National Archives. Reliance upon this source, it must be acknowledged, leaves open several inherent possibilities of error. Incompleteness of returns, erroneous reporting to enumerators by respondents, errors in recording responses, illegibility of schedules, etc. are recognized. Yet the schedules are the most complete set of data for demographic study and with close reading by trained, well-supervised assistants, checking by a second researcher, and accurate transcription, they constitute an acceptable basis for generalized statistical findings.

12. The entries were reduced to magnetic tape images via punched cards, and computer program runs were made on the IBM equipment at the Computer and Data Processing Services (CAPS) facility at the University of Maine at Orono. Basic sorting was done through the local CMSBATCH system and more sophisticated statistical runs through the Statistical Analysis System (SAS) programs leased by CAPS from SAS Institute Inc. of Raleigh, North Carolina. SAS was chosen over the other available computer program, Statistical Package for the Social Sciences (SPSS). SPSS has a four-column limit on value length, while SAS has a 200 character value limit. Thus a series of coding steps for occupations, proper names, etc. were avoided and print-outs are readable without an extensive codebook. SAS control card regimen is simpler and as many procedures are available in SAS as in SPSS. A new SASGRAPH program is being examined for possible use in this study. The *SAS User's Guide* is, however, one of the poorest written for all but the professional programmer.

13. R.G. Albion, W.A. Baker and B.W. Labaree, *New England and the Sea* (Middletown, Conn., 1972), chapters III and IV.

14. The number of very young males who actually went to sea is doubtful. While in most instances, enumerators compiled by entering an occupation, they also made check marks in the schedule column indicating attendance at school during the census year, i.e., the preceding twelve months. Thus, dozens of schoolboy sailors, farmers, blacksmiths, etc. appear, leaving open the probability that the parents' projected occupation for the son rather than actual employment may have been recorded.

15. As already related, enumerators did not differentiate between seamen and masters in earlier censuses. Neither then nor later did they differentiate clearly between masters and mates. It is possible that the term 'mariner' in the Belfast 1880 and 1900 *Census* and in the latter year in Searsport, simultaneously with 'sailor' and 'seaman', may have been intended to distinguish mates from seamen. Further research may reveal the validity or falseness of this hypothesis. Incidentally, only those not clearly designated as serving on steamboats were counted. It is not possible to determine from the censuses whether a seafarer was in the foreign or the coastal trade. See below, n. 17 for some thought on this matter.

16. Joseph Williamson, *A History of Belfast, Maine* (2 vols., Belfast 1877-1913) I, p. 499, states that 858 Belfast men went off to fight and that one hundred died in service, but fails to state how many may have emigrated as a result of their experiences. The possibility that death may account for a significant proportion of the break phenomenon awaits further investigation. A canvass of information in F.F. Black, *Searsport Sea Captains* (Belfast, 1960) on 327 masters who died between 1840 and 1900 shows that 15.6% (51) suffered violent death at sea, 68.6% (35) of these occurring between 1870 and 1900, an average of only a little over one per year. Additional research needs to be done for the rest of the seafarers.

17. It is impossible to determine from the census data which and how many of the seafarers 'sailed foreign' and how many were in the coastal trade. Survival of signed articles is purely fortuitous. We in the States do not have the splendid resource of Board of Trade documentation, especially the crew lists, to draw upon.

18. See Hutchins, *op. cit.,* pp. 416-420, 426-432.

19. Tamara Hareven has discussed the potentials and pitfalls of tracing birth cohorts in her articles "The Family As Process: The Historical Study of the Family Cycle," *Journal of Social History,* (Spring, 1974) and "Cycles, Courses, and Cohorts: Reflections on the Theoretical and Methodological Approaches to the Historical Study of Family Development," *ibid.,* (Fall, 1978). In the present study, it is assumed that ages given on the schedules were accurate so that simple subtraction gives the birth year, plus or minus one.

TABLE 11

AGE DISTRIBUTION, SAILORS,* BELFAST

1850

AGE	FREQUENCY	PERCENT
11-15	3	0.9
16-20	81	24.6
21-25	75	22.7
26-30	66	20.0
31-35	28	8.5
36-40	34	10.3
41-45	13	3.9
46-50	13	3.9
51-55	9	2.7
56-60	6	1.8
61-65	1	0.3
66-70	1	0.3

*No differentiation made between ordinary sailors and masters by enumerator.

N = 330, mean = 28.61, median = 26, range = 14-66

Source: computer files.

TABLE 12

AGE DISTRIBUTION, SEAMEN, BELFAST

AGE	1860 FREQUENCY	1860 PERCENT	1870 FREQUENCY	1870 PERCENT
11-15	8	2.4	16	5.4
16-20	89	27.1	65	21.8
21-25	103	31.3	67	22.5
26-30	46	14.0	60	20.1
31-35	21	6.4	32	10.7
36-40	24	7.3	16	5.4
41-45	11	3.3	16	5.4
46-50	12	3.6	8	2.7
51-55	3	0.9	7	2.4
56-60	6	1.8	3	1.0
61-65	4	1.2	2	0.7
66-70	2	0.6	6	2.0

N = 329, mean = 27.02, median = 23, range = 12-66

N = 298, mean = 28.26, median = 26, range = 11-70

Source: Computer files.

TABLE 13

AGE DISTRIBUTION, MASTER MARINERS, BELFAST

AGE	1860 FREQUENCY	1860 PERCENT	1870 FREQUENCY	1870 PERCENT
11-15	—	—	—	—
16-20	—	—	—	—
21-25	3	3.3	2	2.1
26-30	15	16.4	11	11.3
31-35	12	13.0	14	14.4
36-40	21	22.8	23	23.7
41-45	13	14.1	15	15.5
46-50	12	13.0	18	18.6
51-55	4	4.3	6	6.2
56-60	6	6.5	6	6.2
61-65	4	4.3	2	2.1
66-70	1	1.1	—	—
71-75	1	1.1	—	—

N = 92, mean = 41.3, median = 39, range = 21-27

N = 97, mean = 40.98, median = 40, range = 21-61

Source: Computer files

TABLE 14

AGE DISTRIBUTION, SEAMEN AND MASTER MARINERS, BELFAST

	1860		1870	
AGE	FREQUENCY	PERCENT	FREQUENCY	PERCENT
11-15	8	1.9	16	4.1
16-20	89	21.1	65	16.5
21-25	106	25.2	69	17.5
26-30	61	14.5	71	18.0
31-35	33	7.8	46	11.6
36-40	45	10.7	39	9.9
41-45	24	5.7	31	7.8
46-50	24	5.7	26	6.6
51-55	7	1.7	13	3.3
56-60	12	2.9	9	2.3
61-65	8	1.9	4	1.0
66-70	3	0.7	6	1.5
71-75	1	0.2	—	—

N = 421, mean = 30.14

N = 395, mean = 31.38

Source: Computer files

TABLE 15

AGE DISTRIBUTION, SEAMEN, BELFAST

	1880		1900	
AGE	FREQUENCY	PERCENT	FREQUENCY	PERCENT
11-15	2	1.1	—	—
16-20	23	12.3	3	9.7
21-25	45	24.1	5	16.1
26-30	32	17.1	2	6.5
31-35	23	12.3	4	12.9
36-40	16	8.6	2	6.5
41-45	10	5.4	1	3.2
46-50	15	8.0	2	6.5
51-55	9	4.8	3	9.7
56-60	7	3.7	4	12.9
61-65	2	1.1	1	3.2
66-70	1	0.5	2	6.5
71-75	1	0.5	—	—
76 & older	1	0.5	2	6.5

N = 187, mean = 32.71, median = 28, range = 14-77

N = 31, mean = 43.03, median = 37.5, range = 20-83

Source: Computer files.

TABLE 16

AGE DISTRIBUTION, MASTER MARINERS, BELFAST

AGE	1880 FREQUENCY	1880 PERCENT	1900 FREQUENCY	1900 PERCENT
11-15	—	—	—	—
16-20	—	—	—	—
21-25	1	1.6	1	3.8
26-30	1	1.6	—	—
31-35	8	12.9	—	—
36-40	9	14.5	2	7.7
41-45	8	12.9	1	3.8
46-50	9	14.5	1	3.8
51-55	12	19.4	5	19.2
56-60	8	12.9	3	11.5
61-65	4	6.5	6	23.1
66-70	2	3.2	5	19.2
71-75	—	—	1	3.8
≥ 76	—	—	1	3.8
	N = 62, mean = 47.03, median = 48, range = 25-69		N = 26, mean = 57.27, median = 57, range = 24-78	

Source: Computer files.

TABLE 17

AGE DISTRIBUTION, SEAMEN AND MASTER MARINERS, BELFAST

AGE	1880 FREQUENCY	1880 PERCENT	1900 FREQUENCY	1900 PERCENT
11-15	2	0.8	—	—
16-20	23	9.2	3	5.3
21-25	46	18.5	6	10.5
26-30	33	13.3	2	3.5
31-35	31	12.4	4	7.0
36-40	25	10.0	4	7.0
41-45	18	7.2	2	3.5
46-50	24	9.6	3	5.3
51-55	21	8.4	8	14.0
56-60	15	6.0	7	12.3
61-65	6	2.4	7	12.3
66-70	3	1.2	7	12.3
71-75	1	0.4	1	1.8
≥ 76	1	0.4	3	5.3
	N = 249, mean = 36.27		N = 57, mean = 49.53	

Source: Computer files.

TABLE 18
AGE DISTRIBUTION, SAILORS,* SEARSPORT

	1850		1860	
AGE	FREQUENCY	PERCENT	FREQUENCY	PERCENT
11-15	7	3.2	—	—
16-20	61	28.0	55	20.0
21-25	43	19.7	69	25.1
26-30	37	17.0	51	18.5
31-35	31	14.2	33	12.0
36-40	14	6.4	28	10.2
41-45	11	5.0	9	3.3
46-50	6	2.8	13	4.7
51-55	4	1.8	10	3.6
56-60	2	0.9	5	1.8
61-65	1	0.5	2	0.7
66-70	1	0.5	—	—

*No differentiation made between ordinary sailors and masters by enumerator.

N = 275, mean = 29.39, median = 27, range = 16-65

N = 218, mean = 27.23, median = 25, range = 15-66

Source: Computer files.

TABLE 19
AGE DISTRIBUTION, 'MARINERS',* SEARSPORT 1870

AGE	FREQUENCY	PERCENT
11-15	3	1.2
16-20	38	15.6
21-25	52	21.3
26-30	33	13.5
31-35	35	14.3
36-40	31	12.7
41-45	27	11.1
46-50	11	4.5
51-55	6	2.5
56-60	2	0.8
61-65	3	1.2
66-70	—	—
71-75	2	0.8
≥ 76	1	0.4

*Thus in the census schedules. No differentiation between ordinary sailors and masters.

N = 244, mean = 31.59, median = 30, range = 14-82

Source: Computer files.

TABLE 20
AGE DISTRIBUTION, SEAMEN, SEARSPORT

	1880		1900	
AGE	FREQUENCY	PERCENT	FREQUENCY	PERCENT
11-15	—	—	—	—
16-20	29	20.7	5	16.7
21-25	37	26.4	3	10.0
26-30	33	23.6	5	16.7
31-35	16	11.4	3	10.0
36-40	9	6.4	4	13.3
41-45	7	5.0	4	13.3
46-50	3	2.1	4	13.3
51-55	4	2.9	—	—
56-60	—	—	1	3.3
61-65	1	0.7	1	3.3
66-70	—	—	—	—
71-75	—	—	—	—
≥ 76	1	0.7	—	—

N = 140, mean = 28.59, median = 26, range = 16.76. N = 30, mean = 34.5, median = 32, range = 16-63

Source: Computer files.

TABLE 21
AGE DISTRIBUTION, MASTER MARINERS, SEARSPORT

	1880		1900	
AGE	FREQUENCY	PERCENT	FREQUENCY	PERCENT
11-15	—	—	—	—
16-20	—	—	—	—
21-25	3	2.9	1	2.8
26-30	14	13.3	2	5.5
31-35	18	17.1	4	11.1
36-40	14	13.3	4	11.1
41-45	20	19.1	8	22.2
46-50	19	18.1	6	16.7
51-55	11	10.5	5	13.8
56-60	5	4.8	3	8.3
61-65	—	—	3	8.3
66-70	—	—	—	—
71-75	1	0.9	—	—

N = 105, mean = 41.03, median = 41, range = 21-73 N = 36, mean = 44.92, median = 44, range = 21-64

Source: Computer files.

TABLE 22

AGE DISTRIBUTION, SEAMEN AND MASTER MARINERS, SEARSPORT

	1880		1900	
AGE	FREQUENCY	PERCENT	FREQUENCY	PERCENT
11-15	—	—	—	—
16-20	29	11.8	5	7.6
21-25	40	16.3	4	6.0
26-30	47	19.2	7	10.6
31-35	34	13.9	7	10.6
36-40	23	9.4	8	12.1
41-45	27	11.0	12	18.2
46-50	22	9.0	10	15.2
51-55	15	6.1	5	7.6
56-60	5	2.0	4	6.0
61-65	1	0.4	4	6.0
66-70	—	—	—	—
71-75	1	0.4	—	—
≥76	1	0.4	—	—
	N = 245, mean = 33.92		N = 66, mean = 40.18	

Source: Computer files.

FIGURE I

BELFAST SAILORS, 1850
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SEAMEN AND MASTER MARINERS NOT DIFFERENTIATED

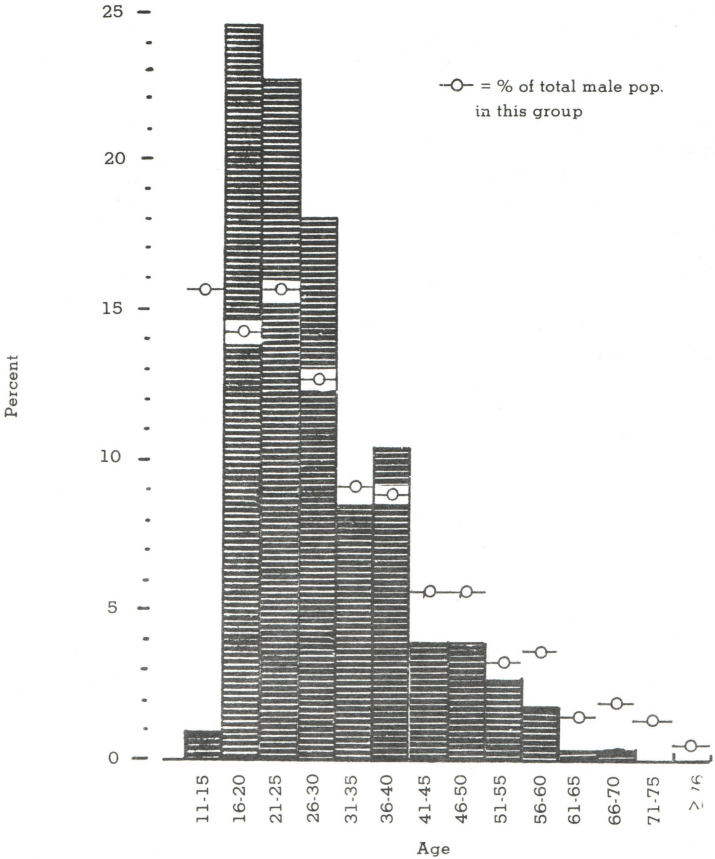


FIGURE II

BELFAST SEAFARERS, 1860
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SHADED BAR = SAILORS, CLEAN BAR = MASTER MARINERS

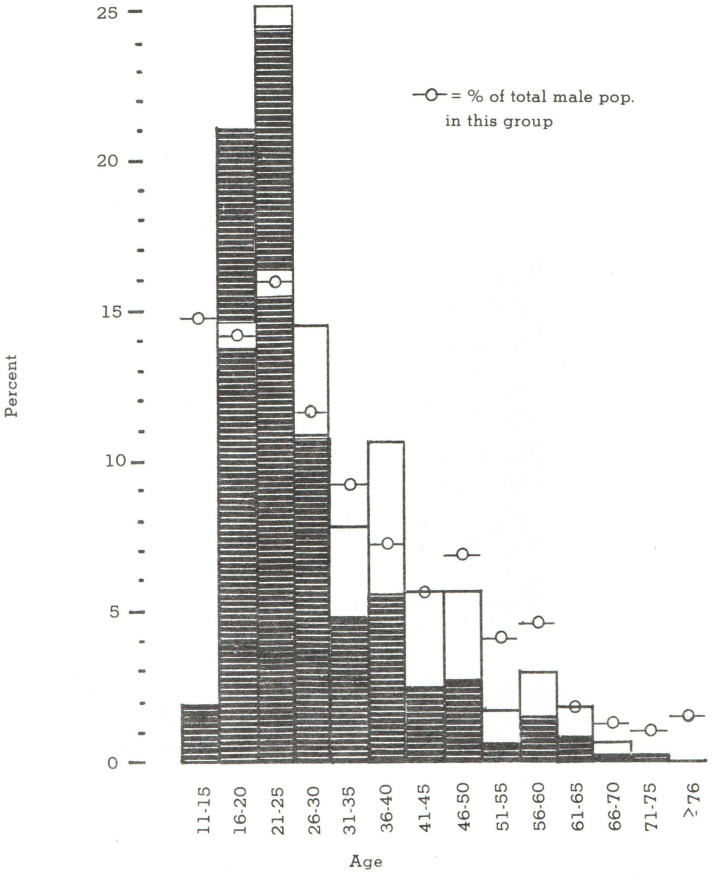


FIGURE III

BELFAST SEAFARERS, 1870
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SHADED BAR = SAILORS, CLEAR BAR = MASTER MARINERS

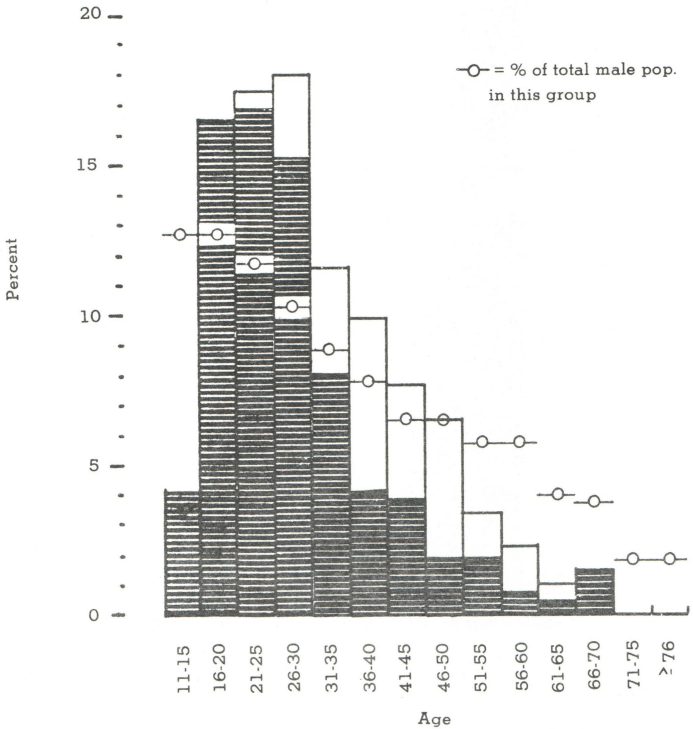


FIGURE IV

BELFAST SEAFARERS, 1880
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SHADED BAR = SAILORS, CLEAR BAR = MASTER MARINERS

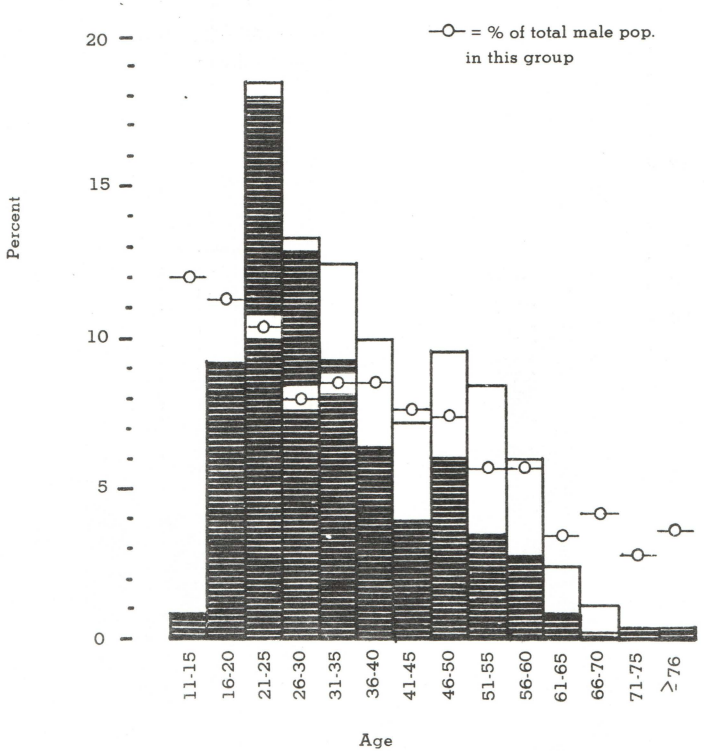


FIGURE V

BELFAST SEAFARERS, 1900
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SHADED BAR = SAILORS, CLEAR BAR = MASTER MARINERS

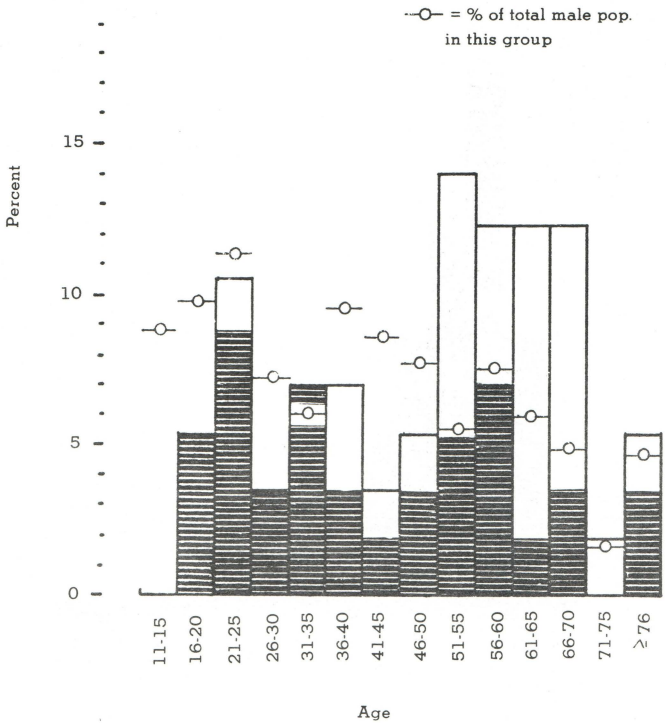


FIGURE VI

SEARSPORT SAILORS, 1850

AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION

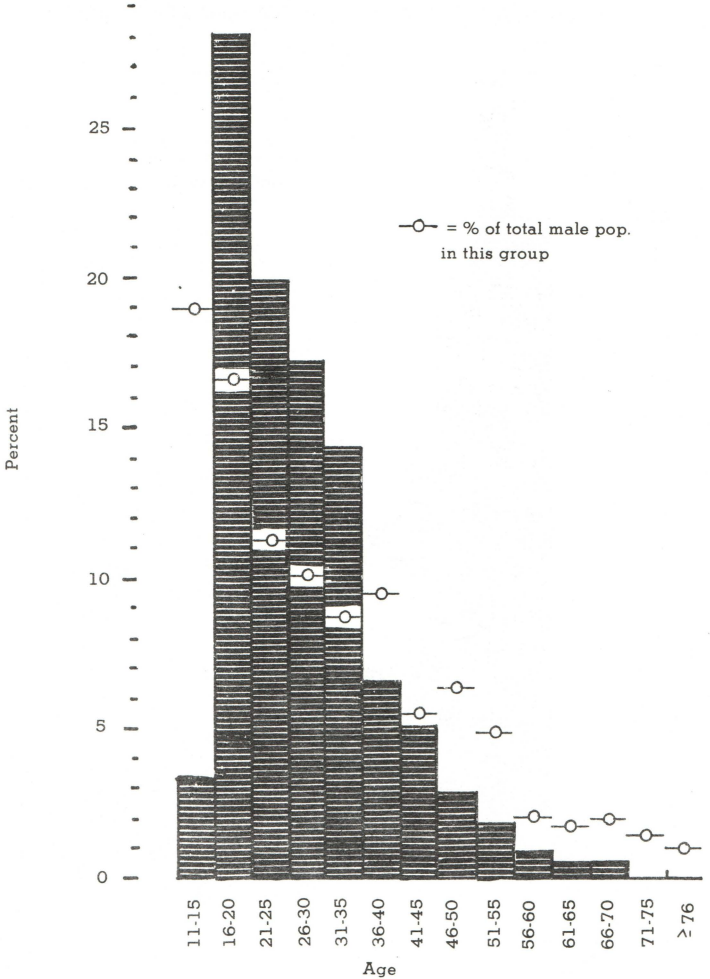


FIGURE VII

SEARSPORT SEAFARERS, 1860
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION

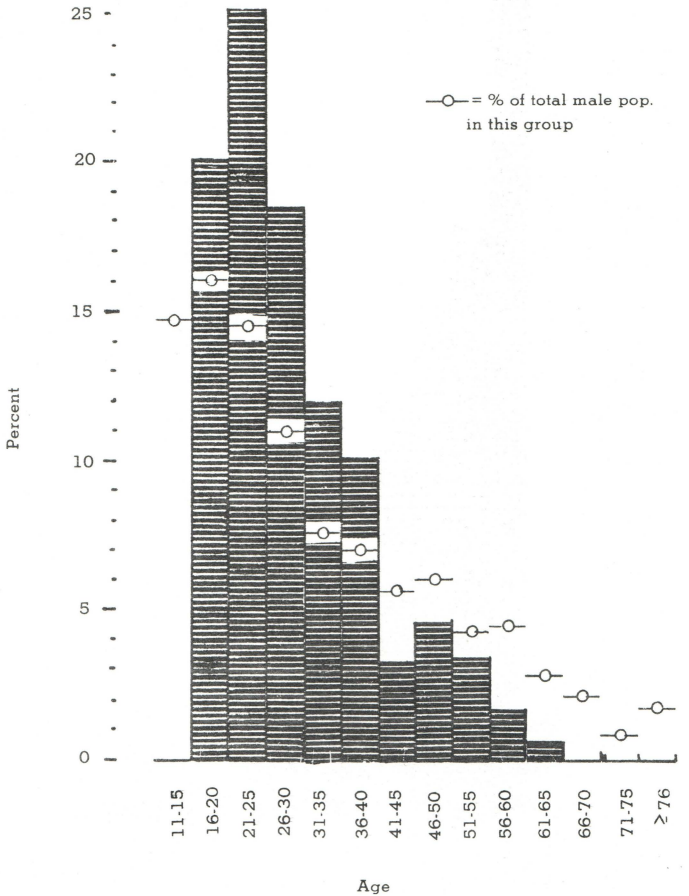


FIGURE VIII

SEARSPORT 'MARINERS', 1870
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION

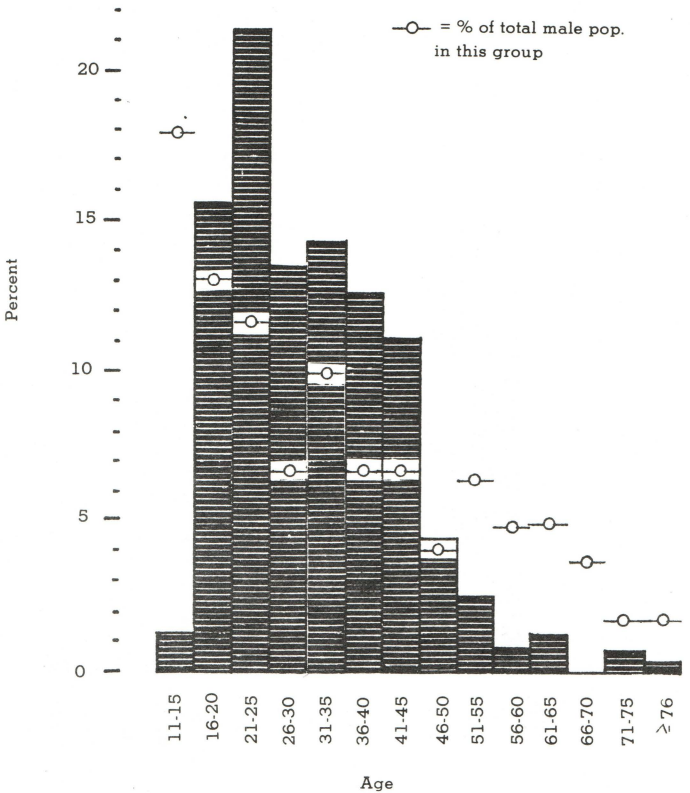


FIGURE IX

SEARSPORT SEAFARERS, 1880
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SHADED BAR = SAILORS, CLEAR BAR = MASTER MARINERS

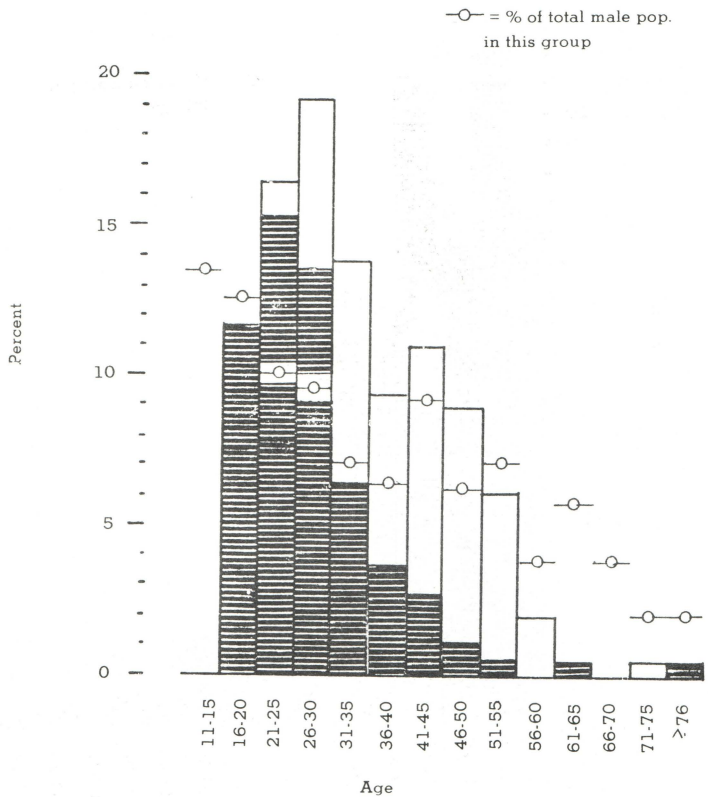
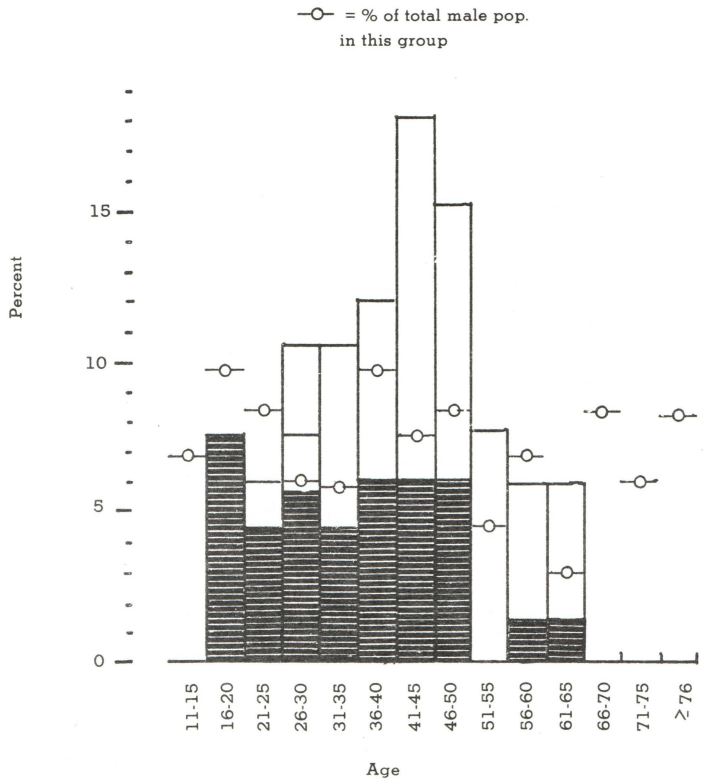


FIGURE X

SEARSPORT SEAFARERS, 1900
AGE DISTRIBUTION BY PERCENTAGE OF SEAFARING POPULATION
SHADED BAR = SAILORS, CLEAR BAR = MASTER MARINERS



11. LASCARS: THE FORGOTTEN SEAMEN

CONRAD DIXON

University College London

LASCARS: THE FORGOTTEN SEAMEN

Conrad Dixon

This study relates to a group of maritime workers whose labours have been largely undocumented although for two hundred years they have made up a significant proportion of the British seagoing work force. Lascars did not serve in any appreciable numbers in European-registered vessels before 1780, yet by 1914 they amounted to 17.5 percent of all those employed in British-registered vessels and in 1980 one in twelve British seafarers is a native of the Indian sub-continent.[1] They have received the very minimum of attention from maritime historians, and the purpose here is to highlight those factors having a bearing on their recruitment, conditions of service and mode of employment and to contrast their lot with that of European seamen.

It may be helpful at this stage to give an explanation of the origins of the collective name given to Indian seamen prior to independence in 1947. It derives from the Persian and Urdu word *lashkar* for an army or camp, and when the British and Portugese began training artillerymen for service afloat in the eighteenth century the term *gun-lascar* was coined. The same root word crossed the Indian Ocean to East Africa so that *askari* became the coast Swahili designation for a private soldier, while the word *lascar* came into general use to denote an Indian seaman.

The colonial powers that opened up trade to India did not envisage that lascars would be employed outside the Indian Ocean in the normal way of things, and as late as 1802 the British government took the formal view that they were not to crew vessels in waters west of the Cape of Good Hope.[2] However, a war-induced labour shortage consequent on the struggle with the French had already compelled a revision of that policy in India,[3] with the Danes being the first nation to crew Europe-bound ships with lascars. A Danish royal edict of 18 November, 1780, put the onus for the return of Indian seamen to their homes on shipowners, and when the governor of the tiny Danish settlement at Fredericknagore sent a copy of the edict to Warren Hastings, governor-general of Bengal, the latter approved of the principle of repatriation and looked for some means of regulating the supply of seamen. Meanwhile, at the London end, the first complaints were being received that lascars were being turned adrift in Europe. A letter in 1782 from the East India Company in London to the President and Council at Fort St. George, Madras, grumbled that lascars were calling at head office having "been reduced to great distress and applying to us for relief".[4]

The Rules governing the recruitment of lascars came into effect in 1783, and had four main features.[5] A fixed wage was announced, and maintenance abroad pending repatriation to India was part of the package. Direct recruiting was envisaged, with shipping offices open to receive recruits. Warren Hastings was employing a western solution to solve an eastern labour shortage, but he soon found that the eastern tradition of indirect labour engagement was too strong for him. In India, as in many other countries of the Far East, access to paid work was, and is, obtained through a combination of family contacts and professional intermediaries, with the jobber, or *sirdar,* a familiar figure in society. In the Indian shipping world, recruitment was initially through a *ghat serang* — a combination of moneylender, labour recruiter and lodging-house keeper — with a *serang*[6] aboard the ship paying and controlling the crew. There were no individual engagements as was the case in European vessels. The *serang* paid the *ghat serang* for his job,[7] and made his profits by taking commission from the hands.

This time-honoured corruption was not going to wither away because of an ordinance from the occupying power, and the new marine offices received only a trickle of recruits. The Marine Registrar at Calcutta was reduced to sending drummers round the city to publicize pay rates, but it soon transpired that the *ghat serangs* had bribed nearly all the *sepoys* in the district to obstruct the agents of the Marine Registrar and turn away potential recruits who came in from the villages. Additionally, the *ghat serangs* put it about that if trained lascars signed articles independently they could expect no work through the usual channels in the future. The upshot was that East and West came to an accommodation. The *ghat serangs* continued to control the labour supply and the *serangs* continued to control the men when on board ship. In between, lascars went through the motions of signing articles at a shipping office and agreed to certain nominal rates of pay. Had an individual received all of his monthly pay it would have amounted to between a sixth and a seventh of the European rate.[8]

With this wage disparity, how was it that European shipowners did not immediately turn over to the exclusive use of lascars in the eastern trades? The answer is that there were additional costs involved in their employment. First, there was a tendency towards larger crews, for which the nineteenth century explanation was that they had less physical strength and could not stand the cold.[9] It seems more likely, however, that these larger crews owed more to the eastern tradition of work-sharing[10] and the propensity of *serangs* to pad out a crew with relatives and debtors from his village. Second, a conscientious owner had to provide a diet vastly super-

ior to the pork and peas/beef and duff pattern common in ships crewed by Europeans. The Instructions to Commanders issued by the Bengal authorities in 1814 directed that rice, dal, spices, ghee, onions and garlic be supplied as basic food, with limejuice, tamarinds, melons, carrots preserved in sugar, green vegetables preserved in salt and potatoes in vinegar as supplements. A generous water allowance was recommended, together with salt beef, salt fish, freshly-killed mutton, tea, sugar and coffee.[11] Third, there was, in East India Company ships at least, an allocation of bedding and clothing consisting of two suits and three blankets sewn together to make a kind of sleeping bag, together with shoes, caps and mittens.[12] A European seaman at this period would, as likely as not, go on board with a thin mattress filled with straw, a knife, a pannikin and the clothes he stood up in. Fourth, there was the continuing obligation to return lascars to India: this aspect of their employment proving to be of some concern to successive British governments.

Responsibility for feeding and housing lascars ashore between voyages in Britain was initially vested in the East India Company and from 1795 the Company accommodated lascars in boarding houses of the lowest type in the Kingsland Road area of East London. In 1802, following complaints from the City of London magistrates, the home for lascars was moved to Shoreditch and a physician called Hilton Docker looked after their medical needs.[13] Towards the close of the Napoleonic Wars their numbers increased dramatically so that as many as eleven hundred were in London at any one time and a barracks at Gravesend was allocated for their use. The death-rate was high in winter, and Hilton Docker 'leaked' information to the Asiatic Society which led to a strong letter of protest in *The Times*.[14] The result was a Parliamentary committee of enquiry, which showed that while lascars may have enjoyed a better standard of living afloat they were grossly exploited when ashore.[15]

Members of the committee made an unannounced visit to the Gravesend barracks and found that lascars were sleeping on bare boards with a blanket apiece in buildings that were devoid of furniture and unheated. There were neither hammocks nor *charpoys*[16] for the sick, and salt fish was a constant element in the diet although "fresh fish are so abundant in London as to be the cheapest article of animal food."[17] Four recommendations were made by the committee: that a new establishment be built near the East India Docks with stricter supervision, and that the issue of clothing be recorded so as to check the sale of it by lascars ashore. Men left at the outports should be sent on to London for early return home, while abuses of power by the *serangs* should be dealt with by the Indian admin-

istration. The committee felt "unwilling to dwell upon the abuses incident to this system" but thought it "capable of improvement."[18]

The only legislation extant in Britain was the East India Trade Act of 1814 which outlined a system of bonding whereby owners and masters had the obligation, under a financial penalty, for feeding, clothing and housing lascars while awaiting a ship. Evasion seems to have been anticipated, because section three provided that the East India Company would care for those who slipped through this flimsy welfare net at the expense of the erring owners, if the latter could be traced. It seems evident that bonding was not a great success, because in 1823 the Lascar Act abolished it and made the East India Company again wholly responsible for repatriation. This Act also had some curious discriminatory features. By section twenty one lascars were declared "not to be equal in Strength and Use to Europeans," while section twenty two permitted their recruitment in India for service in British-registered ships when not enough British seamen could be found. Most peculiar of all, they were held not to be British seamen for the purpose of filling the Navigation Act quota in peacetime, but might count as such in times of war.[19] This situation lasted until 1849 when, with the repeal of the Navigation Acts, they were generally acknowledged to be British seamen. However, the Lascar Act of 1823 was not repealed for a hundred and forty years, and it will emerge that their legal minimum standard of accommodation, their contractual position and diet scales lagged considerably when compared to the advances made by white seamen. For example, lascars had to wait until 1933 before they achieved a standard of accommodation granted to British seafarers in 1867.[20]

In the 1840s and 1850s lascars were wholly crewing the diminishing fleet of East Indiamen with about 130 in each vessel.[21] The men were housed in dockside sheds on reaching London, since the former East India Company home for lascars at St. George's in the East had not survived the virtual demise of the Company, and their distress was noted by George Charles Smith, the incumbent at the London Mariner's Church in Wellclose Square. He agitated to such good effect that the Seamen's Hospital Society — concerned about the ravages of scurvy among Indian seamen — and the newspapers, took up the cause.[22] The eventual result was the building of a Stranger's Home for Asiatics, Africans and South Sea Islanders in the West India Dock Road, and the home came into use just as demand for such facilities peaked. There are no official statistics of any kind covering lascar numbers before 1888, and they are not reliable prior to 1891, but Table 1 has an estimate of their proportional representation

in the seagoing work force on British Empire ships between 1821 and 1901, based on hospital admissions.

TABLE 1

ADMISSIONS OF BRITISH EMPIRE SEAMEN TO THE DREADNOUGHT SEAMEN'S HOSPITAL BY DECADES, 1821-1901

Decade	Lascars	UK Seamen	Colonies	Total	Percentage Lascars
1821-30	71	11,437	497	12,005	0.5%
1831-40	422	19,401	667	20,490	2%
1841-50	553	19,848	844	21,245	2.5%
1851-60	1,269	13,225	837	15,331	8%
1861-70	153	11,826	1,099	13,078	1%
1871-80	281	12,295	1,007	13,583	2%
1881-90	430	12,892	527	13,849	3%
1891-00	1,744	17,600	859	20,203	8.5%

Source: Annual Reports of the Seamen's Hospital Society.

It may be seen that in the 1850s lascars probably made up eight percent of the Empire seagoing work force, and two reasons may be advanced for this state of affairs. The Australian gold rush had led to mass desertion in that country, and an Act of 1853 permitted their employment in ships trading there (See Appendix I). Second, the Crimean War and the Indian Mutiny had generally enhanced the demand for seamen. Their numbers fell away in the 1860s, but gradually built up again with the rise of the steam-propelled vessel and the growth of shipping companies such as the Peninsular and Oriental Steam Navigation Company (P & O), Harrisons and the Clan Line. Owners came to appreciate that the supposed disadvantages arising from the employment of lascars in cold climates began to disappear when they were engaged in engine-rooms and stokeholds where tropical heat was the rule rather than the exception. At the same time, the Board of Trade noted that lascar desertions were on the increase, and in 1871 it appointed Lascar Transfer Officers at the major ports to ensure that Indian crews were sent to London, under escort, to await a ship bound for India.[23] Legislation in 1855 (which was repeated in 1894) made it clear that lascars had to go back to India even though they had not initially contracted to do so (See Appendix I).

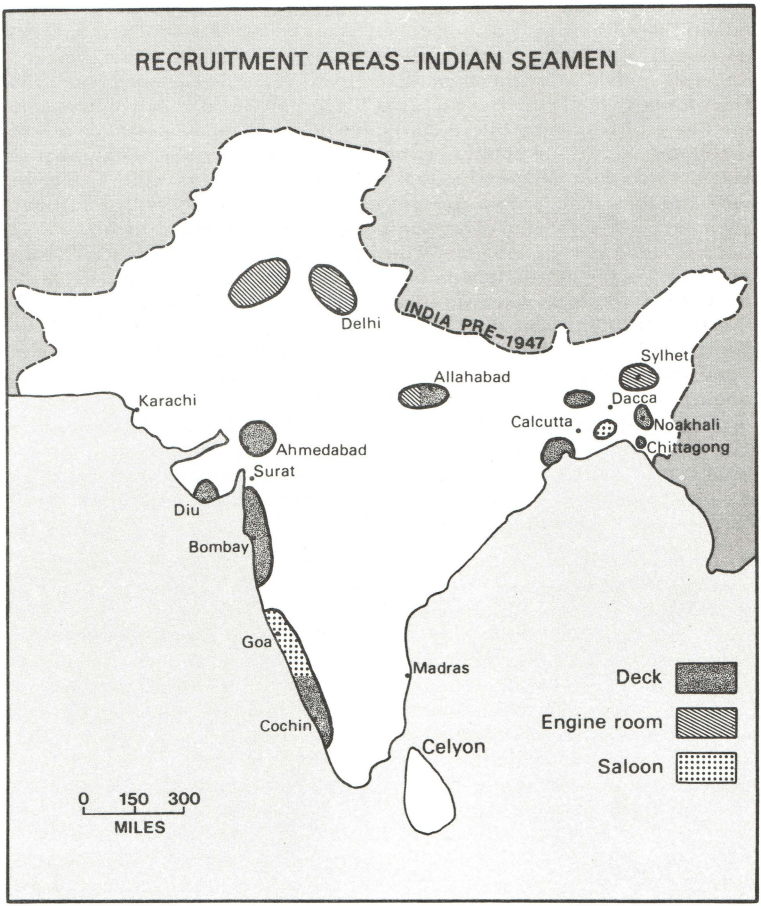
The pattern of lascar employment in steamers now began to emerge. From the stories of travellers to and from India it seems clear that, in general, Pathans and Punjabis worked in the engine-room and stokehold, Goanese and men from Cochin in the saloon, with the deckhands coming mainly from the Malabar coast and East Bengal. The origins of the work force were never established by official enquiry in the imperial period, and the only authoritative document on the point is James Mowat's report of 1949.[24] He obtained his basic information from the Ministry of Commerce, and it is interpreted here in Figure 1. The general picture is that in the Calcutta region the engine-room personnel were mainly from Sylhet, and the deckhands from Noakhali. Bombay recruited deckhands from the Malabar coast, from Ahmedabad and Surat, with the engine-room hands chiefly Pathans and Punjabis and the stewards and catering staff from the coastal strip between Goa and Cochin.

When this pattern of recruitment and employment is compared with that for British seamen, two principal differences may be noted. Religion was not an important factor in job allocation in British-manned vessels, but in the case of lascars the demarcation was that of Muslims in the engine-room, Hindus on deck and Christians in the saloon. Research into the origins of British seamen in the nineteenth century shows that up to about 1880 the overwhelming number came from coastal areas, with an increasing percentage settling in large towns. Less than three percent had rural, inland origins.[25] As may be seen from Figure 1, most lascars lived inland, and were basically agriculturists whose plots remained in cultivation while they were at sea. British seamen tended to be fulltimers whereas, with the exception of the *serangs* and *tindals* who had reasonable hopes of continuous employment, lascars tended to have less regular patterns of employment that were totally responsive to demand for labour and the availability of alternative forms of work. Mowat noted that:

> The number of applicants for employment at sea varies with conditions in agriculture. In 1947, severe cyclones and floods in the Chittagong area did tremendous damage to crops. The immediate consequence was an increase in the number of men from that area seeking employment at sea. These were by no means entirely men who had never been to sea before; many were old hands who had given up the sea for some years and settled down as farmers. One actually produced a continuous discharge certificate which showed he was last discharged from a ship in 1916![26]

When these specific factors of religious demarcation at work, a rural background for the work force and discontinuity of employment are allied

FIGURE 1


RECRUITMENT AREAS-INDIAN SEAMEN
INDIA PRE-1947
Delhi
Allahabad
Karachi
Sylhet
Dacca
Calcutta
Noakhali
Chittagong
Ahmedabad
Surat
Diu
Bombay
Goa
Madras
Cochin
Celyon
Deck
Engine room
Saloon
0 150 300
MILES

to the general Indian problems of illiteracy, language differences[27] and chronic indebtedness, it is not hard to see how the *ghat serangs* maintained their dominant position as suppliers of sea labour. Their success depended on the very minimum of change, and they either blocked attempts at reform or put themselves forward as representatives of the work force. In the 1890s, for example, the Indian Government indicated to the Board of Trade that they would have no objections if crew space was increased. A curious petition, supposedly signed by a large number of lascars, was then delivered to the Secretary of State for India. The basic message was that lascars did not want to have parity with European seamen, but the wording gives rise to the suspicion that the document had been dictated to some *munshi* by the *ghat serangs*. Part of it reads: "To us, poor people, the vessels in which we sail are like palaces...and are ample for our requirements when we compare our own poor hovels on land." At this time, the minimum legal accommodation was six superficial or thirty six cubic feet of living space[28] — about the amount to be found in a good-sized coffin. In 1902, when a Board of Trade enquiry sat to consider, among other items, the working conditions of lascars, the *ghat serangs* arranged that one Khan Bahadur Chichgar — who may fairly be described as the leading Indian crimp of the day — go to London to put the case for the lascars. As the result of some keen bargaining through an English Member of Parliament, Chichgar actually got part of his travelling expenses from the Board of Trade.[29]

Improvement in the lascars' lot ultimately came through unionisation, but in the early years of this century the National Sailors and Firemen's Union under Havelock Wilson was both anti-foreign and anti-lascar. In 1906 Wilson moved that one lascar in every five should be an English speaker, but while section twelve of the 1906 Act duly contained a requirement that seamen had to have "a sufficient knowledge of the English language to understand the necessary orders," Lloyd George saw to it that a codicil was attached to the effect that the requirement did not apply to lascars.[30] Havelock Wilson continued to call for a language test as a means of excluding foreign seamen and lascars down to the First World War, but came to appreciate that as lascars had taken a neutral stance during the 1911 strike, and were virtually a separate element in the labour force because of the continuing contractual obligation to return to India at the end of each voyage, they presented very little real threat to the jobs of British seafarers. There were further spasms of misgiving on the part of the union and the Labour Party in the 1920s and 1930s over the employment of Asian trimmers and stokers in British coasters at intervals,

but anti-lascar feeling faded slowly and the process of unionisation took place almost wholly in India itself.

In 1914, lascar wages were between a third and quarter of British wages,[31] and they did not maintain even this disparity in 1917 when the newly created National Maritime Board raised the British (Able Seaman's) basic pay to £11-10s and gave the master of a twelve thousand-tonner £54 a month.[32] Havelock Wilson had taken advantage of the opportunity offered by the P.C. 5 system[33] during the First World War to seize virtual control of the labour supply, and after the Armistice the Shipping Federation and the National Sailors' and Firemen's Union achieved a *de facto* closed shop situation with the Shipping Federation selecting and training new entrants, and the union signing up those qualified for sea service. In India, lascars were still firmly in the grip of the *ghat serangs,* and as there seemed to be an almost conspiratorial association between the *ghat serangs* and the agents of the British owned and managed shipping companies grouped in shipping conferences, the process of unionisation had a strong nationalist flavour.

The dozen or so seamen's unions formed between the wars had only one conspicuous success — the vigorous strike of 1920 which raised wages between thirty five percent and fifty percent. Split by internal wrangles and weakened by the battle over the leadership fought between moderates and communists, the unions were unable to tackle the corrupt system of recruitment and the International Transport Workers Federation, the International Labour Organization, the Clow Committee of 1922 and the 1929-30 Royal Commission on Labour in India had plenty of ideas, but no teeth. Immediately prior to the outbreak of the Second World War a resolution passed at a Bombay Seamen's Union meeting illustrated the impotence of the unions, and the administration, in the area of recruiting. Part of it reads:

> In view of the acute unemployment prevailing among the crews of the engine-room and deck departments in the Port of Bombay, and in view of the fact that there is no method of recruitment for the employment of seamen, and further in view of the fact that the *ghat serang* recommends the *serang* and the *serang* in turn picks up any seamen he likes, no seaman can secure employment without paying a bribe to the man who recruits him. This meeting, therefore, requests the Government of Bombay and the Government Shipping Master to persuade the shipping companies to evolve a system of recruitment for seamen which will check and completely stop bribery.[34]

Eight years later, James Mowat found that while Indian seamen were "effectively organised", their employment was still characterised by poverty, indebtedness and bribery, with the over-supply of sea labour at the heart of the problem. Low as the wage rates were, they still compared favourably with what could be earned in agriculture, and occasionally employment at sea was eagerly sought. In Calcutta, for example, some 170,000 continuous certificates of discharge had been issued: there were 22,000 jobs.[35] In such circumstances the authorities had to reconcile fair selection with overwhelming demand, and the first attempt to curb the power of the *ghat serangs* to short-circuit fair selection was based on the open muster. This device, copied from the daily recruitment of dockers for work and known as 'on the stones' in London and the 'shape up' in New York, proved to be, in Mowat's words, "unsystematic, cumbersome and wasteful...of the time of the seafarers who attend day after day for months in the hope of finding employment."[36] Moreover, it kept jobseekers tied to the dock area, and thus they tended to be housed in the *lattis* (boarding houses) controlled by the *ghat serangs* and increased their indebtedness.

With Independence, the Indianisation of the shipping fleet proceeded apace, and the recruitment system changed to an amalgam of the British method of joint supply together with rotation of labour. In the mid-1950s employment offices were set up in Bombay and Calcutta (and a little later in Karachi and Chittagong) to supervise rotation and ensure that direct recruitment became the rule.[37] The Indian Merchant Shipping Act of 1958 implemented an hours limitation, set new standards for accommodation and diet and made provision for unemployment pay. In the next decade, International Transport Workers Federation rates of pay were generally adopted, and the opportunities for upward mobility increased. A glance at Appendix II will show that in the imperial era lascars had little opportunity of rising above petty officer level, with only the Butler classed as a ships' officer. The *Dufferin* training scheme of 1927 had not been open to lascars, or the sons of lascars, and the expansion of the Royal Indian Navy in World War Two which had created an Indian officer class afloat for the first time had been both short-lived and narrowly based on recruitment from the educated elite of the country. Training schools for ratings and officers were set up following independence, and the position today is that India, Pakistan and Bangladesh are not only able to crew and officer their own fleets, but export labour to man the new oil-rich Gulf lines, the British merchant service and flag-of-convenience vessels. These Indian seafarers of the 1980s are no longer gangs of villagers chivvied by their *serangs* and shouted at by European officers in *lascari bat.* A recent analysis of manning in Liberian-flag vessels shows that thirty five percent

of the Indian element and twenty four percent of the Pakistan element are officers.[38]

This has necessarily been a cursory survey covering a wide stretch of years, and the aspect that would most seem to require further research is the survival until relatively recently of a corrupt, yet brutally efficient, recruiting system that makes the crimps of Cardiff or Quebec look like bungling amateurs. Warren Hastings' accommodation with the *ghat serangs* in 1783 set in train a kind of *apartheid* in sea employment that neatly paralleled the recruiting process so that rural illiterates, grouped by religious faction, had to accept lower standards, and be denied advancement. Lascars have been commonplace visitors to western seaports for two centuries, yet no everyday account of their lives has been traced. A comprehensive study of this class of worker is overdue: it may soon be too late to obtain first-hand accounts of the life and times of these forgotten seamen.

NOTES

1. Appendix III gives the 1914 figure: enquiry of the General Council for British Shipping in June, 1980, revealed that there were 6300 Indian, Pakistan and Bangladesh seamen among the 75,000 work-force — some 8.5 per cent.

2. By 42 Geo 3 *c* 61. All subsequent references to legislation may be found in Appendix I.

3. As may be seen from the exchange of letters between the East India Company and the Indian Commissioners after the Napoleonic period. *Return of Correspondence between the Commissioners for the Affairs of India and other public relative to the care and maintenance of lascars. Great Britain Parliament, House of Commons, Sessional papers (BPP)* 1816 (279) X, pp. 349-350.

4. India Office Library, London, (IOLL). Home Miscellaneous Correspondence 163, pp. 175-185.

5. The rules were registered at the Supreme Court on 7 July, 1783. IOLL Home Miscellaneous Correspondence 190, pp. 65-103.

6. See Appendix II for titles and job equivalents in respect of lascar crews.

7. This was the case until relatively recently. When James Mowat asked a Punjabi *tindal* in 1947 why he had not been promoted to *serang* the man replied that he could not afford to buy the job. James Mowat *Seafarer's Conditions in India and Pakistan* (International Labour Organization (IOL) Geneva, 1949), p. 19. *(Mowat Report).*

8. A first-class lascar — equivalent to an AB — received, under the Hastings rules, six rupees a month in peacetime and seven in times of war. See IOLL Bengal Public Council Minutes Range Three, Vol. 4, p. 73. British merchant seamen averaged £4-5s a month during the Napoleonic Wars according to the evidence of Robert Gray, a shipowner, to the 1833 Select Committee on Manufactures, Commerce and Shipping. BPP 1833 (690) VI, Minutes of Evidence, pp. 229-230.

9. This point was made many times during the nineteenth century. Joseph Somes, a ship-owner, told the 1844 Select Committee on British Shipping that lascars were thirty per cent less efficient in cold and that three lascars might do the work of two Europeans in northern latitudes. If a ship were detained in the Channel by easterly winds he did "not think they could navigate the ship at all: when the frost takes them they are good for nothing." BPP 1844 (545) VIII, QQ. 618-631.

10. For example, when a ditch is dug in India there are two men to each mattock. One makes the initial stroke and pulls the earth towards him: the other plucks at a rope attached to the handle and returns the mattock for the next stroke.

11. IOLL Marine Miscellaneous Correspondence, 902, pp. 72-74.

12. *Report from the Committee on Lascars and other Asiatic Seamen,* BPP 1814-15 (471) III, p. 217: appendix containing EIC regulations (hereafter *RCLAS 1814-15).*

13. IOLL Marine Miscellaneous Correspondence, 902, p. 116.

14. *The Times,* 9 December 1814.

15. The Committee on Lascars and other Asiatic Seamen. The full reference to their report is at 12 above.

16. Beds consisting of a wooden frame on low legs with string criss-crossed to hold a thin mattress or rug.

17. *RCLAS 1814-15,* p. 221.

18. *RCLAS 1814-15,* p. 217.

19. Section 7 of the Navigation Act of 1660 provided that seventy five per cent of the crew of a British-registered ship must themselves be British. The provision was regularly relaxed in times of war.

20. See Appendix I.

21. *A National Appeal for East India and China Sailors,* p. 223. Public Record Office (PRO), Colonial Office (CO) 77/46.

22. Notably *The Times* and the *Morning Herald.* The most effective contribution appeared in the *Morning Herald* of 28 January, 1842.

23. PRO MT/9 62 M. 79/1871 and M. 7561/1871.

24. Footnote 7.

25. Jonathan Patrick Press, "The Economic and Social Conditions of the Merchant Seamen of England, 1815-45" (Unpublished Ph.D. dissertation, University of Bristol, 1978) p. 21, and research in progress.

26. *Mowat Report,* pp. 9-10.

27. For communication between the races aboard ship, a language called either *lascari bat* or *Bombay bat* evolved. It is a simplified form of Hindi with strengthened imperatives and few verbs.

28. By the 1876 Act — See Appendix I.

29. PRO MT/9 734 M.9811/99 and M.17057/99: MT/9 698 M.11153/01 and M.1019/02.

30. *Report of the Standing Committee on the Merchant Shipping Act Amendment (No. 2) Bill,* BPP 1906 XI. p. 58.

31. See the wages appendices in Dinkar Desai's *Maritime Labour in India* (Bombay, 1940). The average pre-First World War wage for British ABs was £5-10s a month.

32. *Report on the work of the National Maritime Board,* BPP 1920 XXI, pp. 640-675.

33. Form Port Control 5 was a security clearance, and during the First World War it enabled union officials to 'bar' foreign seamen as security risks, and even keep non-union British job applicants out of certain trades.

34. *Bombay Chronicle,* 31 March, 1939.

35. *Mowat Report,* pp. 10, 76 and 8.

36. *Mowat Report,* p. 25.

37. This was a late fulfillment of the concept embodied in Article II of the Seamen's Convention. The ILO Seamen's Conference of 1920 had condemned indirect recruiting and urged that "Each Member which ratifies this convention shall establish a system of free public employment agencies under the control of a central authority."

38. *The Telegraph* (Journal of the Merchant Navy and Airline Officers Association) April 1980, p. 20.

APPENDIX I

Year	Effect of Legislation	Reference
1802	Lascars not to be employed in ships sailing west of the Cape of Good Hope.	42 Geo 3 *c* 61.
1814	Lascars arriving in UK to be bonded, with the owner or master responsible for feeding, clothing and housing them. EIC to care for those slipping through welfare net at expense of carrying ship, if traceable.	54 Geo 3 *c* 134.
1823	Bonding abolished. Stranded lascars to be shipped back at EIC expense. Lascars not British seamen for Navigation Act purposes.	4 Geo 4 *c* 80.
1849	Repeal of Navigation Acts. Lascars presumed to be British seamen for most purposes.	12 & 13 Vic *c* 29, s.8.
1850	British Admiralty to have duty of relieving distressed lascars; cost to be levied on master bringing them to UK, if traceable.	13 & 14 Vic *c* 93, s.64
1850	Minimum accommodation for lascars fixed at four superficial feet. If accommodated in a t'gallant fo'c-sle a minimum of four feet, six inches headroom.	India Act XXVIII, s.38.
1853	Shortage of seamen in Australia due to gold discoveries, and lascars may serve there.	16 & 17 Vic *c* 131, s.40.
1854	£30 fine for leaving lascars stranded in UK.	17 & 18 Vic *c* 120, s.16.
1855	EIC remains responsible for repatriation. Lascars engaged in India are deemed to have signed a further agreement for the return voyage on arrival in the UK.	18 & 19 Vic *c* 91, ss. 22 and 23.
1859	Monetary compensation for bad provisions — three annas daily for Europeans; one anna for lascars.	India Act I, s.66.
1875	Accommodation: Europeans nine superficial or fifty four cubic feet, lascars four superficial feet and four feet, six inches headroom in a t'gallant fo'c'sle.	India Act IV, s.70.
1876	Accommodation increased. Europeans to have ten superficial or sixty cubic feet: lascars six superficial or thirty six cubic feet.	India Act XIII, s.9.
1894	Lascars deemed to have signed a return agreement on arrival in UK despite refusal.	57 & 58 Vic *c* 60, s.125.
1906	Statutory food scale not to apply to lascars: increase in crew space also inapplicable.	6 Edw 7 *c* 48, ss.25 and 64.
1931	Minimum employment age fourteen years except where crew all belong to one family.	India Act IX, s.4.

1933	Accommodation minimum for lascars raised to twelve superficial or seventy two cubic feet. (Same as granted to British seamen in 1867 by 30 & 31 Vic *c* 124, s.9.)	India Act XXV, s.4.
1958	Indian Merchant Shipping Act limits hours of work, establishes principle of continuous employment and gives rights to unemployment pay.	
1963	Lascar Act of 1823 repealed.	

APPENDIX II

RANKS ABOARD SHIP

	British	Lascars
(a) Deck		
	Bosun	Serang
	Bosun's Mate	Tindal
	Quartermaster	Seacunny
	Carpenter	Mistree
	Lamptrimmer	Kussab
	Able Seaman	First Class Lascar
	Ordinary Seaman	Second Class Lascar
(b) Engine-room		
	Donkeyman	Serang[1]
	—	Tindal[2]
	Apprentice	Topas
(c) Saloon		
	Second Steward	Butler[3]
(d) Catering		
	Cook	Bhandary

[1]In larger vessels, such as those of P & O, there was a European Donkeyman and the Serang was a separate, but equal, petty officer.

[2]No equivalent. The Storekeeper, who would normally be next in line to the Donkeyman, was invariably a European. The Tindal usually controlled the dayworkers and stood his watch with the Chief Engineer from 0800 to noon and 2000 to midnight.

[3]In smaller vessels, such as those of the Strick Line, the Butler was also Chief Steward. He had the same rights of engagement, and control, over the Stewards as the Serangs had in their departments.

APPENDIX III

SEAMEN EMPLOYED ON MERCHANT SHIPS REGISTERED IN THE UNITED KINGDOM AND DIFFERENTIATED BY ETHNIC ORIGIN, 1891-1914

Year	Total	British	Foreign	Lascars	Percentage Lascars
1891	240,480	186,176	30,267	24,037	10%
1892	241,735	185,437	30,899	25,399	10.5%
1893	240,974	186,628	29,549	24,797	10%
1894	240,458	183,233	31,050	26,175	11%
1895	240,486	180,074	32,235	28,077	12%
1896	242,039	178,994	33,046	29,999	12.5%
1897	240,931	175,549	33,898	31,484	13%
1898	242,553	174,980	35,308	32,265	13.5%
1899	244,135	174,266	36,064	33,805	14%
1900	247,448	174,532	36,893	36,023	14.5%
1901	247,973	172,912	37,630	37,431	15%
1902	253,540	174,538	39,825	39,177	15.5%
1903	257,937	176,520	40,396	41,021	16%
1904	259,489	176,975	39,832	42,682	16.5%
1905	263,686	180,492	39,711	43,483	16.5%
1906	270,791	183,340	38,084	44,367	16.5%
1907	277,146	194,848	37,694	44,604	16%
1908	275,721	196,834	34,735	44,152	16%
1909	274,307	198,474	31,873	43,960	16%
1910	276,306	201,910	30,462	43,934	16%
1911	281,300	205,065	30,783	45,452	16%
1912	286,806	208,635	30,960	47,211	16.5%
1913	292,057	212,570	32,639	46,848	16%
1914	295,652	212,640	31,396	51,616	17.5%

Source: *BPP Annual Statements of Trade and Navigation.*

12. DISCUSSION FOLLOWING PAPERS BY OMMER, BATTICK & DIXON

PALMER suggested that cyclones in the Chittagong area and push factors in the Shetlands are different expressions of the same phenomenon because both resulted in service on shipboard being used as an alternative to emigration or complete transfer of residence.

DIXON thought the parallel an apt one but felt that, whereas West Europeans somewhat reluctantly used seafaring as a residual occupation, in India, Taiwan and the Philippines it is now the third most important occupation. He suggested that the pull effect is stronger than the push for Asian seamen.

JONES wondered whether there were Lascar officers before the modern period. Were they not mainly stewards and engine room personnel?

DIXON noted that on deck the highest Lascar rank was *serang* (bo'sun) or *tindal* (bo'sun's mate). In the engine room it was petty officer *serang*. Only as a steward could a Lascar reach the top post. They were chief stewards on certain ships of the smaller lines.

JONES stated that, in 1896, petty officer Lascars comprised 13.5 percent of British seamen.

DIXON explained that in ships manned by Lascars, European officers do not give direct orders to these Lascars, but use an intermediary in the *serang* or *tindal*. There would be a *tindal* on each watch for example and in the engine room there would be a *serang*, a first *tindal* and two others. Hence the higher percentage of petty officers.

JONES noted that, in 1896, Lascars constituted 29.4 percent of the engineer and purser occupations among British crews.

WILLIAMS had three questions. (1) In what trades were Lascars employed and how did this pattern change over time? (2) Since Lascar employment was linked to London and the East India Company initially, how soon did private operators from other ports use Lascars once the East India trades were thrown open? (3) To what degree were ships overmanned when crewed by Lascars? At 130 per vessel, the over-manning during the 1830s and 1840s appears to be marked.

DIXON replied that many nineteenth century vessel owners accepted a ratio of three Lascars to two Europeans. A prejudice existed against Lascars, who were considered inferior seamen in northern waters although European seamen were not considered inferior to Lascars in tropical waters. He stressed that at the Indian end of a voyage the *ghat serangs* and *serangs* insisted upon large complements of crew. Then

too, general servants would make up about half of a crew of 130. The overwhelming number of Lascars were in the trades from the Indian Ocean to the United Kingdom. They were not employed in the Atlantic trades.

FINGARD pointed out that since Lascars had to be sent back to India, their articles must have dealt with this situation. By contrast, the seafarers of Saint John and Quebec were discouraged from entering overseas trade because their articles made it possible for them to be stranded in Britain. British vessel owners would not discharge Canadians and others in Canadian ports. They were discharged in Britain and could not ship back because of a glutted labour market.

DIXON responded that Victorian society was indifferent to stranded seamen starving on the streets but saw Asiatics in the context of the overseas missionary effort. He believed that Asiatics were conspicious whereas Canadians were not.

PARKER, noting that Lascars on cargo liners had appeared in Boston and Halifax during the dead of winter, asked if their articles provided protection for them in these conditions.

DIXON observed that, throughout the nineteenth century, responsible owners supplied Lascars with protective clothing. However, in North America they seldom got ashore or were closely supervised while there, thereby keeping desertions to a minimum. Similarly, in San Francisco, local authorities were reluctant to allow Chinese seamen to wander about and get settled.

CRAIG explained that Lascars were employed on vessels carrying jute, for grain sacks, to the United States. After the repeal of the East India Company monopoly, there were still the typical trades from India to Europe, Australia and elsewhere. Lines such as the Clan, the Gulf and the Peninsular and Orient, employed Lascars. They were used in transporting coolies from Asia as well as in the pilgrim traffic to Mecca and British vessel owners made fortunes in both these trades.

DIXON believed that the last British pilgrim ship sailed from Djibouti to Genoa in 1958. He clarified a previous point by saying that Lascars were not involved in the trades from Britain to North America but were in voyages from the Far East.

CRAIG reiterated that few got ashore, like Russians in fishing ports or American ports today. He asked OMMER if the use of 'entries' meant entrances of ships into port, noting that there are always discrepancies between the entrances and clearances of a port because these statistics give tonnages for ships arriving and clearing with cargo and not in ballast. As the nineteenth century went on, more ships cleared from Britain with cargo. These clearance figures should

be used because seamen were recruited when ships cleared. He explained that vessels arrived at certain British ports with cargo but cleared from different ones. Arrivals were more likely to be at London and Liverpool whereas in the coal trade clearances were mainly from Tyne, Cardiff, Newport, Swansea and Barrie. Between British ports, vessels sailed in ballast. In such cases the clearance figure would provide the significant variable.

OMMER stressed that in her analysis she was working with entrances and clearances as given in the crew lists, which give all entrances and clearances regardless of whether the vessel was sailing with cargo or in ballast.

CRAIG thought it was necessary to assume that place of birth was a good indication of residence. He pointed out that increasingly through the nineteenth century sailors clustered at major ports where clearances were made and seamen recruited. Tiger Bay, Cardiff provides the paradigm case with its population of Lascars, Arabs, West Indians, West Africans and Chinese.

OMMER responded that it would be necessary to get at documents which provide the actual residence of seamen.

BROOKES wondered whether the proportion of Windsor men on Windsor vessels increased during the period.

OMMER stated that while the absolute numbers of Windsor men decreased, the proportion of Windsor men among the crew increased relative to the population base of Windsor itself and to the number of entrances into Windsor. The ranking of Windsor men in the Index moved from second highest in the 1860s to first place in the 1870s, 1880s and 1890s. This is a statistical statement and has meaning only relative to the other rankings shown in the tables.

BROOKES queried the consideration of links to the land base when it was not possible to say how many Windsor men were shipping on Halifax and Yarmouth vessels. Could the case be applied to Saint John as well?

OMMER pointed out that the results were based on Windsor-registered vessels only and were restricted accordingly, but she suggested that information from the Yarmouth, Saint John and Halifax files could be pooled and the Index then applied to all these ports, since population increases are built into the Index. What could be concluded was that there was relatively more employment of local men than could have been expected from the absolute figures. But she felt that it was dangerous to talk about the actual cash return into the area. She wondered, however, if emigration increased as the fleet declined and suggested that it might be possible to identify individual emigrants

from the nominal censuses and find out if some of them had been seamen, using the Windsor file on crew. She suggested that once the Index had been refined, it could be more widely applied.

THORNTON asked why, in the study of Belfast-Searsport, BATTICK took from the census only those people with maritime occupations. By leaving out the rest it was not possible to discover whether there were seamen moving into land occupations or emigrating from the community.

BATTICK replied that when names disappeared from the census, it was not clear whether they had moved or had died. Death dates were a particular problem for intercensal periods. Therefore, at this stage of the analysis, only seafarers and shipowners were extracted.

KNOPPERS noted that some of the master mariners were quite old. He wondered whether it was possible to differentiate among sailors and master mariners in active service and those who were still using an occupational designation of twenty or thirty years previous.

BATTICK explained that in the United States there were no crew lists. The captain of a ship kept the articles. There is no simple way to determine the actual occupations beyond those listed in the census.

KNOPPERS pointed out that the Philadelphia Social History Project had a marine component and suggested that there might be useful sources of information among their data.

PARKER asked whether the National Archives held articles of agreement for the Belfast-Searsport vessels.

BATTICK replied that he had checked the registry lists that had been published.

13. CLASS STRUGGLE AND MERCANTILE CAPITALISM: CRAFTSMEN AND LABOURERS ON THE HALIFAX WATERFRONT, 1850-1902

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CLASS STRUGGLE AND MERCANTILE CAPITALISM: CRAFTSMEN AND LABOURERS ON THE HALIFAX WATERFRONT, 1850-1902[1]

Ian McKay

Two slowly evolving structures defined the world of the waterfront worker in the second half of the nineteenth century. The most fundamental of these was the casual labour market which provoked internal division among longshoremen (or, as they were sometimes called, 'ship labourers') and reduced them to the unenviable position of the poorest and least secure of the nineteenth century working class.[2] Since general ports were competitive with one another and were related to the general world of North Atlantic trade rather than to any internal division of labour, the employers of the waterfront had no reason to combine in regional or national federations to fix wages or prices; nor did the longshoremen, whose collective capacity to act was nullified by casualism in any case.[3] The structure of casualism was slowly evolving, however, and by the twentieth century a largely state sponsored system of national ports encouraged longshoremen in various centres to join in common struggles. The second structure, which affected both the craftsmen and labourers of the waterfront, was that of shipping itself. It is a commonplace of nineteenth century maritime historiography that the triumph of steam was inevitable in the fourth quarter of the nineteenth century because of such innovations as improved combustion engines and significant advances in the quality of steel.[4] There is no doubt that the steam vessel came to dominate the trade of the port of Halifax in the 1890s and was an integral part of its waterfront even in the 1880s.[5] But what have been less frequently noted are the changes effected by this transition within the realm of waterfront labour. The transition from sail to steam eased into obsolescence those skilled craftsmen — shipwrights, caulkers, sailmakers and coopers — who had been central figures in the earlier economy, and elevated in their stead the new industrial craftsmen of the twentieth century shipyards — boilermakers, machinists and marine mechanics. It also transformed longshore labour by placing a premium on the quick turn around of vessels in port, a structural necessity of the new economy which placed new bargaining power in the hands of longshoremen, whose strikes now could affect the shipping companies quickly and drastically.[6] These structures were interlocked and the struggles of the waterfront workers took place within the specific context of their

combined development and mutual interaction. No local worker, nor any local capitalists for that matter, could affect the general structure of shipping and consequently much of the history of waterfront labour in Halifax was determined by circumstances beyond local control. But what must be remembered is that before such structures can enter history they must become the objects of conscious practice and that the class struggle, limited as it is by the objective constraints of the conjuncture, is never entirely reducible to it.[7] Nowhere else do we see so clearly that men make their own history, although not on conditions of their own choosing.

The class struggle on the Halifax waterfront is an integral part of the history of the city and deserves to be remembered, if only as a protest against the selective amnesia of Halifax historians who never take the time to understand specific histories of trades and industries, but only notice the vague blur of mobs and masses which occasionally impinged on the attention of the political élite.[8] A clear understanding of the labour movement in the period of mercantile capitalism is also essential for the understanding of the labour history of the Maritime provinces, whose longshoremen and shipbuilders made up a large portion of the wage earning class. But the consequences of such an approach actually go beyond local considerations. The accepted theories of the artisan and the 'labour aristocracy', which American and British historians have found useful as general explanations of labour movements, do not explain the evolution of these working class groups. Nor does the history of waterfront labour allow us to accept the overwhelming emphasis placed on the degradation of the workplace under monopoly capitalism which we find in both sociological and historical writing, since the waterfront evolved in a way which eliminated some craftsmen but created many more and which slowly but inexorably improved the position of longshoremen. The history of labour on the Halifax waterfront raises many questions pertaining to local working class movements, but it has a bearing on more general theories as well.

What follows is in two parts. In the first, the position of the longshoremen from the mid nineteenth century to 1902 will be discussed, noting in particular the effects of steam technology. In the second, the waterfront crafts which slowly succumbed to obsolescence after dominating the skilled work force of the waterfront will be considered. A concluding section will discuss these two histories as they reflect the history of the Halifax working class and as they shed light on more general questions of class consciousness and class formation.

The early longshoremen's movements were spasmodic:

> The history of the Labour Movement on the waterfront of the Port of Halifax would make interesting reading. Its earlier record has been a succession of failures. The workmen realizing the necessity of banding together for the common good, would form a union, and a large amount of enthusiasm would be generated, the men crowding into line, and for a time everything would go along successfully, but the reaction would set in and the membership gradually dwindle away again.[9]

How can this recurrent cycle of failure and defeat be explained? Longshoremen in other Canadian ports enjoyed a good deal of power in the mid nineteenth century. In Quebec, the ship labourers possessed one of the strongest unions in the country; they controlled hiring and firing and enjoyed the highest longshore rates in the country.[10] An equally impressive record was that of the Saint John ship labourers who organized one of the largest unions of the unskilled on the continent.[11] In both these cases the primary export — timber — involved heavy labour on a bulky staple, requiring a great degree of team work during a fairly short season. In more differentiated ports, longshore unions were far weaker.[12] Furthermore, as Judith Fingard has shown, in both timber ports local timber merchants refused to assume the responsibility for delivering the cargo to the sailing vessels.

> They thereby avoided considerable risks but by the same token they lost the chance to become influential in the ship labouring market by employing directly the boat crews and stevedoring gangs who delivered the timber and loaded the ships.[13]

This explains the strategic importance of the batteau-men in Quebec and the scowmen of Saint John who brought the timber to the vessels and loaded them and who, when allied with the ship labourers, could bring the port to a standstill.

The history of Halifax followed an entirely different path. The drying of fish and its packaging in barrels by the process of screwing, along with the subsequent loading of schooners, were activities which were neither as highly seasonal nor collective. The same was true of the labouring jobs associated with Halifax's rôle as an entrepôt of the province. Along the waterfront one therefore found a bewildering confusion of transient and permanent employees, small bosses and master stevedores, often men who slipped from one category to another, or in and out of longshore

labour altogether. There is no safe way of estimating the size, composition, average earnings or average length of employment of this crucial group. The most important single element in the working class, the one whose withdrawal of labour might shut the port down, is ironically the least visible. Nonetheless the nineteenth century press leaves us with enough details out of which a few reasonable inferences may be drawn.

Longshoremen in the nineteenth century generally worked under stevedores, who stood as middlemen between the merchant and longshoremen.[14] Some stevedores were permanently stationed on specific wharves; others managed several wharves and might specialize in various kinds of loading operations.[15] Every wharf had some permanent employees, but by the 1880s the discharging of vessels was dominated by casual labour. Cunard's Wharf employed clerks, a wharfinger, a time-keeper, a storekeeper, truckmen, cargo checkers and forty two permanent hands. When a steamer came into port, between two hundred and five hundred men could be employed while the steamer was loading and discharging.[16]

This distinction between casual and permanent employees was crucial. Permanent employees were steadily employed all the year round, six days a week. Casual employees were employed an average of four and a half to five days a week with drastic seasonal fluctuations. Permanent employees could expect a nine or ten hour day; casual employees might have to work a twenty hour day and then face a week of no work at all. Permanent employees were paid by the week, casual labourers by the hour or by the day.[17]

Casual labour on the waterfront was the last resort of all Halifax workers who were temporarily out of a job. As Andrew McAnish, painter, testified in 1888, unemployed painters found work in the idle season "on the wharves and at steamers, driving cabs and trucks and doing anything they can get to do."[18] Another painter, who thought that skilled workers did not in fact seek employment on the docks, argued against himself when he said that "the labouring classes (on the docks) have an opinion, and they would not like to infringe upon them and consequently they keep from doing it."[19] An even more potent threat to the casual dock labourer lay in the masses of idle crewmen from fishing schooners who congregated in Halifax during the winter. 'Foreigners' from the laid-up schooners took twice as long to do the work of the 'skilled' longshoremen, one man noted, but in fact this invasion of the waterfront was an accepted seasonal fact.[20]

In marked contrast to the twentieth century waterfront, with its clear demarcation of fish-handlers, stevedores and longshoremen, and coal-

handlers, the nineteenth century longshoreman was something of a jack-of-all-trades. Most casual labourers on the waterfront depended on fish-drying and fish-screwing. This meant that such labourers were dependent on the weather: a rainy day ruled them out.[21] This gave rise to a long-standing dispute between the labourers and their employers (often, in this case, master coopers). If the morning began with rain, the master coopers would pay the men for only that portion of the day worked: one quarter, one half, or three quarters. As early as 1856 this practice was fiercely contested. In a police court case of that year, George Chute (identified only as a 'labourer') charged a merchant with assaulting him "because he would not go to work on Monday morning to screw fish." The defence maintained that Chute was one of a "gang of rowdies who tried to get a whole day's wages for three quarters of a day." One witness who worked in the fish store complained that two labourers, including Chute, had interfered with him and would not let him work "unless we made a day." They advised him to strike for wages, whereupon he informed the Master, who came down to the shop to find his employees in an uproar. He threw Chute out of his store for his impertinence and the court concurred in the merchant's action. This practice was evidently not changed from 1856 to 1884, since it was one of the most important issues of the 1884 longshoremen's strike.[22]

Because of the unsteadiness of their work, many casual labourers turned to other marginal occupations, a tendency which naturally militated against a collective response to common problems. A pawnbroker, for example, served on the executive of the first longshoremen's union in the 1870s.[23] These were the most oppressed workers in the city. Labourers in 1878 were paid only eighty cents a day, on the few days a week they worked. Their children worked on the waterfront for fifty or sixty cents a day and these wages were cut in winter. They were said to live in "attics and the cheapest sort of way" and were forced to allow their children to walk through the streets barefooted.[24] As one report noted,

> No man who depends upon labouring work, or its incidental occupations, stevedoring, loading and unloading vessels, etc., can hope to become a settled and in time a progressive member of the community, because he has no regular work, and of course there must be a tendency to shiftlessness and lack of interest.[25]

Even the elementary unity which might have emerged from a collective hiring location was impossible in Halifax where, in marked contrast with Saint John, the workers did not congregate together in gangs.[26]

It is not difficult to understand why this structured casualism, so destructive of working class unity on all levels, proved to be such a stumbling block for trade unionists. The unskilled labour market and the waterfront in general offered no nodal points which might serve as the core of a union.[27] In fact, in both Saint John and Halifax, the unions of the unskilled on the waterfront tended to divide on occupational and ethnic lines.[28] Attempts were made as early as 1854 to organize for a wage increase on the waterfront, which led some Halifax newspapers to speak excitedly about the Lynch Law in Halifax and the need for the government to put down such agitations with force of arms.[29] In the mid 1860s the longshoremen were sufficiently well organized to circulate a handbill petitioning for a wage increase because of the high cost of provisions. This strike was evidently centred on the permanent labourers, since one newspaper expressed fears least it spread to the 'day labourers', by which term they presumably meant the casual employees.[30]

The first concerted effort to form a labourers' union "for mutual protection" occurred in 1873 but this organization disappeared.[31] Further signs of activity were evident in 1880 when some 'wharf labourers' went on strike for $1.25 a day and won a rate of twenty cents an hour for unloading steamers.[32]

In the 1880s the longshoremen responded to the new logic of steam and steel and new ideas of organizing the unskilled. The steamer arrived in Halifax before any attempt had been made to change loading or unloading techniques by using the steam winch or the donkey engine.[33] It also arrived in a highly competitive situation because owners had to recoup some of the capital invested in the new technology by achieving new speed. Consequently the long and expensive stop-over in port became something to be avoided at all costs. Longshoremen had to work around the clock so that the steamer could be loaded on time. A whole new class of coal handlers was created whose feverish labour enabled the steamers to get out of port quickly.[34] This new situation was profoundly ambiguous in its initial phases. As Gareth Stedan Jones suggests, the initial consequence was probably the intensification of casualism because of the sudden requirement for masses of men to be available at a moment's notice.[35] Over the long term, however, the transition to steam made effective trade unionism a genuine possibility, since it alone could create a sudden scarcity of labour in ports which did not have this structural trait.

This explains why it was in the 1880s that the longshoremen for the first time built a strong union. The Halifax Labourers' Union was founded on 13 April 1882 and united casual and permanent labourers into a well

organized body. It provided a fund from which its members could receive assistance and urged the necessity of a "uniform price for labour, per day and by the hour," for discharging and loading vessels and for other labour.[36] Perhaps reflecting the tensions incumbent in any mass union in the nineteenth century, a meeting in June disallowed any discussion of sectarian and political matters and called for the removal of officers who pledged the society to any sectarian or political cause. After three months in existence the union had 325 members.[37] It had an eight-man executive and a twelve-man council.[38] Fees and dues were paid quarterly.[39] Although benefits were in theory restricted to members of one year's standing, this rule was stretched to allow members in the first year to collect benefit money.[40] This was Halifax's first large scale union. By 1883 it had 518 members and had worked to give them a sense of solidarity and pride. There were marches through the street with a fife and drum corps and picnics to McNab's Island and an important new cohesiveness between men who worked on the wharves and in the stores and those who worked on vessels.[41]

Sensing a new mood among their employees, the merchants of Halifax offered their permanent employees a reduction in hours, from twelve hours to eleven.[42] But the same day this offer was made the longshoremen were crowding into Hope Hall to listen to speeches denouncing the high cost of living and the poverty and misery of the waterfront workers. Most important, the men on the vessels and steamships agreed to stand behind those who worked on the shore.[43] On May 6, 1884, a most important notice was published advising the "Merchants, Stevedores, and Other Employers of Transient Labor in the City of Halifax," that henceforth labourers were to be paid $1.50 per day for store work, seventy five cents for a half day, and twenty cents per hour for work after 5 p.m. There were to be no more quarter or three quarter days, a break with the custom of a quarter century at least, and Sunday work was to be paid at fifty cents an hour. Stevedore work was to be paid $2.00 per day on sailing vessels and by the hour and at the rate of twenty five cents on steamships, barges, lighters and tug-boats. All Sunday work was to get fifty cents per hour and again quarter and three quarter days were outlawed.[44]

The union's leader, John A. Mackasey, was a renegade commission merchant who seems to have been primarily interested in weaning the longshoremen from drink. He nonetheless managed to point out the larger social ramifications of this strike when he noted that the longshoremen were merely following the example set by Halifax's merchants. The longshoremen's desire for a better life, he argued, "has been taught them by the merchants themselves. The merchants of twenty years ago, mostly

lived over their stores. Now they live in palaces on the banks of the North West Arm." The workingmen of the city would never submit to having the city built up at their expense, he warned.[45]

These actions and this rhetoric seem tame by twentieth century standards. In nineteenth century Halifax they were unprecedented. No strike in Halifax had arrayed such large groups against each other before. On the one side there was the Chamber of Commerce, which held an emergency session to debate the demands of the men. Here A.G. Jones argued that Halifax would lose its trade to Lunenburg should the demands of the men be granted and W.C. Silver, one of the city's wealthiest men, expressed the view that only one out of twenty merchants made a bare living. There were threats as well. Jones suggested that in the past merchants had dried their own fish in order to supply work for the labourers, but if the cost was increased, "the merchants would have to make the fishermen dry their own fish."[46] It was this new, fighting spirit among the merchants which made one of the chamber's critics wonder, "What was the meeting itself but a union against a union?"[47] Against this newly unified class of employers was arrayed the city's first mass union. Here new methods were adopted for dealing with such large numbers. From the first an effort was put into making badges to identify members, which were marked with 'L.U.' for 'Labourers' Union,' along with the membership number as recorded in the union's books. Mackasey placed almost religious faith in the efficacy of these badges to bring order into the chaotic world of waterfront labour.[48] The reason for the badges was clear: only such designation could enable one member to recognize another and thus avoid strike breaking. Nothing indicates more clearly how different this waterfront sector was from the skilled trades which made up the rest of Halifax's unions.

The strike began on 12 May, a rainy day on which little could be done in any case. No steamers were in port. Many of the smaller stevedores granted the increase. The crucial test came when the first steamer came into port, the *Caspian* on 16 May. The union passed it: all two hundred men employed on the *Caspian* were paid the advanced rate.[49] Master coopers on the waterfront now gave way and paid their labourers a full day's wage for three quarter day's work.[50] Men employed coaling the steamer *Faraday* earned the high wage of fifty cents an hour; some cleared ten dollars each by working a twenty hour day.[51]

Victory lasted for all of two weeks. By May 27, merchants were planning to employ regular hands in drying fish instead of casual labour. Some employers were also insisting on removal of the badges as a condition of going to work. The return of fine fish drying weather

precipitated a crisis and the union, successful on the vessels, met defeat on the shore.[52] By 9 July, Hart's, Mitchell's, Butler's and Boak's wharves were all reported to be employing non-union men exclusively.[53] The union was forced to pass a resolution allowing union men to deliver to non-union men on the shore, provided that all gangs were "on one side and the other."[53] These defeats paved the way for the biggest defeat of them all, in January 1885. When the *S.S. Newcastle City* was docked at Pickford and Black's, it was not unloaded by the usual labourers, who stood about demanding the union rate of twenty five cents an hour. Instead, unemployed schooner men had taken the work away from the Halifax labourers.[54] By 1886 casual labourers were accepting twenty cents an hour for steamer work (five cents less than the 1884 demand).[55]

The Labourers' Union survived these defeats, maintained its cohesiveness and even supplemented its constitutional structure with an ornate system of ward representation.[56] But it did not strike again for the rights of the longshoremen. The sporadic strikes of the 1890s were without union backing. The reasons for this decline obviously reside in the union's understandable failure to control hiring. Since the waterfront was classically the *locus* of strike breaking, control over hiring was an essential feature of any successful longshoremen's unionism. It was a goal that would require more than John A. Mackasey's ingenious badges.

In the late 1890s the longshoremen reorganized as the Port Workers Union of Halifax and made a concerted attempt to consolidate their position. In February 1900 the longshoremen refused *en masse* to work a mail steamer on Sunday unless the steamship companies guaranteed their fines for working on the Sabbath.[57] By 1901 two locals of the International Longshoremen's Association had been formed. On 2 April the longshoremen went on strike for a twelve point programme, which included such demands as the exclusive employment of union labour, where possible, recognised holidays, a day scale of twenty five cents and a night scale of thirty cents an hour. They settled for twenty cents and twenty five cents, after a successful mediation by Mackenzie King. Their union was effectively broken in this struggle.[58]

The same cycle of failure had returned, despite the intervention of an international union and impressive support from a united Halifax labour movement.[59] There was no mystery to this failure. Once again the inability of the men to control the labour market meant that they faced the threat of submission or replacement. As James Hall, manager of the Furness-Withy line of steamers, remarked,

> There are thousands of men all along the coasts of Nova Scotia and Newfoundland seeking work. And they will only be too glad to come to Halifax and get work at twenty cents an hour.[60]

The logic of the union's demand for exclusive hiring lay precisely here as well: the building of a union could not occur in a context of casualism.

This was the last of the spasmodic strikes on the style of the nineteenth century. It took the longshoremen only five more years to achieve the *sine qua non* of effective waterfront unionism: the closed shop. In 1905 the longshoremen promoted a measure which cut out one principal method of strike breaking, the employment of the crews of vessels. City Council passed it without discussion.[61] By 1907, in the context of the Laurier boom and consequent labour scarcities,[62] the longshoremen were able to achieve security for their union and gradually eliminated the endemic casualism which had so damaged them in the nineteenth century.[63] Their history after 1907 is in marked contrast to their ineffectiveness in the nineteenth century. John Joy, leader of the Halifax longshoremen, became the first major labour politician in the city and the father of workmen's compensation in Nova Scotia, as well as vice president of the Trades and Labour Congress of Canada. The longshoremen ceased being the lowest of the working class and assumed their natural position as leaders of the Halifax working class movement. In the context of steam technology and a federally-sponsored port redevelopment the longshoremen had finally been able to convert labour scarcity into effective trade unionism.

II

The history of the skilled workers on the waterfront stands in stark contrast to that of the longshoremen. These craftsmen confronted capitalism not as a direct technological threat, nor as something which they could eventually master and control, but as an external structure, causing obsolescence, whose imposition they could not resist. In a world of diminishing possibilities aggressive trade unionism would only accelerate their downfall. Journeymen in these obsolescent crafts could either move to other areas, or to other crafts and occupations.[64] When they left their craft, they knew their sons would not replace them. This was not a situation conducive to a militant craft unionism on the model proposed by labour historians for other crafts in the nineteenth century.[65] To what allies could they appeal in their struggles against obsolescence? They could oppose the details and the day-to-day infringements, but there was nothing they could do about the structure of the shipping industry whose evolution was making them irrelevant. Gregory S. Kealey has shown that the Coopers International Union was acutely aware of the fate of obsolescence which had overtaken the ship caulkers and the ship carpenters.[66] It is merely to note the obvious to say that there was nothing

individual craft unions could do to change the massive structural change of the international shipping economy, on whose periphery the Halifax craftsmen worked. Moreover, the Halifax crafts faced competition from the country because theirs was not a scarce skill. The labour scarcity on which all craft unionism was based could only be defended in this case through harshly exclusivist strategies by which rural craftsmen could be kept from diluting the labour market. Merchant capitalism was undermining the traditional waterfront crafts both through obsolescence and through dilution.

Each of these crafts represented a body of genuine skills which took time to learn and which in the traditional economy had been protected by apprenticeship. The shipwrights and caulkers of Halifax and Dartmouth were principally concerned with ship repair ('old work') and not ship construction ('new work'). Wooden vessels required repairs frequently and Halifax with its commodious harbour and its proximity to major shipping lanes was a logical location for ship repairing. Although there were three separate crafts practised by the Halifax shipwrights and caulkers — ship carpentry, ship building and caulking — the port was not large enough to sustain these distinctions in the same way that one found in London. Most shipwrights could perform caulking and most caulkers were good shipwrights. Theoretically, the ship carpenter or joiner was responsible for the internal cabin fixtures and did everything a carpenter might do on land; the shipwright built the hull of the vessel.[67] The distinction in Halifax was drawn between those who worked with wood which needed caulking (the shipwrights) and those who worked with wood that did not (the ship carpenters and ship joiners).

The shipwrights and caulkers played an essential role in the urban economy. In the early nineteenth century a fair volume of shipbuilding was carried out in the area, especially in Dartmouth. The most noteworthy development was the building of the Chebucto Marine Railway at the Marine Slip, which from 1860 had been a major centre for ship repair in the port. In Halifax shipbuilding was carried out at Richmond, where Ebenezer Moseley had his shipyard in the 1840s and W.A. Miller his in the 1850s. This yard was taken over by David McPherson, undoubtedly the city's best known shipbuilder. Both the Dartmouth and Halifax locations of the modern shipyards were once used for wooden shipbuilding.[68] After the middle decades of the nineteenth century, the city's few natural advantages for wooden shipbuilding were outweighed by the cost of importing timber from the Musquodoboit Valley and as the century progressed the shipwrights and caulkers did more and more old work — a thoroughly characteristic pattern of retreat for all the old waterfront crafts.

Although it involved tasks which seem to the modern mind surpassingly difficult and demanding, the craft of the shipwright was widely diffused throughout rural Nova Scotia. The work of ship repair as carried out in Halifax, while it does not seize the imagination in the same way as the construction of new vessels, probably demanded just as much skill. Working often in ships careened at a forty five degree angle, shipwrights involved in repair had to possess a strong intuitive sense of the bend of the hull and how to fit their repairs into the ship as a whole. The ship repair facilities in Halifax evolved from the relatively primitive careening wharves of the 1850s to the ultra-modern Halifax Graving Dock,[69] but there were no major technological breakthroughs in labour processes used in the repair of wooden vessels. Caulking, which seems superficially much the easier art, was just as exacting in its own way. A poorly caulked vessel was worthless. Driving a caulking iron into the seams of the ship and then filling the interstices with oakum, the caulkers depended very much on listening to find out when the cracks had been solidly filled. The caulker's labour was an unofficial index of the economic health of the port. A description from the building of a Maine vessel underlines the artistic element in caulking:

> Soon beams were going into the *Spray,* and waterways, decks, and the trunk were started. When she was about together on top, it was time to think of getting her tight so work could go on below in bad weather....Caulking was a trade of its own and took much learning. Morning starts were slow and hesitant, especially if it was a bit chilly. Then the tempo would increase slightly, the magic black hands feeding the cotton and oakum like machines. There would come a moan from somewhere under her, lightly at first, in time with the mallets. Each mallet had a voice of its own. The tempo would increase, with much punctuation from the mallets. The crab pickets next door would pick up the hymn, and soon there would be a real old rouser going.[70]

This was not only the most musical, but also the most physical of the waterfront crafts. Pounding for hours in a half-recumbent position was not a job for weak men.

Because of the location of the Graving Dock company and the continuing presence of small fishing craft, the shipwrights and caulkers did not face a sudden reversal of their fortunes. Theirs was a gentle decline. Increasingly the shipwrights located in Halifax and worked at the graving dock or even the Dock Yard; the caulkers worked at the Marine Slip in Dartmouth.

Sailmaking was another essential craft within the nineteenth century mercantile economy. As with shipwrights and caulkers, the sailmakers found themselves gradually eased into doing repairs on old work. Of all the crafts, sailmakers were the most apt to take off for sea; indeed, they were probably more peripatetic than other craftsmen, travelling with their portable kits up and down the coast in search of employment.[71] The making of sails took judgment and experience; it was vitally important to so design the sails that just the right amount of slack existed. Like caulking, sailmaking combined precision with brute strength. Using a roping palm or (if need be) a mallet, a sailmaker had to be strong enough to force large needles through obdurate canvas; he also had to be able to measure expensive sail cloth according to the rigging plan. Naturally sailmakers were among the first casualities of the transformation of the shipping economy, although the early steel ships in fact carried sails and the British sailmakers' union urged the carrying of sails as a protection long after the combustion engine was commonplace.[73]

The third major waterfront craft was made up of the coopers. Coopers also played a key part in many other aspects of the nineteenth century economy including such industries as flour-milling, distilling and oil.[74] They faced a direct challenge from mechanization and large scale corporations within the industrial economy; the mercantile economy, however, reveals a different and less accentuated process of decline. Virtually all the vital ingredients of the Halifax economy (sugar, liquor, apples, fish) were shipped in barrels. Coopers also manned the city's breweries and distilleries. Most, however, made fish casks for the merchants of Upper Water Street. Divided into wet, dry, white and general cooperage,[75] the trade involved a great deal of knowledge and skill, particularly in estimating the 'boulge' of the staves so that an exact measure could be assumed of the barrel's contents.[76] The Halifax coopers were not threatened so much by mechanization — for the steam cooperages along the waterfront did not render them redundant — but by the widespread knowledge of the art of coopering.

All these crafts were united by the immense value placed on individual initiative and judgement. They were not, however, genuinely scarce skills; each was widely diffused throughout the general population. It was this fact which haunted these craftsmen, and not the threat of mechanization. In vivid contrast to the objective structure of longshore labour, about which the standard nineteenth century statistics tell us virtually nothing, the internal structures of these crafts can be determined with a certain amount of precision. Tables 1 and 2 summarize the gross census estimates of the shipbuilding, cooperage and sailmaking trades in Halifax County as these were presented in the Census. The

immense discrepancy in the number of employers between 1891 and 1901 results from a change in the definition of a manufactory to an establishment with five or more employees. By noting the immense drop in the numbers from the 1891 to 1901 Census, a vivid sense of the continuing hold in these trades of the small producers can be obtained.

TABLE 1

CENSUS STATISTICS ON COOPERAGES, SHIPBUILDING AND SAILMAKING, 1871-1891

	1871	1881	1891
Cooperages			
Number	64	68	96
Value, raw material	$11,370	$28 ,707	$16,656
Value of articles produced	$52,788	$80,699	$61,293
Shipbuilding			
Number	2	8	5
Value, raw material	$ 2,524	$33,870	$ 7,120
Value of articles produced	$ 6,800	$93,650	$20,500
Sailmaking			
Number	n.a.	n.a.	4
Value, raw material	n.a.	n.a.	$27,019
Value of articles produced	n.a.	n.a.	$44,050

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

TABLE 2

RAW MATERIALS AND VALUE OF PRODUCTION, HALIFAX COUNTY, 1901

	Cooperages	Shipbuilding	Sailmaking
Number	6	2	2
Value, raw material	$20,300	n.a.	n.a.
Value of articles produced	$56,225	n.a.	n.a.

Source: *Census of Canada,* 1901

The small producer clearly continued to dominate these trades and they were never truly to become industries. Only the cooperages of the city of Halifax showed any genuine advance in technique, although the estimates are difficult to decipher because of the immensely different rural industry which is included in them. But in Table 2, the cooperages are the only firms which are large enough to warrant a fuller census description.

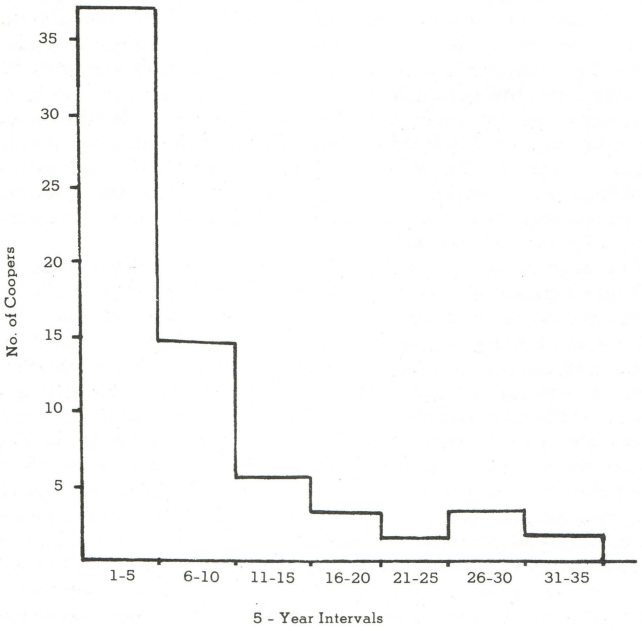
The picture of the small master earning a modest competence and enjoying his independence begs the question of how precarious small urban crafts in Victorian Canada were. The estimates of how many of each type of business were operating in Halifax year by year reveal insecurity, but it is seen most clearly with cooperages. (See Table 3) While many journeymen coopers became small masters, very few survived. Not one firm lasted out the period from 1871 to 1920, although the firm of the Kavanaghs was present from 1879 to 1920, either under their own name or as proprietors of the Halifax Steam Cooperage and a large number of Mulcaheys entered the trade from 1872. Whatever the claims for social mobility in the nineteenth century, they rest on unstable ground when they attach too great a significance to a mere shift from journeyman to master in marginal trades.[77]

The trend across all these crafts is that of a slow and gradual decline. As Figure 1 demonstrates, the chances of surviving beyond fifteen years as a cooper were extremely poor. Sailmaking was perhaps the most stable. Cooperage, like baking, attracted large numbers of undercapitalized journeymen because of the artisanal scale of production which, though modified, was not altered in the twentieth century. The estimates also reveal that the shipwrights and caulkers were becoming more and more free agents, without permanent shipbuilding establishments. The 1871 manuscript census bears out this analysis completely. It reveals that the city of Halifax had eight major cooperages in 1871, employing thirty seven men and boys. All the cooperages worked twelve months a year. A greater sum was invested in raw materials ($7360) than in fixed capital and the actual value of these cooperages' production totalled $27,500. These returns represent a highly flawed account of the local trade, since they miss (as of course do the official figures) half the cooperages known to be present from the directories.[79]

However, the manuscript census also reveals that only a small number of the sixty four Halifax county cooperages were in the city. The remaining fifty six cooperages were largely accounted for by the community of Hammonds Plains, whose white and black citizens had created a rather remarkable one craft community dotted with cooperages, all making casks for fish at well below the costs of production of the shops

FIGURE 1

LENGTH OF SURVIVAL OF HALIFAX COOPERAGES BY FIVE YEAR INTERVALS, 1872-1920



n = 64

Source: *Directories*

in Halifax. The Hammonds Plains coopers produced $20,890 of the $21,658 value of production attributed to rural Halifax County.[80] As prominent black artisans, they were leaders in struggles such as that against school segregation in Halifax.[81]

The manuscript census also reveals important clues about sailmaking. In some cases the value of raw materials carried by a given sailmaking concern would be two thirds that of the aggregate value of production.[82] This also helps indicate why the structure of cooperages and sail lofts were somewhat different. The costs of entry in the latter case were sufficiently high to prevent over-crowding. Although later sources are less ample than those for the 1870s, it is possible to reconstruct some of the details of these crafts in the latter decades of the nineteenth century. Cooperages lined the Halifax waterfront in the 1890s: there were eleven alone within one block of the harbour, many of them on various wharves.[83] The traditional waterfront, from the Royal Engineers' Yard to Cunard's Wharf, had not changed markedly in the second half of the nineteenth century and when the time came to transform the waterfront to conform to the demands of the new integrated Canadian economy, the demands of the traditional wharf owners were closely adhered to. Perhaps the greatest change in any of the crafts occurred in cooperage. A private cooperage, operated by a man from Hammonds Plains, was connected with the sugar refinery and employed from forty six to fifty hands, including twenty coopers. Hayes manufactured about 130,000 barrels per year, including twenty thousand nail kegs and twelve thousand fish drums. He also made staves for lobster shooks and boxes and apple barrels.[84] This was the only cooperage which could be considered a manufactory. An item from the Coopers' International Union Local 140 of Halifax stresses the continuing interdependence of the cooper and the waterfront:

> Time is not very lively in the coopers' trade just at present and some of the boys are out of work, but as the heft of work around Halifax is about fish, we do expect a busy season later on. The fish chokers are doing well, so that means lots of work for the boys.[85]

Many of the master coopers on the wharves supervised fish handlers in drying and storing fish; and journeymen coopers and labourers therefore worked under the same authority and roughly in the same place.

These impressions reveal a slow and steady decline because, in most of these crafts, the trade unionists feared the rural craftsman and the unskilled worker rather than machinery which did not become an issue.

TABLE 3

NUMBER OF FIRMS IN THE WATERFRONT CRAFTS IN HALIFAX/DARTMOUTH, 1872-1920

Year	Cooperages		Sailmakers		Shipbuilders	
	Unrevised/	Revised	Unrevised/	Revised	Unrevised/	Revised
1872	19	19	7	7	1	1
1873	18	20	5	5	1	1
1874	18	21	5	5	2	2
1875	19	19	5	5	2	2
1876	24	25	6	7	2	2
1877	25	28	6	7	1	1
1878	19	21	6	6	2	2
1879	23	25	5	5	2	2
1880	16	18	5	5	2	2
1881	17	17	5	5	2	2
1882	13	14	6	6	2	2
1883	13	14	6	6	2	2
1884	10	11	6	6	2	2
1885	11	11	6	6	2	2
1886	10	12	4	5	2	2
1887	9	11	4	5	2	2
1888	10	12	6	6	2	2
1889	6	8	3	5	2	2
1890	8	9	4	4	2	2
1891	6	7	3	4	2	2
1892	5	5	4	4	2	2
1893	5	5	3	3	2	2
1894	5	5	2	3	1	1
1895	8	8	4	4	5	5
1896	7	7	4	4	4	4
1897	9	9	3	3	4	4
1898	6	6	3	3	4	4
1899	5	5	3	3	4	4

continued

TABLE 3

NUMBER OF FIRMS IN THE WATERFRONT CRAFTS IN HALIFAX/DARTMOUTH, 1872-1920

Year	Cooperages		Sailmakers		Shipbuilders	
	Unrevised/	Revised	Unrevised/	Revised	Unrevised/	Revised
1900	4	4	4	4	4	4
1901	3	3	4	4	4	4
1902	7	7	5	5	1	1
1903	5	5	7	7	1	1
1904	4	5	7	7	1	1
1905	6	7	3	3	1	1
1906	7	7	3	3	1	1
1907	5	5	3	3	1	1
1908	4	4	3	3	1	1
1909	6	7	3	3	1	1
1910	7	7	4	4	1	1
1911	6	6	4	4	1	1
1912	8	8	5	5	1	1
1913	7	7	4	4	0	0
1914	4	4	4	4	0	0
1915	5	5	3	3	0	0
1916	3	3	3	3	0	0
1917	3	3	3	3	0	0
1918	3	3	3	3	0	0
1919	2	2	3	3	0	0
1920	2	2	3	3	0	0

Note: Total Cooperages: 64
Total years: 445
Mean no. of years: 6.95

Total sail-lofts: 19
Total years: 219
Mean no. of years: 11.53

Source: *Directories*[78]

Coopers and sailmakers pursued the defence of craft along quiet and undramatic lines. Halifax coopers were part of the Coopers International Union from July 1870 to January 1874. Apart from joining in a union front with the sailmakers and shipwrights to denounce the 'workingman's candidate' who purported to represent the labour interest in 1874, the International left little trace of its existence.[86] It was succeeded by a local union in the 1880s, which probably lapsed until its revival in the 1890s. Halifax coopers, who represented one of the largest concentrations of the craft in the country by 1901, were a logical group to form the first local of the revitalized Coopers' International Union in Canada.[87] The one strike of coopers which is in the record was on the issue of apprenticeship; coopers were also involved in the strike of Halifax longshoremen in 1902. Sailmakers pursued an even quieter strategy as they declined in the economy. In this tiny craft the conditions were excellent for an insistence on workplace control which became a strike issue. Following the British custom of restricting the number of apprentices to three per sail loft, the Halifax sailmakers went on strike in 1882 to defend this time honoured custom. It does not appear that they succeeded.[88] Of all the organized craftsmen in the city, the Shipwrights' and Caulkers' Association of Halifax and Dartmouth was the most stable craft union. Replacing a *pro tem* bargaining committee which included house joiners,[89] the Association went through two periods of development: that of ship construction as well as repair and that of ship repair alone. Anxious to achieve a foothold in shipbuilding, it was chaired by a shipwright from the Dockyard. Drawing upon representatives from the Dockyard, McPherson's Shipyard and Dartmouth, it grew from sixty seven to ninety members during 1864.[90] Shortly after Nova Scotian trade unions were legalized (in April),[91] an Act of Incorporation defined the purposes of the association as being the assistance of members in sickness and other customary benefits and added this innocuous phrase: "...and also for the purpose of carrying out their trades more advantageously for the mercantile communities of Halifax and Dartmouth."[92]

It was this last phrase, with its benign assumption that a mercantile community in fact existed whose interests might be collectively served, which covered the effective trade unionism of the shipwrights and caulkers. The craftsmen defined the best interests of the mercantile community in such a way that these corresponded perfectly with the objectives of craft unionism — a procedure which made them many enemies. The supplementary rules of the association outline a remarkable programme of collective self defence. Rule One stated exactly what would happen in case of a disagreement between the association and employers

during working hours. The craftsmen were to remain at their work until the first break came and then they were to meet, "decide on the most desirable method of arrangement," and appoint a committee to carry out instructions as agreed by two thirds of the members present. Should such persons fail to carry out the instructions they would be liable to fines of up to five dollars.[93] This is, in nineteenth century terms, a rather remarkable document, since it begins with the assumption of class conflict and outlines a specific method of dealing with it.

From the first, the Association found it difficult to counter the attacks of its critics and accommodate the divergent interests of its members. It was impossible to insist on the closed shop in the Dockyard and on new work and the Association dropped this from its programme. Jurisdiction was claimed for the areas within ten miles of Halifax and over all work which required caulking. Precise guidelines were established for separating joiners' and shipwrights' work.[94] This was a programme for job control. As one editorial in the Halifax *Evening Express* exclaimed, the consequences were dire.

> To give the public some idea of the effect of incorporating Trades' Unions, we may mention the fact that a few days ago one of our Merchants employed a Ship Carpenter to do some repairs to a vessel. It seems the person engaged was only a short time in business and could not afford to employ a large number of hands, so as usual with many a poor Master Mechanic, was obliged to take off his coat and work himself. But what think you reader, he worked one day, and on the next was coolly told by his employees that if he worked the second day they would quit work, and he was obliged to yield.[95]

Some members of the Legislature thought this the 'worst tyranny' but the union's political friends staved off attempts at outlawry.[96] However, serious criticisms were made of the shipwrights' practice of forcing country shipwrights to join the association.[97]

The exceptional bouyancy of the Halifax economy in the 1860s made working class activism seem attractive. Shipwrights and caulkers formed a dynamic part of the political movements of Halifax in the 1860s, usually in the Conservative cause.[98] One of their number, Thomas Spence, was elected an alderman, although his right to take his seat was hotly contested in the courts and he died before revealing what he might have done as a working class politician.[99] Shipwrights and caulkers were also exceptionally active in the struggle for Confederation, although this caused considerable acrimony and the association finally dropped its involvement in politics.[100] But this activism concealed several serious

weaknesses which were unavoidable aspects of the structure of the mercantile economy. There were many shipwrights and caulkers through the province who could swamp the local market. Faced with this challenge, the Association took the highly unusual step of imposing proficiency tests on its members. With an extraordinary rigour, it expelled those members who failed to prove themselves first class mechanics and refused to admit anyone who did not come up to its standards. This policy, initiated in the late 1860s, was still enforced in the 1880s. As Michael O'Brien, secretary of the Association, told the Labour Commission, "[I]f we find a man in the society not a mechanic we dismiss him, we would tell him to take the money paid in to us and go, and we take $12 as entrance fee and this we give him and tell him we don't want him any longer."[101] This was exclusivism carried to its ultimate conclusion.

This kind of craft control was most difficult to defend. One difficulty was reconciling the divergent interests of caulkers, who mostly worked in Dartmouth and likely had Liberal sympathies, with the needs of the shipwrights.[102] More damaging was the threat posed to the society by the organization of a Dartmouth "Union Society of Shipwrights and Caulkers," by Ebenezer Moseley and the management of the Marine Railway. This was formed with the express purpose of breaking the grip of the Association. Its membership was comprised of members who had failed the Association's mechanical tests. As one of the shipwrights noted, it was part of an attempt to adulterate the craft of the shipwright with a lower breed of labour.

> Since the large increase of Shipbuilding throughout the Province, employing as it does about 50 per cent of unskilled labour, we have had numerous applications for admission from persons who, having acquired the alphabet of a mechanical education, attracted to the city by cash payments, travelling like birds of passage from place to place, with an abundance of assurance and a moiety of modesty, who would as readily engage to construct a locomotive or a watch, as a ship, provided they had some persons to show them how, have now taken refuge at Mr. Moseley's Shipyard, a veritable cave of adullam for them, from whence he now trots them out and introduces them to the mercantile community as Shipwrights and Caulkers.[103]

The writer discretely left unspecified the exact nature of the training received by the 'legitimate' shipwrights and caulkers, most of whom had probably picked up the trade in much the same fashion. Nor could the Association claim that new apprentices were being trained to supply the

needs of the mercantile community, since the 1871 Manuscript Census shows that there were virtually no boys learning the trade in the city.[104]

This rival, employer-organized union quickly folded, but its appearance ushered in a new period for the Association. Henceforth it was restricted to ship repair. Paradoxically, the general collapse of shipbuilding (in the context of a continued use of much wooden shipping) meant that the threat from the unskilled in the rest of the province was decreased. It enabled the shipwrights to create a network for themselves centred on their remarkable secretary, Michael O'Brien, who functioned as a one-man hiring hall for shipwrights in the Halifax area. He hired men in the country should they be needed for repair. The caulkers, who formed their own association in 1884, stayed in close contact with O'Brien and the Association. Of the 120 shipwrights and caulkers in the city in 1888, forty were said to work at carpentry, forty worked at caulking and forty did both.[105] But the waterfront craft unions were defensive and protective rather than expansive. They preserved what they could of their traditional prerogatives and dealt with opportunities as they arose.[106]

Every day, as many men gathered for work on the Halifax waterfront as went down one of the province's largest mines.[107] The distinction between mining communities and the waterfront was not based on differences in objective relations to production, because in both cases they were a preponderantly wage-earning class. The explanation lies in the structures of casualism and obsolescence which weakened working-class activism on the nineteenth century waterfront or drove it into exclusivist channels. Lacking any natural centre of coherence, the influx of casual labourers and the unemployed could not be controlled. Craftsmen pursued narrow objectives and raised exclusivist strategies to a new height because they were imperilled by the rural workers among whom their skills were diffused. In neither case did the objective conditions exist for a unified labour movement.

This situation changed dramatically in the twentieth century. The traditional crafts were edged to the periphery of struggle and passed quietly away. The arrival of the steamship, the 'scientific' reorganization of the port and its integration within the Canadian economy as one of the winter surrogates for Montreal, brought a new stability to employment structures. For the first time there was a scarcity of labour created by the new opportunities elsewhere in the Dominion and by the redevelopment of Halifax itself. In this situation the longshoremen acted to end the absolute sway of casualism by imposing a closed shop on the waterfront. Other unskilled groups, such as freighthandlers, fish handlers and coalhandlers, asserted a separate identity and the once seemingly

uniform world of the unskilled waterfront became a variegated realm of specialized employees. One of the most interesting strikes on the waterfront in the early twentieth century occurred when fish handlers went on strike to support wage demands and their efforts were aided by the coopers, who were now without organization. Rather than an indication of a diffusion of craft ideals from a vibrant centre, this should be seen as the intersection of two groups, one in decline and one gradually asserting its own power and position.

It is therefore impossible to speak of a generalized and homogeneous degradation of labour during the period of monopoly capitalism. Longshoremen were direct beneficiaries of the new technologies of shipping and, to a lesser extent, so too were the other unskilled waterfront labourers. They were beneficiaries of the new 'progressive' insistence on state planning which accompanied the growth of finance capital. Longshoremen had little call for nostalgia as they looked back over the 'Golden Age.' As for the traditional crafts, these declined so imperceptibly and gradually that those within them were not suddenly shocked out of their age-old customs and traditions, but found it possible to switch to other things or to move away. Most importantly, the new age meant that it was finally possible to create a modern labour movement in the city which would challenge the *status quo* and begin to offer alternatives. With the advent of the longshoremen to the ranks of 'respectable' labour, Halifax finally acquired a dynamic working class movement. After the First World War, the alliance between the longshoremen and the skilled workers in the Shipyard would provide the driving force of the radicalized workers of the city. Mercantile capitalism created fragmented and fragmenting structures, which made successful opposition difficult and perhaps impossible. The new possibilities of the era of large scale capital included those of linking up masses of workers in a far more aggressive search for political and social alternatives. This change would decisively mark off the era of mercantile capitalism from that of large scale finance capital.

How does this differ from alternative approaches? Briefly, the 'artisanal' approach is to view the workplace restrictions of craftsmen as the embodiment of a 'culture of control', a structured pursuit of power within the work setting and within society. A central aspect of this thesis is that the quest for control was diffused to other groups from this craft core until it became the goal of the entire working class.[108] It goes without saying that this approach has no relevance in this case. There is no evidence to suggest that skilled workers were concerned to extend their workplace controls to the unskilled. There is no evidence to suggest that the unskilled were seen as sharing an identity of interest or a common

class allegiance. The waterfront craftsmen do not show signs of a militant syndicalism that others have insisted is part of the artisanal inheritance.

The mistake which may be involved in general attempts to create models of craft organization is that the specific conditions and structures to which crafts must necessarily respond may be forgotten in the haste to create a homogeneous and simplified concept of a 'cultural' core to which all crafts may be related. There is no *prima facie* reason why we should expect craftsmen in mercantile capitalism to possess the same ideals or the same class allegiances as do those in highly industrialized settings. The truth of the matter is that the world of the Maritime worker was a highly fragmented one and that the crafts which arose within the mercantile economy could not aspire to the same ambitions to generalized control as those within highly capitalized industries. In Canada it is probably true that the various regions possess a distinctive class dynamic according to the relative weight of resource and transportation sectors, as opposed to manufacturing, and that this dynamic may help explain why patterns which seem clear in one region do not work in others. The task then becomes not to attempt to reduce these patterns to deviations from an ideal, but to reconstruct them in their diversity and specificity.

This naturally raises the possibility of the various theories associated with the 'labour aristocracy', the central concept of Marxist labour historiography. This might, however, lead to similar difficulties. Essentially the thesis of the labour aristocracy, which associates the working class acceptance of capitalism with the emergence of labour élites defined in a variety of ways, attaches great weight to the privileged strata of the working class as a decisive social force. Those who are traditionally thought of as the labour aristocracy, bargain not from weakness but from strength. Most modern interpretations insist on their being placed in strategic positions within the modern industrial economy, exerting power over other workers. It is clear that the obsolescent crafts hardly fit this bill. It is legitimate and proper to raise the issue of labour élitism when discussing them. Michael O'Brien, the secretary of the Shipwrights and Caulkers, was the landlord of a number of poor working class families in the North End and there were others like him who exemplified a differentiation of privilege and authority within Halifax society. But it is not clear that these old and dying crafts were exerting the influence that a theory of the labour aristocracy would require. The future of the labour movement did not belong to these crafts, nor to the craftsmen in general. It belonged to the longshoremen and the miners, the millmen and the factory workers and, in certain specific instances, to the skilled industrial workers whose connection with this dying world of craft

privilege was extremely tenuous. As understanding of the limitations and strengths of the nineteenth century movements of workers and primary producers in the region grows, the theories which assign excessive importance to craft struggles will probably be found to miss the distinctive patterns of class growth which are exactly what need to be understood and defined.

NOTES

1. I should like to thank Niels Jannasch of the Nova Scotia Museum for his assistance, although I alone take responsibility for any errors in this paper.

2. See descriptions of dock labour in David Montgomery, *Workers' control in America: Studies in the history of work, technology and labor struggles* (London and New York, 1979), p. 36; Charles Barnes, *The Longshoreman* (Philadelphia 1915); ILWU Local 500 Pensioners, *"Man Along the Shore!" The Story of the Vancouver Waterfront As told by the Longshoremen Themselves 1860's-1975)* (Vancouver 1975); J.S. Woodsworth, *On the Waterfront* (Ottawa *circa.* 1919).

3. The best description of a casual labour market is that provided by Gareth Stedman Jones in *Outcast London: A Study in the Relationship Between Classes in Victorian Society* (Oxford 1971), esp. ch. 5. John Lovell, *Stevedores and Dockers: A Study of Trade Unionism in the Port of London, 1870-1914* (London 1969), is also indispensable.

4. Gerald S. Graham, "The Ascendancy of the Sailing Ship, 1850-85," *Economic History Review,* 2nd. Series, XIX, 1 (1956), p. 7; H.J. Dyos and D.H. Aldcroft, *British Transport* (Leicester 1969), p. 241; Sarah Palmer, "Experience, Experiment and Economics: Factors in the Construction of Early Merchant Steamships," in Keith Matthews and Gerald Panting, eds., *Ships and Shipbuilding in the North Atlantic Region* (St. John's 1978), pp. 233-249.

5. The Pickford and Black Registers, Public Archives of Nova Scotia, MG 27, Vol. 42-44, show that steamships were outnumbered in 1881 by over 2:1, that this ratio had increased to approximately 2.5:1 in 1891, but that by 1901 it had been reversed so that steamships now dominated by a rato of approximately 3:2. The Sessional Papers, Department of Marine and Fisheries: Marine (Ottawa), port records for inward and outward entered vessels, Halifax, 1890-1910, show that the ascendancy of steam vessels as recorded in the return of vessels entered inward at the port of Halifax, subject to compulsory pilot dues, was apparent after the early 1890s; and that steam vessels were far in advance of sailing vessels in the return of vessels outward at the port of Halifax subject to compulsory pilot dues. See Catherine Ann Waite, "The Longshoremen of Halifax 1900-1930; their living and working conditions," (M.A. Thesis, Dalhousie University, 1977), pp. 5-6.

6. See Jones, *Outcast London,* p. 120.

7. Pierre Bourdieu, *Outline of a Theory of Practice* (London and Paris, 1979).

8. Thomas Raddall, *Halifax: Warden of the North* (Toronto 1971) is perhaps the most famous general history of the city which is subject to this criticism.

9. *Souvenir Booklet,* Halifax Trades and Labor Council, 1908, n.p.

10. J.I. Cooper, "The Quebec Ship Labourers' Benevolent Society," *Canadian Historical Review,* XXX, 3 (1949), pp. 336-343; *Royal Commission on the Relations of Capital and Labour* [Hereafter R.C.R.C.L.], Evidence New Brunswick, p. 283.

11. James Richard Rice, "A History of Organized Labour in Saint John, New Brunswick, 1813-1890," (Unpublished M.A. Thesis, University of New Brunswick, 1968), pp. 19-52.

12. This would appear to be true of Montreal as well as Halifax.

13. Judith Fingard, "The Decline of the Sailor as a Ship Labourer in 19th Century Timber Ports," *Labour/Le Travailleur,* 2 (1977), pp. 48-49.

14. *R.C.R.C.L.* (Nova Scotia), Evidence of George Francklyn, p. 95.

15. *Herald* (Halifax), 12 May 1884.

16. *Acadian Recorder* (Halifax), 12 May 1884; *Herald,* 2 November 1880.

17. *Herald,* 7 May 1884; *Acadian Recorder,* 19 May 1884.

18. *R.C.R.C.L.* (Nova Scotia), Evidence of Andrew McAnish, p. 116.

19. *R.C.R.C.L.* (Nova Scotia), Evidence of P.F. Martin, p. 121.

20. *Acadian Recorder,* 24 January 1885.

21. *Herald,* 7 May 1884.

22. *Morning Chronicle* (Halifax), 28 October 1856.

23. Ken Pryke, "Labour and Politics: Nova Scotia at Confederation," *Historie sociale/Social History,* 6 (November 1970), p. 40.

24. *Herald,* 7 and 9 May 1884.

25. *Acadian Recorder,* 9 May 1884.

26. Some evidence of the early difference between Saint John and Halifax can be gleaned from the Halifax correspondent of the Saint John *Morning News* (August 29, 1842): "...yesterday I passed along the head of the market wharf (Halifax), and I counted 20 labourers standing with their hands in their pockets, shoved down to the elbows. I at once recognized them as having come from your market (Saint John) — for in Halifax the labourers do not take up their position at the head of the wharf, as in Saint John. They scatter themselves about, as if ashamed to be seen in one another's company." I thank Judith Fingard for this reference.

27. See the discussion of E.J. Hobsbawm, "National Unions on the Waterside," in *Labouring Men: Studies in the History of Labour* (London 1974 (1964)), p. 205.

28. In the twentieth century the Saint John longshoremen were divided between the "Ship Labourers" who worked for the Allan Lines and undercut the regular association, and the "Longshoremen's Association". These unions were divided on seasonal, ethnic and geographical lines.

29. *Acadian Recorder,* 29 April 1854.

30. *Unionist and Halifax Journal,* 2 May 1866.

31. *Morning Chronicle,* 29 May 1873; *Morning Chronicle,* 31 May 1873; *Citizen,* 7 June 1873; *Evening Express,* 20 June 1873.

32. *Acadian Recorder,* 10 May 1880.

33. This may be inferred from the fact that the introduction of both innovations was used as a threat in the 1884 strike. *Acadian Recorder,* 12 May 1884.

34. *Herald,* 12 May 1884.

35. Jones, *Outcast London,* p. 121.

36. *Acadian Recorder,* 14 April 1882; 8 April 1882.

37. *Acadian Recorder,* 9 June 1882; 13 July 1882.

38. *Acadian Recorder,* 7 April 1883.

39. *Acadian Recorder,* 13 July 1882.

40. *Acadian Recorder,* 19 April 1883.

41. *Acadian Recorder,* 21 August 1882. See also P.A.N.S., Vertical File, "Labour Unions — 1883," [Manuscript of "An Act to Incorporate Laborers Union"]; *Statutes* of Nova Scotia, 46 Vic., Cap. 77, 1883, pp. 188-189; *Journals* of the House of Assembly, 1883, p. 127.

42. *Acadian Recorder,* 30 April 1884.

43. *Herald,* 2 May 1884.

44. *Acadian Recorder,* 6 May 1884.

45. *Herald,* 7 May 1884; 10 May 1884.

46. *Herald,* 9 May 1884.

47. *Acadian Recorder,* 10 May 1884.

48. *Herald,* 10 May 1884.

49. *Acadian Recorder,* 13, 15, 16, 17 May; *Herald,* 13, 16 May 1884.

50. *Acadian Recorder,* 24 May 1884.

51. *Acadian Recorder,* 19 May 1884.

52. *Acadian Recorder,* 27 May 1884; 9 July 1884.

53. *Acadian Recorder,* 9 July 1884.

54. *Acadian Recorder,* 9 July 1884.

55. *Acadian Recorder,* 15 July 1886.

56. *Acadian Recorder,* 6 April 1889.

57. Waite, "Longshoremen," *op. cit.,* p. 136.

58. *Herald,* 2, 3, 4, 8, 12 April 1902.

59. *Evening Mail,* 15 March 1902.

60. *Herald,* 3 April 1902.

61. *Herald,* 21 March 1905.

62. c.f. "The Labor Problem at Halifax Wharves," *Herald,* 15 August 1906.

63. The strike of 1907 occurred in violation of the Lemieux Act. On the use of spies by the employers in this strike, see John Bell, ed., "On the Waterfront: A Glimpse Into Company Espionage," *Bulletin of the Committee on Canadian Labour History,* 1 (Spring 1976), pp. 8-9.

64. See Alan R. Brookes, "Out-Migration from the Maritime Provinces, 1860-1900: Some Preliminary Considerations," *Acadiensis* V, 2 (Spring 1976), p. 47.

65. David Montgomery, "Workers control of machine production in the nineteenth century," in *Workers' Control in America,* pp. 9-31.

66. Gregory S. Kealey, *Toronto Workers Respond to Industrial Capitalism, 1867-1892* (Toronto 1980), p. 54, citing the Chicago *Workingman's Advocate.*

67. Among many excellent descriptions of shipwrights' work, see especially that in E.P. Thompson and Eileen Yeo, eds., *The Unknown Mayhew: Selections from the Morning Chronicle, 1849-50* (Harmondsworth 1973 [1971]), pp. 483-517. See also Charles A. Armour and Thomas Lackey, *Sailing Ships of the Maritimes: An Illustrated History of Shipping and Shipbuilding in the Maritime Provinces of Canada, 1750-1925* (Toronto 1975), for discussions of shipwrights' tools and shipbuilding in general.

68. See J.P. Martin, *The Story of Dartmouth* (Dartmouth 1957) for an exhaustive list of Dartmouth shipbuilders; for McPherson, see his advertisement in *McAlpine's Nova Scotia Directory for 1868-69* (Halifax 1868), p. 103; *Morning Herald,* 23 November 1897; for Miller, see *Morning Chronicle,* 21 August 1855. Ebenezer Moseley was an entrepreneur of some ingenuity: he manufactured a copper paint which could be used on the bottom of ships as a preventative against the growth of grass and other fouling substances. See *The Dominion Copper Paint Company's Circular, 1874...*(Halifax 1874).

69. One such careening wharf, that of Richard Marshall, is described in detail in the *Acadian Recorder,* 28 March 1857. The literature on the Graving Dock is voluminous, but perhaps the most interesting document is the Annual Report of the directors of the Graving Dock Company, reprinted in the *Herald,* 20 September 1920.

70. R.D. Culler, *Skiffs and Schooners* (Camden, Maine, 1974), p. 9.

71. Mark G. Hirsch, "The Federation of Sailmakers of Great Britain and Ireland, 1885-1922: A Craft Union in Crisis," (M.A. thesis, Warwick University 1976); Samuel B. Sadler, *The Art and Science of Sailmaking* (London 1906). There is the kit of an American sailmaker in the Heritage Museum in Dartmouth which was evidently carried by such a craftsmen wandering up and down the Atlantic seaboard.

72. Hirsch, "Sailmakers," *op. cit.,* 12ff. There were variations on methods of making sails, especially between fishing and other vessels. Small boats tanned the sails with hemlock, while some large fishing schooners used salt water and alum. Large ships did not tan their sails. It is unfortunately not possible to present a detailed portrait of this activity in Halifax, because the sources do not include a detailed description of a local sail loft.

73. Elsewhere the sailmakers' craft was undermined from within by sewing machines. It is possible that this also occurred in Halifax, but the evidence only permits us to conclude that sewing machines were definitely used in making flags, tarpaulins, and other specialities. Sailmakers took up such secondary activities as the sailing ships went into decline.

74. Franklin E. Coyne, *The Development of the Cooperage Industry in the United States, 1620-1940* (Chicago 1940); Herbert Gutman, "La politique ouvriere de la grande enterprise americaine de 'L'age du clinquant': le cas de la Standard Oil Company," *Le mouvement social,* p. 102 (janvier-mars 1978), pp. 67-99, examines American coopers' struggles with the oil giants.

75. Wet cooperage concerned the making of barrels which could hold liquids without leakage; dry cooperage, for flour, apples, etc., was looser and somewhat less difficult. White cooperage involved the making of goods for semi-solids, such as butter. Excellent descriptions of the cooper's work may be found in George Elkington, *The Coopers: Company and Craft* (London n.d.); Anonymous, *The Cooper! His Work and How It Is Done* (London 1883), and in Coyne, *Cooperage Industry,* pp. 73-102, which provides a good summary of mechanization. One interesting study of the industry in Nova Scotia is T.A. Meister, *The Apple Barrel Industry in Nova Scotia* (Halifax n.d.).

76. Anonymous, *The Cooper,* p. 40.

77. This information is compiled from a reading of Halifax-Dartmouth city directories for the period 1872 to 1920. (It is not possible to give the same information on a county-wide basis, so it must be remembered that this table refers to urban coopers while those which precede it refer to both rural and urban coopers.) Since the business directory was discontinued for a long period in the 1880s, it had to be reconstituted from the main directory. This entails the serious risk of missing some small masters whose listing in the main directory was no different than that of journeymen. However, most small masters in these trades would have two addresses, one on a wharf and one elsewhere. This was the way small masters were selected for the survey. To compensate for probable directory errors, an allowance of three years or less was allowed to masters who disappeared from the directory, so that the 'unrevised' data reflect the directory listings exactly as they appeared, and the 'revised' data allow for disappearances of three years or less. What we probably have in *both* cases is an underestimation of the numbers of firms established in these trades.

78. *McAlpine's Halifax City Directory for 1871-72* (Halifax...), continuing to *McAlpine's Halifax City Directory for 1920-21.*

79. Census of Canada, Manuscript, 1871, Schedule of Industrial Establishments, Public Archives of Canada, microfilm.

80. *Ibid.*

81. *Herald,* 12 February 1884.

82. Manuscript Census 1871.

83. *Goad's Insurance Map of Halifax, 1895.*

84. *R.C.R.C.L.* (Nova Scotia), Evidence of Norman Hayes, pp. 52-54; *Acadian Recorder,* 7 February 1893.

85. *Coopers' International Journal,* July 1902; similar comments may be found in September 1903.

86. PAC, Forsey Papers, MG 28 I Vol. 251.

87. *Morning Chronicle,* 24 July 1890; the union was formally connected with the international union by John Flett, the American Federation of Labor's main sparkplug in English Canada. *Herald,* 15 August 1901.

88. *Acadian Recorder,* 15 May 1895. For the sailmakers' struggle see *R.C.R.C.L.* (Nova Scotia), Evidence of Thomas Forhan, p. 144; Evidence of William Muir, p. 184.

89. For these early movements, see *Morning Journal and Commercial Advertiser,* 30 March 1857; *Morning Chronicle,* 18 April 1857.

90. *Supplementary Rules* of the Shipwrights' and Caulkers' Association (Halifax 1867), pp. 17-19.

91. *Statutes* of Nova Scotia, 27 Vic., Cap. 33 (1864), "An Act to Incorporate the Shipwrights and Caulkers Association of Halifax and Dartmouth."

92. *Ibid.*

93. *Supplementary Rules,* pp. 11-12.

94. *Supplementary Rules,* pp. 14-16.

95. *Evening Express,* 1 March 1865.

96. *Morning Chronicle,* 3 April 1866; *Report* of the Committee on Trades and Manufactures, Appendix No. 51 (Trades and Manufactures), *Journals* of the House of Assembly, 1866.

97. House of Assembly, *Debates,* 1866, 27 March 1866.

98. This may seem a strange position for craftsmen identified with the old mercantile economy, but most of the shipwrights and caulkers were Irish and would naturally identify with a party opposed to Joseph Howe.

99. *Morning Chronicle,* 4 October 1862; *Morning Journal and Commercial Advertiser,* 19 December 1862; 3 September 1856; *Morning Chronicle,* 7 October 1862; *Morning Chronicle,* 5 October 1864; *Halifax Reporter,* 6 October 1864.

100. *Supplementary Rules,* p. 16.

101. *R.C.R.C.L.* (Nova Scotia), Evidence of Michael O'Brien, p. 108.

102. The caulkers split away from the shipwrights, but men could hold memberships in both unions.

103. *Evening Express,* 1 December 1874.

104. The youngest shipwright listed in the personal schedules of the 1871 Manuscript Census was 20 years old.

105. *R.C.R.C.L.,* Evidence of Michael O'Brien, p. 107.

106. One of the stranger cases of this was the emigration of Dartmouth shipwrights and caulkers to Honolulu in 1882 to assist in the construction of a marine railway under the direction of the Dartmouth shipbuilders H.I. Crandall and James Lyle. Interesting documents relating to this episode may be found in the Crandall Papers, Dartmouth Heritage Museum.

107. Going from the estimates of the Halifax Labourers' Union in 1884, there were 650 labourers on strike. Estimating, from the census, the number of skilled workers at about 300 (170 coopers, 58 sailmakers, and 72 shipbuilders) and the number of white collar workers at 50, we have already accounted for 1000 men. The number employed at Springhill in 1884 was 662.

108. Perhaps the central texts are Bryan Palmer, "Most Uncommon Commen Men: Craft and Culture in Historical Perspective," *Labour/Le Travailleur,* 1 (1976), pp. 5-31, and the same author's *A Culture in Conflict: Skilled Workers and Industrial Capitalism in Hamilton, Ontario, 1860-1914* (Montreal 1979), ch. 3.

14. "THOSE CRIMPS OF HELL AND GOBLINS DAMNED": THE IMAGE AND REALITY OF QUEBEC'S SAILORTOWN BOSSES

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"THOSE CRIMPS OF HELL AND GOBLINS DAMNED": THE IMAGE AND REALITY OF QUEBEC'S SAILORTOWN BOSSES[1]

Judith Fingard

Although the entrepreneurs who controlled the sailor labour market gained a notorious reputation in most of the world's major ports, the crimps of Quebec enjoyed a particularly bad international press in the mid nineteenth century. Described by one British shipmaster in 1848 as "crimps of hell and goblins damned",[2] British opinion forced the local authorities to clean up the disorder in the Lower Town. They found however that their legal and administrative changes between the 1830s and the 1870s had little effect before the onset of Quebec's commercial decline.[3] In the meantime, the persistent manipulators of the sailor labour market took advantage of whatever scope was available to them to continue their influence over supply and demand. Although the resulting labour mobility may not have enriched anyone, it did at least provide deep sea sailors, who ordinarily suffered both from underpay and servile bondage, with a degree of control over their wages and working conditions. For to accept the contemporary view that crimps were the exploiters of sailors is to miss the significance of the alliance which existed between the closely interrelated denizens of Quebec's sailortown.

The purpose of this paper therefore is to challenge the nineteenth century interpretation of crimps as low, vile, semi-criminal elements who profited at the sailors' expense and ruled dockland by such unsavoury and brutal methods that poor Jack was rendered a helpless victim in their hands. This conventional view is one of extremely limited usefulness. Quite apart from anything else, it does not allow us to place the people who were labelled as crimps in a historically specific context. Without trying to elevate the Quebec crimping fraternity to a pedestal, it can be argued that crimps should be rescued from the gutter of history and given a fairer and more serviceable status as members of a highly vulnerable *lumpenproletariat* whose class interests coincided rather than conflicted with those of the merchant sailors. Not only has insufficient historical analysis of the employment agents and boarding masters who earned the epithet of crimp allowed the contemporary view to be uncritically perpetuated but also it has allowed it to go unchallenged as the contemporary view. Yet the perspective of the generality of landsmen differed significantly from that of Quebec's political and economic elite and that of

British shipping interests. As F.W. Wallace noted in reference to Quebec's best known crimp, Jim Ward, crimps were not considered disreputable by their fellow citizens. He wrote:

> Ward was perhaps the most notorious crimp in Quebec and is credited with some particularly daring and reprehensible deeds. Yet, from what I can learn of this man, he did not appear personally as a criminal character to his fellow-townsmen, although few shipmasters could say a good word for him.[4]

In other words, the opportunism, boldness and violence displayed by crimps were not uncharacteristic of their contemporaries in other occupations.

This re-evaluation of the role of the crimp in Quebec attempts to correct three misconceptions. The first of these concerns the tactics employed by crimps to secure incoming sailors for deployment on other vessels. We are led to believe that the operations of crimps depended on deception and force, that rational persuasion had no place in their approach. Since the prevailing image of sailors, conveyed in literary sources, was that of dumb, naive, dissolute men, sailors were easily envisioned to be victims for the landsharks who either duped them or intimidated them into deserting from their vessels. The truth was somewhat different. For most of the nineteenth century the wage rate for sailors which prevailed at Quebec was three or four times that available in the ports of the United Kingdom. With demand always exceeding supply, because of local shipbuilding and the lack of a native sailor work force, sailors had every incentive to rid themselves of the British wage rate by changing ships and returning across the Atlantic at the far more attractive Quebec rate. In these circumstances the shortage of sailors at Quebec was a real one, not an artificial one created by the machinations of the crimps. But a middleman was nonetheless necessary to mediate between job-seeking sailors and shipmasters needing crew replacements, because most visiting sailors and masters were strangers and because the sailor was not a free labourer.

Although the stranger's need for assistance from a knowledgeable resident is self-evident, the contractual obligations of the sailor require some explanation. Both crew agreements and the restrictions placed on articled seamen under the provisions of the merchant shipping acts, British and colonial, are familiar aspects of a sailor's work, but it would be erroneous to think that the much publicized desertion was the only route open to the sailor who wished to escape from his existing contract. As long as the laws and the structure of the courts permitted him, he resorted to litigation in order to rid himself of his unwanted job. In Quebec he was

encouraged in that litigation by the crimps. The regularity with which the crimp persuaded the sailor to undertake legal actions in Quebec was summarized by a British Board of Trade official in 1848:

> their practice, is, in the first place, to endeavour to convict the masters of ships arriving there of some breach of the provisions of the Merchant Seamen's Act and thus to get the men discharged. If they do not succeed in this they offer them facilities for deserting.[5]

A captain explained in 1858 how crimps encouraged sailors to resort to the courts:

> In the month of June last I arrived at Quebec from Havannah with a crew with which we had left Liverpool a few months before, at £2.10s. per month wages; but no sooner had we dropped our anchor in the St. Lawrence then we were boarded by crimps, who of course informed our men that the wages from Quebec were £10 per month, which was the case, and in the course of the next few days I received summonses from nine of the crew, claiming the balance of wages, amounting to about £11 each. This I determined to resist, as they had signed articles in Liverpool to proceed to a port or ports in the West Indies, or wherever freight might offer, and to a final port of discharge in the United Kingdom, the voyage not to exceed 12 months. This you would have thought, was binding enough; but no. The magistrate decided that the men were entitled to their discharge, and I had to pay them the full balance of their wages...[6]

The sailortown bosses preferred to help the sailor to use his loosely written articles to obtain his discharge rather than encourage him to break the law through desertion. It was less risky for the crimp; if it worked, the sailor sometimes acquired back pay which he would otherwise have lost. This made him a more attractive boarder to the crimp boarding house keepers.

The resort to the courts by the crimps, which was the favoured way to obtain their sailor-clients through the 1830s and 1840s, required a knowledge of the rules governing crew agreements and logs, a familiarity with the law, and close connections with lawyers and justices. Accordingly, before mid century, crimps were unlikely to be ruffians acquainted with pistols and belaying pins; instead they were shrewd forensic experts versed in the procedures for obtaining warrants and writs. A prominent supplier of sailor labour in Quebec during the period of 'legal' crimping was John Wilson, who had trained as an advocate in Gray's Inn and, being unacquainted with French civil law on immigrating to Quebec, he had turned to the business of supplying the sailors required by the seasonal

shipping of the port. He had the requisite expertise to encourage sailors to seek their discharge through any and every loophole which could be found in their articles.[7] Limejuice cases, for example, became a much favoured ploy in Quebec in the late 1840s. The spurious nature of most of the sailors' charges against their captains for withholding the statutory ration of limejuice, lemon juice or vinegar and water became so notorious that the British authorities retaliated in the Mercantile Marine Act of 1850 by removing anti-scurvy remedies as a requirement on voyages to British North America.[8]

Wilson's brand of non-violent crimping was also one of the principal inspirations behind the changes in Quebec in the late 1840s and early 1850s which destroyed Wilson and others like him and produced a more aggressive form of crimping. The crimp-led resistance of sailortown to the 'reforms' resulted in a campaign in the 1850s to obtain the repeal of the local shipping act which had established the government shipping office in 1848 and thereby outlawed private suppliers. Besides attacking the shipping office, the crimps and their allies stepped up their use of legal process in an attempt to intimidate the visiting shipmasters who had been the source of the pressure in favour of the anti-crimping measures.[9] It was only when they had failed to re-establish their legitimacy as labour suppliers in the course of the early 1850s that crimps began to assume some of the nasty characteristics associated with the conventional view. In other words, left to themselves, crimps might have continued to combine astute business practices with their legal expertise to help the sailor to secure higher wages without promoting undue disorder. As it was, however, the labour suppliers were forced to turn from litigation to desertion as their primary tactic. Moreover, the more repressive the law became, the greater the distance the crimp felt he had to put between himself and the actual procurement of the sailors, with the result that hired hands did the dirty work and did it with the growing degree of force and brutality expected of shiftless ruffians. Rather than labour mobility within the letter of the law, the interference by the shipping master and the courts with customary practices in Quebec produced labour mobility in defiance of the law. It would seem that this change — which culminated fatally in 1872 with the shooting of a reluctant deserter by crimps and the axing of a crimp by a shipmaster — was no more the fault of the crimps than it was of the anti-crimping reformers.[10] It was through the deliberate attack on the traditions of the port that sailor suppliers were converted into sailor snatchers.

The second misconception relates to the view that the sailors were the major sufferers from crimping, that it deprived them of a say in the deter-

mination of the ships they manned and the voyages they undertook and impoverished them because of the enormous exactions made by the crimps for the services they provided. To add credibility to this interpretation, contemporaries drew on the readily accepted view of the sailor as a fool. Although they saw him as a hardworking, brave, underfed and abused worker at sea, once on shore he was miraculously transformed into a ninny, unable to resist temptation, spendthrift in his habits, and foolhardy or dissolute in character. Such aphorisms as 'the sailor earns his money like a horse and spends it like an ass' reinforced this image. Poor Jack: he was unable to discern where his best interests lay; he was unable to fend off the landsharks who were out to deceive, demoralize, or rob him. Never has any section of the workforce been subjected to such patronizing calumny at the hands of their social superiors.

The same sources which portray the sailor as incompetent to look after himself strongly imply that he derived no benefits from crimping or dealing on a voluntary basis with the boarding house keepers who controlled the sailor labour market. As proof they could offer only hearsay, whereas it should not be assumed that, in the absence of rosy accounts of dealings between crimps and sailors, sailors were not consulted by the Quebec crimps when it came to choosing new shipping engagements. After all, the crimps were as dependent on the sailors for their living as the sailors were on the crimps for acting as their agents. The major examples of coercion which have come down to us relate to circumstances in which the sailor changed his mind about his arranged employment. When this happened, the boarding house keeper tried by whatever means he could to hold the sailor to his new contract or, failing that, he shipped a substitute fraudulently.[11] Otherwise, the advance note by which the sailor defrayed his debts to his boarding master became unredeemable. A successful crimping operation depended on an orderly fulfilment of mutual obligations between boarding master and sailor.

But, even admitting that some sailors were shipped without being consulted, what difference was that likely to make to the sailor? In fact, in Quebec the whole question of choice was an academic one. As official shipping returns in the Trade and Navigation statistics prove, and Table 1 shows, the vast majority of vessels clearing from Quebec on ocean voyages — close to ninety percent — were destined for ports in the United Kingdom, usually the major timber import centres such as Liverpool, London and Bristol. The likelihood, therefore, of the stereotyped drunken sailor, shipped in a stupified state upon an unknown vessel destined for an unknown port, waking up in a grossly inconvenient location was very remote. The worst that could happen would be for a sailor to end up in

Ireland, or on the east coast of England, when he might have preferred to be discharged on the west coast of England. Cheap railway passages or brief engagements on coastal vessels were readily available to take the sailor home.

TABLE 1

DESTINATION OF OCEAN-GOING VESSELS CLEARING FROM QUEBEC

YEAR	TOTAL VESSELS CLEARING	VESSELS DESTINED FOR UK
1840	1314	1186
1845	1499	1409
1850	1275	1057
1855	877	717
1860	1293	1136
1865	1690	1217
1870	999	848
1875	1041	943
1880	611	529

Source: Trade and Navigation Tables in the Blue Books and Canadian Sessional Papers.

The far more serious allegation against the crimp was that he stole the sailor's money. The critics of sailortown's customary practices believed that when the typical sailor was enticed, he had something under half a month's wages owing to him, which would amount to roughly thirty shillings given the longstanding wage rate of £3 a month. The argument goes that thirty shillings was sacrificed for nothing. The sailor allowed the crimp to demand a large advance from the shipmaster, equivalent to a month's wages, shipped the sailor and collected the month's wages from the vessel's agent. On arrival in Britain after the normal month's voyage by sail, the witless sailor was discharged penniless. Here again the evidence contradicts contemporary assumptions. A random survey of crew agreements for vessels visiting Quebec between the late 1850s and the late 1880s suggests a number of possible flaws in the traditional view.[12] First, it seems unlikely that deserters were knowingly abandoning wages. In the 1860s and 1870s, and again after 1889 when the British act of 1880 prohibiting advance notes was repealed, most able seamen shipped in United Kingdom ports received one month's wages in advance, not half a month's wages. Those who deserted in Quebec, therefore, were often leaving no wages behind. The wages they signed on for in Quebec were about three times higher than their original wages, though by the 1860s

they were paid by the run rather than by the month. In the event of a slow crossing, this could be a disadvantage to the sailor, but the chance that the vessel might cross in less than a month made the rate very attractive. It is also a mistake to imagine that the Quebec crimp secured all the sailor's return wages by means of the advance note. With the exception of the late 1870s, the advances which were available in Quebec were seldom more than fifty percent of the run money. Although on paper the amount of wages the sailor collected on discharge in the United Kingdom was not significantly higher than the pay he might have expected to collect had he stayed with his original agreement, he still came out ahead. Had he stayed by his vessel in Quebec, the sailor's original wages would probably have been considerably reduced by the shore expenses incurred during the port call, paid by the captain and charged against his wages. On arrival home, there was a strong possibility that he might be in debt to the ship. On the other hand if he deserted, the time in which he could accumulate debts to his new ship was much less and indeed the crimp assumed that burden, relying on the new advance to cover the services, board and supplies provided for the sailor.

If the wage information available after mid century makes it appear that the sailor not only did not suffer from his change of ship but probably benefited financially, a different source for the earlier period from the 1830s to 1850s confirms that certainly before mid century the sailor gained advantageous remuneration from changing his vessel and reshipping in Quebec. The confirmation can be found in British magistrate court records. The London *Shipping and Mercantile Gazette* regularly carried the reports of sailors' cases tried in Mansion-house, Thames and Rochester police courts, with occasional references to those in other ports like Plymouth and Bristol. Most of the cases which throw light on the wages available in the crimp-controlled sailor labour market of Quebec were suits initiated by sailors to recover their outstanding wages, that is, the wages owing for the voyage from Quebec to Britain. The fact that seamen had to resort to litigation for this purpose pinpoints the identity of the real culprit in the sailor labour market. It was the shipmaster who withheld wages on the grounds that, as deserters, sailors had no right to their wages. Fortunately for the sailors, many of the magistrates took a very dim view of shipmasters who knowingly shipped deserters in Quebec and then tried to deprive the sailors of their wages on that account. The balances owing to men who took their shipmasters to court in Britain were substantial enough in the mid century period to discredit the view that the wages of the disloyal or crimped sailor ended up in the pockets of the Canadian boarding masters.[13]

The third misconception is the notion that the interests of the crimp were antithetical to those of the sailor, that the naive but essentially good sailor was exploited by the crafty but essentially bad landshark. This view is perniciously misleading. Both sailor and crimp had the same aim: to achieve a high wage rate. Moreover, crimps and sailors were cut from the same cloth. Often mariners themselves or, if not, *lumpen* residents of sailortown, crimps shared a community of interest with visiting sailors. They only infrequently took each other to court, they rescued each other in difficult circumstances and they banded together against authority both on ship and shore. Many sailors were 'crimped' because they wanted to be. They even paid to be crimped. When a sailor told his new captain in 1849 that he needed an advance of £6.10s. out of his £12 monthly wages to cover costs incurred during the two days he had been ashore, the captain asked him how he could have spent so much money in so short a time. In reply the sailor said:

> In the first place, I pay one pound for being crimped out of my ship. I then pay a pound of entrance-money to the house; and then, another pound is considered all right to treat the company. Then there is 10s. for putting me on board the other ship. The rest is spent on tobacco and grog.[14]

In circumstances where self-reliance was virtually impossible the sailor relied on the crimp. While the authorities tended to blame the crimps for sailors' wage strikes and to see the sailors as mere tools in their hands, the sailortown bosses would have found it impossible to apply successful pressure on the shipping office and shipmasters without the large-scale and willing cooperation of the seamen themselves. During many seasons, seafarers passively refused to ship — a withholding of labour engineered and maintained by the boarding masters through their tight control over when and at what wages shipping articles were signed. But sailors also resorted to noisy street processions with mottoes, flags and music to draw attention to their wage demands. The strikes, active and passive, were against the shipmasters and the shipping office, not the crimps.[15]

Undeniably the relationship between seamen and crimps was often marked by violence, but it was a violence which was self-generated, not one which was imposed from the outside. That the relationship involved exploitation cannot be denied either, but it was exploitation characteristic of the urban *lumpenproletariat,* not of the capitalist over the unpropertied or the rich over the poor. The failure of crimps and sailors to appear to be equal partners in an enterprise beneficial to both was caused more by the

transitory nature of the sailor labour force than by a fundamental cleavage of interest between crimps and deserters. Indeed it was the transiency of the sailors which produced and nurtured the crimping establishment. Sailors themselves could easily slip into crimping either as runners or, for those who stayed long enough, as boarding house keepers. Equally, the seasonal implications of shipping meant that crimps might turn to sailoring to get them out of the St. Lawrence in the winter season, returning with the first vessels in the spring. The economic marginality common to both crimps and sailors ensured that, despite the power displayed by crimps, they were given few opportunities for upward mobility and the chance to get away from sailortown. On the contrary, crimps and sailors demonstrated a consciousness of their community of interest again and again in the face of interference from upper town society. Their attacks against the Quebec shipping office, their strikes for higher wages, their hostility to reformers, were conclusive evidence not of the manipulation of sailors by crimps but of the identity of interest between crimps and sailors.

The black contemporary picture painted of crimping owes more to the need of Quebec society to find scapegoats for the continued failure of the shipping interests to solve the problem of the shortage of sailors than to objective reality. By concentrating on the evils of crimping and gradually converting enticement from a misdemeanour to a felony, the authorities helped to deflect public attention away from the wider business community. This meant that the more respectable elements in the port who actively connived at desertion in order to secure sufficient mobility in the sailor labour market escaped serious reprimand.

The sailor's opinion remains the most elusive factor in an assessment of crimping. If the nineteenth century sailor could describe his relationship with the Quebec crimps he might well express considerable resentment over the control which rested in the hands of boarding masters and their cohorts. The infamous Jim Ward was called "the biggest rogue in Quebec" by seamen in the late 1860s.[16] But as a form of labour organization, the crimping system bore much the same relationship to the sailor as the trade union management bore to the industrial worker. The class affinity of sailor and crimp may not have taken orthodox modes of expression and the mutually beneficial arrangement was clearly a transitory phenomenon tied to the age of sail. But for all its unconventionality, it was a relationship which was eminently suited to forcing the shipping interests both to comply with maritime labour law and to pay sailors a wage which reflected free market forces rather than conformed to the traditional pittance paid to seamen in the overstocked British labour market.

NOTES

1. This paper relies heavily on the author's completed book manuscript entitled "Jack in Port: Order and Disorder in the Sailortowns of Eastern Canada".

2. Meeting of shipmasters, 29 May 1848, Quebec *Morning Chronicle,* 8 June 1848.

3. The anti-crimping measures included a river police force established in 1838; restriction of vice-admiralty court jurisdiction in sailors' cases in 1836 and 1854; a government shipping office established by legislation of 1847; and major anti-crimping laws in 1853, 1871 and 1873.

4. F.W. Wallace, *In the Wake of the Wind-Ships* (London, 1927), p. 118.

5. Memorandum by Northcote on Desertion at Quebec, Public Record Office (PRO) and Board of Trade (BT), 1/468/50/1848.

6. Quebec *Morning Chronicle,* 23 January 1858.

7. On Wilson's career see London *Shipping and Mercantile Gazette,* 27 September 1849; Quebec *Morning Chronicle,* 17 October 1849, 31 July 1852; London *Shipping and Mercantile Gazette,* 24 September 1852; Quebec *Morning Chronicle,* 25 July 1853; *Quebec Mercury,* 7 September 1854; Hawkins to Brown, 15 December 1848, BT 1/468/50/1848; Wilson to Brown, 7 July 1848, BT 1/469/1613/1848; Hawkins to Brown, 18 January 1850, BT 1/479/2425/1850; Wilson to Governor General, 2 December 1850 and Wilson to Provincial Secretary, 21 February 1851, Public Archives of Canada (PAC), RG 4, C 1, vol. 288, No. 2548; Wilson to Governor General, 29 March 1852 and Wilson to Lt. General Rowan, 27 March 1854, PAC RG 4, C 1, vol. 346, No. 476; Wilson to President of British Board of Trade, 10 November 1867, CO 42/665/12120, ff. 497-514.

8. *Quebec Gazette,* 27 January 1847; Quebec *Morning Chronicle,* 31 May, 3 and 5 June 1848; Great Britain, 13-14 Vic. cap 93, paragraph 65.

9. See Quebec *Morning Chronicle,* 27 August 1853.

10. *Quebec Mercury,* 29 and 30 May, 16 and 17 July and 2 and 4 November, 1872.

11. Halifax *Morning Chronicle,* 29 and 30 November 1869; *Quebec Mercury,* 14 July 1884.

12. *Albertine* (No. 50465), 1879, Maritime History Group Archive (MHG); *Becherdass Ambaidass* (No. 50483), 1872, MHG; *Bellcarrigg* (No. 10544), 1863, PRO BT 99/149; *Birmingham* (No. 6055), 1860, BT 98/6380; *British Lion* (No. 23089), 1872, MHG; *Cap Rouge* (No. 26821), 1860 BT 98/6825; *Charger* (No. 35098), 1872, BT 99/844; *Effingham* (No. 26825), 1860, BT 98/6825; *Glencairn* (No. 24132), 1863, MHG; *Hahnemann* (No. 44182), 1889, MHG; *John Davies* (No. 14358), 1860, BT 98/6536; *Kertch* (No. 35493), 1870, MHG; *Lady Seymour* (No. 33189), 1858, BT 98/5494; *Lord Sidmouth* (No. 32805), 1859, BT 98/6172; *Madawaska* (No. 5606), 1859, BT 98/5686; *Nile* (No. 10726), 1867, MHG; *Redan* (No. 33080), 1872, MHG; *Red Jacket* (No. 25758), 1867, 1868, 1870, 1871, 1872, 1873, 1874, 1876, 1878, 1880, 1882, MHG, 1875, National Maritime Museum (NMM); *Rochester* (No. 69313), 1879, MHG; *Simonds* (No. 13740), 1866, MHG; *Stadzierikzee* (No. 44482), 1864, MHG; *Strathblane* (No. 60389), 1870, MHG; *Tara* (No. 24207), 1861, NMM; *The Craigs* (No. 47524), 1882, MHG; *Tiger* (No. 24391), 1879, MHG; *William G. Putnam* (No. 46027), 1879, MHG; *Zambesi* (No. 35207), 1872, 1873, 1874, 1876, 1878, 1880, 1882, MHG, 1875, NMM.

13. For example, London *Shipping and Mercantile Gazette,* 6, 16, 25 November, 15 December 1847, 4, 10, 20 January 1848.

14. *Quebec Mercury,* 1 September 1849.

15. *Quebec Gazette,* 20 October 1841; *Quebec Mercury,* 7 July 1865; Quebec *Morning Chronicle,* 7 July 1876, 21 April 1877.

16. Halifax *Morning Chronicle,* 30 November 1869.

15. PERSONNEL AND INVESTMENT IN CANADIAN SHIPPING, 1820-1889

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PERSONNEL AND INVESTMENT IN CANADIAN SHIPPING, 1820-1889

Gerry Panting

The Golden Age of nineteenth century Nova Scotia, it has been argued, spanned the years 1835-1867.[1] One side of that age was the achievement of responsible government and its attendant shift of political power from which Joseph Howe and his opponent, Sir Charles Tupper, emerged as dominant figures. Another was the development of the sailing vessel as the great international carrier. Larry McCann has pointed out that the Nova Scotian economy, at the time of Confederation, was dominated "by staple processing and commerce-serving industries."[2] As David Alexander has defined the characteristics of such an economy: "Labour and land are the most important factors of production while capital plays a minor role under the assumption that land is a constant;...."[3] Although Halifax was the dominant centre, the towns of Pictou, Windsor and Yarmouth carried on locally oriented manufacturing.[4] These foci of the 'traditional' economy performed the same function for the shipping industry since they were Ports of Registry. Halifax opened its registers in 1787, Pictou and Yarmouth in 1840 and Windsor in 1849.[5] Of course it was the era of iron, steel and coal that heralded the end for both the traditional economy of Nova Scotia and its vital service industry, shipping under sail. The purpose of this paper is to consider the links between the shipping industry and both the traditional economy and the emerging industrial one.

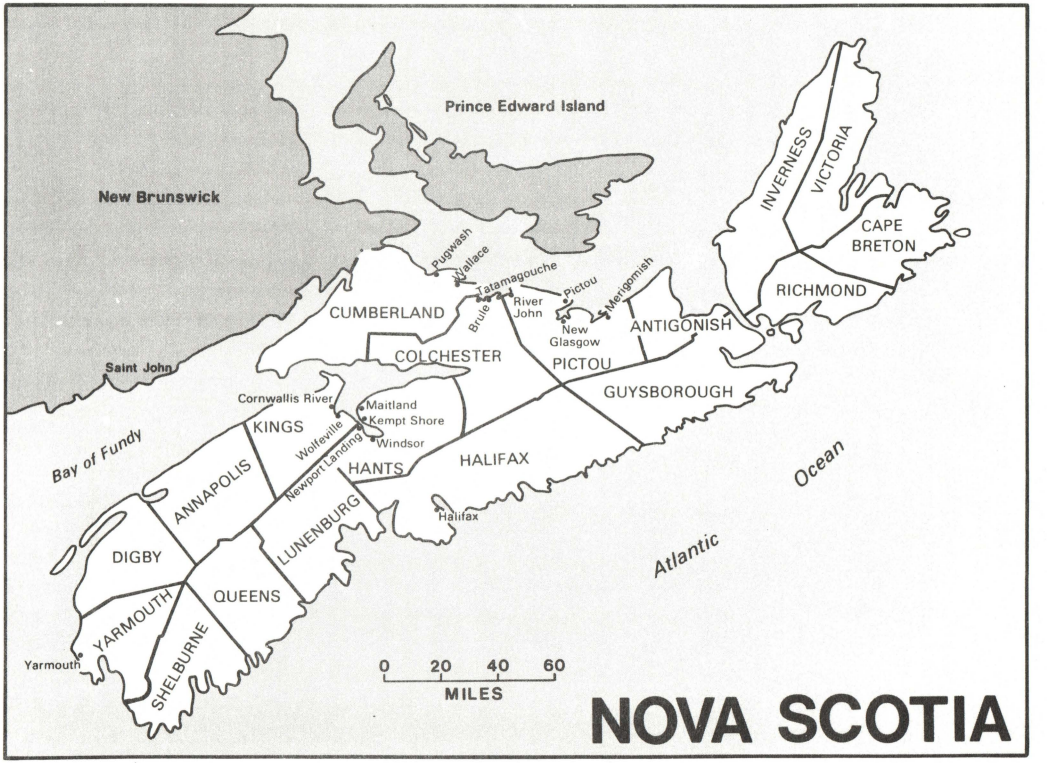
Between 1820 and 1889,[6] there were 13,815 Nova Scotian owners who invested $57,771,445.00 in new tonnage (1,650,613 tons) during that period. A sample of 224 individuals, composed of vessel registrants who each acquired more than one thousand tons at the Ports of Registry, was constituted.[7] The members of this sample registered an estimated $42,559,548.00 worth of shipping (743,148 tons) or an average holding worth $189,997.98 (3318 tons) and seventy (thirty one per cent) of them purchased more than this mean.[8] The spread in the size of individual holdings ranged from the $698,985.00 (19,971 tons) of George McKenzie at New Glasgow to the $35,035.00 (1001 tons) registered by James M. Davis of Yarmouth. On this distribution, the midpoint was $367,010.00 (10,486 tons), exceeded only by the holdings of one Haligonian (Samuel Cunard), one Windsorman (Bennett Smith), two denizens of Yarmouth (George H. and William D. Lovitt) and the three leading individuals on the

Pictou Registry (Alexander Campbell, James W. Carmichael and George McKenzie). Together, these seven registrants held $3,938,375.00 (112,525 tons) during the period under consideration. Of this provincial sample, 108 owners (forty eight per cent) purchased between 1000 and 1999 tons; forty one (eighteen per cent) were in the 2000-2999 bracket; while forty one (eighteen per cent) held over 5000 tons.[9]

Analyzing the individual Ports of Registry, Yarmouth provided the largest contingent of vessel owners, sixty five (twenty nine per cent), while Windsor contributed fifty nine (twenty six per cent), Pictou fifty three (twenty four per cent) and forty seven (twenty one per cent) were drawn from Halifax. A similar rank order applied to tonnage, beginning with $8,379,945.00 (239,427 tons) at Yarmouth and dropping to $4,304,195.00 (122,977 tons) at Halifax, where owners acquired the lowest mean value of $91,579.00 (2616 tons) per individual.[10] In addition, twenty six (forty per cent) owners at Yarmouth held tonnage above the mean figure for the port, while at Windsor seventeen (twenty nine per cent), at Pictou fifteen (twenty eight per cent) and at Halifax eleven (twenty three per cent) were 'above average' registrants.[11] The midpoints of these distributions ran from $367,605.00 (10,503 tons) at Pictou to $245,910.00 (7026 tons) at Windsor.[12] Above the midpoints, in addition to Cunard, the Lovitts, the three leading Pictou registrants and Smith, the Windsor Registry contributed four additional owners (George W. and John W. Churchill, George Mounce and John B. North). As in the provincial sample, so in the individual ports, the largest number of owners held between 1000 and 1999 tons extending from twenty nine for Pictou (fifty three per cent) and twenty eight for Windsor (forty seven per cent) to twenty five for Halifax (fifty three per cent) and twenty six for Yarmouth (forty per cent). Pictou also had thirteen (twenty five per cent) owners registering above 5000 tons, while Yarmouth had fifteen (twenty three per cent), Windsor ten (seventeen per cent) and Halifax only three (six per cent). In general, Halifax registrants fell into the two brackets below three thousand tons as did those of Pictou and Windsor, whereas those at Yarmouth were more evenly distributed across the tonnage categories.[13] Expressed in terms of mean tonnage, Yarmouth's ratio was two above to three below, whereas for Pictou and Windsor it approximated one to three while Halifax dropped slightly below one to four. Therefore this evidence suggests that Yarmouth had the least concentration of tonnage in the hands of specific individuals for the four Ports of Registry while Halifax had the greatest.[14]

The residences of this sample of leading vessel owners were to be found in seven Nova Scotian counties, six of which formed a block of territory in the centre of the province (see Figure 1). These were Halifax,

FIGURE 1


Prince Edward Island
New Brunswick
Saint John
Bay of Fundy
Atlantic Ocean
INVERNESS
VICTORIA
CAPE BRETON
RICHMOND
ANTIGONISH
GUYSBOROUGH
PICTOU
COLCHESTER
CUMBERLAND
Pugwash
Wallace
Tatamagouche
Brule
River John
Pictou
Merigomish
New Glasgow
Cornwallis River
Maitland
Kempt Shore
Windsor
Wolfeville
Newport Landing
KINGS
HANTS
HALIFAX
Halifax
ANNAPOLIS
DIGBY
YARMOUTH
Yarmouth
SHELBURNE
QUEENS
LUNENBURG
0 20 40 60
MILES
NOVA SCOTIA

containing Nova Scotia's entrepôt and incipient metropolitan centre; Pictou, Colchester and Cumberland on the Northumberland Strait; Hants and Kings on the Minas Basin; and Yarmouth at the western end of the province. Of course, it is within this 'shipping' territory that the change from traditional to industrial economy began.[15] During the period 1838-1891, the population of these shipping counties increased by 126 per cent while in the remainder of the province it rose by 118 per cent.[16] In 1838, about half (fifty one per cent) of the Nova Scotian population was in the seven counties, a proportion that remained fixed (fifty to fifty two per cent) during the period 1851-1891.[17] After initial substantial increases, population growth tapered off until, in the 1880s, the shipping counties grew by four per cent while the rest of the counties underwent a one per cent increase. Moreover, that decade witnessed population decreases even in the vessel owning counties of Hants, Kings and Pictou.[18]

Turning to the relative size of county populations, between 1838 and 1891 there is little discernible alteration. In the shipping counties, the proportion of county to provincial populations varied, on average, from five per cent for Hants and Yarmouth to fifteen per cent for Halifax. The other counties ranged from three per cent in Queens to seven per cent in Cape Breton.[19] Actually, because the vessel owning counties already contained established centres in 1838, they grew at a slower rate than the remainder of Nova Scotia, even though their proportion of the provincial population tended to be higher by county. Yet the urban centres where the vessel owners resided were involved in the increasing population density that also occurred. When the rank order of increasing density between 1838 and 1891 is considered, five of the shipping counties fall into the upper half of the distribution. Of these, the density in Yarmouth and Cumberland rose by eighteen and seventeen persons per square mile respectively. By comparison, Cape Breton increased by twenty three.[20] Between 1861 and 1881,[21] the 'vessel owning' centres of Hants County contained about thirty four per cent of the county population while those of Pictou declined from thirty one per cent to twenty two per cent, those of Cumberland from twenty nine per cent to seventeen per cent, and Yarmouth town rose from twenty seven percent to thirty per cent as proportions of county population. For Tatamagouche in Colchester, the figure was seven per cent while at Wolfville in Kings it stood at eight per cent during this period. Thus, on average, the vessel owning centres made up twenty one per cent of the population in the shipping counties.[22] The ratio for Halifax, Hants, Yarmouth, Pictou and Cumberland Counties varied from one in two to one in four. Yet, for Colchester and Kings, it was closer to one in ten.[23]

The relatively stable relationship between county and provincial

populations, despite growth in populations and population densities, suggests an equally stable occupational mix for the shipping counties. Therefore, the occupational pattern is of some interest. For the purposes of this analysis, six categories of activity have been used: those enumerated in agricultural, commercial and industrial categories along with fishermen, labourers and mariners. Because of the differences in the presentation of census statistics, the years 1838 and 1891 will be excluded from the analysis.[24] The objective was to obtain a profile of the work force in the shipping counties.

In these counties, it is clear that investment in shipping did not produce a large pool of seagoing personnel. The proportion of mariners among the working population declined from ten per cent in 1851 to five per cent in 1881.[25] In contrast, the commercial component of the work force increased marginally from four per cent to eight per cent, those in industry hovered around twenty five per cent and the proportion of labourers between five per cent and nine per cent. But the lineaments of the traditional economy can be discerned most clearly in the percentage of agricultural participants which stood at fifty or higher from 1851 to 1881.[26] What distinguished the rest of the province from the shipping counties was a significant proportion of fishermen in the work force, about seventeen per cent on average, during this period. Halifax was the only vessel owning centre located in a belt of 'fishing' counties stretching from Shelburne along the south coast of Nova Scotia to Richmond and Victoria on Cape Breton Island. Along with Yarmouth, Halifax had a substantial fishing component. In 1851 for Halifax and in 1881 for Yarmouth, it was twenty five per cent.[27] The five remaining shipping counties made up part of an agricultural belt extending from Annapolis by way of the Minas Basin and the Northumberland Shore to Inverness on Cape Breton Island.[28] (See Figure 1).

Clearly, the work forces of Halifax and Yarmouth Counties were more diverse than those of the other shipping counties. For Yarmouth, the mariners comprised over ten per cent in all census years, being twenty five per cent in 1851 and twenty per cent in 1871. By the latter date, Halifax's commercial group made up twenty per cent of its work force.[29] In summary, then, five of the seven shipping counties were also agricultural. Of each one hundred persons in the work force,[30] the agricultural components were sixty eight for Kings, sixty five for Colchester, sixty one for Pictou, sixty for Cumberland and fifty nine for Hants. The industrial figures extended from twenty eight for Pictou to nineteen for Kings. Each of these counties had less than one person per hundred in the fisheries. This presents a striking contrast to the fifteen persons per hundred in fisheries in the case of Halifax and Yarmouth.[31] Another difference can be

found in agriculture where the figures were twenty one and thirty nine respectively. Halifax stood out in the industrial and commercial components with thirty nine and fifteen persons per hundred in these activities. Yarmouth had only twenty persons per hundred in industry but led with eighteen mariners. The nearest competitor was Hants with ten. When agriculture and industry are considered together, they absorbed sixty out of each one hundred persons in the case of Halifax and fifty nine in that of Yarmouth. But, for the other five counties, the proportion was above eighty out of one hundred. Indeed, for Pictou, Colchester and Kings it approached ninety.[32]

That this industrial component of the work force was linked to the traditional economy is evident from the "staple producing and commerce-serving" characteristics of the industrial activities revealed by the census figures.[33] Among the 'mills and factories' enumerated for the shipping counties in the 1851 and 1861 Nova Scotian censuses, grist and saw milling, primary processing, absorbed over half of the *investment.* In Yarmouth county this was true of 1861, but in 1851 tanneries (twenty eight per cent) and 'other factories' (thirty four per cent) were almost as important as milling (thirty six per cent). By 1861 in Halifax County, investment in mills had declined proportionately. When the *value* of products in 1861 is considered, milling and shipbuilding provided at least seventy five per cent except in Halifax County, where the figure was thirty per cent.[34] Thus, the economy of the Bedford Basin had a more varied industrial sector than could have been found in the other shipping counties. But Hants and Kings, as well as Halifax and Yarmouth, displayed a diversification of industrial investment.[35]

In the *Census* of 1871, although the trend to variegated production was marked, the value of shipping produced still loomed large in Hants, Kings and Yarmouth. Ten years later, shipping had become even more important in Kings. By 1881, sawmilling comprised about half (forty six per cent) of the value of production in Cumberland County while flour and saw milling production in Colchester County reached forty two per cent. Among the proliferating industries of Halifax in 1881, sugar production provided twenty eight per cent of values.[36] Yet, despite the harbingers of industrialism to be discerned by 1881, the traditional economy was still strong, as is evident in the juxtaposition of farmers with shipbuilding in Hants and Kings, with milling in Colchester and Pictou, or with fishing in the case of Yarmouth. In all the shipping counties, the agricultural component of the work force formed a reservoir of labour which could shift into the woods trades and shipbuilding. The organizers engaged in this operation — which was an organic part of the traditional economy,

being based upon local materials as well as local labour[37] — could turn their talents to the acquisition and deployment of locally built vessels.

What then were the occupational connections between the traditional economy and the major vessel owners of the Ports of Registry under study? The tonnage registrants were classified according to the principal private business in which they were engaged, apart from ownership of shipping, where that was feasible.[38] Such an exercise revealed that the members of the sample were not drawn from all areas of the traditional economy. Among them were ninety nine (forty four per cent) merchants, fifty five (twenty five per cent) shipbuilders, twenty seven (twelve per cent) sea captains, fifteen (seven per cent) whose primary business *was* shipping, and ten (four per cent) ship chandlers. The remaining nineteen (eight per cent) were in various occupations, although only three (one per cent) were professional men.[39] The orientation of their occupations suggests that one half (112) of the occupations related to the sea while the other half were linked to the land.[40]

Moreover, the owning sample of each port had its own characteristics.[41] Of the forty seven Halifax registrants, thirty six (seventy seven per cent) were merchants, six (thirteen per cent) were ship chandlers and three (six per cent) were in shipping. The remaining two were a lawyer and a farmer. Yarmouth turned out thirty one (forty eight per cent) merchants, nine (fourteen per cent) shippers and eight others in various occupations. But the significant differentiating group in that port consisted of seventeen (twenty six per cent) sea captains. In the case of Windsor, shipbuilders were the largest group (twenty two persons, thirty nine per cent) followed by seventeen (twenty nine per cent) merchants and six (ten per cent) sea captains. Thirteen (twenty two per cent) were in other occupations. For Pictou, the most important group by size was shipbuilders, from among whom were drawn thirty (fifty seven per cent) of the sample. Another fifteen (twenty eight per cent) were merchants. These occupational proportions indicate that Haligonian registrants were overwhelmingly mercantile in background whereas the largest number of Pictou and Windsor shippers were shipbuilders although merchants were also important. For Yarmouth, the occupational links of the industry were comparatively evenly balanced between twenty six (forty per cent) shippers and captains on the one hand and thirty one (forty eight per cent) merchants on the other. Needless to say, in all ports merchants were concerned with the sea. Therefore, the distinction between land and marine provenance cannot be regarded as categorical.

Clearly, the entrepôt functions of Halifax are reflected in this occupational analysis just as the particular agricultural and industrial emphasis among the populations of Colchester, Cumberland, Hants,

Kings and Pictou Counties are related to the proportion of shipbuilders owning tonnage. Equally clearly, at Yarmouth the important proportion of the work force who were mariners or engaged in the fisheries was paralleled by the proportion of captains among the owners. This reflection points to the need for an analysis of the ways in which the growth of tonnage acquisition by the individuals in the port samples was related to their other commercial activities. In order to facilitate this analysis, the registrations of tonnage have been grouped by quinquennia.

The growth and decline of tonnage registered in the various ports can be viewed as a movement across a series of 'thresholds'.[42] The first of these can be defined as having occurred when, during any quinquennium, the largest number of investors entered the industry by registering the highest mean tonnage per individual. The second threshold is identified when the largest number of owners increased their acquisitions in a given quinquennium by at least one hundred tons over their purchases of the preceding quinquennium, thereby increasing their combined tonnage to the greatest extent. These two measurements of the attractiveness of the shipping industry to investors were followed by the 'peak' of tonnage acquisition, which was that quinquennium during which the largest number of investors acquired the largest mean tonnage. The final threshold was the point at which the largest number of registrants ceased registering tonnage after buying a significant mean tonnage during the preceding quinquennium.

These movements over the thresholds executed by the investors in the four Ports of Registry were carried out in bursts of activity.[43] The first occurred in 1835-1839, the second covered the period from 1845 to 1854, the third 1860-1864 and the fourth from 1870 to 1889. Halifax led the way during the first part of the century. Appropriate to its established position as capital and entrepôt, that port crossed the entering threshold in 1835-1839 and achieved the best level of tonnage increase by 1845-1849. During the subsequent quinquennium (1850-1854), the Pictonians negotiated these first two thresholds and reached their tonnage 'peak'. It is noteworthy that the provincial sample as a whole crossed the 'entering' threshold during 1850-1854, thereby establishing the shipping industry in the province, building upon the Halifax and Pictou components. After a quiescent quinquennium, 1855-1859, the Yarmouth and Windsor registrants surmounted their entering thresholds during the first half of the 1860s. No thresholds were crossed during the late 1860s. After 1870, the Haligonians reached their tonnage peak in 1870-1874. The Yarmouth cohort and the provincial sample negotiated the second and third thresholds during 1870-1874 while the Windsormen followed this pattern in 1875-1879. In that same quinquennium, the Haligonians led

the way out of the industry, followed by the denizens of Yarmouth in 1880-1884. The remaining groups of vessel owners left in 1885-1889.

As the patterns of development for each port are considered, it is evident that with the exception of Halifax, the second and third thresholds were crossed during the same quinquennium. In the case of that port, the first and second thresholds were negotiated within fifteen years and the third and fourth in ten. After moving over three thresholds during their first burst of activity, Pictou owners took thirty years to reach the leaving threshold. The other ports took no more than five.

By 1835-1839, when five Halifax merchants acquired $104,265.00 (2979 tons) worth of shipping as new registrants, the pre-eminent vessel owner of the port, Samuel Cunard, had already registered fifty per cent of his total tonnage.[44] Prior to the crossing of this entering threshold, $386,155.00 (11033 tons) had been invested between 1820 and 1834. In the quinquennium 1845-1849, five merchants, three shipchandlers and Samuel Cunard mustered $431,305.00 (12323 tons) to carry their industry across the second threshold. During the next twenty years, 1849-1869, another $1,444,485.00 (41271 tons) of investment was put into the industry before the peak was approached. While the launching of the Halifax shipping industry was taking place, the vessel owners of Pictou, having registered $2,530,465.00 (72299 tons) worth of tonnage, were preparing to follow. Then, in 1850-1854, seven shipbuilders, four merchants and three others joined the local shipping fraternity through the expenditure of $344,330.00 (9838 tons). At the same time, nine shipbuilders, one merchant and three other owners carried the Pictou industry over the second threshold with $980,910.00 (28026 tons) while five more shipbuilders and a merchant pushed it to its peak of $1,569,820.00 (44852 tons). The Pictou vessel owners sustained their fleet for the next thirty years with $5,452,265.00 (155,779 tons) worth of shipping before they approached their leaving threshold.

Therefore, by the mid 1850s, the Halifax merchants and the Pictou shipbuilders had established their shipping industries. The entering thresholds at Yarmouth and Windsor were not crossed until the early 1860s. By that time, vessel owners at Yarmouth had registered $1,432,200.0 (40920 tons) worth of tonnage while those at Windsor had invested $629,580.00 (17988 tons). The next step at Yarmouth was taken by eight merchants, three shippers and two sea captains who set the industry on its way with $172,480.00 (4928 tons) and by a mixed group of fourteen new entrants at Windsor who contributed $68,425.00 (1955 tons) with the same result. Over the next ten years the Windsormen approached the second threshold by investing $1,615,600.00 (46160 tons). For the provincial sample, the fifteen years after 1854 witnessed the

growth of investment by $7,344,925.00 (209,855 tons) as the second threshold was approached.

The early 1870s were crucial for the development of Nova Scotian shipping. Twenty Halifax merchants and six other owners expended $761,355.00 (21753 tons) to carry the industry to its peak. Concurrently, at Yarmouth, fourteen merchants and sixteen marine oriented owners bought $1,238,475.00 (35385 tons) worth of shipping in order to cross the second threshold and combined with the eleven merchants, a lawyer and eight owners with a marine orientation to create the industry's peak at $1,798,790.00 (51394 tons). The provincial sample also crossed the second and third thresholds between 1870 and 1874 at $2,210,110.00 (63146 tons) and $3,913,735.00 (111,821 tons) respectively. By the late 1870s, the turn of Windsor had arrived. The second threshold was crossed as eleven shipbuilders, six merchants and nine others invested $964,810.00 (27566 tons). At the same time, twelve owners with a marine orientation, including seven shipbuilders and seven merchants as well as seven other owners, reached a peak investment of $1,415,120.00 (40432 tons).

But this intense activity during the 1870s presaged the precipitous decline of the shipping industry which occurred within five years, as these leading owners in the four Ports of Registry ceased buying vessels. Even as the Halifax industry reached its peak of investment between 1870 and 1874, the leaving threshold was reached. Twelve merchants and two others invested $417,095.00 (11917 tons) and then registered no tonnage in 1875-1879. In 1880-1884, seventeen Yarmouth owners, who had invested $386,925.00 (11055 tons) in the previous quinquennium left the registry. Eight Pictonian owners expended $309,855.00 (8853 tons) while Windsormen were investing $535,955.00 (15313 tons) between 1880 and 1884. In the following quinquennium, they had all ceased registering tonnage.

By the mid 1830s, when the Halifax shippers were poised to cross their entering threshold, those who had entered the shipping industry already were linked to the Halifax Banking Company, the Bank of Nova Scotia and a number of business partnerships. The key figure, of course, was Samuel Cunard with a background in the West Indies trade and investments in whaling and mining.[45] The major concern in the latter area was the General Mining Association (G.M.A.) which constituted part of the metropolitan extension of Halifax interests to Pictou Harbour. Among the five individuals who moved into shipping to push the Halifax industry across its entering threshold were Samuel Cunard's brother, Edward, and his brother-in-law, John Duffus. Edward, having been his brother's partner in a defunct shipping company, in 1838 became a partner in the

successful British and North American Royal Mail Steam Packet Company. Two other merchants in this group were George P. Oxley with possible connections to Pugwash[46] and Henry Mignowitz in dry goods like Duffus, originally from Lunenburg. Benjamin Weir, the fifth entrant, figured in the second movement affecting the Halifax industry carried out by nine owners. These included Samuel Cunard, who had become associated with a land company and with a transatlantic financial connection to match his steamers carrying transatlantic mail. A partner in one of his shipping ventures, William A. Black, had three sons, all owners who were increasing tonnage. Another partner was William Stairs, whose two sons were to enter the shipping industry in the 1860s.[47] Three other business partners who were involved in the second threshold were William B. Fairbanks, his brother-in-law David Allison, and Jonathan C. Allison, David's cousin. Fairbanks and D. Allison were both directors of the Halifax Water Company, along with Duffus. Two of Allison's insurance colleagues on the Board of the Union Marine Insurance Company were James A. Moren and John Strachan, both participants in the negotiation of Halifax's second threshold.[48]

Therefore, by mid century, the Halifax shipping industry had emerged out of the port's mercantile functions, although the coming style of industrial technology can be seen in the steam shipping ventures stimulating the entrepreneurial talents of Samuel Cunard. In addition, there were evident links among hardware merchandising, ship chandling and shipping. At this point, the estimated investment in shipping of this group of major owners, when matched with their estimated investment in other enterprises, where it can be identified, suggests that shipping constituted a major portion of their business operations.[49]

At the same time, out of the timber resources of Cumberland, Colchester and Pictou Counties emerged the foundation of a service industry centred around sails and wooden hulls. Between 1800 and 1820 timber was prepared by the farming population for export. The dominant figure in the settlement of Pictou was Edward Mortimer, a timber merchant, who had first come to the area as the agent of a Halifax firm. Across the harbour, at New Glasgow, James Carmichael was merchandising timber and farm produce.[50] Both of these individuals were to establish links to the shipping industry through their relatives or progeny. George McKenzie, Carmichael's brother-in-law, began life in Halifax but moved to Pictou Harbour in 1802. By the 1820s he had become foreman of a shipyard at River John. After a partnership with vessel owner and merchant, Henry Hatton, he set up his own yard at New Glasgow. Another Pictou owner and shipbuilder, James Purves, rose through the coal trade generated by the G.M.A. Two other vessel

registrants were the business partners William Mortimer, nephew of Edward, and George Smith. One of their employees, Alexander Campbell, along with his brothers, James and William, moved from Pictou to Tatamagouche in order to build vessels and export timber. Alexander's brother-in-law, Alexander McKenzie entered the shipbuilding industry at River John. Along the Northumberland Strait Shore, at Pugwash, Levi W. Eaton also engaged in shipbuilding.[51]

The connection between steam technology and its power source, coal, brought a first touch of industrialism to Pictou Harbour. In 1836-1838, a railway was built to replace the tram cars that had been used to supply the coaling lighters. By 1841, the G.M.A. had been reorganized and the needs of the coal trade continued to call forth more shipping from Pictou Harbour and environs. The commercial life of New Glasgow was closely linked to shipping and shipbuilding while the Pictou shore was filled with shipyards. Hundreds of craftsmen were employed as carpenters, blacksmiths and riggers by the 1850s. From the countryside around, ton timber and ship's timber were drawn to the ports.[52] It was during the period 1850-1854 that the vessel registrants of Pictou Harbour and the Northumberland Shore crossed three thresholds. Fourteen individuals drawn from seven of the small urban settlements in the area entered the industry. Relatives of those already owning vessels were among them. At Tatamagouche, Alexander Campbell was joined by Robert Logan, a former clerk in his brother's employ, while his son-in-law, Archibald Patterson, entered the lumber trade and then passed from vessel ownership to shipbuilding after 1854. The elder James Kitchen entered the industry at River John while two Crerars joined their brother John at Pictou.[53] Relatives and business associates increased their tonnage during the same period, such as the half-brothers George McKenzie and Thomas Graham at New Glasgow. John Millar of Tatamagouche was a partner and former clerk of Alexander Campbell. At River John ,Charles McLellan was a nephew, son-in-law and former employee of Alexander McKenzie. John Mockler was an erstwhile partner of James Kitchen, Sr.; James Purves and James Primrose of Pictou were directors of the local gas company. Among those who helped to carry Pictou to the 'peak' was James W. Carmichael, nephew of McKenzie and Graham. He began in business supplying shipyards and their workers, having an informal working relationship with McKenzie.[54] At Pictou, John T. and William Ives, shipbuilders and shipbrokers, were also involved in this movement to the peak.

From the late 1850s to the 1880s, there were investments competitive with shipping. Certainly, financial and other enterprises appeared in all four Ports of Registry. Yet the shipping industries of Yarmouth and

Windsor were launched and, along with that of Halifax, they peaked. This suggests that shipping was an attractive proposition in comparison with other possibilities. The exception, perhaps, is the Pictou Registry on which the total tonnage ran down gradually to the level of 1880.[55]

At Windsor, by 1830, the needs of the gypsum trade had made shipbuilding the leading industry and, from the 1830s, the two developed together.[56] One of those who helped to establish shipping, Edward W. Dimock, with his brother transformed a shipchandling and hardware business into the Windsor Foundry Company between 1849 and 1855. Another new registrant, Mark Curry, moved from furniture and agricultural implements to shipping during the early 1860s. Other vessel owners invested in insurance and other public companies during the 1850s.[57] So far as can be ascertained, these investments were comparable to those in shipping.[58]

The Yarmouth shippers who approached their entering threshold in 1860 were citizens of a developing town. Groups of relatives and business associates had organized themselves for shipping investment among other kinds, in particular the Killam 'connection'[59] who had established in marine insurance, steam shipping and shipchandling. Another connection, the Lovitts, had begun their rise as the leading shipping investors of the port. By 1870-1874, when the Yarmouth sample crossed their second and third thresholds, the Lovitts had become leaders both in shipping and in the banking and investing community of the town.[60] During that quinquennium, forty seven vessel registrants invested $1,798,790.00 (51394 tons) in shipping. Some of them invested as well in two insurance companies, a marine railway and the Western Counties Railway. George B. Doane, a merchant who was involved in all four enterprises, held an estimated $9400.00 in them along with an investment of $73,465.00 (2099 tons) in shipping. His commitment to shipping and that of the other owners appears to be substantial by comparison with their other commitments.[61]

By 1860, at Halifax, the Cunards, the Allisons, W.B. Fairbanks and John Strachan had registered their last tonnage. However, the brother-in-law of the Cunards, Joseph Duffus, was the central figure in a network of marriages binding together eleven of the twenty six vessel registrants whose investments carried Halifax to its peak in 1870-1874.[62] This connection launched the Merchants Bank and also had interests in the Union Bank. By 1870, Duffus and associates had reached a strategic location in Halifax financial circles.[63] Yet, during 1870-1874, fourteen owners were buying their last tonnage, leaving only twelve owners on the Registry during the next quinquennium. At this point, in addition to their financial interests, the Haligonian vessel owners had moved into the new

mining developments in Cape Breton and elsewhere as well as into manufacturing.[64]

As the shipping industry of Halifax passed over its final threshold, in 1875-1879, at Windsor the owners were negotiating their second and third. By the 1870s, Windsor was the centre of a thriving gypsum trade and Edward Dimock was emerging as a central figure in the industry. Two other shippers who had invested in gypsum were Senator Ezra Churchill and Bennett Smith.[65] Besides Dimock and Smith, the two shipbuilding sons of Churchill, three younger Smiths, two Burgesses in shipbuilding and gypsum, two shipbuilding Moshers with their seafaring relatives, Frederick Curry and George Mounce constituted half those increasing tonnage. These shipping purchases ran parallel to a series of investments in gypsum productive facilities, banking and insurance, metallurgical works, a cotton mill and a gas company. An estimate of the identifiable commitments of five of the vessel owners was $230,796.00 whereas their shipping registrations amounted to $347,235.00 (9921 tons). Inasmuch as all collateral investments were not identifiable, the two kinds of business activity are probably comparable in financial terms.[66]

By 1880 the Yarmouth owners had reached the leaving threshold. In 1875-1879, seventeen of them ceased registering tonnage after purchasing $386,925.00 worth of shipping. These owners also held investments in insurance, banking, railways as well as a gas lighting company and a duck and yarn enterprise amounting to an estimated $125,300.00. At this point, the retiring vessel owners had made a final commitment to new vessels that was significant in terms of their alternative investments.[67] The Killam and Lovitt connections were involved with railways, textiles, utilities, small financial institutions and small manufacturing concerns.[68] On a relatively small scale, the industrial economy had come to Yarmouth.

The Port of Pictou, thirty years after reaching peak tonnage, reached its final threshold by the mid 1880s. As McCann has pointed out, two vessel owners, James W. Carmichael and his brother-in-law, Jeffrey McColl provided an integral component of the business and kinship connection of New Glasgow that launched the Nova Scotia Steel and Coal Company in 1882.[69] These two were also involved in financial activities. Carmichael was the agent of the Bank of Nova Scotia in New Glasgow. McColl and three shipping colleagues — John T. Ives, Robert Doull and John Crerar — were involved in the launching of the Pictou Bank in 1874. Crerar and Ives had ceased tonnage registration when they became petitioners for the creation of the bank. In addition, James Kitchen Sr. was a director between 1883 and 1885, by which time he had ceased tonnage purchases. At the point of the bank's demise in 1887, McColl, Charles

McLennan of River John and John Keith of Windsor were directors.[70] If it is assumed that a bank director had a commitment of about $35,000.00, it appears that only Kitchen had a larger commitment to shipping.[71] Therefore, while a group of Pictou vessel owners were moving out of the framework of the traditional economy, by 1880-1884, eight of them made their last purchases amounting to $309,855.00 (8853 tons).

Windsor crossed the final threshold along with Pictou. By the 1880s the gypsum industry faced a crisis in both finance and technology. American businessmen had become interested. Attempts were made to reorganize this industry by establishing the Windsor Plaster and Cement Manufacturing Company in 1870 and the Wentworth Gypsum Company in 1891. A mate to this enterprise was the Gypsum Packet Company launched at the same time, both being the results of E.W. Dimock's entrepreneurial talents.[72] Along with such industrial investments, vessel owners continued to purchase tonnage. Although fifteen of them registered their last purchases in 1880-1884, twenty four were still on the Registry in 1885-1889.

Looking at this sample of vessel owners drawn from the traditional economy and society of nineteenth century Nova Scotia, it becomes evident that the development of the shipping industry was tentative until the 1860s. Halifax, although an entrepôt of eighteenth century provenance, had a relatively small deep water fleet. That fleet was supported by the mercantile community but developed very slowly after the initial surge of 1835-1839, led by Samuel Cunard. In accordance with the port's metropolitan position and pretensions,[73] some shippers interested themselves in the development of Pictou Harbour. At the same time there were other opportunities in the Halifax-Dartmouth area, notably in insurance and banking, that provided a channel for the parallel investments of vessel owners. These were taking place even as the Halifax fleet reached its peak and crossed the leaving threshold. Among them were some owners who continued the connection with industrialism, by way of coal mining, that began in the 1830s.

Yarmouth, while an aspiring metropolis, did not have a hinterland upon which to grow. By the 1850s, shipbuilding for the port was carried on elsewhere and the fisheries, while important in the county's economy, did not provide the necessary impulsion to industrial development before 1889. Perhaps inevitably, the shipping industry reflected in its investing personnel the determination of the citizens of Yarmouth to master the sea. Of the four Ports of Registry, it is Yarmouth that had the largest blue water fleet, owned to a considerable extent by men with experience on the quarterdeck.

Before 1850, on the Northumberland Strait Shore and at the mouth of the Avon River, a connection was established between mining or quarrying and the local resources of wood and labour. At Pictou harbour, there was an explosion in shipping just before the General Mining Association lost its monopoly. Carmichael and Company, a typical product of the alliance among forests, wood workers and shipbuilding, provided a vehicle for this traditional industry as well as a stepping stone to industrialism. In the Windsor area, there were close links among shipping, shipbuilding and the gypsum trade. So the late flowering of the latter enterprise paced the equally late development of the shipping industry. The late 1880s seems to be the point at which the emphasis shifted from shipping to gypsum production on an industrial scale, aided by outside capital.

The shipping industry, then, provided one of the avenues from a traditional economy to an industrial one. Although it did not create a large seagoing contingent in the work force, it did provide an outlet for the capital and talents of local businessmen, thereby laying the ground for a new style and scale of enterprise.

NOTES

1. The idea is broached by D.C. Harvey, "The Intellectual Awakening of Nova Scotia," in G.A. Rawlyk (ed.), *Historical Essays on the Atlantic Provinces* (Toronto, 1967), pp. 99-100.

2. Larry McCann, "'In Accordance with this Law of City Growth', The Metals Industry and Urban Growth in Pictou County, 1858-1929", Paper presented at the Atlantic Canada Studies Conference, Dalhousie University, Halifax, Nova Scotia, April 25, 1980, p. 3.

3. David Alexander, "A New Newfoundland: The Traditional Economy and Development to 1934", a copy of which was supplied to the writer by the author, St. John's, 1973, p. 2.

4. L. McCann, "Pictou", *op. cit.*, p. 7.

5. Adjustments have been made in order to provide the same starting date for registry information, 1820, for all four ports. Tonnage acquired at Halifax by owners from the other ports has been added to their tonnage acquired at their home ports. However, tonnage acquired at Ports of Registry not in the Project data bank are not included. Therefore, there may be underrepresentation of registrations before the 1840s.

6. This paper is a small part of a large scale study of the shipping industry of Atlantic Canada being carried on by members of the Maritime History Group of Memorial University with the support of the Social Sciences and Humanities Research Council. The author wishes to acknowledge that support; the aid of Heather Wareham, Research Assistant with the Atlantic Canada Shipping Project and of colleagues David Alexander, Rosemary Ommer and Eric Sager; 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 responsibilty of the author.

7. The pre-eminent port was Halifax, with 5340 owners registering 641,241 tons. Windsor had 4098 owners but only 341,296 tons. Yarmouth's 2228 owners acquired 405,500 tons while the 2149 of Pictou registered 262,575 tons. The mean tonnages were: Halifax 120,

Yarmouth 180, Pictou 122 and Windsor 83. In the cases of Halifax and Yarmouth, residents only have been included in the sample. The Pictou component is composed of residents of Antigonish (1), Boston (1), Merigomish (1), New Glasgow (9), Pictou (19), Pugwash (3), River John (7), Tatamagouche (10) and Wallace (2). That of Windsor includes residents of Canning (1), Cheverie (1), Cornwallis Valley (11), Halifax (3), Hantsport (2), Horton (2), Kempt Shore (3), Kingsport (1), Maitland (2), Newport Landing (10), Wallace (1), Windsor (20), and Wolfville (2).

8. The data on tonnage manipulations is drawn from computerized files created by colleagues. Windsor and Pictou registry information was provided by Rosemary Ommer. That for Halifax and Yarmouth was supplied by Eric Sager and David Alexander respectively. The dollar evaluation of tonnage is based on the work of Lewis Fischer. Of the seventy owners, ten were on the Halifax registry, fifteen on Windsor's, eighteen on Pictou's and twenty seven on Yarmouth's.

9. The tonnages of the seven owners were: George McKenzie, 19971; Alexander Campbell, 18344; Samuel Cunard 18050; William D. Lovitt, 17836; James W. Carmichael, 13782; Bennett Smith, 13029; and George H. Lovitt, 11513. They held fifteen per cent of the tonnage of the provincial sample and seven per cent of the total tonnage acquired in the four Ports of Registry.

The distribution of Sample Owners by tonnage category was:

	Halifax	Pictou	Windsor	Yarmouth	Totals
	No.:%	No.:%	No.:%	No.:%	No.:%
1000-1999	25:53	29:56	28:47	26:40	108:48
2000-2999	12:25	6:11	14:24	9:14	41:18
3000-3999	4:9	3:6	5:18	6:9	18:8
4000-4999	3:6	2:4	2:3	9:14	16:7
5000 and over	3:6	13:25	10:17	15:23	41:18
	47	53	59	65	224

10. The sample tonnage for Yarmouth was 239,427; for Pictou 202,341; Windsor 178,403 and Halifax 122,977. Mean tonnages were: Pictou, 3818; Yarmouth, 3683; Windsor, 3024; and Halifax 2616. By far the largest fleet for a Port of Registry in the Maritimes was Saint John, where 1,687,891 tons ($36,625,715) were registered between 1820 and 1889 by a *total* of 4350 owners, averaging 388 tons ($14,580).

11. At Yarmouth, the 'above average' registrants held seventy per cent (166,551) of tonnage; at Windsor sixty per cent (106,286 tons), at Pictou sixty seven per cent (135,192 tons); and at Halifax fifty per cent (60,996 tons).

12. The Halifax midpoint was $333,900.00 (9540 tons) while that of Yarmouth was $329,665.00 (9419 tons).

13. For comparative figures, see note 9 above.

14. The ratios of individuals above/below the mean were, for Yarmouth 26/39:2/3; for Windsor 17/59:1/3.4; for Pictou 15/53:1/3.5; and for Halifax 11/47:1/4.3.

15. See L. McCann, "Staples and the New Industrialism in the Growth of Post-Confederation Halifax", *Acadiensis,* VIII (2) pp. 57-61; L. McCann, "Pictou", *op. cit.,* pp. 7-15.

16. The figures for these rates of population increase are calculated from the data found in Nova Scotia, *Journals of the House of Assembly, 1839,* Appendix No. 32 and Canada,

Census 1891, I. The 'shipping' counties increased from 103,478 to 234,345 while the remainder of the province increased from 99,097 to 216,051 persons.

17. In addition to the sources cited in note 16 above, the proportions were calculated from the data found in Nova Scotia, *Journals of the House of Assembly, 1852,* Appendix 94, pp. 429-35 and *Report of the Secretary of the Board of Statistics on the Census of Nova Scotia, 1860-61,* Appendix No. 5; Canada, *Census 1871,* I, pp. 72-83 and *Census 1881,* I, pp. 4-15. The percentage of the seven counties to the total provincial population, by censal years, was 1838:51; 1851:50; 1861:51; 1871:51; 1881:51; and 1891:52.

18. The figures for population increases, calculated from the appropriate censuses, are:

Counties and Groups	Actual 1838-51	%	Actual 1851-61	%	Actual 1861-71	%	Actual 1871-81	%	Actual 1881-91	%
Pictou	4,069	19	3,198	12	3,329	12	3,421	11	-994	-3
Halifax	11,344	50	9,107	23	7,942	16	10,954	19	3,441	5
Yarmouth	3,953	43	2,304	18	3,104	20	2,734	15	932	4
Kings	429	3	4,593	32	2,779	15	1,959	9	-980	-4
Hants	2,909	25	3,130	22	3,841	22	2,058	10	-1,307	-6
Colchester	3,970	35	4,575	30	3,286	16	3,389	15	440	2
Cumberland	6,767	89	5,192	36	3,987	20	3,850	16	7,161	26
Shipping	33,441	32	32,100	23	28,268	17	28,365	14	8,693	4
Other Counties	40,838	41	21,903	16	28,675	18	48,922	26	1,131	1

19. For the seven counties, the percentages were: Yarmouth: 5; Hants: 5; Kings: 6; Colchester:6; Cumberland: 8; Pictou: 9; and Halifax: 15. These figures are the results of averaging the percentages for the censal years from 1838 to 1891.

20. The areas of the counties were assumed to be those of 1871. See Canada *Census 1871,* I, P. 72-83. Population figures are derived from the sources cited in notes 16 and 17 above. In the shipping counties, the increase in density, 1838-1891 and the density in 1891 are as follows: Yarmouth: 18,30; Cumberland: 17,21; Colchester: 12,21; Pictou: 12,31; Kings: 11,28; Hants: 9,19 and Halifax: 3,5. The comparable figures for Cape Breton and Lunenburg were: 23,29 and 17,28. In the cases of Pictou, Hants and Kings, the 1881 densities were one digit higher in 1881 than in 1891.

21. Prior to 1861, it is not possible to get the appropriate figures for small urban centres. The appropriate census sub-districts are not identifiable in the 1891 census. The centres for which population could be identified were as follows: in Cumberland, Pugwash and Wallace; in Colchester, Tatamagouche; in Pictou, Merigomish, New Glasgow, Pictou town and River John; in Hants, Kempt Shore, Maitland and Windsor; in Kings, Wolfville; Yarmouth town and the town of Halifax.

22. The population of vessel owning centres by County and the percentages of county populations were:

	1861		1871		1881	
Counties	Pop.	%	Pop.	%	Pop.	%
Halifax	25026	51	29582	52	36100	53
Hants	6203	35	4348	21	7710	33
Yarmouth	4152	27	5335	29	6288	30
Pictou	8897	31	7700	24	7911	22
Cumberland	5665	29	3199	14	4615	17
Kings	1577	8	1697	8	1880	8
Colchester	1400	7	1525	7	1500	6

The sources for these figures are the *Census Report* 1860-61; *Census 1871,* and *Census 1881.*

23. See the table in note 22 above for the ratios.

24. The Nova Scotian census of 1838 does not provide an occupational breakdown and the 1891 Canadian census does not do so for counties. Fishermen have been separated from the figures for industrial activities after 1851 and mariners from those for commercial activities. There is no figure for labourers in the Nova Scotian census for 1851. Labourers in the 1871 and 1881 censuses were classified with a miscellaneous category. See Canada, *Census 1871,* Vol. 2, pp. 334-345; *Census 1881,* Vol. 2, pp. 232-243.

25. The number of mariners and percentages of total work force for the shipping counties were:

Counties	1851	%	1861	%	1871	%	1881	%
Cumberland	237	7	179	3	416	6	316	4
Colchester	263	7	148	3	192	3	207	3
Pictou	255	5	137	2	298	3	322	3
Hants	372	13	457	10	624	9	595	8
Kings	155	5	202	4	334	6	282	4
Yarmouth	763	25	512	14	980	20	719	11
Halifax	357	5	742	6	396	2	974	5
	2402	10	2377	6	3240	7	3415	5

26. The appropriate percentages for the shipping counties were:

Categories	1851	1861	1871	1881
Commerce	4	3	7	8
Agriculture	57	58	48	51
Industry	25	24	27	24
Labour	—	5	9	7

The sources of this data are cited in note 24 above.

27. For the non-shipping counties, the percentages of fishermen in the work force were: 1851:24; 1861:14; 1871:16; 1881:17. (See the map of Nova Scotian counties for the location of the 'fishing' counties.) For Halifax and Yarmouth, the percentages were, respectively: 25,13; 15,10; 6,10; 14,25; and for the shipping counties as a group: 6; 4; 2; 6.

28. See the locational map for the 'agricultural' counties.

29. See note 25 above for the percentages of mariners in Yarmouth County. On a related point, the recruitment of seamen and officers locally in Yarmouth County, see the paper by David Alexander, "Literacy Among Canadian and Foreign Seamen, 1863-1899", *this volume.* The percentages for the Halifax commercial group were: 1851:10, 1861:9; 1871:23; 1881:19.

30. This index is an attempt to obtain occupational profiles for the counties. The figures for each of the categories are averages of the proportions in the censal years, 1851-1881.

31. The profile numbers per one hundred persons, by county, were as follows:

Counties	Agriculture	Industry	Fisheries	Mariners	Commerce	Labourers
Cumberland	60	25	0.2	5	3	9
Colchester	65	23	0.2	5	4	8
Pictou	61	28	0.2	3	4	5
Hants	59	23	0.1	10	4	7
Kings	68	19	0.5	5	4	7
Yarmouth	39	20	15	18	6	4
Halifax	21	39	15	5	15	8

The sources for these numbers are cited in note 24 above.

32. The combined numbers for agriculture and industry were the following: Cumberland: 85; Colchester: 88; Pictou: 89; Hants: 82; Kings: 87; Yarmouth: 59; Halifax: 60.

33. The figures that follow are based upon the data presented in Nova Scotia, *Census 1851,* Appendix 94, pp. 429-435; *Census Report, 1860-1,* pp. 274-285; Canada, *Census 1871,* III, pp. 290-429, and *Census 1881,* III, pp. 324-473. See also L. McCann, "Pictou", *op. cit.* Figures 1 and 2. In order to achieve some commensurability in values, one pound sterling was assumed to be equal to $5.00.

34. For the shipping counties, the investment in saw and grist mills for 1851 and 1860-1861 constituted sixty six per cent ($595,664.00) and fifty per cent ($454,305.00) respectively of the total investments. In Halifax County, the decline of investment in mills was from fifty five per cent to twenty nine per cent. The 1860-1861 values of production were estimated from McCann's figure noted above. The rest of the figures were derived from the sources cited in note 33 above.

35. See the appropriate data in the censuses for 1851 and 1860-1861. Besides producer goods, such as lumber, flour, leather, textiles, and ships, the shipping counties also turned out consumer goods, such as candles, soap, boots and shoes, furniture and carriages.

36. The 1871 percentages of estimated total production for the value of shipping produced by county were as follows: Hants: fifty one per cent; Kings: twenty nine per cent; Yarmouth: twenty seven per cent; Cumberland: eleven per cent; Colchester: ten per cent; Pictou: six per cent. The 1881 percentages were: Hants: forty eight per cent; Kings: forty six per cent; Yarmouth: twenty eight per cent; Cumberland: six per cent; Colchester: ten per cent; Pictou: seven per cent. These figures and those in the text are derived from the source cited in note 33 above.

37. On this point, see David Alexander and Gerry Panting, "The Mercantile Fleet and its Owners: Yarmouth, Nova Scotia, 1840-1889", *Acadiensis,* VII, (2), p. 6; Arthur W.H. Eaton, *The History of Kings County, Nova Scotia: Heart of the Acadian Land* (Salem, Mass., 1910), p. 199; Frank H. Patterson, *A. History of Tatamagouche, Nova Scotia* (Belleville, Ont., 1973), p. 100-1; Gwendolyn V. Shand, *Historic Hants County* (Windsor, 1979), p. 12; Shand, "Shubael Dimock", in Public Archives of Nova Scotia (PANS), Vertical MS File (VMF) Shipbuilding: Dimock, Shubael; John H. Sinclair on New Glasgow in PANS, MSS Group (MG) 9, Vol. 43, p. 463.

38. The information about occupations is derived from the files cited in note 8 above and from the personal files of the vessel owners which in turn are compilations from a variety of sources. The card indexes of the Public Archives of Nova Scotia and the manuscript collections and files relfected in them are being searched from time to time. Almanacs, gazeteers, registries and directories for the period 1823 to 1910; as well *The British Colonist,* 1848-74, the *Evening Express,* 1858, the *Novascotian,* 1824-48 and the *Yarmouth Herald,* 1833-73 provided various kinds of information. In addition, George S. Brown, *Yarmouth, Nova Scotia: A Sequel to Campbell's History* (Boston, 1888) pp. 349-356, p. 359, pp. 362-386 and *passim;* James M. Cameron, *Pictou County's History* (Pictou, 1972) *passim;* Eaton, *Kings,* pp. 177-184, pp. 194-202, pp. 407-9, p. 457; James C. Farish, M.D., *Yarmouth, 1821* (Yarmouth, N.S., 1971) pp. 39-43; J. Murray Lawson (comp.), Yarmouth, Past and Present: A book of Reminiscences (Yarmouth, N.S., 1902) pp. 576-592, pp. 612-644; T.G. MacKenzie, "The Mackenzies of River John" (Published by the author, undated), *passim* Patterson, *Tatamagouche, op. cit. passim;* Terrence M. Punch, *The Halifax Connection,* Appendix III; Shand, *Hants, op. cit. passim;* and David Sutherland, "The Merchants of Halifax, 1815-1850, A Commercial Class in Pursuit of Metropolitan Status", Unpublished Ph.D. Thesis (University of Toronto, 1975) *passim.*

39. The breakdown of occupations by port and orientation were as follows:

Occupations	Nova Scotia	Yarmouth	Windsor	Pictou	Halifax
Land:					
Merchants	99	31	17	15	36
Professionals	3	1	1		1
Gypsum Traders	2		2		
Tradesmen	2		2		
Wood Working	1			1	
Foundry	1		1		
Others	4		1	2	1
Totals	112	32	24	18	38
Marine:					
Shipbuilders	55	3	22	30	
Captains	27	17	6	4	
Vessel Owners	15	9	2	1	3
Ship Chandlers	10	3	1		6
Insurance	3		3		
Shipbroker	1		1		
Sailmaker	1	1			
Totals	112	33	35	35	9
	224	65	59	53	47

These figures are drawn from the sources cited in note 38 above.

40. See the totals in note 39 above.

41. The percentage calculations are based upon the data set out in note 39 above.

42. This concept has been introduced in an attempt to focus upon the significant tonnage movements in each port.

43. The tonnage basis of this analysis is to be found in the computerized port files cited in note 8 above, as are the dollar estimates. Fischer has suggested an average rate of evaulation of $35.00 per ton.

44. From 1820 to 1834, Cunard had acquired 8,948 tons of his total 18,050.

45. Cunard had interests in the Halifax Whaling Company and the Annapolis Mining Company. William Lawson and Stephen N. Binney were directors of the Bank of Nova Scotia while Binney's partner, William Pryor, was Vice President of the Halifax Banking Company while Cunard was a director. The partners of Fairbanks and Allison were related to Joseph Allison (Allison and Company) also a Bank director. See Belcher's *Farmers' Almanack...1834,* (Halifax) p. 51, and *1836,* p. 43; "Bank of Nova Scotia, Directors of the Bank", unpaginated, and "Halifax Banking Company Commentary", pp. 1-3, PANS; Leonard A. Morrison, *The History of the Alison or Allison Family in Europe and America, A.D. 1135 to 1893,* (Boston, 1893), p. 194.

46. Edward Cunard had been a partner in the Quebec and Halifax Steam Navigation Company, 1825-1832. George P. Oxley was the name of a prominent shipbuilder at Pugwash later in the century. See an article of the *Eastern Chronicle,* Mar. 11, 1923 in PANS, MG 1, Vol. 43, p. 251.

47. William A. was the father of Benjamin E., Martin P. and William L. Black (Black and Brothers) while the two Stairs sons were William J. and John. See Punch, "Halifax Connection", *op. cit* Genealogical Charts; Cyrus Black, *Historical Record of the Posterity of William Black,* (Amherst, N.S., 1885), pp. 39-43; and H. Gerald Stairs, *The Stairs of Halifax* (Aubrey, P.Q. 1962) pp. 54-6.

48. Fairbanks and D. Allison were directors of the Halifax Water company and Allison was on the Board of the Union Marine Insurance company with Moren and Strachan. J.C. Allison was a director of Nova Scotia Marine Insurance Company with S.N. Binney, E. Cunard and W. Pryor. See *Belcher's, 1836,* p. 45 and *1844,* p. 53.

49. As stated in note 8 above, one pound sterling is assumed to be equal to $5.00. The interest in companies, unless more precise information exists, for each director was assumed to be equal. The total capital was divided by the number of directors who were each assigned one half of the result. Undoubtedly, this provides a liberal estimate of holdings in public companies. Private partnerships are not included because no reasonable data has yet been collected on them. Therefore, these figures are suggestive only.

During the period from 1832 to 1851, a dozen Halifax vessel owners — E. and S. Cunard, the Allisons, Fairbanks, Binney, Lawson, Duffus, Pryor, Moren, Strachan and Kinnear — were associated with the Bank of Nova Scotia, Union Nova Scotia Marine Insurance Companies, Halifax Gas, Light and Water Company, Halifax Water Company and the Halifax and Annapolis Steam Navigation Company. An estimate of their total investment, based upon the assumptions above is $219,481.00. The shipping registered by these individuals during the same period was worth $924,000.00. See *Belcher's 1834,* p. 51, *1836,* pp. 43, 45 and *1844,* pp. 53-5; Bank of Nova Scotia, "Directors of the Bank, 1832-1931", PANS 7 Vic C. 61, An Act to Incorporate the Halifax Water Company; 2 Wm 4, C. 50, An Act to Incorporate...The Bank of Nova Scotia; 5 Wm 4, C. 7, An Act to Incorporate a Marine Insurance Company in Halifax; 1 Vic, Sess. 1, C. 3, An Act to Incorporate the Union Marine Insurance Company of Nova Scotia; 3 Vic, C. 16, An Act to Incorporate the Halifax Gas, Light and Water Company; 4 Vic, C. 14, An Act to Incorporate the General Mining Association; 14 Vic, C. 19, An Act to Incorporate the Halifax and Annapolis Steam Navigation Company, PANS.

50. On the early development of Pictou Harbour, see Rev. George Patterson, *A History of the County of Pictou, Nova Scotia* (Belleville, Ont., 1972), pp. 250-4, 274-5, 366-7; and Sinclair in PANS, MG9, V. 43, p. 463. Mortimer was an agent for Liddells.

51. See Patterson, *Pictou, op. cit.,* pp. 304, 309; Patterson, *Tatamagouche, op. cit.,* pp. 61-3, 72; Sinclair, PANS, MG9, V. 43, p. 462; PANS, MG1, V. 43, p. 251.

52. See Hon. James D. McGregor, PANS, MG9, V. 44, p. 244; Cameron, *Pictou, op. cit.,* pp. 71, 74-5; Sinclair, PANS, MG9, V. 43, p. 463.

53. See Patterson, *Tatamagouche, op. cit.,* pp. 77-8; Mackenzie, "River John", *op. cit.,* p. 23.

54. See Sinclair, PANS, MG9, V 43, p. 463.

55. From the peak of 1850-1854, at $1,569,820.00 (44852 tons) this Port of Registry declined to $295,540.00 (8444 tons) in 1870-1874, while the other ports were peaking and then reached $368,515.00 (10529 tons) at the final threshold in 1880-1884. See also R.E. Ommer, "Anticipating the Trend: the Pictou Ship Register, 1840-1889," *Acadiensis* X (I), 1980, pp. 77-79 for an analysis based upon *total* registry of the port of Pictou. The analysis in this paper is based on a sample of owners drawn from across the whole study period of 1820-1889.

56. Shand, *Hants, op. cit.,* p. 45.

57. See PANS, Record Group (RG) 5, Series "P" V. 54, 1857; and Shand, *Hants, op. cit.,* pp. 138-142. Bennett Smith, Ezra Churchill, Nicholas Mosher, Sr., Godfrey P. Payzant and Theodore S. Harding were directors of the Avon Marine Insurance Company (1851) while Harding also had an interest in the Kerosene Gaslight Company (1852).

58. Between 1830 and 1860, E. Bigelow, E. Churchill, T.S. Harding, N. Mosher, Sr., G.P. Payzant and Bennett Smith acquire $256,670.00 (7333 tons) of shipping. Along with G. Armstrong, M. Allison, Frederick Curry and Edward W. Dimock, they duplicated that purchase $256,270.00 (7322 tons) in 1860-1864. These ten individuals between 1851 and 1865 invested an estimated $103,129.00 in the Avon Marine Insurance Company, the Windsor Marine Insurance Company and the Commercial Bank of Windsor. See Shand, *Hants, op. cit.,* pp. 142-3, 147; 14 Vic, C. 26, An Act to Incorporate the Avon Marine Insurance Company.

59. For a definition, see Panting, "Cradle of Enterprise: Yarmouth, Nova Scotia, 1840-1889", 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), p. 268, note 56.

60. Panting, "Yarmouth", *op. cit.,* pp. 260-2 and "Vessel Owners of the Atlantic Provinces, 1820-1890", a paper presented to the Canadian Historical Association, Saskatoon, June 1979, pp. 6-8.

61. Forty of these owners held an estimated $20,400.00 in the shares of the Oriental (1874) and Pacific (1870) Insurance Companies while five of them, as directors, held a commitment of about $4960 in the Marine Railway (1870) and the Western Counties Railway (1870). Doane was a shareholder in the insurance companies and a director of the railways. In addition, as bank directors, L. Baker, G. Doane, A. Goudey, J.R. Kinney, J.W. and W.D. Lovitt, J.W. Moody and A.C. Robbins had an estimated investment of $300,000 in the Bank of Yarmouth and the Exchange Bank. See Brown, *Yarmouth, op. cit.,* pp. 370-1, 374-5, 382-3.

62. Panting, "Vessel Owners", *op. cit.,* p. 14.

63. Thomas C. Kinnear, partner of Duffus' nephew, Alfred G. Jones was a director of the Union Bank, established in 1857. By the 1870s, he was replaced by J.A. Moren, another West Indies trader and W.J. Stairs. In 1864, the Merchants' Bank was launched by Kinnear, Duffus and John Stairs. John Taylor, yet another West Indies trader, and Joseph Weir, a hardware merchant, held directorship in the Merchants' Bank by the 1870s. See Stairs, *The Stairs, op. cit.,* p. 90 and Panting "Vessel Owners", *op. cit.,* p. 15.

64. During the late 1870s, J.A. Moren was a director of Glace Bay Coal Mining Company; W.J. Stairs and W.L. Black, who had ceased buying by 1870, were on the Board of Victoria Coal Mining Company; and John Taylor and William Esson served as directors of Blackhouse Coal and Railway Company. By 1870, Joseph Weir and George J. Troop had become directors of Dominion Copper and Paint Company. From 1875 into the mid 1880s, W.J. Stairs was on the Board of Starr Manufacturing and by the early 1880s, Daniel Cronan for the Nova Scotia Cotton Manufacturing Company and Thomas E. Kenny for the Nova Scotia Manufacturing Company, performed the same function.

65. Shand, *Hants, op. cit.,* pp. 54, 101, 103, 123.

66. The five individuals were: E.W. Dimock, G. Mounce, G.P. Payzant, J.A. Shaw and B. Smith. The identifiable investments were in Windsor Iron and Brass, Inc., Foundry and Machine Company, Cotton Mill, Gas Company, Fire Insurance Company and the Commercial Bank of Windsor.

67. In 1875-1879, a dozen registrants were still increasing tonnage to the extent of $892,500.00 (25,500 tons). During the following quinquennium, $234,325.00 was spent increasing holdings as against $229,180.00 invested in the final registrations.

68. Panting, "Yarmouth", *op. cit.*, p. 261, notes 72 and 73.

69. McCann, "Pictou", *op. cit.*, pp. 21-8.

70. William Ives, shipper, became agent for the Merchants Bank of Halifax in Pictou. On the Pictou Bank, see James M. Cameron, "The Pictou Bank", *Nova Scotia Historical Quarterly*, VI, 2, pp. 119-20, p. 124.

71. These vessel owners had the following shipping investments: J. Crerar: $15,575.00; R. Doull: $18, 655.00; J.T. Ives: $6055.00; J. Keith: $28,140.00; J. McColl: $18,270.00; C. McLennan: $25,725.00; and J. Kitchen, Sr.: $78,925.00.

72. Shand, *Hants, op. cit.*, p. 103, pp. 114-5.

73. David Sutherland, "Merchants", *op. cit.*, pp. 4-6.

16. DISCUSSION FOLLOWING PAPERS BY McKAY, FINGARD AND PANTING

JANNASCH noted that sparmakers and blockmakers were important trades missing from McKay's list.

McKAY could give little information about workers involved with block-making firms and asked JANNASCH if he knew what their working conditions were like. He believed that Haligonians took such trades for granted and therefore did not describe them.

MACLEOD noted that, outside of Halifax, the most important fishing ports were not shipping ports. He suggested that Lunenburg was a single product economy whereas Pictou and Windsor had agriculture and mining to produce cargoes.

PANTING emphasized that Lunenburg was not one of the ports chosen for study despite its importance in the development of the Nova Scotian fishery.

JANNASCH felt that Lunenburg rose to eminence after the period covered by the port studies of the Project.

MACLEOD raised the point of a fishery revival at Yarmouth based on new techniques and resources and wondered whether this represented a re-direction of energy, money and personnel as part of the withdrawal from the carrying trade.

PANTING noted the importance of the movement to fresh fish production for the American market that shaped the Nova Scotian fishery but was unaware of the size of the investment involved at Yarmouth.

CRAIG asked how the tonnage of vessel owners in each port was aggregated.

PANTING replied that new tonnage, as it appeared on the registries, was used.

CRAIG thought that a number of questions were raised by this procedure because, without the transactions, the results were markedly distorted.

FISCHER indicated that a pilot project for the period up to 1889 revealed no large transactions among major owners.

CRAIG pointed out that tonnage holding must have been more static in Nova Scotian than in British ports, which would raise a huge conceptual problem for the development of a one per cent sample. He continued by stressing the links between vessel owning and financial institutions to be found in the British registries. Practically every

Prince Edward Islander that was registered British had a mortgage on her when the transfer to British ownership took place, indicating that people were amortizing loans against the capital value of the ships. He was interested that this was not characteristic of Nova Scotia.

PANTING believed more research was required in order to determine that point.

CRAIG stressed the importance, in Britain, of vessel ownership being transferred to mortgage holders and then asked about banks in Nova Scotia accepting ships as collateral for loans. It seemed to him that it was pointless to tie up cash in a ship when a loan or a mortgage on her could be obtained at fairly low interest rates. He noted that the extent of involvement by the banks in the industry had not been discussed at the annual conferences.

PANTING pointed out that vessel owners with considerable tonnage did act as directors of banks and insurance companies. So it seems reasonable that they did not deny themselves loans. He agreed that bank records are a part of the ground that has to be covered.

CRAIG wanted to know whether an owner who held half the tonnage in a ship was credited with this amount when tonnage was added up.

PANTING confirmed this.

FISCHER returned to the point about the use of a static analysis of tonnage holdings. While, before 1854, the mortgages were entered on the registers, the great boom in vessel ownership occurred after 1854. At present, the extent of mortgaging is unclear.

CRAIG took up the importance of analyzing the transaction books for transfers of vessel ownership. These may be occurring before total disinvestment in a port takes place. Nonetheless, the idea of using 'thresholds' appears to be a good way to analyze a port. Was 'entry' the point when people began investing in shipping?

PANTING answered that this occurred when the largest number of new owners registered the best mean tonnage for a quinquennium.

CRAIG wondered if the second threshold was when tonnage was increasing at the greatest rate.

PANTING defined it as the point when the most people, undertaking an increase of their tonnage, put the best mean tonnage on registry. He noted, however, that because the method was relatively simple, it might not really grasp the point.

CRAIG insisted that this was precisely where the transactions were needed and PANTING agreed. CRAIG next asked if the 'peak' was based on aggregate registry statistics and was answered in the affirmative. Was it related to what individual owners did?

PANTING gave the example of Yarmouth where the peak was comprised of the aggregate tonnage held by forty eight owners all operating in a single quinquennium. This was the largest tonnage held during the period analyzed.

CRAIG wondered if 'decline' was the year after the peak but PANTING characterized it as the point when people were getting out with the largest mean tonnage.

CRAIG returned to the need for the transactions while PANTING indicated a prior problem. If one talks of disinvestment in 1875-1879, this meant that people who had considerable tonnage during 1870-1874 did not appear on the registry in the following quinquennium.

CRAIG felt that the concept would be valuable for analyzing the vessel owning profile of any port, if it were refined to include the data from the transactions. This would entail a phenomenal amount of work. When 'peaks' on the registry were being considered, were casualties and ships sold out of registry deducted?

FISCHER indicated that disposal of tonnage was based on the registries and not the transactions.

CRAIG was of the opinion that when a ship met with a mishap it was not clear whether or not disinvestment had taken place, although people might thereby be induced to pull out.

PANTING felt that the method of calculation was experimental and noted that the definition of disinvestment being used was the one that could be used with the data under analysis. Techniques for handling other data would have to be worked out. Certainly, there are a number of questions to be dealt with.

DIXON, moving to desertion, wondered whether the criminal law was being used to punish a breach of a civil contract. The military term 'desertion' was first applied in 1729 to merchant seamen's activities and thereby stigmatized them as disloyal. He suggested that the Quebec crimps, in the early stages, were acting like present day headhunters who were trying to entice people from one occupation to another.

FINGARD agreed that the mid nineteenth century legislation passed under pressure from British vessel owners created crimping. Until that time, they were honest labour agents performing a service by bringing non-resident ship masters and sailors together. The more movement in the labour market, the more money made by crimps, but the sailors got something as well.

FISCHER asked if the argument about Quebec crimps could be extended to Halifax, Saint John and other ports.

FINGARD thought that Saint John, like Quebec, was unique. There, a group of respectable boarding house keepers formed a very powerful association and operated like the Quebec crimps although quite openly. After mid century, the application of the laws began to force them out of business. Both crimping and desertion increased in Halifax during the 1870s, largely among crews on foreign vessels.

FISCHER wondered if, given the higher wage rates at Quebec, the sailors of the Fundy and Atlantic ports could also be argued to have come out ahead.

FINGARD believed that Saint John sailors were collecting considerable balances at mid century. The evidence for Halifax, however, is available for a time when wage rates on this side of the Atlantic were in decline.

CRAIG wanted to know if the criteria by which Quebec crimps were being judged could be applied to the crimps of Cardiff during the 1880s.

FINGARD pointed out that their usefulness in the collective bargaining process had been acknowledged because shipowners were forced to pay cash advances, as had occurred in Saint John. The boarding house keepers became a part of the trade union operation despite some tensions.

CRAIG felt that other aspects of Cardiff crimping should be considered. What was done about the surplus of labour? Actually, the seamen received no increment of value and there was exploitation because the notes advanced to sailors by shipowners were taken at heavy interest rates. What of the problems of alcohol and venereal disease which prevented men from fulfilling a contractual obligation to man a ship?

FINGARD eschewed a defence of crimps and argued that the situation in Cardiff was created by the law in the first place. After all, problems were created for traditional societies when laws began to disrupt prevailing practices and greater and greater pressures forced these people to respond. Each shipping act, presumably, had something to say about crimps, with an imposition of larger fines or longer jail sentences.

PARKER noted that the Oslo Museum held voyage stories told by Norwegian seamen, one of whom stated that one of the hardest experiences was working a voyage in a Nova Scotian vessel. Consequently, sailors took pride in having endured one.

BATTICK wondered how seamen behaved when they were not controlled by crimps and boarding house masters. What about seamen who lived with their families? They were probably in the coastal trade. But

how did the sailor comfort himself in familiar surroundings as against the way he was handled as a stranger in a strange town?

FINGARD responded that in a home town the sailor town establishment was ignored. Since they were a young labour force, seamen used the sea as their frontier for a short time and took advantage of what foreign ports offered.

BATTICK noted that, in the records that he had studied, about two per cent of seafarers were boarding with shipmates.

CRAIG emphasized that, in British shipping, family men went into the coasting trades. These men made sizable allotments to families and tended to settle down, not wishing to be far from home any more.

17. CONFERENCE SUMMARY

ROBIN CRAIG

University College, London

CONFERENCE SUMMARY

Robin Craig

I am sure that I shall be expressing the feelings of all those who have attended this Conference in extending deep sympathy to Anne Alexander and young Dominic. The untimely death of David Alexander is not just a personal loss for all of us, however, because he has had a profound influence upon the work of the Maritime History Group at Memorial University and none present today can be unaware of the crucial role he has played in the work of the Group over the past years. David Alexander was widely respected and loved. He was an inspiration to those who came into contact with him, not least those who shared with him the strenuous work in maritime history in this University. That he should have died during this Conference is profoundly sad, but I am sure that it would have been his wish that we should continue to meet despite the tragedy of his passing. I am confident that we can best commemorate his marvellous life, and the high regard in which he was held, by continuing and completing the work to which he gave so much in his lifetime. All of us, whether we share the work on the Project, or support it from without with such help as lies within us to give, should draw inspiration from his high intelligence, his diligence, his kindness and good humour, and thus make the work of the Maritime History Group a fitting memorial to a great gentleman, a scholar and a warm, endearing human being.

I should also like to take this opportunity to send greetings to Keith Matthews who will be extremely sorry not to be here today. Happily, however, he is recovering from his operation and will 'ere long return to his work with the Group. You will all wish to join with me in sending him our good wishes, and the hope that he will soon be with us again.

Finally, before we turn to the subject with which this Conference has been concerned, I would like to express sincere thanks for all the kindness and hospitality which, despite all the sadness, has been so lavishly bestowed upon us. Those of us who have had the privilege of attending more than one of these occasions are especially conscious of the warmth and kindness which seems to grow with each year. For those for whom this is the first experience of Newfoundland hospitality, I am certain that they, no less than the 'old hands', will wish to extend grateful thanks. The kindness of our hosts will never be forgotten.

I would specially like to mention how much we appreciate the enormous amount of hard preparatory work undertaken by the Staff of the Maritime History Group, who have done so much to make our visit a

happy and memorable one. I hope it is not invidious to mention the thoughtful care shown to us by Mrs. Pike and Mrs. Thomas, who, with their dedicated helpers, have done so much to make these Conferences the success they unquestionably are.

The papers presented at this Conference have been exceptionally interesting and useful: in some respects, they have broken entirely new ground. As well as embodying much research and rigorous analysis, they have suggested fruitful areas for future research, as all good papers should. Our speakers have covered a great deal of territory, extending from the decisions made by shipowners and shipbuilders (Panting), to the inhabitants of the waterfront (McKay and Fingard). We then went to sea in the wake of the sailors whose origins have been analyzed for us with clarity and precision (Ommer and Matthews). The age structure of seagoing personnel has been expertly quantified (Battick), as has their literacy (Alexander) and their loyalty to their employers (Matthews again). Labour productivity in relation to the size, rig and deployment of vessels in which seamen served has been subjected to careful scrutiny (Williams and Sager) and we have examined the impact of the new technology of steam (McMurray). An important minority group of seafarers, the lascars, has been rescued from obscurity (Dixon) and, finally, the motives for jumping ship have been expertly explored (Fischer).

It would be impossible in the time at my disposal to do full justice to all the many lines of enquiry which these papers suggest, and which have stimulated such lively discussions, both formally and informally. I must do no more than make a few comments which strike me, beginning with the thoughtful paper by Panting. He introduces a concept which warrants further attention: the idea of thresholds. These may be summarized as the entry, when shipowners acquire an appreciable amount of tonnage (perhaps 'critical mass'?); the threshold when fleets are increasing in tonnage at their greatest rate; the threshold of maximum shipowning activity when aggregate fleets reach their peak; and finally, the threshold that heralds decline.

In identifying these thresholds, one is reminded of W.W. Rostow's *Stages of Economic Growth* and the long and sometimes acrimonious wrangle his 'stage' theory generated. The difficulty with Rostow was the problem of identifying just when a 'stage' was reached and it may seem that we shall have something of the same problem with 'thresholds'. Unless we select some rather arbitary criteria, it will surely be difficult to relate threshold theory to very disparate maritime communities. In any case, for Panting's typology to be more extensively applicable, surely we

need to add another threshold which few entrepreneurs engaged in shipping or shipbuilding in the Maritime Provinces successfully crossed — the technological threshold which embraced iron, steel and steam. This threshold was surely the means by which Panting's last threshold could be averted or avoided. Having made these reservations, I am nonetheless certain that the concept of thresholds is valuable and demands further study and refinement.

McKay's careful analysis of the waterfront crafts of Halifax also reveals the extent to which a technological threshold remained uncrossed by highly specialised groups of workers who sought to cling to their painfully acquired skills, protecting themselves as best they could both from changes in demand and from the threat of unskilled labour. There is no hint in McKay's paper that the Halifax waterfront had undergone any technical transformation by 1914, but surely this cannot have been altogether the case. To be sure, the demand for sail making, cooperage and caulking unquestionably declined, but did not new metal-working skills and engineering expertise expand with the advent of the steamship — no stranger to Halifax waterfronts as early as the 1850s? It is to be hoped that McKay will extend his research to the more dynamic demands for skills engendered by iron, the paddle and the screw.

Fingard leaps to the defence of the crimp — at least the Quebec crimp — and argues forcefully that we should see them as having a community of interest with the very sailors who were popularly supposed to have been exploited by them. Quebec was, perhaps, *sui generis,* and the problem of crimping there was the object of much anxious and troubled enquiry in Britain. Crimps were essentially middlemen — intermediaries between employer and employee. Much of their power in British ports derived from the institution of the advance note; in Quebec, it was more the differential in wages between ship and shore that determined the extent of their activities. However, crimps had relationships with masters and shipowners as well as with seamen and the one group was as important to them as the other. That few crimps sought or achieved 'upward mobility' was hardly surprising, given the circumstances prevailing on the Quebec waterfront in the sailing-ship-dominated mid nineteenth century when their functions often included the provision of cheap drink, cheap lodgings and other more dubious delights. The organization of these services no doubt demanded skills of a high order, but they were not such as to commend themselves to the tastes of polite society.

Perhaps we need to remind ourselves that seamen signed voluntarily an agreement to serve on vessels on a specified voyage in a specified functional capacity. In return for these services they were to receive wages

and food which were also set out in the formal agreement. Although the food was often exiguous in quality and quantity, and the accommodation very far from ideal in most cases, they all expected to receive the wages set out in the agreement and indeed invariably did so unless sums were deducted because of disciplinary infractions on a scale which was also embodied in the official document they signed. We perhaps need to remind ourselves that shipowners ventured a great deal of capital in their vessels; for them, wage and victualling costs were not their main outgoings, as is often asserted. Shipowners stood to lose heavily if their vessels were delayed or prevented from sailing. They could suffer severe pecuniary penalties if *their* contractual obligations to charterers were unfulfilled. Irresponsible seamen, aided and abetted by crimps (who were far from disinterested and did little if nothing for seamen's welfare) were not conducive to an efficient or prosperous shipping industry, upon which all, whether they served ashore or afloat, ultimately depended.

Ommer, in examining the crew agreements for Windsor, N.S. shipping, pays particular attention to the origins of the work force, relating them to the ports at which seamen were engaged. The over-representation she finds of personnel emanating from places such as Ireland or the Shetland Isles suggests to her that seafaring was an alternative to emigration. It was also, for some, the first step on that journey, notably for unskilled ordinary seamen. She finds that major ports tended to attract a much more cosmopolitan seagoing pool of labour than did minor ports, as was to be expected. Her conclusions respecting master mariners are confirmed in large measure in the work by Alexander and Matthews. Ship's officers, especially masters, tended to be 'local' men, or at least known to the shipowners in their proximity. This might also be true of apprentices, certainly in the first three quarters of the nineteenth century, although the catchment area for apprentices widened as the premiums paid by them or their guardians increased. Ommer, Matthews and Alexander are unquestionably correct in establishing the close link between the appointment of masters and individual shipowners. It must be remembered, however, that the method by which master mariners were engaged was different from the appointment of crews. Masters and apprentices came under the special purview and scrutiny of shipowners, whereas crews were engaged in the impersonal and more or less random circumstance of the Shipping Office. Shipowners had to repose complete confidence in the character and ability of their master mariners. Much of the shipowners' success depended critically on the judgement they exercised in selecting men to command their ships. Qualities of seamanship, the commercial acumen of masters, their honesty and reliability, were all vital to the shipowner

before the development of the electric telegraph when so much chartering business was of necessity undertaken by shipmasters in foreign ports. The predilection of shipowners would often determine the pattern of recruitment: as Matthews tellingly shows; Bowring, for the best of reasons, sought West Country masters, whereas able seamen and ordinary seamen were randomly recruited. Matthews interestingly comments on the length of service of some of Bowring's personnel and confirms what was a common pattern among the better class of owners — that loyalty and efficiency were rewarded by reappointment and the prospect of a permanent career within the Company. Similar patterns can be perceived in the case of many famous and long-established British shipowning enterprises, both sail and steam. We may instance here Smith's City Line, Cunard, Union Castle, Lamport and Holt, and Alfred Holt. Many senior masters were to find shore positions with their employers as marine superintendents, having achieved a long continuity of faithful service.

Alexander confirms Runciman's opinion that seamen were just working men who got wet, but can find no evidence that seamen were drawn from an especially depressed segment of the working population. However, it seems likely that any comprehensive analysis of the birthplaces of seamen would reveal that, in one respect, they would be found to be untypical of the British work force as a whole. My own work on the composition of crews suggests that the big cities furnished fewer seamen than any random sample would lead one to expect. Sailors, it seems, came from a rural or small seaport background rather than from the great urban centres. Alexander notes that the crews of Yarmouth, N.S. vessels were getting older by the 1880s, but confirms Battick's interesting analysis of the seagoing population of Belfast and Searsport, Maine. Battick's findings are wholly in accord with British evidence as indicated, for example, by J.H. Brown's tabular data given to the *Select Committee on the Merchant Seamen's Fund* in 1844. Brown's classification of seamen registered between 1835 and 1841 at British ports also distinguishes men by age and by capacity, showing that ordinary seamen and able seamen were predominantly young. No less than half the seamen were aged between twenty and thirty years whereas ship's officers were older — no less than fifty four per cent were aged between thirty and forty five. Battick makes the interesting observation that it was between the ages of twenty six and thirty five that the Maine men decided either to 'swallow the anchor' (go ashore) or seek promotion. Despite this, it is worth noting that many British shipmasters were much younger: twenty nine were under eighteen years of age and seven per cent of all master mariners were aged twenty five or less.

The papers by Williams and Sager focus upon the relationships between the size, rig and manning of merchant ships, predominantly sail, in the deep sea trades. It is reassuring that their conclusions achieve a high level of agreement despite the entirely different sources that they have analyzed. This is also despite the fact that Williams examines two sample years in the 1830s and 1850s, whereas Sager's study covers the period between 1863 and 1891. Both authors note an increasing tendency to employ larger vessels as time progressed but, in respect of the wooden sailing vessels which fall under Sager's purview, there is a halt to this progress soon after 1869 when the limits of economies of scale had been reached. Man-ton ratios are found to have been in inverse ratio to the size of vessels, with rig by itself having little influence in the first half of the nineteenth century. However, the trend was different by the 1870s and 1880s when barques, barquentines and schooners were established as the most economical types of vessel in the employment of labour. The length of the intended voyage was an important factor in determining crew size in both periods: for example, voyages to the West Coast of South America necessitated the engagement of larger crews than were required in the less hazardous and less protracted North Atlantic trades. Williams is able to quantify the superior labour productivity of American tonnage in the age before the Civil War in America and Sager makes the interesting point that older and more experienced seamen helped to account for improved labour productivity, which he also analyses with reference to wages by calculating output per man, which he notes significantly increases after 1879. Sager also confirms the findings of Ommer and Matthews that the masters of ships tended to have a close relationship with the ports where the vessels they commanded were owned.

Dixon directs our attention to a minority group of seamen of different ethnic origins — the lascars. They played a significant role in the manning of British merchant ships at least from the beginning of the nineteenth century, but have been neglected by maritime historians until Dixon, and Frank Broeze in Australia, rescued them from obscurity. Since they did not enter the North Atlantic trades in any considerable numbers, they will not have featured prominently in the work so far of the Maritime History Group. But as research is extended to embrace the Far Eastern trades and the advent of the steamship, their part in the British mercantile marine will be seen to have been well worth recognition.

It is with steamships that McMurray is concerned. He considers the implications for seafaring and seafarers of the advent of steam, showing how new technological requirements were to have a profound effect on seagoing personnel. The men of the engine room and stokehold had an

exceptionally testing time in the developmental period of the marine engine and boiler, when design was highly diversified and principles barely understood. Unreliability of operation in both engines and boilers delayed the maturity of the steamship for half a century, during which time new classes of men had to be assimilated on board ship. The advent of the engineer created new tensions, ambiguities and divisions of loyalty and precedence, as McMurray has ably shown. It is worth stressing that the concern of engineers for their status assumed greater urgency as the need for their skills began to diminish in the late nineteenth century when, in the case of the generality of steamships, standardization and reliability had removed some of their more onerous responsibilities. The advent of large numbers of stokers, firemen, trimmers, greasers and donkeymen give the late nineteenth century crew agreements a highly complicated appearance which almost defies analysis — however, I am confident that members of the Group will solve this problem as they have solved others!

Lastly, in this brief review of papers presented at this Conference, we come to Fischer on desertion. He examines evidence on desertion from the ships of Saint John, New Brunswick, between the years 1863 and 1914. Nearly one quarter of crews deserted and desertions reached their peak in these predominantly wooden sailing vessels in 1895. The 'target areas' for deserters were, not surprisingly, found to be the U.S.A. and Australia, followed by British North America and the United Kingdom, with younger men showing a greater propensity to desert than their older shipmates (c.f. Battick's comments on the age at which seamen tended to decide to leave the sea). Ordinary seamen were more disposed to desert than able seamen, but Fischer notes that most ordinary seamen didn't desert on their first voyage, which somewhat modifies the idea that going to sea as an unskilled man was a cheap method of emigrating. Without looking at other records, bearing in mind that official logs are scanty for much of the period subject to Fischer's analysis, it is not very easy to determine the factors that led to the decision to jump ship. However, I think that conditions on the ships themselves would often be a determining factor. Poor food, unsatisfactory accommodation, severe discipline, accompanied perhaps by physical violence, excess of work brought about by hard-driving masters, climatic conditions, the nature of the companionship — these are all factors which might have some bearing on the matter. It may well be that desertion was itself the consequence of such 'push' factors, rather than the 'pull' factor of better economic opportunities in the country where desertion took place. Perhaps it could be argued that much desertion occurred, not where economic opportunities on shore were greatest, but where seamen were most in demand: and where they were most demanded were often very unsalubrious places indeed!

Perhaps I may make another point concerning push and pull factors. The more recent orthodoxy concerning the process of industrialisation in Britain is to emphasize the squalor, exploitation, misery and hardship that generally prevailed. I think that the pendulum of opinion has swung too far in that direction and we need to reassert how 'wildly unhistorical' this view may be. Blessed with hindsight and from the totally transformed viewpoint of today, we may well exaggerate the unfavourable face of industrialisation. Taking the fashionable view of life on shore, we may mistake the motives of those who took to seafaring in such large numbers. We ought to correct the bias in favour of 'push' and re-examine the 'pull' factors. Countless writers, from Adam Smith onwards, have testified to the positive attractions of seafaring without any suggestion that men were driven to it for lack of other opportunities. I believe that it is misleading to make a presumption that men only went to sea as a last resort, or as an escape.

The striking omission from the research done on crew agreements so far is that, because it is largely confined to the sailing ship, it has neglected the fact that the majority of sailors from the 1870s were employed in steamships and that sailing ship men cannot be considered in isolation from the alternative form of employment. Steamships offered crews higher wages, more regular employment and often much better physical conditions both with respect to accommodation and victualling. The identification of changing trends in the structure and composition of sailing ship crews between, say, 1860 and 1914 ought to be seen against that background.

Few seamen in the nineteenth century could ensure themselves secure and continuous employment. It seems probable that most were lucky to be employed at sea for nine months in every twelve. We need to explore what happens to men during the three months ashore as well as during the nine at sea. Havelock Wilson speaks of sailors doing casual shore jobs in London — some, he says, were employed as cabbies: we know from other sources that sailing ship men were eagerly sought for service in the early fire brigades because of their mastery of heights. No doubt there were other occupations open to seamen, at least in the larger towns and cities. But the common seaman had few skills which were generally valuable ashore: in this respect he was at a disadvantage compared with the engineers and firemen. For all those who served at sea, in whatever capacity, we need some career profiles and it might be possible to glean useful information from the crew agreements if some really intensive work were to be done. At least we could examine the previous discharge dates of seamen to determine what changes there were in the

length of time between voyages. Did most seamen take spells ashore as Wilson thought, followed by spells at sea, in harmony with the pattern of the trade cycle?

Perhaps we might distinguish three types of seafarer. At the bottom, came the untrained ordinary seaman, the archetypal casual worker who neither sought nor attained continuity of employment. In the middle was a sizeable majority of men who achieved competence as seamen and might, in time, aspire to at least some promotion to a specialised role, as carpenter, sailmaker, donkeyman or bo'sun. Finally, at the top, there was a minority group of career men who sought a continuous and professional life at sea — men who could expect to take and pass examinations, and become master mariners. Since many large steamship companies demanded sail trained officers, there would be an incentive for such men to serve their time in sail as a preliminary to being given a command.

The dominant feeling I have when I attend these Conferences at Memorial University is the admiration aroused in me by the dedication and resourcefulness that members of the Maritime History Group have shown in handling and processing large quantities of inchoate and intractable primary material. The theme of this Conference must inevitably send us to that great archive which you have so spendidly preserved and analysed — the crew agreements and official logs. The papers we have listened to testify to the skill of Group members in assimilating an archive of massive proportions. However, there is some danger that secondary material, which can illuminate many aspects of the data, may be neglected and I want to conclude by mentioning just one or two secondary sources which may perhaps be relevant to your future work.

Only Williams refers in his paper to the abundance of material that exists among the Parliamentary Papers. There is much evidence given by seamen to many Select Committees and Royal Commissions that dealt with problems that attend the seafarer's calling. Many witnesses gave vivid testimony concerning most aspects of life ashore and afloat and their evidence needs careful appraisal in the light of findings from the archives at Memorial University. To be sure, sailors were (and are) the most beguiling spinners of yarns and tellers of tall stories — stories that became elaborated and embellished with each retelling. Memories were frail and sailors were prone to exaggeration and distortion. However, more than most kinds of worker, they spent much time in talking to one another. I have never tried to quantify the number of published reminiscences by sailors in the nineteenth and early twentieth centuries, but there must be well over a hundred of them. Some accounts repay careful study: Crosbie Garstin's edition of the memoirs of Samuel Kelly, published in 1925, not

only gives an authentic picture of life at sea between the 1770s and 1790s, but can be shown to be of quite exceptional accuracy. With the materials at your disposal, you could go a long way towards assessing the accuracy and validity of this kind of material and I believe it would add a dimension to your quantification of the crew agreements, as well as affording you some desirable light relief.

Some shipowners were seafarers and some have published widely. Alexander uses Walter Runciman's *Collier Brigs,* for example, but there are plenty of other books of a similar kind. W.S. Lindsay was both sailor, Member of Parliament and shipowner: he was only one of several M.Ps. with seafaring experience and speeches in Hansard are not a negligible source of insights. Two other sources occur to me: Lord Brassey had a deep interest in the British mercantile marine and in the welfare of its personnel. His compilation *British Seamen* draws very heavily upon Parliamentary Papers and is a most valuable guide to those aspects of seafaring life that attracted the attention of legislators. Such matters as crimping, the advance note, dietary and examinations for master mariners are dealt with authoritatively by Brassey in this book. I would also like to mention the name of Frank T. Bullen, who is perhaps best known for his book about whaling, *The Cruise of the Cachalot.* His later book, *The Men of the Merchant Service,* published in 1900, deserves to be better known since it serves as a good guide to the organization of work and duties on merchant ships, both sail and steam.

Another useful source is the journal *Nautical Magazine,* the best of several publications of a similar kind. It exists in a continuous series from 1832 and contains much illuminating comment on the seafaring life. It ought not to be neglected as a source.

Reading reminiscences of seafaring life, turning the pages of *Nautical Magazine* and similar publications, you will I hope be struck by an aspect of life at sea which was clearly of great importance to those that experienced it. This was the sense of companionship which often arose in the confined life aboard ships on long ocean voyages. Despite the fact that men came from diverse and unrelated backgrounds they often came to have a sense of community, sympathy and fellow feeling one with the other. Amidst the hardships and brutalities, the 'Liverpool pantiles' and the salt sores, there was engendered a sense of comradeship which some men were to value all their lives. Furthermore, as anyone who reads Runciman will know, men often loved their ships and took a fierce pride in them. Life had a sense of coherence, there was achievement in sharing hardship and surmounting difficulties: above all, these sailors relied upon each other for survival in a way unmatched by any other workers

except miners. Sailors led a life apart, but it could be a rich life upon which they could reflect without rancour or malevolence in later years.

Far off like floating seeds the ships
Diverge on urgent voluntary errands,
And the full view
Indeed may enter
And move in memory as now these clouds do,
That pass the harbour mirror
And all the summer through the water saunter.

18. DISCUSSION FOLLOWING CRAIG'S SUMMARY

BUCKNER drew a distinction between maritime historians and Maritimes historians with respect to the research priorities of the Project. For the former, the major emphasis will be on ships, sea lanes and ultimately Britain as the heart of the industry. For the latter, the essential questions deal with the land, with the relationship between the shipping industry and the wider economic developments taking place in the area. He called for the Project to focus on this second set of priorities, with greater concentration on such sources as the newspapers and the legislative papers of the Atlantic Provinces.

SAGER stressed the need to understand the vessels and their deployment in an international service industry, their competitive position in that industry and also the labour force involved. He felt that the decline of the Canadian shipping industry could only be explained through an understanding of both its competitive potential on the international scene and the prospects for alternative landward opportunities which existed in Atlantic Canada. Moreover, since shipping and shipbuilding constituted the linch-pin of the economy, their decline and ultimate removal would explain the progressive relative decline of the region.

BUCKNER insisted that in order to demonstrate that it was the linch-pin, it was necessary to understand the relationship of shipping to the economic and social structure of the region. He pointed out that this would required detailed work on some of the staple industries, such as the timber trade.

SAGER replied that last year the Project had taken a first step towards regional explanation with its estimates of output and productivity in the industry. He stressed that it was not always possible to foresee the relevance of a research topic, such as man-ton ratios, in the early stages of analysis, even though the final result could prove as useful as man-ton ratios had done in requiring an estimate of the total wage bill which, in turn, brought the Project closer to an estimate of financial returns to the industry.

PANTING indicated that it was difficult to decide how far inland one should carry the analysis. At this point, documentation had been used to obtain masses of data. The next step was to decide what this data meant. When problems with the analysis of commercial data for the various ports are overcome, there are others posed by voluminous non-computerised data. For any given period of time it is necessary to

discover how much money owners invested in vessels rather than in other enterprises. In addition, an attempt is being made to look into the economy surrounding the ports by means of trade statistics. He believed that a basic reinterpretation of the economic history of the Maritimes would take ten years.

BUCKNER was concerned that the Project had not led to an understanding of the prosperity of Saint John, which was the key to the region because of its size and importance. He felt that this pin-pointed the problem of Project priorities, explaining that while a correct picture of the shipping industry could be gained from a focus on ships going in and out of port, that would not necessarily be a correct picture of the region.

KNOPPERS thought that the port, its hinterland and the world market, taken together, constituted the appropriate unit of analysis. The transportation industry could work as an engine for growth, if other things such as entrepreneurial spirit, factor endowments and geographic location were working positively. Market demand could operate from both the hinterland and the external world. Trade cycles could affect bulk commodities such that the shipping industry ceased to be viable; it is important that such cycles and their effect on sea transportation be understood. This could result in a positive assessment of the Maritimes shipping industry as having survived under difficult conditions long after other areas of a similar nature had given up. Thus, he thought, there was not really a dichotomy between priorities, but one unit of analysis incorporating the port, the international context and the hinterland.

FINGARD suggested that case studies, oriented to ports as communities rather than ports of registry, would provide a measure of the impact of the shipping industry aside from vessel owners' profits. As an example, entrances and clearances indicate that the number of foreign vessels was increasing relative to British ones. The former would not generate so much activity among waterfront crafts, labourers and suppliers. Steamships in particular tended to take activity out of the region so their large crews and their requirements as vessels had little local impact. She therefore thought the degree to which the shipping industry focussed on the region is important, especially if successors of the vessel owners began to make external investments which did not help the region.

FISCHER said that while he accepted the inter-relationships between various aspects of the shipping industry and did not see any dichotomy, he nevertheless felt that there was a question of priorities

involved with respect to where fundamental time, effort and emphasis had to be placed. He thought that the Project priority, seen in this sense, had to be placed on the region; an emphasis on international shipping would produce different allocations of time and effort, although over a long time-span the results might well be the same.

KNOPPERS cautioned that the answers to the fundamental questions posted by the Project might still lie outside the region and it could not be assumed that they would be found within the Atlantic Provinces.

BROOKES, recalling the prime mandate of the Project, felt that the reasons for the rise and decline of the shipping industry might well lie in the international economy at sea. A separate question was the impact of this decline on the people of the region. For example, as the industry declined did local crew participation on local vessels increase or decrease? How important was it, in the Maritimes life style of occupational pluralism, to be able to go to sea for two years? Did it become more difficult to get local crews as competing opportunities arose? Did local men decide they could do better in Boston than as a ship's carpenter on a Windsor vessel? In other words, did the decline of the industry affect the local population, or were competing opportunities elsewhere making that decline irrelevant?

SAGER stressed the concern of Project members to uncover both the returns of the industry to the region and the impact of the industry on the region. He pointed out that it was a service industry that originated in the region and remained a regional industry even when operating in farflung corners of the world. He felt that, despite the evidence for an immense competitive advantage to Britain in terms of steam technology, Canada had missed an opportunity in shipping. He asked for assistance from participants in attempting to estimate these missed opportunities.

CRAIG replied that this related to KNOPPERS' argument about external factors. He pointed out that the Atlantic grain trade arose on the back of the Black Sea grain trade and that Maritimers could never have broken through that advantage, considering the predominance of steamships in the Black Sea trade by 1870-1880. Given that, along with existing expertise and markets in Europe, there was not, he felt, a realistic counter-factual argument.

PANTING asserted that the term 'Maritimes' had no cultural or social content. Most people were aware of a great international market in vessels, commodities and labour because they wanted to operate in the black rather than the red. They did not operate in the 'Maritimes' and were not concerned, in their decisions, with the good of the region

or Nova Scotia and in some cases with that of places like Windsor. Where it is possible to establish family business networks, it is evident that this is what interested people. When case studies of ports are developed, the nation and the province disappear. Nationalism is, psychologically, a system of control and not a good analytical concept. National documents, like commission reports, aggregate information according to legally defined political units. This was not the concern of vessel owners.

BUCKNER agreed with BROOKES that there were two problems: one, the decline of the wooden shipping industry and related issues; the other, the significance of that industry in the regional context. The question is not whether or not vessel owners were concerned with the region's well-being, but whether the industry was of benefit to the region or not. Despite the probable external generation of the decline of the industry, there is no clear perception of how to situate that industry among the various economic and social upheavals of the time in the Atlantic region. He stressed the need to decide which were the important questions.

PANTING pointed out that the nineteenth century lack of regional consciousness was important because, in the twentieth century, regional consciousness is a concern. There may be no point in trying to get a twentieth century answer from the study of a nineteenth century situation.

KNOPPERS saw a parallel in the eighteenth century decline of the Netherlands, where nationalism had also been retrospectively associated with the shipping industry. What had actually occurred was a shift in national policy from sea-based to land-based interests. In Canada, national interest has not been focussed on the shipping industry so much as on favourable freight rates for central Canada and the industry has not, therefore, been able to develop in a national context. He saw the nature of the Project as a 'development' type of research and thought that perhaps there was no need to develop priorities. The result will be to provide a good basic outline of what happened, indicating lacunae and remaining problems. He felt that pure research like this should not be constrained by questions about the time spent on local or international aspects of the problem.

BUCKNER felt that, during the nineteenth century, the question of the importance of the shipping industry had been a contemporary issue. He pointed out that, if KNOPPERS' direction were followed, a magnificent study of a shipping industry would result, but that the issue of importance for the Atlantic Provinces would not be resolved.

PANTING agreed that people in Saint John debated the value of the shipping industry to Saint John, but they would gladly have built up Saint John at the expense of Halifax. That is, the national and regional context was not there. A regional, or national, assessment of the industry will be a twentieth century explanation.

McKAY felt that the question of regional identity could usefully be examined through the study of the working people. Did they see themselves as Maritimers and were they only 'working men who got wet' or a separate set of labour? After all, if a ship owner was not dependent upon a given body of workers for his profits, it must have given him more independence than, say, a mine owner or a mill owner would have possessed.

FINGARD took up the international nature of the sea-going labour force, pointing out that this made it easy for owners to abdicate responsibility to the labour force. She pointed out that in Canada attempts were made to protect Great Lakes seamen but not the ocean-going merchant marine.

PANTING thought class bias could be seen in the behavior of vessel owners in, for example, the greater ease with which an owner's son or nephew could achieve promotion to master.

CRAIG opined that seafaring produced greater opportunities for class mobility than many other occupations — through such common occurrences as marriage with an owner's daughter, but also simply by working up through the ranks from apprentice all the way to shipowner. Shipping, he pointed out, is capital intensive, not labour intensive with wages representing about twenty percent of total costs; this sets it apart from other industries.

McKAY thought class was important in the landward aspect of the shipping industry.

CRAIG agreed that it would be much more visible among longshoremen and the auxiliary trades.

FISCHER asked about wage bills for sailing vessels.

CRAIG said that if one included all the variable costs of a sailing ship, including repairs, pilot dues, etc., wage costs would be in a minority at about twenty percent.

SAGER felt that there was a real need to uncover the business records of shipowners. The few existing collections are not sufficient to estimate the financial situation of the industry. Data on cargoes, freight rates, wages, capital costs, the selling price of vessels abroad, port charges, etc., are all part of the research design and some way must be found of uncovering and then analysing all these variables.

OMMER drew attention to the wide range of expertise that was required for a satisfactory conclusion of the Project. Project members were asked to become experts at the local, national and international scale; they were dealing with issues as wide-ranging as the possibility of seafaring as an alternative to emigration during the great migrations of the nineteenth century down to the importance of seafaring as an employment opportunity for a local community. Basic dilemmas of economic cause and effect had to be resolved: did Windsormen emigrate because their fleet was in decline, or did the fleet decline because alternative opportunities had drawn the labour force and capital investment elsewhere? The Project had to range from the international to the very local — and she asked for the patience and assistance of interested observers.

BROOKES recognised that the Project was getting more involved in an analysis of landward impact of the seaward sector. He returned to the idea of the shipping industry as a linch-pin, but a linch-pin in a society in which occupational pluralism was the norm. He wondered how important seafaring might have been in terms of supplementary income and whether or not the decline of the industry destroyed both a quality of life and a financial safety valve for the local people.

BUCKNER pointed out that this reinforced his point, and FINGARD's, about the need to pursue the study of the community in greater depth, rather than the seaward side.

CRAIG suggested that international academic interest in the Project would be a function of the extent to which researchers followed KNOPPERS' model. He thought that Memorial University could become a leading centre for maritime studies as a result of the pioneering methodological nature of the Project which is transforming the nature of the field. He suggested that the academic significance of the work would be greater if the focus were international.

BUCKNER rejected the viewpoint that one approach was of more scholarly value than another just because one was international in focus and the other local. He insisted that an explanation of the historical evolution of a neglected region of Canada was equally valid.

OMMER responded that the Atlantic Provinces, as a fragmented region or perhaps even series of regions, were encompassed by the sea and in the past had been linked together by the sea. Increasing landward economic development broke up this sea-based coherence. Headland communities, which had previously projected out into the sea lanes, became isolated when roads and railways were built. In the process

the area became increasingly fragmented. Today, the nineteenth century is perceived in the Atlantic Provinces as a Golden Age which has been lost and people see themselves as second class citizens who made a terrible mistake. This is a misunderstanding of the past, which the Project members can perhaps correct. Although the shipping industry carried produce all round the world, it was not often Canadian produce; vessels sailed initially from Canadian ports but goods did not necessarily flow from those ports. There was a disjunction between the seaward and the landward sectors of the Atlantic Canadian economy; there was a disjunction between the international economy and the maritime Canadian economy although Maritimes ships carried so many international commodities. Given a data base of documents that come from the seaward economy, Project members cannot do the detailed landward work that is undoubtedly needed, but they can perhaps say whether or not the shipping economy was an important part of the whole tableau.

CRAIG suggested a parallel with Britain whose merchant marine used to be at the centre and is now peripheral.

OMMER pointed to the Channel Islands which were too small to support a major domestic industry, but which solved the problem by setting up colonies based on fish in Gaspé and Newfoundland. The Maritimes, however, could not do that — they were colonized by others and that was an important economic distinction.

KNOPPERS felt that Project members had pulled together the components of maritime economic history. Moreover, the Conference had provided an opportunity for frank discussion and the generation of mutual confidence within the academic community.

FINGARD commented on the receptiveness of the Project to criticism and suggestions. She encouraged the Project researchers not to be content with the acquisition of a data bank, but to continue their search for questions that would ultimately provide some of the answers needed.