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Literacy and Economic Development in Nineteenth Century Newfoundland**

Economics has a central place in Newfoundland's history because the country acquired a reputation for poverty, which was mostly deserved, and suffered a national bankruptcy which was deeply unfortunate. One explanation for the economic misfortune of Newfoundland, in a part of the world where the opposite has generally been true, has focused upon inadequacies in the resource endowment. Poor soil and a wretched climate limited the production of food in Newfoundland, and in the past rich or powerful countries were those with productive agricultural sectors. In this century agricultural output and employment in developed countries has shrunk drastically relative to total output and employment and such a deficiency may not now be so important. But in nineteenth-century Newfoundland the absence of a strong agrarian sector heightened the employment problem and placed strains on the balance of payments. Compensating for this was the country's location on a great ocean resource in a world characterized by unprecedented population growth and rising demand for animal protein. Simply because it was not a great farming country is no reason to forget that Newfoundland was a major world food producer.

While no country has built prosperity around fishing alone (or any other single resource for that matter), the Dutch in the seventeenth century, the New Englanders in the eighteenth and Maritimers in the nineteenth were able to

* On 25 July 1980, after a prolonged and courageous struggle against cancer, David Alexander died in St. John's, Newfoundland. A frequent contributor to this journal, David had already established his reputation as one of the finest economic historians in Canada. He was a scholar of unusual breadth of vision and extraordinary intelligence. He was also a man of rare charm and great humanity. David was working on this paper at the time of his death and would undoubtedly have made revisions in it, if he had had the time to do so. The paper was the first in a series of annual lectures delivered at U.N.B. by distinguished regional scholars and a revised version was read by David's colleague, Stuart Pierson. — Editor's note.

** This paper has been written in difficult circumstances and carries a list of acknowledgements longer than usual. I am indebted to William Shrank for reviewing the statistical analysis, and to Allan Macpherson for making available his research notes. Elliott Leyton, James Hiller and Keith Matthews read earlier versions and drove me on to expand and clarify. Harold Paddock offered me important insights and confidence in the conclusions. Rosemary Ommer was a constant companion throughout, and designed the illustrations. All of the staff of the Maritime History Group helped in one way or another. I am particularly indebted to friends who have not only read this paper but have helped me through many efforts to understand and to write Newfoundland's economic history, especially Stratford Canning, Peter Neary, Stuart Pierson and George Story. More than twenty years ago Rodney Poisson tried to teach me to write decent English, and he tried once again with this paper.

develop their ocean resource into a much wider trading economy. This was something Newfoundland did not do, despite the expansion of output and trade in the world and the fact that the non-marine resource base strengthened as mineral and forest resources met a growing demand coupled with a developing technology for their exploitation. Relative to population size Newfoundland was never resource poor, and by the last half of the nineteenth century an explanation of the weakness of the economy which emphasizes geographic limitations becomes less interesting and probably wrong. Copithorne has challenged the empirical grounds for arguing that regional disparities have much to do with the distribution of resources by pointing out that Newfoundland and the Maritimes have a higher per capita supply of resources than Ontario. Moreover, he offers theoretical arguments to show the differences in resource endowment are much less important in explaining per capita income differences than are other factors which determine relative levels of labour productivity.[1] This is an important perspective on the problem for while Newfoundland's resource base might appear inferior to the lush landscape of Southern Ontario, it does not appear so when compared with the harsh environments of successful countries like Iceland, Norway and Sweden.

If resource weakness is not the explanation for Newfoundland's economic problems then it might be that the country failed to maximise its potential through incompetence. Much has been made of the inadequacies of the clique who dominated the economic and political life of the country, and their characteristics and behaviour should not be ignored. In a narrowly based export economy, entrepreneurial failures in the key trading sector could be sufficient to weaken the whole country.[2] On the other hand, mismanagement is easy to discover in any economy and its scale must be enormous in order to make a substantial impact on national well-being. The magnitude of any resulting lost income is difficult to measure and it has not been proven that better decision-making would have made an appreciable difference.[3] One is driven to ask

1 L. Copithorne, "Resources and Regional Disparities", *Canadian Public Policy*, V (1979), pp. 181-94. For arguments which stress the resource problem in Newfoundland see the valuable collection in Peter Neary, *The Political Economy of Newfoundland* (Toronto, 1973). The campaign for union with Canada produced two of the strongest arguments along these lines in R.A. MacKay, ed., *Newfoundland: Economic, Diplomatic and Strategic Studies* (Toronto, 1948) and H.B. Mayo, "Newfoundland and Canada: The Case for Union Examined" (D Phil thesis, Oxford University, 1948). The most persistent modern argument along these lines has been pursued by P. Copes, *The Resettlement of Fishing Communities in Newfoundland* (Ottawa, 1972).

2 David Alexander, "Newfoundland's Traditional Economy and Development to 1934", *Acadiensis*, V (Spring 1976), pp. 56-78, and *The Decay of Trade* (St. John's, 1977).

3 The only attempt to guess at a magnitude is the "what-if-Newfoundland-realised-Norwegian-fish-prices" argument in David Alexander, "Development and Dependence in Newfoundland, 1880-1970", *Acadiensis*, IV (Autumn 1974), pp. 4-31. This is really not a terribly convincing

whether entrepreneurial failure was a reason for low productivity or whether low productivity restricted the supply and limited the efficiency of entrepreneurship.

While many economists will deny its importance, historians who pay attention to politics accept that an imbalance of power can affect the distribution of income among classes and between countries. It is always tempting to explain the problems of weak countries in terms of the capacity of powerful ones to exercise domination over them, especially when there is a formal colonial relationship. Arguments have been advanced to suggest that Newfoundland has been oppressed by foreign corporations and governments.[4] But is it really necessary to show that income was drawn away from the country in excess of services delivered by the colonial power, or that by transfer pricing or the imposition of unwarranted concessions corporations extracted more income than an unbiased market would yield? On the first point it is demonstrable that Newfoundland received more in the way of services from the Imperial Government than it supplied revenues directly or indirectly to support them. With respect to the second the answer is less clear, but it is unlikely that the country was greatly disadvantaged relative to other countries, which achieved higher material comfort and national security with an equal or larger dependence upon foreign firms.

A subtler exploitative hypothesis has been developed by Antler, who attempts to measure the size of capital exports from Newfoundland up to the last decades of the nineteenth century.[5] The existence of such capital exports has been questioned,[6] but even if they existed, the long-term implications of the argument are undermined by the fact that from the last quarter of the nineteenth century there was a substantial net capital inflow into the country. Apart from that, one is still obliged to show that retention of capital would have had positive, dynamic effects on national income through a higher investment ratio.[7] One must also

approach in this case. The argument is more successfully pursued for recent times in Ottar Brox, *Newfoundland Fishermen in the Age of Industry* (St. John's, 1972).

4 This again includes Alexander, "Development and Dependence" and "The Political Economy of Fishing in Newfoundland", *Journal of Canadian Studies*, VIII (February, 1976), pp. 32-40.

5 His basic argument is set out in Steven Antler, "Colonialism as a Factor in the Economic Stagnation of Newfoundland" (Newfoundland Studies Centre, Memorial University, 1973). It is elaborated and defended in "The Capitalist Underdevelopment of Nineteenth Century Newfoundland", in Robert J. Brym and R. James Sacouman, eds., *Underdevelopment and Social Movements in Atlantic Canada* (Toronto, 1979).

6 The reservations have been argued by Eric Sager of Erindale College, University of Toronto, in an unpublished paper for the Maritime History Group at Memorial University. He argues that Antler's net capital exports would be much reduced and perhaps eliminated if he had taken into account the import of vessels and the registration in Scotland of steamers by Newfoundland merchants who employed them in the sealing industry and other trading sectors of the Newfoundland economy.

7 That is, retention of any net capital exports would not by itself make any appreciable impact on per capita income, and so one must project the development effects of a higher investment ratio.

ask why native and foreign businessmen working in the Newfoundland economy would find it to their advantage to withdraw capital rather than re-invest it to expand and modernize existing sectors of the economy or to develop new ones. Unless one posits that entrepreneurs had some peculiar animus against Newfoundland or an extra-ordinary inclination to consume rather than to invest, then one must conclude that the country was unattractive for investment. It is not necessary to deny in general that economic relations in the nineteenth century were manipulated to favour the developed countries over the underdeveloped in order to question whether it was an important factor in explaining Newfoundland's misfortune compared to the rest of British North America or other dependent colonies. But, if colonial exploitation was the reason for Newfoundland's extreme underdevelopment, it must be shown that Newfoundland was subject to super-exploitation, and this would be difficult to demonstrate.

It is not true that Newfoundland's economic performance was entirely dismal, at least from the last quarter of the nineteenth century. Estimates of the Gross Value of Production show a rate of expansion equal to that of the Maritimes in 1880-1910 and equal to that of Canada in 1910-1939.[8] This growth was fuelled by foreign investment in the mineral and forest products sectors, but it was characterized by very weak linkages to other sectors of the economy. In the domestically owned and controlled sectors — the fishing industry and the fast growing but massively protected secondary manufacturing sector — low productivity and technological stagnation prevailed. It is demonstrable that the country was unsuccessful in exploiting for its own benefit more of the opportunities arising from its wealth of ocean, land and other resources. While the example is now a cliché, Newfoundland stands in contrast to Iceland, which with more limited opportunities managed to mobilize its people to develop a self-reliant and prosperous economy, although still facing the insecurities endemic to any very small country.[9] To explain the contrast it is not sufficient to dwell upon the inadequacies of the merchant class, the iniquities of the credit system, the horrors of denominationalism, the smothering superiority of the British Empire, or the rapacious self-interest of foreign investors. There must be an explanation from a national perspective why entrepreneurship was unproductive, why the British connection was not effectively exploited or else sloughed off, and why foreign investment was neither limited nor, more realistically, employed to stimulate something better than enclave development. In short, as Copithorne would argue, it is necessary to pay much more attention to the sources of low productivity. These may involve a resource factor, they may include the

8 David Alexander, "Economic Growth in the Atlantic Region, 1880-1940", *Acadiensis*, VIII (Autumn 1978), pp. 47-76.

9 See William Chamberlin, *Economic Development in Iceland Through World War II* (New York, reprinted 1968).

inefficiency of economic and social relationships among classes, and they may be related to the relationships between government and domestic and foreign corporations. There is no good reason why research into these questions should now be limited; but far too little effort has been devoted to examining the 'quality' of the labour supply and how this factor might have affected the ability of the country to mobilize its population to maximise its potential.

An important task for the economic historian is to begin studies into the 'quality of human capital' in the Newfoundland economy. This is a delicate subject for the academician may wound through being terse and those who are not academics may be angered through misunderstanding. Estimating the value of human capital has nothing to do with making statements about the merits of a people or their society. The objective of this paper is simply to measure the level of literacy, as literacy was an increasingly essential tool in the modern world for fashioning a better personal and national life. Literacy and education are essential to a lively intellectual life wherein the goals of a country are effectively debated, defined and efficiently implemented. This, of course, is a much wider issue of intellectual history, about which we know almost nothing for Newfoundland. But the kind of work which is needed has been initiated by O'Flaherty, who better than any other modern writer has explored the complexities of Newfoundland culture — its enormous capacity to absorb hardship without sinking into despair, and the deep conservatism which assures survival but may indicate an inclination to absorb change rather than to initiate reform.[10] Much more work of this kind is required, for today Newfoundland confronts once again a test of whether it has the human and intellectual resources which are needed to control development in ways which will be beneficial to itself and the rest of the world.

As a measure of economic, political and social development historians quarrel about literacy and education being an independent or dependent variable.[11] But the first task is to establish a measure of literacy (and by inference from that a measure of the general level of education) and to estimate the extent of literacy in Newfoundland. There are parish registers and other documents which allow estimates to be established on the basis of signature rates. Alan MacPherson has examined several hundred marriages registered in the Anglican parish of Hermitage on the South Coast and has estimated a literacy rate among the young married population of only 18% in the years 1867-1880, rising rapidly to 53% in 1901-1910.[12] It is essential that this work is pursued for it is the only way

10 These are my conclusions from P.A. O'Flaherty, *The Rock Observed* (Toronto, 1979).

11 Mary Jean Bowman and C. Arnold Anderson, "Concerning the Role of Education in Development", in Clifford Geertz, ed., *Old Societies and New States* (New York, 1963), p. 266, and H.J. May and H.F. Manzil, "Literacy and Social Structure in Nineteenth Century Ontario: An Exercise in Historical Methodology", *Social History/Histoire Sociale*, VIII, no. 14 (1974), p. 331.

12 I am grateful to Allan Macpherson of the Department of Geography, Memorial University for

to establish age, sex and occupational literacy rates as well as truly accurate regional ones. It will be a long time, however, before such studies will yield literacy estimates for Newfoundland as a whole. Accordingly, this paper is based upon information provided in the published censuses. There are weaknesses in this source,[13] but, as Harvey Graff has argued, census data is to be preferred because it is comprehensive of the population, which is not the case with any other source.[14] The nineteenth-century Newfoundland censuses, however, vary widely in accuracy at the community and even district levels and any interest beyond the broad aggregates of this paper will require the use of other sources. Moreover, the heroic assumptions and statistical techniques employed here to produce the aggregates invite approaches through other material to verify the findings.

What literacy information do the censuses provide? In 1869, enumerators were asked for the first time to report the number of children able to "read and write", and this question was repeated in 1874. It is clear that some enumerators interpreted this to mean "read *or* write" while others took the strict meaning. In 1884 the question was extended to include the entire population but the ambiguity of interpretation remained. In 1891 and 1901 the confusion in the question was resolved by separately asking how many could read and how many could write. In 1911 the question was limited to those aged five years or more, and in 1921 and 1935 to those ten years of age and older. It is not possible in most census years to distinguish literacy by sex. The other educational information provided is an enumeration stretching back to 1836 of the number of children attending school, and in some census years the number of children *not* attending school. The fragility of the census data is indicated by the fact that in many districts for those years the total of children attending or not attending school does not roughly equal estimates of the number of school-age children.[15] From

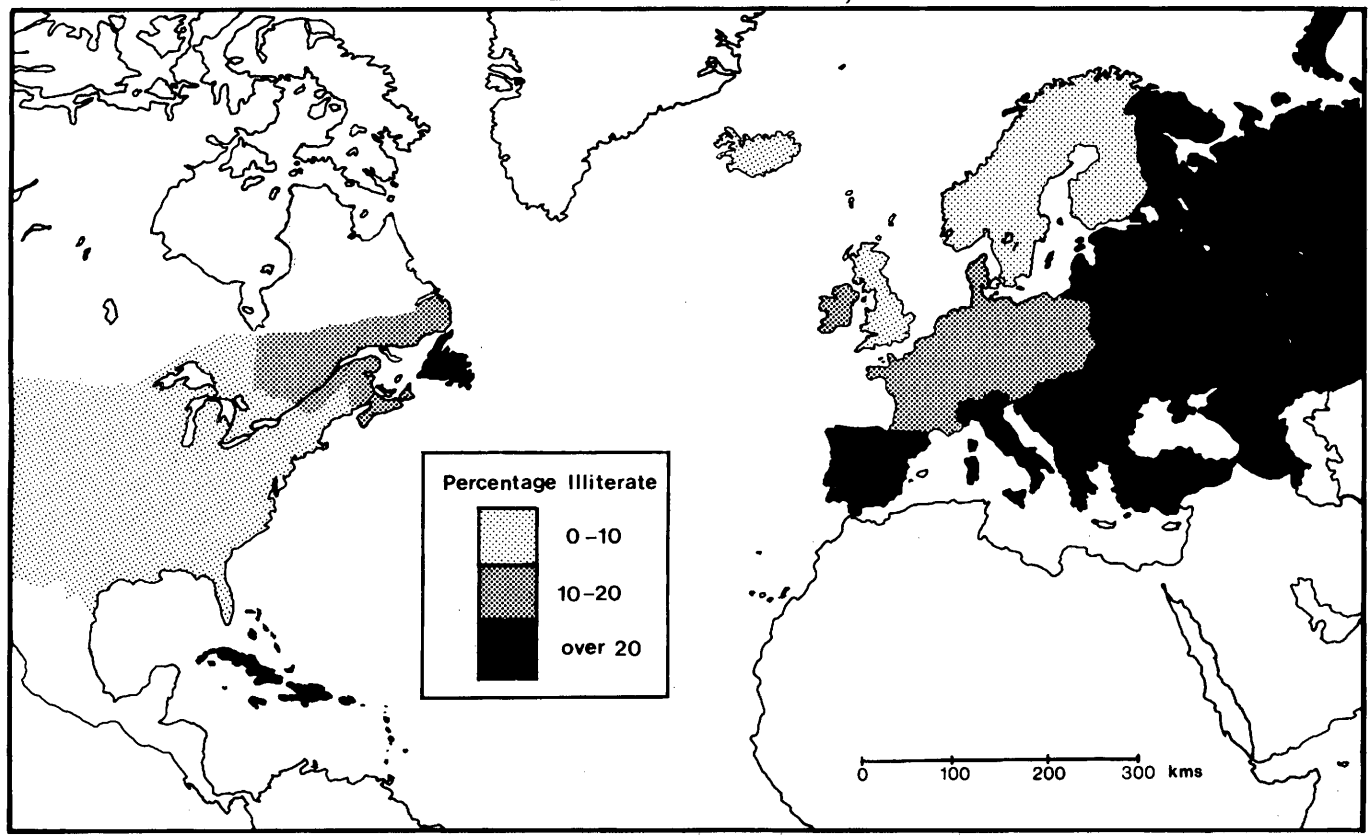
making available to me his research notes on these registers, some of the results from which are reported below. Literacy rates calculated from ability to sign are usually taken as a 'middle' range estimate of literacy, lying between those who are able to read and those who are fully literate in that they can read and write. On this point see R.S. Schofield, "Dimensions of Illiteracy, 1750-1850", *Explorations in Economic History*, 10 (1973), p. 440. This interpretation would be compatible with the reading literacy estimates for the South Coast developed later in this paper, which are higher than Macpherson's signing rates for Hermitage. Macpherson, however, has some reason to suspect that more people could sign their names than could read, and those who are interested in pursuing this subject should consult with him.

13 A major weakness for Newfoundland is that both the instructions to the enumerators and the manuscript returns have apparently been destroyed. The more usual limitation involves the possible reluctance of the enumerated to admit illiteracy. Since illiteracy was so pervasive in Newfoundland, it is unlikely that many regarded it as a matter of social stigma.

14 Harvey J. Graff, "What the 1861 Census can tell us about Literacy", *Social History/Histoire Sociale*, VIII, no. 16 (1975), p. 338.

15 Estimating the age structure of the population is necessary at many places in this paper because of another limitation of the censuses. In 1836 and 1845 the population was divided into those

LEVELS OF ILLITERACY, 1900



such obviously flawed data the paper attempts to estimate back to the first official census of 1836, child, total, labour force and regional literacy rates. The definition of literacy which is measured is a reported ability to read, and this includes many children and adults who possessed a minimal level of comprehension. As a definition it has the virtue of consistency across time. Its limitation is that it exaggerates the real capacity of Newfoundlanders in the nineteenth century to absorb the information provided by print and to use literacy as a tool for developing a lively intellectual culture within their own society.

By this generous interpretation the 1891 census indicates that 68% of the population ten years of age and more was literate; but only 52% could write as well as read. The rate of improvement thereafter was not remarkable (unless the rigour of the test was increased) for in 1935 only 82% could read, although the writing capacity had risen relatively to 79%. In 1891, at the very least, about 32% of Newfoundland's population over ten was totally illiterate. This does not compare at all favourably with other countries in the Western World. In 1891 in Ontario the comparable figure was 6%, in the Maritimes 13%, although a high 26% in Quebec. In the United States in 1900 illiterates were 11% of the population over ten, but only 5% for the native born white population. In Great Britain only 3% was illiterate and the Irish rate at 13% was closer to Canada as a whole. In European countries illiteracy was more extensive, as in France where it was 17%, in Belgium 19%, and in the Austrian Empire 23%. Newfoundland levels of illiteracy, however, were only exceeded in southern European countries, like Italy (48%) and Spain (56%), and in the huge Russian Empire, where it was 72%.[16] Whether one views literacy as an investment or a consumption good, it is obvious that in the North Atlantic world of which Newfoundland was a part and in which it had to make its way, its people were massively disadvantaged. There were areas in most countries, such as Quebec and Northeastern New Brunswick in Canada, which had substantially higher illiteracy rates than is indicated by national aggregates. But there was no *country* responsible for its affairs and the progress of its people which drew upon such a meagre supply of educated people for its entrepreneurial, managerial and administrative requirements.

The level of illiteracy at the turn of the century is not an indicator of the rate at which Newfoundland was overcoming this limitation. To have this would at least provide a crude indicator of the determination to achieve modernization.

0-13, 14-70 and aged over 70; in 1857, 1869, 1874 and 1884 the division is those aged 0-9, 10-19, etc. Only from 1891 did the census provide a detailed breakdown of the age structure. For this paper age-cohorts have been estimated for earlier years from the 1891 distribution. More sophisticated approaches are possible, but this simple procedure has been used because of its ease, because there is no evidence of radical changes in fertility over the period, and because the estimates of literacy are so gross as to discourage any pretence of fine accuracy.

16 The rates refer either to the adult population, or the population 10 years and more. The Canadian data are calculated from the *Census of Canada*; all other data are drawn from Carlo Cipolla, *Literacy and Development in the West* (London, 1969), Statistical Appendix, Table 30.

At the mid-nineteenth century all of Scandinavia (including Iceland and the Faroes), together with Germany, Holland, Switzerland and Scotland, were characterized by adult illiteracy of less than 30%. By inference from the 1871 census this highly literate group would have included Ontario (8% of its population 20 years and more was illiterate in 1871), New Brunswick (14%) and Nova Scotia (17%). Quebec (36%) was probably on a par with the second group of European countries, which included England and Wales, Ireland, France, Belgium and the Austrian Empire, where illiteracy ranged from 30 to 50%. High illiteracy of more than 50% characterized all of southern and most of eastern Europe.[17] What we cannot know directly from the census is where Newfoundland would rank at the same time, although the 1891 results are a strong indication that it would be in the third group, or the bottom of the second.

The number of literates in society should be strongly correlated with exposure of children to schooling. The correlation will not be perfect because some children will leave school before an ability to read or write is firmly implanted,[18] some will be indifferent or poor scholars, and others will lose through infrequent use any literacy which was acquired. The Newfoundland censuses provide data from 1836 on the number of children attending school for at least part of the year. We also know from the School Inspectors' Reports that attendance rates were typically very low.[19] For example, in four years between 1860-1876, the inspectors reported average attendance at between 50-65%, and typically at around 55% in both St. John's and rural schools. Of course, poor attendance was not unique to Newfoundland schools. What is more important is to have some idea of the level of proficiency in reading that was being acquired by children who were attending some of the time. This is important because primary school attendance has a doubtful relationship to significant improvements in the labour force or even in the literacy rate itself.[20]

The School Inspectors' Reports provide information which can be used to estimate the quality of literacy. If it is true that the bulk of children by the later nineteenth century had some exposure to schooling, then the statistical materials in the Reports should reflect the schooling experienced by the school-age population. Table 1 indicates that in the 1850s around a third of the pupils acquired at least an elementary reading capacity, the fraction rising to about a half by the mid-1870s. An advanced reading ability was being achieved by another third, and they would undoubtedly have some ability to write.[21] Of the

17 Cipolla, *ibid.*, Table 23.

18 This is usually from the age of ten. See Allan Greer, "The Pattern of Literacy in Quebec, 1745-1899", *Social History/Histoire Sociale*, XI, no. 22 (1978), p. 326.

19 These were printed occasionally from the mid-1840s as an appendix to the *Journal of the House of Assembly*.

20 David C. McClelland, "Does Education Accelerate Economic Growth?", *Economic Development and Cultural Change*, XIV, 3 (1966), p. 262.

21 At the Protestant schools this was defined as the capacity to read Scripture.

TABLE 1: READING PROFICIENCY

	1860	1869	1874
% All Pupils	%	%	%
Elementary	36	41	50
Advanced	30	31	35
% Pupils Reading			
Elementary	54	57	59
Advanced	45	43	41

Source: *Journals of the House of Assembly*, School Inspectors Reports, 1861, 1870 and 1875.

Note: The returns are incomplete, and the calculations exclude convent schools where a distinction was not made between elementary and advanced reading levels.

school population who were able to read about 40% to 45% could do so at an advanced level. Among those reputed literate in the school-age population this would be the fraction entering the labour force described as "able to perform jobs characteristic of the middle class".[22] Even though the School Inspectors' Reports are intermittent and the quality of the reporting is very mixed, they could profitably be mined to test and develop the literacy estimates provided in this paper. A rough and conservative assumption will be made here that among those estimated as being able to read between 40% to 50% could read and write to an effective or 'functional' level of competence.[23]

In 1836, according to the census, the fraction of the school-age population actually attending school for some time during the school year was only 26%. The work of the Select Committee on Elementary Schools in 1836 led to state aid to the Church and charitable school societies,[24] and by 1845 the fraction

22 McClelland, *op. cit.*, p. 262.

23 There are two problems in using this proportion which would tend to operate in different directions. Some of those who acquired an elementary ability to read while at school would probably regress to illiteracy as adults and would be reported as such. Among adults, therefore, those claiming to read would likely have a higher capacity to do so effectively than the school-age population. On the other hand, the proportion of the school-age population (age 5-14) attending school rose slowly from the mid-1830s to the end of the century with the consequence (possibly) of a rising fraction of semi-literates to literates. Table 1 provides limited evidence that this was happening.

24 *Journal of the House of Assembly*, 1836.

attending school had risen to 42%. In the interval between 1845 and the Education Act of 1874, the level of state funding to schools was increased and provided for the addition of a secondary school programme. But as well as being a period of periodic and severe economic difficulties, this was also a period of conflict and confusion over the structure of the system (at the centre of which was the denominational issue), so that in 1874 the attendance rate had risen only to 47%. Thereafter, the rate improved sharply and in 1901 some 68% of the school age population was attending school. This improvement led the Colonial Secretary optimistically to claim in the 1901 census report that the problem of illiteracy among children had been overcome.[25] These school attendance figures, together with the 1869 and 1874 census reports on the number of children who could read, provide the basis for constructing estimates of the literacy of children in the school age group 5-14. While it is not claimed that access to schooling alone determined literacy, the relationship between these two variables should be closer than between either of these variables and any other. The additional assumption which lies behind this work is that the relationship between school attendance and child literacy which prevailed in the 1860s and 1870s also characterized earlier and later decades. It might be that the 'productivity' of the school system improved over the years with better schools, more regular attendance and teachers with higher qualifications. To the extent that this happened, estimates based upon relationships in the 1860s and 1870s would overestimate literacy in earlier decades and underestimate it in later ones. But, as will be shown, there is a method for testing the accuracy of the estimates, which indicates that if there is a problem it is one involving the quality of the literacy and not the number of literates.

If the number of child literates is a function of school attendance, then from the data available for each census district the relationship should be described by one of the following equations:

(1) Child Lits + 872 + 1.20 Attd. r= +0.86, t = 5.31, n = 13, years = 1874
(1171) (470) (.226)

(2) Child Lits = 669 + 0.854 Attd. r = +0.85, t = 5.15, n = 12, years = 1869
(860) (396) (.166)

(3) Child Lits = 593 + 1.09 Attd. r = +0.86, t = 7.26, n = 22, years = 1869
(1053) (328) (.150) 1874.

The dependent variable is the number of literate children aged 5-14 and the independent variable is the number of children reported to be attending school. The standard errors are indicated in parenthesis and for each equation the

25 The major source for the history of education is F.W. Rowe, *The History of Education in Newfoundland* (Toronto, 1952). Another useful source is William B. Hamilton, "Society and Schools in Newfoundland", in J. Donald Wilson, Robert M. Stamp, and Louis-Philipe Audet, eds., *Canadian Education: A History* (Scarborough, 1970), pp. 126-44.

t- statistic of the regression coefficient is significant at the 99% level.[26]

Which of these equations most accurately predicts the development of child literacy? Neither the correlation coefficients nor the t-test of the regression coefficient provide a basis for choosing, but as shown in Table 2 each equation predicts quite different levels of literacy. Equation (2) accurately forecasts the 1869 census report and equation (1) the 1874 census, while equation (3), which is simply the sum of the two years, predicts neither within 90% confidence intervals. There are reasons for rejecting equation (1) in favour of equation (2), not least because the first substantially overestimates the possible number of child literates at the end of the century. The 1869 and 1874 censuses are obviously in conflict, for it is impossible that child literacy could have expanded from 59% to 84% in only five years. Since the 1874 census was taken to determine the number of children of various denominations, for the purposes of sectarian division of the educational budget, there is reason to believe the 1869 census was the more accurate of the two. This assumption is confirmed by Table 3. If either of the equations accurately predicts the literacy arising from school attendance, then it should be possible to use the rates calculated in Table 2, apply them to the relevant educational age cohorts of the 1901 census, and thereby generate the total number of Newfoundland literates as given in the 1901 census. Equation (1) does this with a huge +43% error while equation (2) reproduces the 1901 census total with only a +5% error. The magnitude of the latter error is certainly acceptable given the crudity of the data; but the error is also in the right direction since not all of the children in the 5-9 age group would have yet achieved the 5-14 age group literacy rate. Moreover, in all age groups there was certain to be people who reverted to illiteracy, and since heavy net emigration began in the 1880s, it is possible that a disproportionate number of the better educated left the country.[27]

It is reasonable, therefore, to accept the pattern of child literacy development

26 An alternative formulation of the relationship is to hypothesize that the number of literates in a district is a function of the *percentage* of children in the district attending school. For 1869 the resulting equation would be:

Child Lits. = -123 + 52.3 Perc. Attd. r = +0.60, t = 2.36, n = 12

With this formulation the b-coefficient is significant at the 97% level, but the correlation coefficient falls to +0.60. In other words equations (1) to (3) capture the effect of child population growth as well as the effect of education. Since the function of the equation is to predict as accurately as possible the number of literates and there is no analytic use to be made of the regression coefficients, equations in the form of (1) to (3) are used throughout this paper. In predicting from these equations the number of literates in any census year it is necessary to estimate the literacy of each district and then sum these for the national total rather than simply to supply the equation with the country total of children attending school. This is because the latter figure falls outside the range of the independent variable used to construct the equations.

27 Immigrants to North America tended to be the better educated and more mobile element of the home population. See Harvey J. Graff, *The Literacy Myth: Literacy and Social Structure in the Nineteenth-Century City* (New York, 1979), p. 65.

TABLE 2: CENSUS AND ESTIMATED CHILD LITERATES

	Pop. 5-14	Census Lits.	Estimated Literates Eq 2	Eq 1	Eq 3	Census	Literacy Rate Eq 2	Eq 1	Eq 3
1901	51,788	—	39,390	54,387	46,613	—	76%	105%	90%
1891	49,416	—	34,441	47,433	40,296	—	70	97	82
1884	48,291	—	31,738	43,635	36,847	—	66	90	76
1874	40,379	33,043	24,088	33,023	27,606	82%	60	82	68
1869	37,231	21,918	21,911	29,963	24,826	59	59	80	67
1857	31,630	—	19,436	26,555	21,931	—	61	84	69
1845	24,216	—	14,699	20,035	16,406	—	61	83	68
1836	17,222	—	8,547	11,528	9,077	—	50	67	53

TABLE 3: 1901 CENSUS LITERACY REPLICATED BY 1869 AND 1874 CHILD LITERACY RATES

Age	No.	Education Cohort	Estimated Literates Equation 2	Equation 1
5-9	27,374	1897-1901	20,476	27,210
10-14	24,414	1892-1896	17,529	23,877
15-19	22,982	1887-1891	15,812	21,833
20-29	36,416	1877-1886	23,488	32,046
30-39	24,464	1867-1876	14,605	19,914
40-49	20,229	1857-1866	12,178	16,689
50-59	14,806	1847-1856	9,032	12,363
60-69	8,821	1837-1846	4,975	6,730
70+	5,443	Pre 1836	2,722	3,647
			120,817	164,309
Total Census Literates			114,835	114,835
Error			+ 5,982	49,474
			(5.2%)	(43.1%)

Note: The number of literates in each age cohort is estimated by assuming that individuals are evenly distributed through the age group, and applying to them the literacy rate projected between census years through the appropriate annual rate of growth.

indicated by equation (2) in Table 2. This shows that in 1836 only half of the school age children had some ability to read, the proportion increasing sharply to 61% in 1845. This sharp increase is not improbable, for this was the period that state aid to education was begun and pursued with some energy. But from 1845-1874 the equation predicts complete stagnation. This prediction also corresponds with what we know about the educational history: there was very considerable conflict over the structure of education and emphasis by the government upon introducing programmes for secondary education. Then, after the settlement of these problems through the 1874 Education Act, literacy growth accelerated and, by the end of the century, reached 76%. It was a period of rising educational expenditures, incentives for better qualified teachers, and special grants to establish schools in the remoter and poorer regions of the country. Thus both the level and the pattern of literacy development indicated by Equation (2) in Table 2 are intrinsically believable. If, however, the earlier hypothesis is correct and only 40-45% of children claiming an ability to read had an advanced competence to do so, then the rates cannot be judged as anything better than appalling. For this would mean that less than a quarter of the children had such a competence in 1836, only 27% in 1874 and only 34% in 1901.

The 1884, 1891 and 1901 censuses provide data on the total number of literates which can be used to generate estimates of total literacy. The hypothesis leading to equations (4) to (7) is that there was a functional relationship between the aggregate number of literates in a census district and the number of children being sent to school. The hypothesis would certainly be true if we introduced lagged child literacy rates into a multiple regression equation — the disturbing effects of migration being ignored. It is less clear that there would be a relationship between total literates in any one year and the number of children at school, but since local factors were important in opening and maintaining schools the hypothesis is not unreasonable. Since the objective is once again to establish strong descriptive relationships rather than to use regression coefficients for analytical purposes, the equations generate what is needed of them.

(4) Total Lits = 44 + 3.25 Attd. $r = +0.98$, $t = 17.39$, $n = 14$, year = 1901
(1250) (265) (.187)

(5) Total Lits = 1147 + 2.69 Attd. $r = +0.98$, $t = 27.63$, $n = 14$, year = 1891
(689) (275) (.097)

(6) Total Lits = 394 + 2.75 Attd. $r = +0.98$, $t = 15.34$, $n = 14$, year = 1884
(1120) (439) (.179)

(7) Total Lits = 538 + 2.92 Attd. $r = +0.97$, $t = 27.55$, $n = 42$, year = 1884-1901.
(1246) (300) (.106)

Which equation provides the most reliable estimate of total literacy? The correlation coefficients are all very high and the regression coefficient for each equation is significant at the 99% level. Each of the first three equations accurately predicts the census total literacy level for the year on which it is

based, but for no other. Equation (7) is constructed from the combination of observations in all the census years and alone has the advantage of including within a 95% confidence range the census counts for both 1901 and 1891.[28] Equation (7) overestimates the number of literates in 1884, but it is probably nearer the truth. For the 1884 census asked the question how many people could "read *and* write". Since it is clear some of the enumerators interpreted the question strictly and thereby under-reported literacy relative to 1891 and 1901, it follows that equation (7) provides the most reliable estimate of the path of total literacy growth.

To calculate the literacy rate in Table 4 the population base employed is that aged 10 and more. Obviously some of the literates counted by the census would be under ten, and hence the estimated and census rates in Table 4 moderately overestimate the literacy of this population.[29] Combining the census literacy rates for 1901 and 1891 with the estimates of equation (7) for 1836-1884 generates a series which moves at lower levels in the same way as the series for children, but converging towards the child rate at the end of the century.[30] In the 1870s little more than half the population ten years of age and more had any capacity to read and less than three quarters by the end of the century.

The literacy level of the country was clearly very low, but Table 5 indicates that there were also very wide regional variations. On a generous interpretation of the 1901 census, the district of St. John's East, traditionally the area where the more prosperous lived and the part of the city best supplied with schools, was close to the literacy level of the Maritimes.[31] But this was a recent phenomenon and characteristic of no other district. At the other extreme was the St. Barbe Coast where barely half the population could read. Over the census years 1884-1901 there was considerable stability in the relative levels of literacy across

28 The 95% confidence intervals for each of the estimates is tested by $Y_0 = Y \pm t0.25\ syx$

	Equation 4	Equation 5	Equation 6	Equation7
1901	120,283	113,436	106,614	115,149
	109,388	107,430	97,466	104,972
1891	101,473	97,883	87,248	98,250
	90,578	91,877	81,247	88,072
1884	96,025	89,378	82,315	89,015
	80,292	83,372	72,554	78,837

29 If the population base was taken as the population five years and more, the opposite error would result. Since most total literacy rates are calculated from the base of population ten years or more, this option was adopted.

30 There was bound to be a strong correlation between child and total literacy and, ignoring 1836-1845, the correlation of the two series by first difference gives a coefficient of +0.78.

31 The census districts of St. John's East and West included extensive rural areas but were dominated by the city population.

TABLE 4: CENSUS AND ESTIMATED TOTAL LITERACY

	Pop. 10+	Census Lits	Estimated Literates Eq 4	Eq 5	Eq 6	Eq 7	Estimated Literacy Rate Eq 4	Eq 5	Eq 6	Eq 7	Census Literacy Rate
							%				
1901	158,323	114,835	114,835	110,433	102,040	110,061	73	70	64	70	73
1891	140,140	94,880	96,025	94,880	86,128	93,161	69	68	61	66	68
1884	135,388	77,436	85,739	86,375	77,435	83,926	63	64	57	62	57
1874	110,247	—	61,625	64,239	56,350	61,355	56	58	51	56	—
1869	99,376	—	53,337	57,393	49,348	53,909	54	58	50	54	—
1857	82,595	—	46,426	50,572	43,151	47,200	56	61	52	57	—
1845	66,625	—	33,403	37,592	31,434	34,501	50	56	47	52	—
1836	49,077	—	14,998	20,165	15,170	16,968	31	41	31	35	—

TABLE 5: DISTRICT LITERACY, 1901, 1891, 1884 (POPULATION 10+)

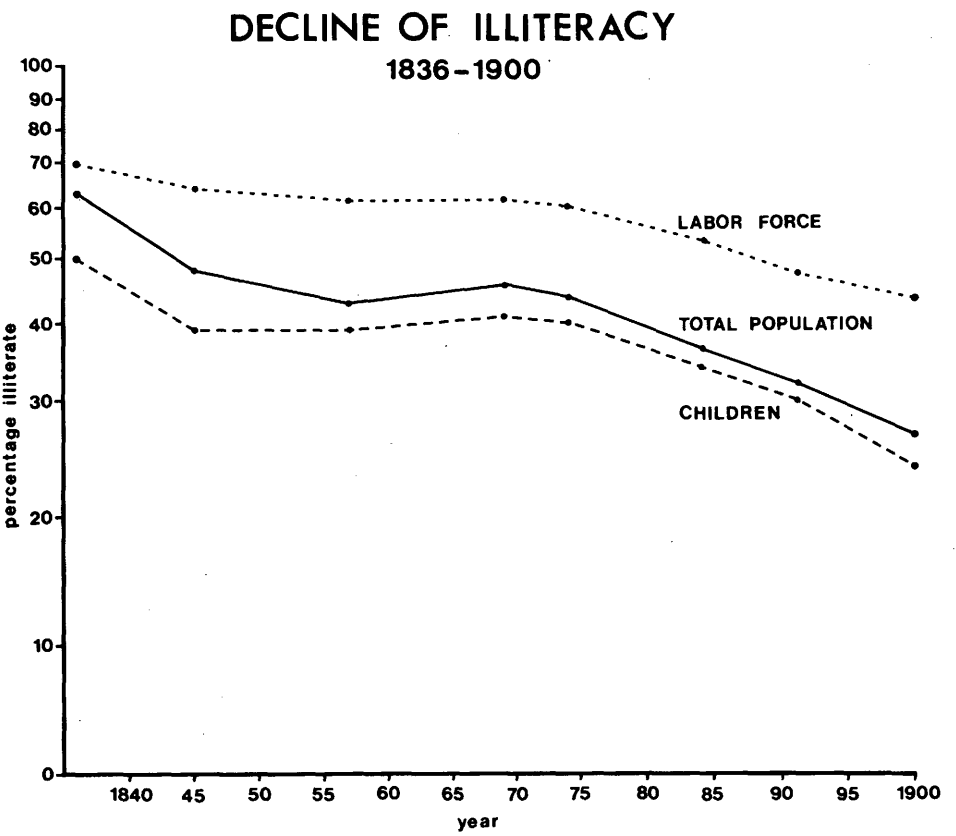
District	Read			Difference as % of Nfld		
	1901	1891	1884	1901	1891	1884
Newfoundland	73	68	57			
St. John's East	96	86	71	+32	+26	+25
St. John's West	84	79	77	+15	+16	+35
Ferryland	82	82	62	+12	+21	+ 9
Fogo	76	72	66	+ 4	+ 6	+16
Burin	74	65	57	+ 1	− 4	0
Conception Bay	73	66	57	+ 0	− 3	0
Trinity Bay	72	66	44	− 1	− 3	−23
Twillingate	70	72	49	− 4	+ 6	−14
Bonavista Bay	65	64	61	−11	− 6	+ 7
St. George's	62	52	48	−15	−23	−15
Placentia and St. Mary's	62	62	46	−15	− 9	−19
Fortune	57	45	38	−22	−33	−33
Burgeo and LaPoile	56	54	51	−23	−20	−11
St. Barbe	52	46	37	−28	−32	−35

*Kendall's coefficient of rank correlation = +0.92.

the various districts,[32] and there were distinct strata within the broad regions of the country. The Eastern Avalon (St. John's East and West and Ferryland) was a high literacy region.[33] Parts of the huge Conception Bay district should be included in this category, and possibly also the small and prosperous Burin district. Pockets of high literacy were undoubtedly scattered across the Island (although census-hunting at the micro-level should be pursued with caution), but outside the Eastern Avalon a broadly defined medium stratum stretched up the East coast to include Conception Bay, Trinity Bay, Bonavista Bay (which apparently stagnated into a low literacy level by 1901) and Twillingate and

32 Kendall's coefficient of rank correlation for Table 5 = 0.92.

33 Since in many literacy studies the Irish and Catholic population is identified as tending to have lower literacy rates than Protestant and Anglo-Saxon groups, it is interesting to note that Newfoundland's high literacy region was predominantly Irish and Catholic. Peter Neary of the Department of History, University of Western Ontario, has commented that this undoubtedly reflects the very strong presence in the region of the Irish teaching orders.



Fogo. A third broad stratum of low literacy (which properly should exclude Burin) stretched from St. Mary's Bay on the Southern Avalon along the South Coast and up the newly settled West Coast into darkest St. Barbe on the Great Northern Peninsula.

As a means of projecting total literacy rates for these regions back to 1836, equations (8), (9) and (10) have been derived from the census data for 1901, 1891 and 1884 and yield the regional rates in Table 6:

(8) E.A. Total Lits = -1258 + 4.28 Attd. r = +0.96, t = 9.16, n = 9
(1005) (800) (.467)

(9) E.C. Total Lits = 1295 + 2.68 Attd. r = +0.98, t = 18.78, n = 15
(1297) (565) (.143)

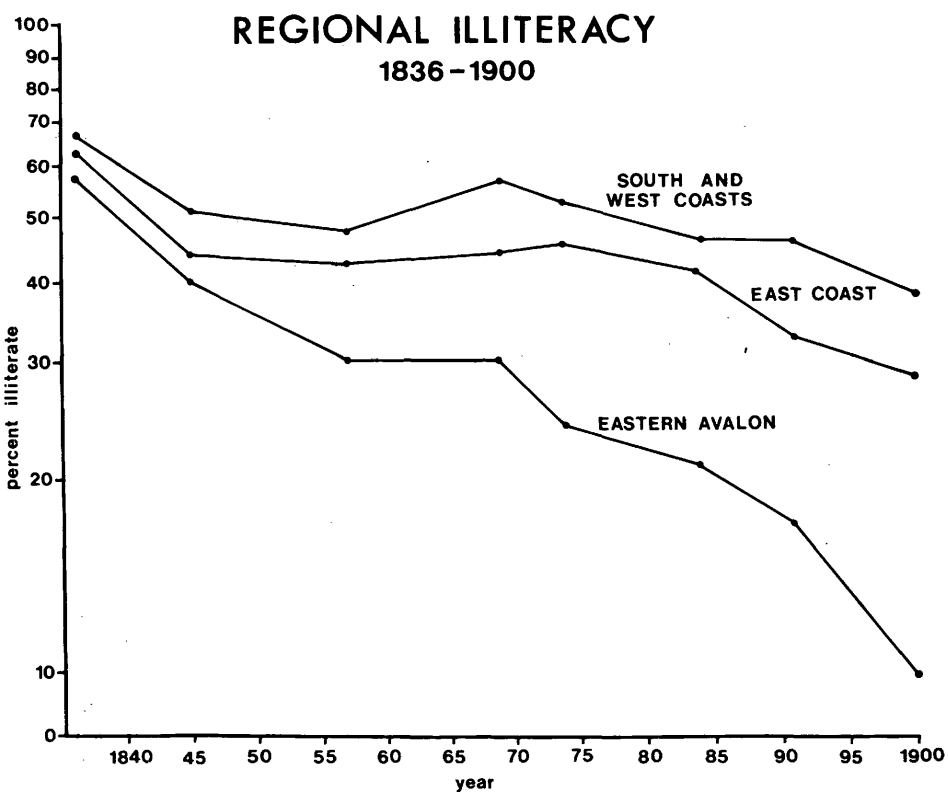
(10) S. & W. Total Lits = 741 + 2.28 Attd. r = +0.95, t = 9.91, n = 18
(575) (289) (.230)

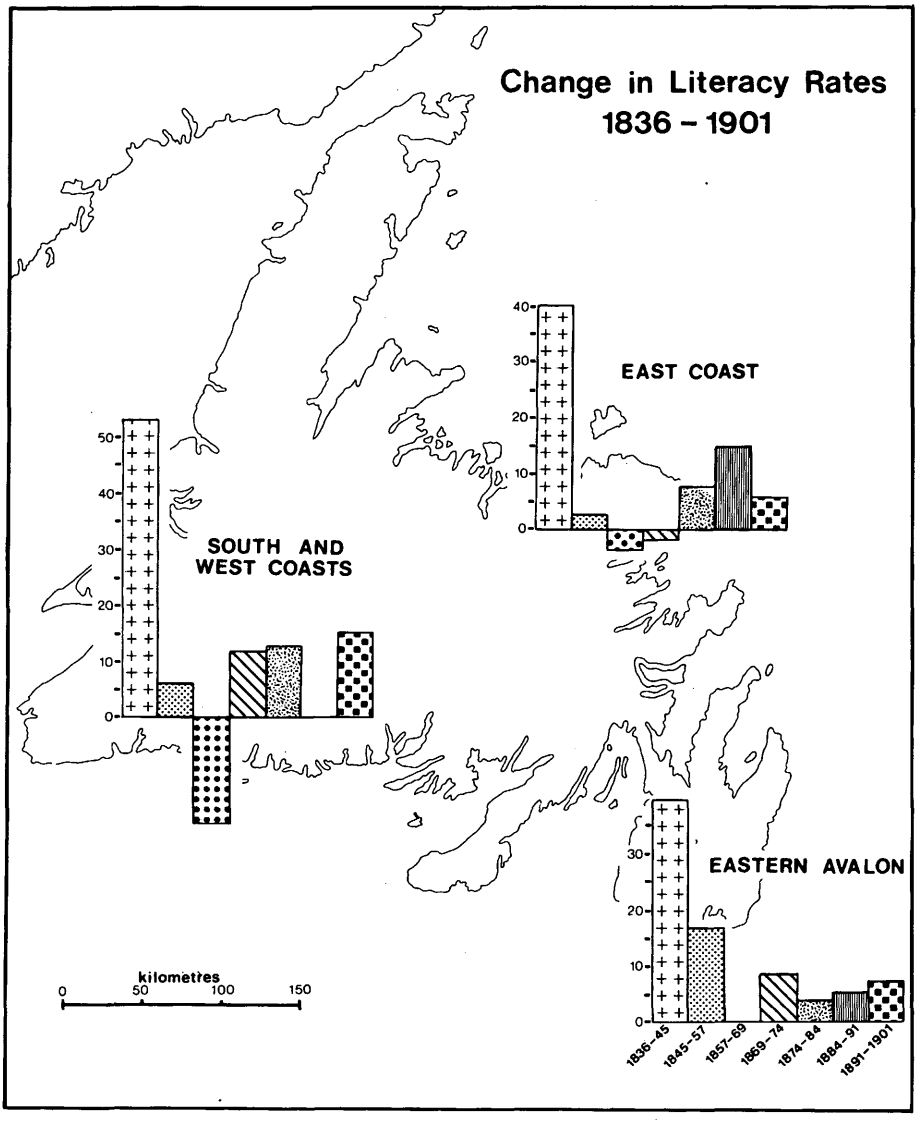
Table 6 indicates that the Eastern Avalon by the mid-1850s had reached the literacy level which is recorded for the whole of Newfoundland at the end of the

TABLE 6: TOTAL LITERACY RATES — REGIONAL

Year	Eastern Avalon	East Coast	South and West Coasts
1901	89	71	61
1891	83	67	53
1884	79	59	53
1874	76	54	47
1869	70	55	42
1857	70	57	52
1845	60	56	49
1836	43	40	32

Note: 1901 and 1891 as calculated from the census; all other years as estimated from equations 8, 9 and 10. 'Eastern Avalon' includes the city and its rural hinterland and the district of Ferryland; 'East Coast' includes the districts of Conception Bay, Trinity, Bonavista, Twillingate and Fogo; 'South and West Coasts' includes Placentia and St. Mary's, Burin, Fortune, Burgeo and LaPoile, St. George's and St. Barbe.





century, and at that time this region was substantially even more literate. It is also striking that though no progress was made between 1857-1869, the region was not afflicted by the long period of stagnation which characterized the East Coast region between 1845-1884 and the South and West Coast region from 1845-1891. If the rate of growth of literacy on the Eastern Avalon was hardly breathtaking, it is apparent that the even slower improvement recorded for the

country as a whole was due to lack of progress towards literacy in the Bays. It is also apparent that reorganization of the educational system following the 1874 Education Act did result in a resumed growth of literacy in the Bays after the long pause from the mid-1840s.

This is made clear in Table 7 where annual rates of growth of literates is calculated for the country, the Eastern Avalon and 'Other Newfoundland'. During 1845-1874 the total number of literates was growing everywhere at around 2.0% per annum, but because of more rapid population growth in the Bays this resulted in hardly an improvement in the literacy rate — the net growth of literates. In fact, it was only among the children on the Eastern Avalon that gains were made in the literacy rate, which was negative in the Bays and therefore unchanged in the country as a whole. This was reversed in the period 1874-1901. Total literacy grew much faster outside the Eastern Avalon where the literacy rate was improving at almost twice the speed of the Eastern Avalon. This was because strong net gains were made in educating children to literacy whereas on the Eastern Avalon the situation for children actually deteriorated. This deterioration on the Eastern Avalon possibly was a function of the population stagnation and heavy emigration which affected the region in that period. But it might also be a reflection of the fact that because of the position of the elite Academies, it became relatively more difficult for city children to gain good education than for children in the larger outports.[34]

To posit a relationship between literacy and economic development requires concentration on the literacy of the labour force rather than the literacy of children or total literacy, since the latter includes a large number of children. An approximation to labour force literacy is to deduct child literates from total literates. This is done in Table 8 where the regional breakdown is limited to the Eastern Avalon and Other Newfoundland.[35] The Table indicates that at the end of the century only slightly more than half the potential labour force had a capa-

34 Rowe, *History of Education*, p. 101.

35 Truncation of the regional breakdown is necessary because of the predictive weakness of child literacy equations for the regions. For example, the equation for the Eastern Avalon is barely significant at the 95% level.

E.A. Child Lits. = 1767 + 0.395 Attd. r = +0.47, t = 0.91, n = 6
(774) (884) (.433)

Hence for the Eastern Avalon the Child literacy rate is taken as the difference between the Newfoundland and 'Other Newfoundland' estimates. The differences are not large, however, between the estimate of the equation and the estimate provided by subtraction. For Other Newfoundland two equations were estimated which are satisfactory in terms of correlation coefficients and the statistical significance of the b-coefficient namely,

Total Lits. = 515 + 2.80 Attd. r = +0.98, t = 30.16, n = 33
(1035) (262) (.093)

Child Lits. = 666 + 0.89 Attd. r = +0.87, t = 3.50, n =9.
(1250) (523) (.254)

These equations are used to generate and to deduce the broad regional estimates in Table 7.

TABLE 7: GROWTH OF LITERACY
(rate of growth per annum)

1845-1874	Nfld %	Eastern Avalon %	Other Nfld %
Gross Total Literates	2.0	2.1	2.2
Net Total Literates	0.3	0.9	0.2
Gross Child Literates	1.7	2.3	1.4
Net Child Literates	0.0	1.6	−0.3
1874-1901			
Gross Total Literates	2.3	1.1	2.6
Net Total Literates	1.0	0.6	1.0
Gross Child Literates	1.8	−0.2	2.6
Net Child Literates	0.9	−0.6	1.6

Note: Gross literates is the rate of growth of people estimated to be literate, while Net literates is this figure less the appropriate population growth rate, reflecting changes in the literacy rate.

TABLE 8: LABOUR FORCE LITERACY

Year	Nfld	Eastern Avalon	Other Nfld	Nfld	Eastern Avalon	Other Nfld
		No.			%	
1901	75,445	22,982	52,463	56	77	51
1891	60,439	18,523	41,916	52	69	47
1884	52,188	18,333	33,855	46	64	40
1874	37,267	11,367	25,900	40	48	37
1869	31,998	11,923	20,075	38	53	32
1857	27,764	11,784	15,980	39	51	34
1845	19,802	8,270	11,532	36	46	31
1836	8,421	5,619	2,802	29	48	16

Note: Labour force literacy is estimated as the difference between total and child literacy. For the Eastern Avalon the child estimate is based on few observations. The equation provides a poor fit and the regression coefficient is barely significant at 95%. Hence for this purpose the Eastern Avalon literacy rate is taken as the difference between the 'Newfoundland' and 'Other Newfoundland' estimates. The differences are not, however, large between the two possible estimates.

city to read, considerably more on the Eastern Avalon and rather less in the rest of the country. But this inference overestimates the pool of educated labour available for entrepreneurial, managerial and administrative purposes. Around half of the potential labour force in 1901 would be women, excluded from active participation in the affairs of the country,[36] leaving in 1857 and 1901 a labour force pool of educated males of 14,000 and 38,000 respectively. A further assumption that about 45% of these men had a reading and writing capacity at an 'advanced' level after leaving school, reduces the pool to around 6000 at mid-century and 17,000 at its end, or 5% and 8% of the population respectively. It was neither absolutely nor relatively a large pool of educated people out of which to run a modern country. It appears even smaller when one asks how many of them had personal qualities and opportunities which amounted to more than a decent competence in literary and mathematical skills. The educated talent in the country was thus spread rather thinly in terms of what other countries had and what it was desirable to have.[37]

What was the level of effort — the needed investment in education — necessary to bring about universal child literacy and ultimately universal adult literacy? Table 9 calculates the expansion required in the educational system from 1845 to achieve total child literacy by 1874, and then from the actual level in 1874 to

TABLE 9: INVESTMENTS IN CHILD LITERACY REQUIRED TO ACHIEVE UNIVERSAL CHILD LITERACY
(rate of growth per annum)

	1845-1874	1874-1901	1845-1901
No. Years	29	27	56
Child Population	1.8%	0.9%	1.4%
Needed Gross Growth	3.5	2.9	2.3
Needed Net Growth	1.7	2.0	0.9
Actual Gross Growth	1.7	1.8	1.8
Actual Net Growth	−0.1	0.9	0.4
Deficit	1.8	1.1	0.5

36 In traditional societies female literacy was normally less than that of males, but for the purposes of this argument it will be roughly assumed that half the adult population consisted of women, and that they were as well educated on average as the males. Moreover, if Macpherson's Hermitage work reflects the situation in the country as a whole, it may well be that women in Newfoundland were more literate than the men.

37 The argument here is not that illiterate or semi-literate people were unproductive. The assumption is, however, that a country hoping to perform successfully in the Western World at the end of the century was better off if it had a universally literate population. This will be argued more thoroughly at a later point.

achieve that goal by 1901.[38] In the first period a very substantial annual growth of investment of 3.5% was required, but because the actual growth was only 1.7% no progress was made in eliminating illiteracy. In the second period the growth rate was only marginally higher than in the first at 1.8%, but since the child population growth rate was cut in half this allowed for progress in the literacy rate of almost 1% per annum. The educational effort was therefore expanding at a constant rate over the half century for net gains and losses in the literacy rate were determined independently by the rate of growth of child population. In accomplishment if not in intention, the Newfoundland authorities did not proceed with urgency to wipe out child illiteracy.

The incremental effort required to eliminate illiteracy over the half century does not appear very great. But this impression needs to be supported by evidence of the country's material capacity to provide more resources for education. The best index of this would be Gross Domestic Product, but in the absence of such a series it is necessary to interpret within less certain boundaries. Throughout its history Newfoundland has been extraordinarily dependent upon foreign trade and the rate of growth of exports is a lower bound estimate of the rate of growth of GDP. Table 10 shows that real exports grew between 1847-1898 at only 1.3% per annum compared with population expansion of 1.5%. The worst period for exports was in 1847-1868 when there was virtually no growth, compared with an expansion of 1.6% per annum from 1868-1898 which was somewhat faster than population growth. As a lower bound estimate of economic growth, therefore, merchandise exports indicate a decline in national income per capita up to the 1870s and very modest growth thereafter. As an index of economic growth, however, exports probably tell less than the truth, since over the half century there was substitution of domestic goods and services for imports, and as the society matured after the first decades of settlement the size of the internal market expanded relative to the external.[39] An upper bound estimate of the expansion of GDP is the rate of growth of government expenditures, and reflects both the expansion of the tax base in the domestic economy and the additional resources made available to the government through external borrowing. Real growth of the public sector in 1847-1901 was three times that of merchandise exports, and once again it occurred at a significantly faster pace in the last three decades of the century. Therefore, over the long period the

38 The assumption behind the table is that the marginal cost of educating additional children was equal to the average cost. This is clearly wrong and was recognized by the government in the late 1860s when it introduced special grants for remote and disadvantaged communities. Consequently, Table 9 underestimates the magnitude of effort required, but by how much is unknown.

39 See John Joy, "The Growth and Development of Trades and Manufacturing in St. John's, 1870-1914" (MA thesis, Memorial University of Newfoundland, 1977). Research has not fully established this point, but the inferential reasons for believing this are argued in Alexander, "The Traditional Economy", *op. cit.*

TABLE 10: INDICIES OF REAL ECONOMIC GROWTH
(Compound Rates per Annum)

	Period	Rate	Period	Rate	Period	Rate
		%		%		%
1. Population	1845-1869	+1.7	1869-1901	+1.3	1845-1901	+1.5
2. Population 5-14	1845-1869	+1.8	1869-1901	+1.0	1845-1901	+1.4
3. Merchandise Exports	1847-1868	+0.1	1868-1898	+1.6	1847-1898	+1.3
4. Govt. Expenditures	1849-1870	+3.6	1870-1901	+4.5	1847-1901	+3.9
5. Education Expenditures	1849-1873	+3.5	1873-1901	+4.6	1849-1901	+4.1
6. Gross Investment Needed	1845-1874	+3.5	1874-1901	+2.9	1845-1901	+2.3
7. Gross Investment Actual	1845-1874	+1.7	1845-1874	+1.8	1845-1901	+1.8

Note: Growth rates for lines 1, 2, 6 and 7 estimated by end-point ratios and for 3, 4 and 5 by regression on annual data, fitted from trough to trough. Government and educational expenditures are a mixture of budget estimates and actual expenditures. Merchandise exports for 1846-1856 are based on salt cod export only. Exports and expenditures have been deflated with the Sauerbeck-Statist index.

TABLE 11: EXPENDITURES REQUIRED TO SUSTAIN UNIVERSAL CHILD LITERACY

Period	Actual	Required	% Of Required	% of Govt. Expenditures	% of Exports
	$	$	%	%	%
1847-1857	401,825	1,506,770	27	33	2
1858-1869	773,122	2,307,423	34	30	3
1870-1874	342,313	1,094,017	31	29	3
1875-1884	1,036,098	2,685,046	39	24	3
1885-1891	1,185,519	2,470,794	48	18	6
1892-1901	2,233,546	3,242,888	69	13	4
Total	$5,972,423	$13,306,938	45	20	3

economy must have been expanding at a rate somewhere between 1.3% to 3.9% per annum, with the strong likelihood that it was higher than the growth rate of population at 1.5%. A guess — and it can only be a guess — is that the economy expanded between 1845-1901 at around 2.0 to 2.5% per annum, and thus at a rate of 0.5% to 1.0% per annum on a per capita basis. Of course, there were wild annual fluctuations around this trend, and it is very probable that growth was concentrated in the last third of the century.

A growth in economic capacity of 2.0 to 2.5% per annum falls within the range required to generate universal child literacy (2.7%) and what was actually achieved (1.9%). If the resources of the society were expanding at about 2.0% per annum, then the implication is that the growth of literacy kept pace with the material capacity required to support it; and if the economy was growing at around 2.5% then literacy was skimped at the expense of consumption or other investments. The data are far too rough to draw conclusions other than the suggestion that the country probably had the capacity to educate its children more rapidly if it highly valued literacy as a consumption or investment good.

The data on educational expenditures in Table 10 shows that education maintained its share of government expenditures over the period and was growing at a rate which was high enough (under the assumptions of Table 9) to eliminate illiteracy by 1874 or by 1901. Expenditures were not confined to primary education, however, and much of it went to finance secondary education. Hence to estimate the level of expenditure required to eliminate child illiteracy without reallocation of priorities between elementary and secondary schooling in the budget, equation (11) fits the estimates of child literacy to the expenditure on education in the various census years.[40]

(11) Child Lits = 15,018 + 0.11 Exp., r = +0.98, t = 10.62, n = 7
(1995) (1317) (.010)

This relationship again has a high correlation coefficient and a strongly significant regression coefficient, and can be used to predict the costs which would have been incurred by educating all the children to literacy rather than a fraction of them. These are set out in Table 11 and, of course, represent nothing more accurate than a rough order of magnitude. In constant dollars it would have cost around $13.3 M. to educate to basic literacy all the children in the society from 1845 to 1901 — more than twice what was actually spent by the state. The Table shows that a sustained improvement in the ratio of what was actually spent to what was required came only after the mid-1870s. It is also apparent that an effort to wipe out illiteracy at any period before the end of the century required a very considerable shift in resources. In the 1840s and 1850s, rather than allocating 7% to 8% of Government expenditures to education, it

40 The expenditure contributions of the churches to education is ignored here. Their contribution was significant but it is reasonable to believe that the burden of incremental expenditures would have to be borne by the state.

would have been necessary to spend at least a third, and until the early 1880s no less than a quarter. This would have involved either a substantial increase in taxation or a reduction of other services and investments. Could the country have absorbed higher levels of taxation? Since the required expenditure represented only 2% to 4% of merchandise exports, and therefore probably around 1% to 2% of National Income, the challenge appears to be within the range of feasibility. But in Canada where national income per head was probably more than twice that in Newfoundland, expenditures on publicly controlled elementary and secondary schools was slightly less than 1% of GNP in both 1890 and 1900.[41] The implication is that without an unusual commitment to education Newfoundland could not expand child literacy at a faster rate than it did.[42] Would such a commitment have been a valuable investment for the country?

This paper has estimated that at mid-century no more than 40% of the potential male and female labour force had any capacity to read, and no more than 56% by the end of the century. It has also speculated from the School Inspectors' Reports that only 40% to 45% of children who emerged from the school system had an ability to read complicated material, and therefore probably an ability to write and cipher with some competence. While a thorough study is needed into the 'productivity' trends in the school system over the course of the century,[43] this preliminary estimate from the Inspectors' Reports would indicate that at mid-century only 18% of the potential labour force was fully literate, rising to 25% by the end of the century. The situation was somewhat better in the Eastern Avalon region, which was the economic and administrative heartland of the country, but even there the proportion of full literates would be only 20% at mid-century and 35% at its end. In the rest of Newfoundland, where most of the new industrial opportunities were emerging, the estimates would be only 15% and 23% respectively.

Do these appalling figures give any reason for believing that the country's economic and political troubles had their source in factors other than resource inadequacy, entrepreneurial mismanagement, or exploitation? Is there any reason to believe Newfoundland would have been more successful in developing its potential if it had been blessed at the time of settlement with a better educated population or had set about to create one in the face of the considerable sacrifices such an effort would have required? To answer this question with any confidence requires a calculation of the social rate of return to education and a comparison of that with other investments which were made or could have been

41 Calculated from M.C. Urquhart and K.A.H. Buckley, *Historical Statistics of Canada*, series 158-170.

42 Hamilton, *op. cit.*, p. 141 argues that the annual grants to education exceeded what might be expected and indicated the priority placed on education.

43 Given the emphasis on primary education and the growth of school enrollments, it is possible that the proportion of children emerging with an advanced competence declined rather than rose.

made. This is an impossible task for this paper and perhaps for any other. Nonetheless, it is reasonable to observe that before the collapse of the country in 1933 some $34 M. was borrowed on capital account to build and maintain the railway, and since the railway was central to the bankruptcy of the country it is tempting to infer that however low the rate of return to education it could not have been worse than the return to that ill-conceived project.[44] But this still does not establish that Newfoundland's progress would have been substantially improved with a widely and better educated population, or specifically a more literate population.

There is no consensus on this matter in the literature which examines the relationship between literacy and economic development. In the early 1960s Bowman and Anderson in a survey of income levels in thirty-two countries around the world concluded that an adult literacy level of 30% to 40% was essential for a country to escape from the lowest level of economic development, but that little relationship was apparent between increases in income per capita and literacy rates in the range of 30% to 70%.[45] If there is a literacy threshold for economic development it has probably risen since the nineteenth century and hence our estimates would suggest that Newfoundland had crossed it by the end of the century. The implication from Bowman and Anderson is that a more rapid improvement in educational levels would not have been especially functional in raising national and per capita income levels since the social rate of return to additional expenditures would have been very low.

This conclusion would receive support from McClelland who argues that enrollments in primary education are less likely to be important for economic growth than expansion of secondary or tertiary schooling and that primary school attendance was not essential to effective performance of the jobs of skilled artisans, and not enough by itself "to lift a person to a level of being able to perform jobs characteristic of the middle class". For these reasons he concludes that "post-primary education seems likely to be the more important input for economic growth *on the average*".[46] McClelland thus leaves open the possiblilty of high rates of return to some educational investments, and in terms of this argument it is possibly significant that, compared with the rest of British North America, Newfoundland placed its emphasis on primary schooling.[47] His conclusion that mass literacy at low levels of competence is unrelated to economic development has also been supported by several historians. Sanderson claims that in Lancashire during the early years of industrialisation literacy rates actually fell and that the new industrial economy created in the textile and

44 Great Britain, *Newfoundland Royal Commission* (HMSO, 1933), p. 253. This does not include several millions borrowed to cover operating losses in the 1920s.

45 Bowman and Anderson, "Role of Education", pp. 251-3.

46 McClelland, "Does Education Accelerate Economic Growth?", p. 262.

47 See Rowe, *History of Education*, p. 103.

other industries a range of new occupations which required even less literacy and education than was required of the older crafts.[48] The question Sanderson leaves unanswered is whether it was necessary to have basic mass literacy in order to provide a 'firm base' to supply necessarily literate employees like clerks and foremen.[49] Schofield would probably think not. The industrial towns of Britain were less literate than the surrounding countryside and the more traditional market towns, because literacy was irrelevant to many of the new industrial occupations.[50] In the commercial sectors of the economy, however, literacy was required, and in so far as economic growth entailed an inter-sectoral shift in employment, Schofield implies that market forces would provide the necessary supply. But for nineteenth-century England, the rapid decline in illiteracy "would appear more as a cultural change brought about by economic growth than as one of the causes of growth".[51]

The pessimistic conclusions of Sanderson and Schofield are strongly supported by Graff's detailed analysis of literacy in mid-century Ontario. He finds that literacy did not economically benefit all who had it or disadvantage those who did not, which is hardly surprising. A more interesting observation, however, is that illiteracy served "as a symbolic focus of other forces of inequality, such as ethnicity, class, sex and age".[52] Literacy by itself, he believes, influenced remarkably little one's life chances.[53] But to argue from the fortunes of individuals that literacy is unimportant to economic development is to risk the fallacy of composition. While Graff does not make this error, his observations on the relationship between literacy and economic development do little but repeat and restate those of Sanderson, Schofield and others, since his own empirical research lacked a time dimension and was confined to a society which was already overwhelmingly literate by the 1860s.[54]

The pessimists have not lacked challengers. West has shown that Sanderson's Lancashire calculations are misleading and that in general the date of distinct improvement in British literacy rates coincided with the beginnings of the factory system.[55] This still does not prove that literacy was causally related to Britain's economic development, but recently Sandberg has argued that this was the case of Sweden, which was characterized in the mid-nineteenth century by a

48 Michael Sanderson, "Literacy and Social Mobility in the Industrial Revolution", *Past and Present*, no. 56 (1972), pp. 75-104, esp. p. 89.

49 *Ibid.*, p. 92.

50 Schofield, "Dimensions of Illiteracy", p. 452.

51 *Ibid.*, pp. 453, 454.

52 Graff, *Literacy Myth*, p. 19.

53 *Ibid.*, p. 91.

54 *Ibid.*, pp. 223-33.

55 E.G. West, "Literacy and the Industrial Revolution", *Economic History Review*, XXXI (1978), p. 382.

"level of useful natural resources per capita. . .abysmally low by any standard" and therefore had one of the lowest levels of per capita income in Europe.[56] Yet Sweden was also an 'impoverished sophisticate', since the country possessed administrative and financial institutions which were developed well in advance of what might be expected of such a poor country. Since the mid-eighteenth century it also possessed one of the world's best educated populations. Since natural resource endowment is as much a product of technology and demand as of nature, from around the mid-nineteenth century the country "was propelled forward by a large exogenous increase in the international value and economic usefulness of its natural resources and in the availability of technological opportunities".[57] The supply of human capital is much less elastic than the supply of physical capital in responding to rapidly changing material circumstances, and hence Sweden with its generous stock of 'over-educated' labour was ideally situated to seize the opportunities which opened up and to transform the country into one of Europe's wealthiest by the end of the century. It was exactly this kind of 'internalizing' of opportunities which failed to occur in Newfoundland when resource expansion began to occur in the late nineteenth century — perhaps because the country was not an 'impoverished sophisticate' like Sweden, but simply impoverished.

Iceland, another poor and sophisticated country, underwent a similar transformation in the late nineteenth century by assuming national control over foreign business assets and by expanding its fishery resource into an internationally competitive export industry.[58] It was not a sudden acquisition of literacy that generated this national revolution, but it is unlikely that it would have happened or succeeded in the absence of a well educated population and a lively intellectual life. Those who stress the importance of literacy and education do not argue that it is essential for an individual's success in life or for the satisfactory performance of all economic tasks; rather they point to its mass presence in a society as a requirement of social transformation and liberation from stultifying traditions and other barriers to progress. Clammer found that in Fiji "literacy. . .lies at the base of almost every transformation of. . .society".[59] Stone in his long survey of the development of literacy in England from the seventeenth century concluded that it is "hard to deny the enormous importance of the widening of the intellectual pool from which could be drawn leadership of society at all levels and in all fields" and that "there seems to be a direct connection between the evolution of mass literacy and the emancipation of the lower

56 Lars G. Sandberg, "The Case of the Impoverished Sophisticate: Human Capital and Swedish Economic Growth before World War I", *Journal of Economic History*, XXXIX (1979), pp. 225-42.

57 *Ibid.*, p. 227.

58 See Chamberlin, *Economic Development in Iceland.*

59 J.R. Clammer, *Literacy and Social Change: A Case Study of Fiji* (London, 1976), p. 2.

classes from intellectual dependence upon their social superiors".[60] Even Graff, who makes so much of the 'literacy myth', accepts that "the transition to both commercial and industrial capitalism in North America was a smoother one than in England. . .as one direct consequence of the comparatively earlier and more extensive educational development and its intimate reciprocal relationship to economic change and industrialisation".[61] And it must not be forgotten that education is valuable for itself; an asset which "enhances national pride, any practical economic effects aside".[62]

It cannot be shown that higher levels of literacy and education would have made Newfoundlanders more productive fishermen, loggers and miners than they were. It might be possible to show that its relative absence blocked the growth of other employment opportunities and forced the country to import goods and services which might have been efficiently supplied by a better educated local labour force. No counterfactual testing can ever prove the hypothesis that more of the direct and indirect benefits of resource development would have come to the country if it had possessed a more literate labour force. The Maritime Provinces did not shake themselves free from economic and social stagnation despite a more literate population, and so it cannot be assumed that Newfoundland would have triumphed over the mismanagement and national lethargy which plagued it to the collapse in 1933. But it is difficult to see how the country could rise to meet its opportunities and challenges when its educated population was so small. As a country Newfoundland was like a workman sent out to do a job without his tool box. Lawrence Stone believes that in early Victorian England the illiterate bottom third of the population "was cut off from the rest, not only by its abject poverty, but also by illiteracy".[63] Newfoundland increasingly in the nineteenth and early twentieth centuries was in a similar position — a society with a low level of basic literacy and education attempting to compete and survive in a world where that asset was almost taken for granted. It is difficult to believe that this deficiency did not impose heavy costs upon the country in limiting its capacity to adapt, innovate and face the external world with pride and self-confidence.

The extent of illiteracy in Newfoundland is not proof that labour productivity was less than it might have been, but it is good reason to suspect a linkage. Far more important, however, are its implications in terms of class social relations and the quality of public life and public decision making. Wide differences in educational skills and information between a governing elite and the mass of the population can breed an unwarranted deference on the one hand and a selfish

60 Lawrence Stone, "Literacy and Education in England, 1640-1900", *Past and Present*, no. 42 (1968), p. 137.

61 Graff, *Literacy Myth*, p. 232.

62 Bowman and Anderson, "Role of Education", p. 247.

63 Stone, "Literacy and Education", p. 119.

noblesse oblige on the other. It also breeds a sluggish intellectual life and an unimaginative and inefficient debate about the goals of the society and how they might best be realised. Anyone who surveys the economic and political history of Newfoundland cannot escape the impression of a political culture which was sunk in a mediocrity which the country and its people did not need.[64] Perhaps it was an inescapable adjunct of the country's small size, its relative youth and the conflict of loyalties generated for British people abroad of vicariously participating in the magnificence of the British Empire. We will not know until some scholar produces an intellectual portrait of the country, for in such a work lies more of the answers to the problems of Newfoundland's economic history than its economic historians are ever likely to supply.

64 This is the general message in S.J.R. Noel, *Politics in Newfoundland* (Toronto, 1971).