Nebulous Substance: The Portrayal of Iron and Steel Employment in the Printed Census Reports of British North America, 1851-1891

by **WILLIAM WYLIE***

There is a need for a long-term study of occupational types and distribution in late-nineteenth-century British North America. According to the Parks Canada Systems Plan, this would facilitate further research in the history of social and economic organization in Canada.[1] While a variety of sources exist for such an undertaking, this analysis focuses on the utility of the printed census reports. They provide a readily available overview of occupations although they are hampered by a series of problems. The most serious problems are caused by the ambiguities of the occupational categories. To what extent do the statistics in these categories reflect actual changes in work structure, and to what degree have the statistics been affected by the shifting organization of the data by census officials? To expedite the inquiry, this study concentrates on a select group of classifications relating to the iron and steel industry. The results throw some light not only on the value of the census reports, but on the particular industry. In this way the data may prove useful in a more detailed study of blacksmithing now underway.

Occupations in the Printed Census Reports

Occupational statistics may be used to indicate changes in economic structure or social hierarchy. In the first case, work is grouped by economic function into broad categories of primary (extractive), secondary (manufacturing), and tertiary (service) industries, which give an idea of trends in economic activity. When combined with other measurements such as those of capitalization and output, the distribution of the work-force contributes to an understanding of economic history. In the second case, occupations are grouped according to their relationship to the means of production or according to criteria of status

* *Archivaria* thanks Parks Canada for permission to reprint this article from *Research Bulletin* No. 199 (August 1983).

1 See Parks Canada, National Historic Parks Systems Plan, "Framework for Canadian Historic Resources," manuscript on file, National Historic Parks and Sites Branch, Ottawa, July 1979, p. 9.

to indicate relationships of power within society. Thus the study of occupations can be useful in evaluating the evolution of both social and economic development.[2]

The sources available for the study of occupations include census material, assessment records, city and business directories, voting and parish rolls, and court records. The census records have the advantage of giving data on a whole society at a particular point in time. In British North America between 1851 and 1891, they contain occupational information of two kinds. Residents gave their occupations in the nominal census. In the industrial section, information was collected on employment as one of a series of measurements of industrial establishments. The printed census reports provide an abstract of the information available in both manuscript schedules. Because the nominal census provides information on a wider range of occupations, the printed version of these statistics will be studied here.

The reports readily available for study include the provincial reports for Canada in 1851 and 1861, the census for Nova Scotia in 1861, and the federal census reports from 1871 to 1891.[3] The geographical areas under consideration in this study shift. For 1851, Upper and Lower Canada (Ontario and Quebec) are included; for 1861, the regions are Upper Canada, Lower Canada, and Nova Scotia; for 1871, they are Ontario, Quebec, Nova Scotia, and New Brunswick; and finally for 1881 and 1891, Prince Edward Island, Manitoba, British Columbia, and the North-West Territories are considered in addition to the four original provinces.

While the printed reports constitute a handy synthesis of the more detailed information in the manuscript schedules, the published statistics suffer from weaknesses of two kinds. The manuscript censuses contain deficiencies which are compounded by the process of aggregation in the reports. The weaknesses of the original censuses were almost inherent in the process of census-taking. The procedure involved the interviewing of family heads by enumerators appointed temporarily for the job. Two levels of subjectivity were involved: on the part of the public in reporting and on the part of the enumerators in recording their comments. The early reports of 1851 and 1861 were particularly weak, since neither public nor enumerators were yet familiar with the task.

---

2 On the methods and uses of occupational classification, see Michael Katz, "Occupational Classification in History," *Journal of Interdisciplinary History* 3 (Summer 1972), pp. 64-66; Thomas Smith, "Reconstructing Occupational Structures: The Case of the Ambiguous Artisans," *Historical Methods Newsletter* 8 (June 1975), p. 134; W.A. Armstrong, "The Use of Information about Occupation," in E.A. Wrigley, ed., *Nineteenth Century Society, Essays in the Use of Quantitative Methods for the Study of Social Data* (Cambridge, 1972), pp. 191-92; Clyde Griffin, "Occupational Mobility in Nineteenth Century America: Problems and Possibilities," *Journal of Social History* 5 (Spring 1972), p. 318; Theodore Hershberg, et al., "Occupation and Ethnicity in Five Nineteenth Century Cities: A Collaborative Inquiry," *Historical Methods Newsletter* 8 (June 1974), p. 179.

3 Canada, *Census of the Canadas, 1851-52* (Quebec, 1853-55), 2 vols.; *Census of the Canadas, 1860-61* (Quebec, 1863-64), 2 vols; Nova Scotia, *Report of the Secretary of the Board of Statistics on the Census of Nova Scotia, 1861* (Halifax, 1862); Canada, *Census of Canada, 1870-71* (Ottawa, 1873-78), 5 vols; *Census of Canada, 1880-81* (Ottawa, 1882-83), 4 vols; *Census of Canada, 1890-91* (Ottawa, 1893-97), 4 vols.

Many individuals suspected that the information being gathered would be used against them, especially in the levying of taxes. While this encouraged false reporting, misrepresentation also occurred because of ignorance. Residents sometimes failed to understand questions concerning country of origin, or they were unable to give accurate information, for instance, concerning age.[4]

The enumerators were often chosen primarily because of political affiliation rather than competence. As a result there were errors and inconsistencies, especially in the returns of 1851 and 1861 when the officers received little guidance from their superiors. Writing of the reports for Peel County in Upper Canada, David Gagan notes instances when whole families, including babies, were given the occupation of the major bread-winner.[5] A distinct improvement occurred with the appointment of J.C. Taché in 1864 as permanent deputy minister in charge of the census in the province of Canada. Taché attempted to improve the accuracy of the first federal censuses by instituting provisions for prosecuting enumerators on inconsistencies.[6] In spite of these measures, scholars have noted contradictions between the census schedules for 1871-1891 and other sources such as city directories.[7]

According to contemporaries, the occupational returns were the least reliable part of the census, not only in British North America, but also in England, Ireland, and the United States. Unlike questions of age or country of origin, occupation tended to be a matter of personal opinion. Commenting on the Canadian census of 1851, William Hutton, who was Secretary to the Board of Registration and Statistics, noted that the occupational section had been published because "it contains at least as few absurdities as that of England, Ireland, and the States, and it has not been deemed advisable to withhold even the inconsistencies, or may be, inaccuracies of so important a work."[8] Hutton noted that some places seemed to possess a surplus of artisans such as axe-makers while others "appear to be without, and make no return under the head of edge-tool or manufacturers, which can explain the deficiency."[9] He ascribed these oddities to the vagaries of the categories and to the incompetence of the enumerators. In England, a similar problem led to the publication of occupational dictionaries after 1861 for the benefit of the enumerators. In Canada, only a few general instructions were advanced which may actually have served to confuse rather than clarify matters. A person with two occupations could report

4 *Census of the Canadas, 1851-52*, Vol. 1, p. iv; *Census of Nova Scotia, 1861*, p. 6.

5 David Gagan, "Enumerators' Instructions for the Census of Canada, 1852 and 1862," *Histoire sociale-Social History* 7, 14 (November 1974), pp. 355-56; see also Claudette Lacelle, "Employers and Domestic Servants in Urban Centres: The 1871 Census," *Research Bulletin* No. 166 (1981), pp. 1-2.

6 Gagan, "Enumerators' Instructions," p. 358; *Manual Containing "the Census Act" and the instructions to officers employed in the taking of the second census of Canada* (Ottawa, 1881), pp. 8, 10.

7 Kevin Burley, "Occupational Structure and Ethnicity in London, Ontario, 1871," *Histoire sociale-Social History* 11, 22 (November 1978), p. 392.

8 William Hutton, "Report to the Board of Registration and Statistics," *Census of the Canadas, 1851-52*, Vol. 2, pp. 40-41.

9 *Ibid.*, p. 41.

one or both. If he chose only to report one, he could made his decision according to which one provided his chief livelihood, which took up more of his time, or which he happened to be pursuing at the time of the census.[10]

Particularly embarrassing for nineteenth-century census officials was the discrepancy between the occupational tables of the nominal returns and the employment figures of the industrial census. The difference was partly due to the differing criteria for reporting in the two schedules. While residents were usually encouraged to declare their chief occupation in the nominal list, in the industrial schedule they were to report details of any establishment in which they were involved in which materials were altered for profit. They were asked to indicate the numbers employed, even if only for a short period each year. The industrial schedule was also susceptible to false reporting based on the proprietor's desire to minimize the importance of his activities in order to avoid taxation, or on his propensity to exaggerate his operations in order to impress his neighbours.[11]

The errors in the manuscript censuses were magnified in the printed reports. This was partly due to the miscalculations of the clerks in aggregating the data compiled by individual enumerators. Scholars have noted that the occupational figures for particular industries and regions in Ontario seem lower than the totals in the original manuscript schedules.[12] There were also internal inconsistencies, particularly in the Canadian reports for 1851 and 1861. Writing in 1865, Taché commented on the problem:

> The additions of the columns do not always agree; but they sometimes agree in totals, while they disagree in the details forming the elements of the calculation. I have learned by consulting the traditions of the office, that such a wonderful result was obtained by a high-handling of figures, called at the time — *to make them correspond.* [italics original][13]

In view of these deficiencies, the minister in charge of statistics, Thomas D'Arcy McGee, concluded in 1864, "that the printed reports of the last two Censuses are not to be relied upon."[14] The remedy, in the opinion of those who favoured the systematic accumulation of statistics, was the training of a more competent

10 Armstrong, "The Use of Information about Occupation," pp. 194-95; "Instructions to officers employed in the taking of the Census," in *Sessional Papers*, No. 64, 1871, p. 134; "Instructions to officers," in *Manual Containing "the Census Act" and the instructions to officers employed in the taking of the second census of Canada*, p. 30; *Census of Canada, 1880-81*, Vol. 2, p. vi; *Census of Canada, 1890-91*, Vol. 2, p. vi-viii.

11 Concerning the discrepancies, see *Census of Nova Scotia, 1861*, pp. 14-15; *Census of Canada, 1880-81*, Vol. 2, p. vi; *Census of Canada, 1890-91*, Vol. 2, p. vi-viii; concerning the inconsistencies of the Canadian census of 1851-52, see David L. Newlands, *Early Ontario Potters: Their Craft and Trade* (Toronto, 1979), pp. 23-24; my thanks to Hilary Russell for this last reference.

12 On potters in the 1851 census, see Newlands, *Early Ontario Potters*, pp. 23-24; concerning occupations in the census of 1871 in London, Ontario, see Burley, "Occupational Structure and Ethnicity," p. 392.

13 J.C. Taché, "Memorial on the Board of Registration and Statistics," in *Sessional Papers*, No. 5, 1866, p. 26.

14 *Sessional Papers*, No. 6, 1864, p. 14.

staff. Taché recommended particularly that permanent clerks be appointed to superintend the collection of census statistics. While improvements in training did occur, no permanent staff was assembled in the nineteenth century. The accuracy of the reports continued to rely on the competence of the particular clerks hired for each census.[15]

While these problems are serious, they are not as crucial as the ambiguities surrounding the headings of the occupational tables. Between 1851 and 1891, the categories of work were constantly reclassified and never defined. The headings included general designations such as "Mechanics" as well as more specific ones such as "Gunsmiths." The number of categories varied dramatically over time. In 1851, every occupation listed in the manuscript census was included in the printed report.[16] This resulted in approximately 300 headings. There were about the same number in 1861 though some of the classifications had changed. In Nova Scotia, there were approximately 180 headings in the census of 1861.

A major change took place in the first federal census. In the report of 1871, the list of occupations was reduced to about 140 general headings. This action was probably motivated by a desire to shorten an already unwieldy report. However, it also seems inevitable that the categories would become more general as the range of industries and the subdivision of work increased after Confederation.[17] In 1881, the number of headings was approximately the same, but many of the designations had changed. In 1891, the list increased to about 280 groupings — a total which reflects growing specialization in industry and, in particular, the growing distinction between the production and distribution functions of specific industries.[18]

The difficulties presented by categorization raise questions about how useful the occupational tables can be in reflecting the changes in types and distribution of occupations over time. To consider this question, a select number of headings relating to the iron and steel industry have been chosen for further study.

Occupational Categories in the Iron and Steel Industry

The purpose here is to analyze the types and distribution of employment in the iron and steel industry using the census reports. While eighty-three categories seem relevant to this industry between 1851 and 1891, only four can be traced through all the reports. These are "Blacksmiths," "Machinists," "Moulders," and "Plumbers and Pipe-fitters" (see the Appendix). Blacksmiths were the traditional artisans working in wrought iron. The category does not reveal to what extent techniques were evolving in the trade from the time-honoured hand craftsmanship to the new machine tools. Nor do the blacksmithing statistics throw

15 Taché, "Memorial to the Board of Registration and Statistics," pp. 27-28.

16 *Census of the Canadas, 1851-52*, Vol. 2, p. 41.

17 *Census of Canada, 1870-71*, Vol. 2, pp. 250-347; concerning the changing organization of work, see James M. Gilmour, *Spatial Evolution of Manufacturing: Southern Ontario 1851-1891* (Toronto, 1972), pp. 26-28 and James Rinehart, *The Tyranny of Work* (Toronto, 1975), pp. 23-53.

18 *Census of Canada, 1880-81*, Vol. 2, pp. 232-329; *Census of Canada, 1890-91*, Vol. 2, p. viii, 140-193; *ibid.*, Vol. 3, pp. iv-vi.

light on the organization of work through division of labour between smiths who were wage-earners as opposed to owners of the means of production.

The designations "Machinists" and "Engineers" were used to describe craftsmen working primarily with the mechanized tools beginning to replace traditional hand labour. These two descriptions seem to have been used almost synonomously in the British North American reports — with first one and then the other predominating until "Machinists" emerged as the sole category in the 1891 census. While not all machinists worked on iron and steel products, most probably did, and for this reason the category has been included in this study of iron and steel employment.[19]

Unlike blacksmiths and machinists, moulders concerned themselves with the casting rather than the forging of iron and steel. The casting of molten metal resulted in a product which was harder and more brittle than iron shaped at the forge. Foundry work required larger-scale operations than the smithy. The highly specialized hand technology of the moulder changed little before the 1890s.[20] Perhaps for this reason the categories of "Moulders" and "Founders" were maintained more consistently than most others.

Plumbing was a new branch of the metals industry. Rising first with the introduction of gas and steam power, pipe-fitting expanded at the consumer level especially after 1850 with the new emphasis on sanitation facilities in the cities.[21]

The aggregate category of iron and steel employment presents certain problems. Some of the eighty-three headings bear more directly on iron and steel than others. While "Blacksmiths" seems a perfect fit, categories such as "Agricultural Implement Makers" probably involved other activities in addition to metal processing. The term "Mechanic" was an all-purpose classification in which some metal-work was probably included. Including these categories tends to inflate the iron and steel numbers, but this is balanced by excluding other groupings such as "Carriage-making" and "Ship-building," in which metalworking played a minor role. Obviously the process of selection is arbitrary and the results must be inexact. The difficulty is underlined when the statistics from the eighty-three categories are compared with the employment data from the industrial census. While the numbers approximate one another in 1871 and 1891, they do not in 1881.[22] Moreover an internal inconsistency was discovered in the occupational tables. The totals of "Moulders"

19 The terms "Machinists" and "Engineers" seem to have originated in the United States and Britain respectively; see Craig Heron, "The Crisis of the Craftsman: Hamilton's Metal Workers in the Early Twentieth Century," *Labour/Le Travailleur* 6 (1980), p. 12; Katz, "Occupational Classification," p. 180; Roderick Floud, *The British Machine Tool Industry, 1850-1914* (Cambridge, 1976), pp. 24-31.

20 Heron, "The Crisis of the Craftsman," p. 10; Raphael Samuel, "The Workshop of the World: Steam Power and Hand Technology in Mid-Victorian Britain," *History Workshop 3* (1977), pp. 39, 42-43.

21 I am indebted to Arnold Roos of Parks Canada for his information on this subject.

22 The statistics from the industrial schedule are 28,260 in 1870; 32,205 in 1880; and 45,600 in 1890; M.C. Urquhart and K.A.H. Buckley, eds., *Historical Statistics of Canada* (Toronto, 1965), p. 471; compare these with the numbers in Table 1.

for Canada do not correspond to those derived from the sums of the various provinces and territories between 1871 and 1891 (see table 5). Since other irregularities might be revealed by further study, the reliability of the statistics remains in doubt.

To what extent can the employment statistics be used to reveal changes in the structure of the industry? Here the value of the data is limited. The occupational tables reveal nothing about the scale of operations. The categories are too imprecise to permit study of specialization. It is true that there are more specialized categories in 1891 than in the reports of 1871 and 1881. This reorganization of the data reflects structural changes to the extent that the census officials were reacting to the changes they saw occurring in the economy around them, but this by no means justifies the use of the occupational statistics as an indicator of increasing specialization. Finally, employment statistics are useful in explaining increasing output only when compared with measures of investment, which with labour power were the major ingredients in production.

Trends in Iron and Steel Employment

The iron and steel industry was a minor one in British North America in the process of rapid growth. The economy continued to rely on the export of natural products. Secondary manufacturing grew only as capital accumulated, as the supply of labour expanded through natural increase and immigration, and as technological innovations such as the steam engine were exploited. The development of the iron and steel industry was stimulated by the building of railways in the 1850s, the American Civil War of the 1860s, which temporarily reduced manufacturing imports, the installation of the protective tariff after 1879, and the system of government bounties and bonusing which expanded in the 1880s. Because of shortages of coal and iron ore in the country, the smelting of ore into iron and steel never became a significant factor in the industry during the period. Instead, pig iron was imported from Scotland and the United States. The major growth took place in the two main branches of the finishing sector, founding and forging, which produced cast and wrought iron respectively.[23]

Trends in iron and steel employment conform to the broad patterns of this picture. The work-force constituted a small proportion of total employment in British North America. This proportion increased only slightly through the period (see table 2). Employment increased in every decade with the greatest expansion in the 1860s (table 1). Secondary sources indicate these were years of particularly rapid growth in output. On the other hand, the growth of the work-force slowed in the 1880s, though this decade was also one of greatly

23 The following sources are not intended to be exhaustive: W.T. Easterbrook and H.G.J. Aitken, *Canadian Economic History* (Toronto, 1956), pp. 516, 523, 531; G.W. Bertram, "Economic Growth in Canadian Industry, 1870-1915: The Staple Model," in W.T. Easterbrook and M.H. Watkins, eds., *Approaches to Canadian Economic History* (Toronto, 1967), pp. 74-98; R.T. Naylor, *The History of Canadian Business, 1867-1914* Vol. 2 (Toronto, 1975), pp. 114-20; William Kilbourn, *The Elements Combined: A History of the Steel Company of Canada* (Toronto, 1960), pp. 11-22, 46-47; W.J.A. Donald, *The Canadian Iron and Steel Industry: A Study in the Economic History of a Protected Industry* (Boston & New York, 1915), pp. 111-20.

increased production.[24] Two considerations seem relevant here. First, the employment figures derived by Urquhart and Buckley from the industrial rather than the occupational census substantiate the 1880s as a period of rapid expansion in employment as well as output.[25] Secondly, it is possible that development in the industry in this decade owed more to increased investment than employment. O.J. Firestone indicates that productivity rose dramatically between 1870 and 1890. With the establishment of new rolling and finishing plants, capital input may have been decisive in the development of the iron and steel industry in the 1880s.[26]

TABLE 1

EMPLOYMENT IN IRON AND STEEL

Region	1851	1861	1871	1881	1891
Canada			27,805	39,843	44,924
Ontario	6,584	9,135	14,769	21,205	22,760
Quebec	3,702	5,297	8,142	10,919	13,472
Nova Scotia		1,954	2,748	3,436	3,251
New Brunswick			2,141	2,683	2,424
Prince Edward Island				799	627
Manitoba, British Columbia and the Territories				801	2,223

SOURCE: Data in all the tables in this article was obtained from the printed censuses cited in footnote three above.

TABLE 2

THE IRON AND STEEL WORK-FORCE AS A PERCENTAGE OF TOTAL EMPLOYMENT

Upper Canada and Lower Canada 1851	Upper Canada, Lower Canada, Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
2.3	2.3	2.8	2.9	2.7

Blacksmiths

The figures regarding blacksmiths are indicative in several ways of the state of the iron and steel industry in British North America during the period. Between 1851 and 1891, blacksmithing was consistently the largest category of employment in the industry. This typified the early level of development of the industry, which was still emerging from a stage when finished goods were largely

24 O.J. Firestone, *Canada's Economic Development, 1867-1953* (London, 1958), p. 213.
25 Urquhart and Buckley, eds., *Historical Statistics*, p. 471.
26 Firestone, *Canada's Economic Development*, pp. 225-28.

imported and ironwork was limited mainly to the generalist working in small shops. On the other hand, blacksmiths comprised a declining proportion of the workers employed in iron and steel between the beginning and the end of the period (see table 3). This suggests increasing levels of mechanization, specialization, and scale in the industry as a whole. Moreover, these trends are not fully represented since boilermakers, and car and locomotive builders probably included numbers of smiths near the end of the period.[27]

TABLE 3

BLACKSMITHS AS A PERCENTAGE OF IRON AND STEEL WORKERS

Upper Canada and Lower Canada 1851	Upper Canada, Lower Canada, Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
68.8	63.5	56.4	49.8	41.3

Machinists

The growth of employment in this category reflects the gradual mechanization of the industry. Between 1851 and 1881, the numbers increased in each census. Moreover, the proportion of machinists to blacksmiths increased steadily with the greatest expansion occurring in the decade 1871 to 1881 when the ratio jumped from 0.19 to 0.50 for the country as a whole. In 1891 the number of machinists decreased. Since an actual reduction in the work-force seems unlikely, it is possible that some tool operators were being included in other specialized categories which became more numerous in 1891.

TABLE 4

THE PROPORTION OF MACHINISTS TO BLACKSMITHS

Upper Canada and Lower Canada 1851	Upper Canada, Lower Canada, Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
0.13	0.16	0.19	0.50	0.52

Moulders and Cast Iron

The output of cast iron remained a small proportion of wrought iron products through the period. This also was reflected in the percentage of persons employed in casting iron (which was roughly 11-12 per cent of total iron and steel employ-

27 Gregory S. Kealey, *Toronto Workers Respond to Industrial Capitalism, 1867-1892* (Toronto, 1980), p. 18.

ment through most of the period). On the other hand, the number of foundrymen increased in every decade until 1881. This branch was keeping pace with the industry as a whole. Indeed many of the new heavier products such as agricultural machinery, stoves, and railway equipment required both cast and wrought iron fittings. The numbers of founders decreased between 1881 and 1891. As with machinists, this may be due to the inclusion of foundry workers under other headings.

TABLE 5

EMPLOYMENT IN MOULDING AND CAST IRON

Region	1851	1861	1871	1881	1891
Canada			3,457	4,488	4,070
Ontario	490	939	2,544	4,269	3,317
Quebec	218	320	916	1,064	1,001
Nova Scotia		100	255	309	264
New Brunswick			276	251	293
Prince Edward Island				26	24
Manitoba, British Columbia and the Territories				52	146

NOTE: The totals in 1871, 1881, and 1891 are smaller than the sum of their parts.

Plumbers and Pipe-Fitters

The numbers show a phenomenal growth in plumbing between 1851 and 1891 in the country as a whole. After the outbreaks of cholera and typhus between 1832 and 1870, concern about sanitation stimulated a great expansion in activity especially in Ontario and Quebec. Within these provinces, Toronto, Montreal, Hamilton, and Quebec City accounted for 88.8 per cent of those in the occupation in 1851. By 1881, with the demand for services spreading, the percentage of pipe-fitters in the four cities declined to 71.7 per cent in the two provinces and to 60.9 per cent across Canada.

TABLE 6

PLUMBERS, GAS AND STEAM FITTERS AS A PERCENTAGE OF TOTAL EMPLOYMENT IN IRON AND STEEL

Upper Canada and Lower Canada 1851	Upper Canada, Lower Canada, Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
0.4	1.7	1.9	3.3	7.2

Geographical Distribution of Employment

The output of iron and steel products was not confined to one province or region. It was greatest in Ontario, but both Quebec and the Maritimes were significant producers prior to 1891.[28] This pattern was also visible in the occupational statistics. Between 1871 and 1891, approximately 50 per cent of the workers were situated in Ontario, about 30 per cent in Quebec, and from 12 to 18 per cent in Nova Scotia and New Brunswick (see table 7).

Ontario's production was linked to locational factors. The iron and steel industry relied on the demand and the capital generated by the growth of the province's extractive economy and especially its agricultural sector. The surbordinant position of iron and steel is implied by the fact that it never employed more than 3.4 per cent of the province's work-force. While no attempt has been made here to trace the spatial evolution of the industry within the province, James Gilmour has noted that a process was underway leading to concentration of iron and steel manufacturing at the western end of Lake Ontario.[29]

In Quebec the industry was limited more completely to one centre, Montreal. While Quebec lacked Ontario's strong agricultural base, Montreal entrepreneurs utilized a plentiful supply of water power, cheap labour, and large amounts of capital amassed in the forwarding business to exploit the market in Ontario.[30] The importance of the industry, in terms of the total percentage of employment in the province, increased much more steadily in Quebec than in the other provinces. Indeed in the period 1881-91, Quebec's proportion of iron and steel employment increased relative to the country as a whole.

According to T.W. Acheson, Nova Scotia and New Brunswick were among the leaders in iron and steel production until after the turn of the century. In 1881-91 the rate of manufacturing expansion in these provinces was greater than that in Ontario or Quebec.[31] Employment, however, was not keeping pace. The percentage of iron and steel employment relative to that in Canada generally slipped from 17.6 per cent in 1871 to 15.4 per cent in 1881, and to 12.6 per cent in 1891 (table 7). Furthermore, in the decade 1881-91 the number of workers actually decreased. This raised several possibilities. Are the results purely due to the choice of categories? A preliminary investigation suggests not. For example, if the statistics for plumbers, pipe-fitters, and blacksmiths (all traditionally operating on a small scale) are removed, the Maritime proportion of iron and steel employment still decreased. It seems more likely that the establishment of new plants and machinery were enabling higher productivity in Nova Scotia and New Brunswick, thus permitting capitalists to constrain the size of their work-force. Acheson, himself, indicates that investment increased more dramatically than employment during the manufacturing boom of the 1880s.[32]

28 John McCallum, *Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario until 1870* (Toronto, 1980), pp. 102-7; T.W. Acheson, "The National Policy and the Industrialization of the Maritimes, 1880-1910," *Acadiensis* 1, (Spring 1972), pp. 5-10, 14.

29 McCallum, *Unequal Beginnings*, pp. 86-91, 100-5; Gilmour, *Spatial Evolution of Manufacturing*, pp. 122-23.

30 McCallum, *Unequal Beginnings*, pp. 98-99.

31 Acheson, "The National Policy and the Industrialization of the Maritimes," pp. 4-5.

32 *Ibid.*

TABLE 7

PERCENTAGE OF IRON AND STEEL EMPLOYMENT BY REGION

Region	1871	1881	1891
Ontario	53.0	53.0	50.1
Quebec	29.3	27.4	30.0
Nova Scotia and New Brunswick	17.6	15.4	12.6

Conclusion

This study has examined the feasibility of using the occupational statistics of the printed census reports to indicate changes in the type and distribution of work in late-nineteenth-century British North America. The question was pursued by tracing the evolution of a group of occupational categories relating to the iron and steel industry. The statistics reveal trends in only four specific occupations — blacksmithing, machining, moulding, and pipe-fitting.

Here the data give some indication of the trend in the industry towards mechanization. For iron and steel manufacturing as a whole, the occupational reports confirm that the industry was still of minor importance, though the numbers employed were increasing in every decade. The statistics in the 1880s underline the need to consider employment in conjunction with other factors, particularly investment, in analyzing the development of the industry. In this case, the slowing rate of employment growth combined with the increasing rate of output serve to underline the growing importance of productivity in the industry. To sum up, the value of the reports in studying shifts in types and distribution of work is limited by the ambiguities of the occupational headings. As a tool in analyzing industrial structure, the occupational tables are less useful. The information in the industrial census, which includes data on investment, size and number of firms, as well as employment, would be a better starting point.

APPENDIX

CATEGORIES OF IRON AND STEEL EMPLOYMENT, 1851-91

Category	Upper Canada and Lower Canada 1851	Upper Canada and Lower Canada 1861	Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
Blacksmiths						
Blacksmiths	7,075	8,891	1,518	15,694	19,846	17,957
Apprentice Blacksmiths						588
Machinists						
Engineers	598	833	64			
Engineers and Machinists					9,861	
Engineers and Mechanicians				2,945		
Machinists	346	786	35			9,101
Appentice Machinists						471
General Categories						
Mechanics	98	1,077		4,508	1,503	638
Metal Workers (not specified)						292
Millwrights	593	528	134		908	
Iron and Steel Workers						2,804
Cast Iron						
Brass and other Founders						544
Founders	237	328				
Foundrymen				3,457	4,488	
Furnace Makers	2					
Furnace Builders				5		
Iron Founders			15			
Metal Workers (moulders)						4,070
Moulders	452	741	38			
Stove Makers	20					
Stove, Furnace and grate makers						460
Type Founders	7	10				
Specialized Categories						
Apprentice Plumbers						362
Agricultural Implement Makers						285
Armourers and Gunsmiths		94				

APPENDIX

CATEGORIES OF IRON AND STEEL EMPLOYMENT, 1851-91 (continued)

Category	Upper Canada and Lower Canada 1851	Upper Canada and Lower Canada 1861	Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
Axe Makers	40	61				
Bell Hangers	10	11				
Block Makers	36	15				
Block and Pump Makers			47			
Boiler Builders					722	
Boiler Makers	73	158	4			
Car and Locomotive Builders					98	
Cutlers	15	11	4			
Chain Makers	3					
Drillers	16					
Edge Tool Makers	12	13		362	220	
Fanning Mill Manufacturers	47	29				
Farriers	38	49				
File Makers		5				
Fishing Tackle Manufacturers	2		1	8		
Gas Fitters	13	60	14			
Gas Works Employees					39	184
Gas Works Engineers				16		
Gunsmiths	74		6			
Gunsmiths, Locksmiths, and Bell Hangers						350
Hoopmakers	55					
Iron Puddlers			7			
Iron Safe Makers				21		
Japan Ware Manufacturers		6				
Lathe Makers	23	1				
Locksmiths	9	24	3	221		
Lock and Gunsmiths					202	
Model and Pattern Makers						451
Nailers	9	68				
Nail Cutters			3			

APPENDIX

CATEGORIES OF IRON AND STEEL EMPLOYMENT, 1851-91 (continued)

Category	Upper Canada and Lower Canada 1851	Upper Canada and Lower Canada 1861	Nova Scotia 1861	Canada 1871	Canada 1881	Canada 1891
Nail Makers					338	
Nail and Tack Makers						457
Pattern Makers	31	22				
Plane Makers	4	7				
Plate Makers	8					
Plough Makers	124	14	3			
Plumbers	29	172	22	526	1,307	
Plumbers, Gas and Steam Fitters						3,249
Pump Makers	58	112				
Pulley Makers		3				
Rake Makers	19	5	2			
Safe Makers		5				
Saw Makers		14				
Saw and File Cutters					290	
Scale Makers	9	8				
Scythe Makers	6	13				
Sewing Machine Makers						151
Spade Makers	12	17				
Spoon Makers	5	2				
Spring Makers		3				
Steam Boiler Makers						1,250
Steam Engine Makers				42	21	
Steam Fitters		3				
Thrashing Mill Makers	1	2				
Tool and Cutlery Makers						964
Turners	107	183	34			
Weighing Machine Makers	1					
Wireworkers	5	13				283