

The development of management accounting at the Hudson's Bay Company, 1670-1820

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Abstract

In their archival study, Roy and Spraakman (1996) found that the Hudson's Bay Company had developed extensive management accounting techniques by the 1820s. However, they did not concern themselves with the origins of the management accounting techniques employed in the 1820s. Based on the Company's archives for 1670 to 1820, it is clear that the basic components of the management accounting techniques were in place from the Company's beginnings or by 1700. These practices were changed significantly in 1810 as the Company grappled with declining profits and the need for new management accounting techniques that allowed for efficiency in inland trading. This trading had different requirements than trading from a few posts with easy ocean access to London. Although the successful techniques were put in place in 1810, it took until the 1820s and the efforts of Governor George Simpson for them to work effectively as a system. This paper also tests hypotheses developed from transaction cost economics and makes suggestions for a transaction cost economics theory of management accounting.

Keywords: *management accounting; transaction cost economics; Hudson's Bay Company.*

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Introduction

From an examination of its archives, Roy and Spraakman (1996) found that the Hudson's Bay Company (HBC) had developed extensive management accounting techniques by the 1820s. Using transaction cost economics, this finding was not unexpected as the HBC faced significant levels of asset specificity and uncertainty. However, despite their descriptions and analysis of what techniques were applied in the 1820s, the question of how the HBC came to employ those management accounting techniques remained unanswered. Were the management accounting techniques developed in response to the particular and unique circumstances facing the HBC or were they applications of basic management accounting techniques?

The paper is structured as follows. Background is provided in the next section for understanding the HBC's accounting techniques during the study period, including a description of the changes to the independent TCE variables, asset specificity (i.e. customised assets) and uncertainty (i.e. large numbers of parts or components that differ and which change in unpredictable ways). The third section describes the evolution of the five dominant management accounting techniques that existed in the 1820s. Section four discusses the development of the HBC's management accounting techniques during the study period and how that development supports the TCE-based management accounting hypotheses used by Roy and Spraakman (1996) for the period 1820 to 1860 and by Spraakman and Davidson (1998) for the 1860 to 1914 period. The last section is a conclusion.

By examining the 1670 to 1820 period, this paper, as the third in a series, is able to make three contributions. First, it describes the management accounting practices at the Hudson's Bay Company which were not dealt with previously. Second, it addresses the question about whether the practices adopted were new. Third, it adds to the original transaction cost analysis by considering a time when reverse pressures existed to the ones described in earlier articles.

Background

The HBC's governance in the 1820s was dominated by a nine-member committee, including a (London-based) governor and deputy governor as members, which directed the fur trading operations. At the time the North American operation consisted of two departments, the Northern and the Southern. Each department was headed by an inland governor, who reported to the committee and/or the London governor. Following this bureaucratic practice, departments were divided into districts of one or, generally, more posts. Each district was normally headed by a chief factor, who reported to the departmental governor. Districts were generally composed of posts which tended to be headed by a chief trader. Large posts were headed by a chief factor while small posts were headed by traders or clerks.

The organisational structure of governor and deputy governor, plus a committee had been established under a charter from the King of England in 1670 (Rich, 1960a, p.169). The HBC is recognised as the world's oldest commercial organisation that continues in its original line of business (Milgrom & Roberts, 1992, p.6). It was to have a monopoly on trade and commerce in those lands whose rivers and streams drained into the Hudson Bay, the inland ocean bay occupying much of the northeast corner of North America. By 1683 the Company had a simple but effective operating system for conducting business, with a secretary-husband (i.e. secretary-warehouseman), a series of bankers, and a treasurer or team of ad hoc treasurers drawn from the committee (Rich, 1960a, p.171). Further, delegation of day-to-day management at individual posts began at that time because no committee members were expecting to be anywhere in the vicinity of the posts. It was also consistent with the practice of the time in assigning cargo to captains complete with written instructions, invoices, and bills of lading to ensure agreement on what was received and delivered (Sheldahl, 1989, p.181).

From 1670 to 1713, the HBC established posts such as Albany, Moose, and York at the mouths of rivers flowing into the Hudson Bay. This was known as a "factory system" meaning that the HBC had opted for the trading methods used by other English merchants in Africa and Asia (Ray & Freeman, 1978, p.30). With this system the trade was conducted at coastal establishments rather than from aboard ships. The HBC traders waited for the aborigines to come for their annual trading expeditions and then encouraged them to return next year with more furs.

Competition at the Bay came from the French colony of Canada; much of it was violent with HBC posts being captured from time to time by the French colonists. The annual shipment of trade goods and supplies from London was also precarious because of the dangers of trans-Atlantic travel in relatively small ships, inexperienced captains, and a limited ice-free shipping season. The HBC also had to learn to trade with the aborigines. A remission came in 1713 with the Treaty of Utrecht which confirmed the British possession of the Hudson Bay. This treaty marked the end of French competition at the Bay.

Without direct French competition, trade improved during the 1713 to 1763 period. The HBC experienced profitability and even prosperity indicated by a constant succession of dividends and by the accumulation of a substantial reserve of capital (Rich, 1960a, p.59). The approach to fur acquisition continued with the traders meeting the aborigines at the Bay. Although excluded from the Bay, the French of Canada did not withdraw from the fur trade. They intercepted the aborigines inland, away from the Bay and up the Moose and the Eastmain Rivers (Rich, 1960a, p.503). This shortened the trips of the aborigines. After 1730, the French competed from the southwest as La Verendrye and his sons developed a series of posts to intercept the aborigines travelling from the west to the Bay (Rich, 1960a, pp.517-24).

There were a number of reasons for the HBC's improved performance during the 1713 to 1763 period. With experience, the HBC captains gained skills in navigating the Atlantic Ocean and the Bay itself. Competition with the French had declined, and the HBC understood more about trading with the aborigines and living at the bayside posts. This changed in 1763 when France lost its Canadian territories to the British (Rich, 1960a, p.660). There was a "rush of the English into Rupert's Land" from the United States and England (Rich, 1960b, p.13). These "peddlers" were able to form partnerships with the French Canadians and one another and expanded the trading to the south and west of the Bay to such an extent that the HBC's trade was dramatically harmed (Rich, 1960b, p.18). A decreasing number of aboriginal furs reached bayside posts. In 1774, the HBC reacted by finally, after more than 100 years at the Bay, establishing a post inland named Cumberland House. More inland posts were established in subsequent years.

In 1783, a group of Canadian traders from Montreal formed the North West Company (NWC) to reduce costs and competition among themselves, and to compete more effectively with the HBC (Rich, 1960b, p.119). The NWC was reorganised in 1787 to include the entire resources of the Montreal traders (Rich, 1960b, p.122). The organisation of the NWC and the expansion of the HBC inland led to intensified competition between the two companies. By 1800, their competition further intensified with the depletion of beaver in many areas; they competed head-to-head farther west extending into present day Saskatchewan and Alberta, and later expanded farther west and north.

To implement the strategy of inland expansion, the committee advised those in charge of bayside posts to establish inland posts, which they did independently of one another and the committee, which had little information on those operations. During the years 1794 and 1795, the building of new posts was especially abundant. Two Assiniboine River posts were 15 miles apart (Rich, 1960b, p.183). Albany House was supplied by Albany, a bayside post. Carlton House was supplied by another bayside post, York. Competition among these inland posts was "repugnant" to the committee (Rich, 1960b, p.184). However, the committee continued to direct posts and to co-ordinate the activities among posts with seriously incomplete information.

While at bayside posts, the bulk of the trading had been undertaken by the post master or trader. Employees did not need to be virtuous because, except for private trade, their disobedience had little effect on the HBC's profits (Burley, 1993, p.4). Employees appeared to have been poorly motivated, lacking writing, reading, and bookkeeping skills, and without business talent (Davies, 1965, p.xiv). However, once the trading moved inland, more dependence was placed on employees (Tyrrell, 1934, p.447). Consequently, new employees were to have more initiative and a willingness to assume responsibility (Hudson's Bay Company Archives (HBCA), reel 39).

The HBC responded to the problems of moving inland and the competitive challenge from the NWC in 1810 by introducing, according to the committee, "a Radical Change in the System of Carrying on the Trade" which saw the division of the North American operation into two parts, each under the responsibility of a newly appointed superintendent (HBCA, reels 6, 39). With this retrenchment system, the committee assigned more responsibility to superintendents for co-ordinating operations, which was recognition that more detailed co-ordination was needed. Another attribute of the retrenching system was a push by the committee for better information. Employees in charge of posts were to submit reports to their district superiors who examined them before submitting their own reports to their superintendents. The importance of information was reflected in the demand for traders who could write and understand, if not to keep, accounts (Burley, 1993, p.66). The result of this transformation was more competition and even hostility between the HBC and the NWC. Both companies were suffering seriously from the competition when they merged in 1821. The HBC name was retained in the merger.

The remuneration of employees also changed during the 1670 to 1820 period. Up to 1779, employees were essentially remunerated with salaries. However, the move inland led the HBC to provide incentives proportionate to a post's success (HBCA, reel 38). The greatest reward went to the post master who received one shilling for each score of beaver or an amount of furs of the same value (Rich, 1951, p.xxxvii). Lesser amounts were provided to the post assistants and labourers. Numerous other incentives were tried until the 1810 retrenchment, when under the committee's influence, salaries were to be reduced while half of the profits of the trade was to be set aside, as the "Share of Profits" for division among the traders. The superintendent of each department was to get a third of the Share of Profits and the masters in charge of posts were to share the remaining one-third (Rich 1960b, p.292). The group subject to profit sharing was enlarged in 1814 in order to motivate more employees (Rich 1960b, p.313). Of the hundred shares, superintendents were to get 10 each, district masters four each, second masters two, and junior masters one. However, in 1815 the committee terminated its use of incentives because all attempts had been deemed unsuccessful (Burley, 1993, p.81). The numerous piece-rate and profit-sharing schemes did not work as planned. Although not noted by Burley, the HBC was unprofitable in 12 of the 21 years between 1800 and 1820 (Carlos & Hoffman, 1986, p.976). This led to difficulty with profit sharing as often there were no profits to distribute. Incentive remuneration was not brought back until the merger in 1821. Then the deed poll or agreement for merger specified that 40 per cent of the profits were to be divided into 85 shares. Under this arrangement two shares were allocated to each chief factor and one to each chief trader.

Asset specificity and uncertainty, the major independent variables for TCE analysis, increased with the move inland. High uncertainty has been defined by

Duncan (1972, pp.318-21) as complexity in a dynamic environment. More specifically, Duncan measured high uncertainty in terms of a large number of parts that differ and which change in unpredictable ways. The uncertainty with inland trade persisted after the HBC merged with the NWC in 1821. At that time the HBC traded over half a continent, from Labrador on the Atlantic Ocean to Vancouver Island on the Pacific Ocean, from the Canada-United States border on the south to Great Slave Lake on the north, and included parts of the present states of Washington and Oregon. Transportation among the dispersed employees and posts (1,983 and 172 in 1821, respectively) was by water, specifically with birch-bark canoes and crude (York) boats.

In this context, uncertainty was categorised as: (1) inland travel on rivers and lakes, (2) trade conditions, and (3) living off the land. These categories related to major groupings of parts, activities or means-end chains in the fur-trade operation. The inland travel activities were particularly complicated. The ships from London had to be unloaded and then the trade goods and supplies stored in warehouses or directly loaded into canoes or boats for shipment to posts. The trips took weeks or months, and for each day there were demanding tasks in order to manoeuvre man-powered canoes and boats along rocky bottomed rivers and lakes. These trips often required portages or the carrying of the canoes, boats, and their contents around rapids or water falls, or from one water system to another. Portages were physically demanding on the men. Inland travel was problematic for three key reasons. First, employee (i.e. manager and non-manager) actions were unobservable resulting in unsupervised behaviour. Consequently, effort and diligence were not always explicitly known. Second, employees were subject to opportunistic behavior. They were not always willing to give priority to the HBC's interests. For example, after 1774 when the competition forced the HBC to move inland, employees exerted all forms of effort in their resistance to go inland (Burley, 1993, p.5). Simpson observed in 1820 "that there is great want of subordination in general amongst the people" (Rich, 1938, p.51). To resolve some of these inherent problems with employees, Simpson spent considerable effort in developing rules which were approved by the councils (annual meetings of the inland governor with the department's chief factors and some of its chief traders). For example, the 22 July, 1823 council of the Northern Department established that chief factors and chief traders were to travel with their freight canoes and boats in order to ensure the safety of the freight (transcribed by Fleming, 1940, p.57). Third, there was environmental uncertainty from random events. The arrival times at various posts could not be predicted with so many weather and environmental factors interfering with schedules. Moreover, the exact distances and best routes between posts were uncertain.

Trade conditions were complicated because of the lack of a monetary system. A large number of furs were traded for an even larger number of European trade

goods. Predictability was further complicated by distance and the large number of different aboriginal groups with different languages and customs. Moreover, the behaviours of traders were not observable, and thus it could not be ensured that they acted in the best interests of the HBC. Trade uncertainty increased with the move inland because there were additional aboriginal groups, languages, and customs. North American aborigines had developed a system of middlemen for transporting furs to bayside posts. The distant aborigines who did the trapping would trade with others who would take the furs to the bayside posts or trade with others again who traded with those who made the trip (Innis, 1956, pp.119-22). However, this system of middlemen started to unravel when the HBC moved inland and dealt directly.

There was no infrastructure inland, and in contrast to posts located on the Bay, all food and clothing requirements could not be sent from London because of high transportation costs. To pursue inland trade, living off the land was necessary. Food and clothing had to be supplied locally at hundreds of posts either by HBC employees or through trade. Hunting, fishing, and farming were pursued by HBC employees. There was transformation uncertainty as employee behaviour could not be observed. Weather was always crucial for these primary activities, but it varied significantly because of seasonal conditions and according to geographical location. Hunting and fishing were precarious because of unpredictable migration patterns. In addition, the short growing season and infertile soil especially at some northern posts yielded poor and uncertain crops.

Similarly, there were differences between the pre-1774 and post-1774 operations of the HBC in regard to asset specificity. To effectively travel inland, the HBC developed specialised and dedicated (freight) canoes and (York) boats that were simple and light, yet designed to travel great distances and to avoid damage in shallow rocky rivers. There was site specificity with inland posts strategically located near aboriginal tribes. More important was the development of human asset specificity with traders, especially after the move inland. Trader-asset specificity was systematically pursued based on selective recruitment of European youth and the talented offspring of HBC traders and aboriginal women. Most were hired as apprentices during which they underwent a long period of socialisation and learning (Roy & Spraakman, 1996, pp.63-4).

Development of management accounting techniques

Five management accounting techniques were found to be dominant in the 1820s – budgets (outfits and indents), standards, inventory records, operating statements (“balance sheet”), and operating data. This section traces their development from 1670 or later. Each technique is described in its management context using TCE, particularly in how it is used to control transaction costs with increasing asset specificity and uncertainty. Management accounting is defined as the provision to management of statistical information for the purposes of planning, decision-

making, and control (Edwards & Newell, 1991, pp.412-15). With this definition, the dominant attribute is that management accounting is information of a financial or operating nature that can be used for co-ordination. Temporally, this information can be ex ante or ex post and thereby can be used for directing and monitoring as described by TCE. Ex ante information such as budgets, plans, and standards can be used for directing. On the other hand, ex post information, for example, internal financial/operating statements, can be used for monitoring.

To assist in finding the sources of the HBC's management accounting techniques, it is useful to elucidate the accounting education for the mercantile trade that existed in London, and, more generally, in Great Britain. According to Sheldahl (1989, p.68) the first English accounting book was published in 1543, which was followed by 10 others in the next 100 years. For the century after 1641, another 30 books were published (Yamey *et al.*, 1963, p.170). Yamey *et al.* pointed out that the Dutch influence reached a high point in the 1630s, and that the subsequent books of the last quarter of the seventeenth century and the whole of the eighteenth century were "essentially home-grown, with a preponderance of the best works being published in Scotland, or in England by Scottish authors". The earlier books of this period emphasised recording transactions with debits and credits, whereas books published in the latter part of the eighteenth century also emphasised the production of useful information for decision making with subsidiary ledgers and additional columns (Yamey *et al.*, 1963, pp.155-79; Mephram, 1988, pp.164-75, 305-8).

As many of these authors were also teachers, their books played a major role in spreading the knowledge of sound mercantile accounting methods (Mephram, 1994, p.282). During the eighteenth century many of these authors started private schools that were typically termed academies for training young men for the mercantile trade, specifically for positions in the counting houses. These academies existed because the grammar schools and universities were unable or unwilling to provide the specific training required by trading companies (Hans, 1951, p.209).

Budgets

Although not known by that term, budgets existed at the HBC in the 1820s as outfits and indents. The outfit was the listing and the actual shipment of trade goods and supplies dispatched from London to North America for the annual trading expedition with the aborigines. The committee determined the composition of the annual outfit with available information. This included the recent indents (or preliminary budgets) prepared by the traders in charge of posts, districts, and departments that suggested what should be included in the next outfit (HBCA, reel 374). In addition, indents were mechanisms for co-ordinating the use of trade goods and supplies. This practice was crucial with the long time lag between shipping trade goods and the eventual sale of furs in London. The indent, in effect,

became a series of indents for planning future movements of trade goods and supplies, and related trading activities.

An example for amplification was the indent prepared in 1821, prior to the merger, by George Simpson who served as inland governor from 1821 to 1860 (transcribed by Rich, 1938, pp.141-69). It also revealed Simpson's thoughts on management. This indent for the Athabasca Department specified the trade goods, supplies for maintaining employees, and the complement of employees. It contained nearly 500 different items that were tentatively requested in various quantities and allocated to the five districts and further allocated within three of those districts to a total of 12 posts. Trade goods were listed in alphabetical order from "augers" to "worm gun" and "worsted assorted colours". (Actually, the last entry was "plough shear" which seems to have been overlooked and then entered at the end.) Simpson's first indent also contained 16 food items, including butter and tea, although the managers and employees were expected to obtain the bulk of their food supplies through their own efforts or through trade. Ten different supply items for canoes were specified, as were seven leather and fur items for making clothes. Employee requirements were specified according to three levels, clerks, interpreters, and men.

From 1670, the outfit was an essential component of the HBC's trading process – the loading of ships with trade goods and supplies for the "adventure". Similarly, indents existed from the beginning. They began with the committee's use of the insights and suggestions of knowledgeable employees in determining the content of outfits. The first was based on the experience of the French-Canadian explorers Groseilliers and Radisson with the aborigines in Canada (Rich, 1960a, p.33). For the 1672 outfit, the committee also used the knowledge and experience of Gillam, the captain on an earlier voyage and also Bayly, an early bayside trader (Rich, 1960a, p.70). By 1683, the committee was able to reconcile shipments, with inventories and trade, and asked why certain quantities were being requested (Rich, 1960a, p.156). For example, a 1684 letter to bayside trader Sergeant from the committee demonstrates increased sophistication with respect to trade and implies that indents were being prepared by bayside traders (transcribed by Rich, 1948, p.122). The letter stated "The Invoice of Goods you say is wanting in the Countrey we Judge is very Extravagant for your Advicer has done it without consideration as in some things we will touch upon to make you sensible of the rest". Later, inventory levels are addressed in the letter. It gives an example of short guns indicating that, with existing inventory, there will be enough guns for more than two and a half years of sales at the quantity sold in a year if the full amount of the request is shipped, and that two years of inventory is the maximum that will be tolerated. In 1703 the committee started asking for two-year indents as assurance against the supply ship not arriving. There was resistance, as attested that year in the letter from John Fullartine at Albany to the committee:

And as for indenting for two years it is impossible for the trade is so uncertain, considering the inconstant humor of the natives and the numbers that come down some years by what there does others (transcribed by Davies, 1965, p.7).

The bayside indents were well received by the committee in the years prior to the move inland. The entire process was uncontroversial as judged by the annual letters from the committee to the traders at the bayside posts (HBCA, reel 38). The most common comment was that the indent was complied with. Only after the move inland did problems arise with the indents. The first problem recognised by the committee was the large increase in inventory necessitated by the added stages in the transportation cycle. For example, the committee complained in 1780 that the:

amazing increase of the indents makes it almost impossible to find room for the contents aboard our ship. We therefore require that this and every future year the indent be examined settled and signed in council [the senior managers at the post] whilst the captain is with you (HBCA, reel 38).

In the following year (1781) as a means of grappling with the extensive inventory, the committee asked that the indents include details about quantities or qualities if there were changes to indented items. Then in 1782 the committee attempted to refine the indenting process by asking that records of the consumption of provisions be maintained in order to provide a baseline for ordering. Indenting instructions in 1785 specified that columns were to be used to indicate the "quantity of each article" to go to each trading location and that the total should equal the entire amount sent to the factory (or main post) (HBCA, reel 38). Apparently, indents had often been prepared with a single total amount without showing the expected distribution by trading location. Alphabetical arrangement of trade goods and supplies was also demanded by the committee during this time to ease the preparation and review of indents.

The York post indent was particularly important as York was the port for most of the inland trade. Consequently, it was an aggregation of numerous other post and sub-post indents. Its format was changed in 1804; the single heading of requested items became: remains 1803, indent 1804, and remarks (HBCA, reel 1M823). All items continued to be alphabetically ordered. This format, however, was not used for supplies until 1806. The 1810 retrenchment led to the superintendents being placed in charge of examining and regulating the indents.

Standards of trade

The committee reduced the agency problem by directing the actual exchange of trade goods for furs with a system of exchange rates. In the 1820s each post was required to have a "standard of trade" that related the numerous trade goods to the various furs in such a way as to cover all costs (i.e. invoice price, transportation, employees, and supplies) and still yield a profit (HBCA, reels 195 and 508). This standard of trade was expressed with a prime beaver pelt (designated "made

beaver”), and it provided explicit instructions on the amount of furs to be obtained from an outfit.

A standard of trade existed from the HBC’s beginning (Rich, 1960a, p.75). Ray and Freeman (1978, p.54) concluded that the standard of trade was actually invented by the HBC. As the aborigines in periods prior to European settlement had no conception of the use of money, the HBC had to establish an institutional framework that permitted barter trade on an accountable basis. The committee developed its first standard of trade with advice from the French-Canadian explorers Groseilliers and Radisson (Rich, 1960a, pp.75-6), which implies that it did not originate with the HBC. A rigid standard was established to avoid competition among HBC posts and the extravagant expenditure of trade goods to receive furs. Moreover, the standard of trade gave the aborigines a certainty as to the rewards from trade. Since the HBC’s purpose was to develop a pattern of aboriginal life in which fur hunting and an annual trade journey to the Hudson Bay were essential parts, certainty of trade conditions was necessary.

The use of the standard of trade was complex. Although the official standard was rigid, the committee expected traders to be flexible. Variations were expected as long as in the end the specified furs were exchanged for the specified trade goods. This was expressed in a 1688 letter from the committee to bayside trader Geyer at Port Nelson:

We would have you keepe, to the Standard, that Mr. Radisson agreed to, but with all to give the [aborigines] all manner of Content and Satisfaction and in Some goods Under Sell the French that they may be encouraged to Come to our Factory’s and to bring their Nations Downe (transcribed by Rich, 1957, pp.14-5).

A detailed examination of the committee’s annual letters to posts after the move inland and up until 1810 revealed that few changes were made to the standard of trade. One example occurred in 1794 in the committee’s letter to York where the standard was changed for iron barbs, awl blades, canisters, sashes, cutlasses, and cotton shirts (HBCA, reel 38). Similarly, in its 1795 letter to the Churchill post, the committee noted that:

We have revisited the old standard of trading good in some articles made an alternation which you will herewith receive and confine yourselves to it. The times demanded it and it became highly necessary to make this alteration (HBCA, reel 39).

One of the most extensive changes came in 1798 when the committee in its annual letter requested all posts to revise the standards for numerous trade goods (HBCA, reel 39). The most for any post was 22 articles for York. Then in 1810 a most significant change came in conjunction with the retrenchment system. The old, official committee-imposed standard of trade was abolished (HBCA, reel 6). It had been strictly adhered to for 140 years despite many changes to the relative prices

of goods and furs over that time (Rich, 1939, p.xxi). Instead the traders responsible for posts were allowed to trade with the aborigines with the standard judged most advisable and suitable to local circumstances. They were provided with the invoiced costs to port (i.e. York) for all articles consigned (HBCA, reel 39). From the landed costs they were to add an "advance" or markup for all expenses, risk, and a reasonable profit to the Company (HBCA, reel 6). The committee provided a list of recent fur prices to serve "to regulate you in some measure in trading with the aborigines at the same time ... you must add the officers and men's wages and all other expenses" (HBCA, reel 39). In effect, the standard of trade from 1810 that pertained into the 1820s and for decades thereafter was just as demanding as the rigid committee imposed standard of trade that had existed for nearly 140 years, but it became flexible or adjustable for costs which differed in line with distances from ports. Thus, the HBC had a large number of different standards of trade all showing trade goods and various furs in terms of made beaver.

During the study period, the accepted practice was for barter transactions to be recorded at market values in monetary terms (Stone, 1985, p.100). Both sides of the barter transaction were recorded in physical terms and, in the journal, the two sides of the transaction were translated into monetary terms (Stone, 1985, pp.95-6). The HBC deviated from this practice; its standard of trade reflected each side of the transaction in terms of made beaver until 1810. In other words, made beaver was used to record the furs received and the trade goods supplied. After that date, the numerous standards of trade were employed, with the recording of furs in physical terms and the translation into monetary terms only occurring at the end of the outfit, and then only using the past market prices provided by the committee.

Inventory records

Inventories were crucial for a trading organisation facing slow transportation and communications. Because the HBC was responsible for feeding and clothing employees, supplies were equally important. During the 1820s this led to a detailed, periodic system for tracking inventories. The records were kept at York and Montreal in both monetary and physical terms, showing the location of each item, either at a port or at an inland depot (HBCA, reel 1M839). Physical inventories were recorded annually (1 June), and served as the starting point for the indents. More specifically, from the inventory records the clerks first prepared a "scheme distribution"; this was a planned distribution of trade goods and supplies from existing inventories for the current year and also the following year to meet the expected trade by each post. When the outfit for the current year arrived in mid-summer, a "scheme indent" was developed. This specified what the traders thought the post outfits needed for the next two years. Subsequently, the master indent was prepared; it was the basis for the importation of trade goods and supplies for the subsequent two years. The store balance book was particularly important; it reconciled the stock held at the depots and posts with the distribution for each outfit

(HBCA, reel 1M689). This was a very detailed document showing the location of everything. Thus, detailed book balances were generated for comparison to actual trade goods and supplies. In addition, it reconciled opening inventory, receipt of new inventory, distribution of inventory, and ending inventory.

From the earliest years, the HBC had been concerned with tracking inventories, which was a standard mercantile practice. Committee minutes for 1671 to 1674 indicate that records were maintained of trade goods, supplies, and furs loaded on ships, unloaded, and transferred (transcribed by Rich, 1942, pp.3-5). Nixon, who became a bayside trader in 1679, was urged by the committee to handle trade goods systematically, to return defective or unattractive goods, and to ensure that his warehouse keeper sent home annual lists of the stock on hand at the end of each season (Rich, 1960a, p.109). Another example was the committee's 1683 instructions to bayside trader Sergeant asking that he send home, on an annual basis, a list of all employees ("Serveants in the Bay and their severall Employments") and a list of all trade goods and supplies ("an exact Account ... of what remaines of all sorts of provissions and Stores as well as of Goods & Merchandizes in every of our Factories") in order to better manage operations ("that we may the better know what to sende") (transcribed by Rich, 1948, p.79). By 1692 there was growing evidence of meticulous record keeping. For example, in a letter to trader Geyer located at York, the committee asked the following: "There is a Box of Indian paint mentioned in Capt. Edgcombes Journall, wch. we never Received, We desire to be informed of it" (transcribed by Rich, 1957, p.138).

An examination of the annual letters between 1770 and 1809 from the committee to the various posts showed that there was little concern with the recording of inventories (HBCA, reels 38 and 39). Apparently, the committee was generally satisfied given their infrequent reminders about inventory accuracy. The committee also requested an additional count when management was changed at a post. For example, in 1775 the committee said in its letter to the York post that the incoming trader should "take the earliest opportunity and to compare the same with the last account book and the subsequent trade which may have occurred" (HBCA, reel 38).

However, it was not until the 1810 retrenchment that there were significant changes to the recording of inventories. An additional list was required of the quantity of goods of every denomination at all locations, in physical and monetary terms. The records were to be accurate and not estimates. Counts were to be done at the end of each season, and valued at cost plus an advance to cover the expenses of storage and the labour incurred in transporting the goods inland.

Operating statements

The committee required the North American operations of the 1820s to supply accounting information on the district costs for gathering furs (HBCA, reel 508). These were referred to as the "country accounts" which culminated in the "balance

sheet" for a district outfit. The debit side contained the following for the 1823 outfit for the Severn District balance sheet (HBCA, reel 1M590): beginning inventory on 1 June, received from York Factory, servant wages, and the balancing profit. The credit side contained supplies provided to York Factory, servant debts, ending inventory, and returns of furs. The same format was used with departments and posts, but the latter were not prepared regularly. Although called a balance sheet, it was actually a ledger account and part of the debit and credit bookkeeping system. Specifically, it was used to close the district books at the end of the outfit year. It was, in effect, a means of elucidating a district's efficiency, and in being a culmination of the year's activities for the district and its posts, it represented an operating statement. This was possible with the use of recent fur prices provided by the committee for estimating district revenues (HBCA, reel 508). Unprofitable districts were examined for causes; subsequently, the persons in charge were replaced or other changes were made such as amalgamation of posts or districts to achieve acceptable profitability.

Ray and Freeman (1978) documented the format used for post accounting prior to 1763, which is shown in Appendix 1. It was in effect from at least 1692 according to the Albany account book for that year. There were two sections. The first was the journal, which tracked in detail the trade goods and supplies received and traded or expensed, as well as the furs received for trade goods. It also presented the standard of trade used in conducting the trade. The second section was the ledger, consisting of all accounts and their debit and credit entries. These accounts were denominated in made beaver except for sales to employees. That is, all furs and trading goods were converted to made beaver with the standard of trade. At the end of the outfit year, a balance sheet was prepared, which was similar in format to that which existed at the HBC in the 1820s.

This balance sheet was used to indicate the profitability of posts which was not a common practice. Yamey (1977, pp.25-7) believed that the advent of the joint-stock company in the nineteenth century was a key motivation for the preparation of annual reports on profitability. As one of the earliest joint-stock companies, and by being directed by a committee of shareholders who desired profits for dividend paying purposes, the HBC was motivated to report profitability annually and by post almost from the beginning.

Ledger accounts dominated the accounting records described in Appendix 1. There was some evidence that accounting techniques of the time similarly emphasised ledger accounts (Mephram, 1988, pp.108, 112). Ledger-account reconciliation of trade goods, supplies, and furs as individual accounts and with one another through debit and credit entries was important for the HBC.

Based on the committee's comments in their annual letters to the posts, the account book worked well up to the move inland. The complaints of the committee were few. For example, the 1771 committee letter to the Prince of Wales post

points out that the “total of the men’s debts collected was omitted to be cast up as was also the total of the goods supplied them” (HBCA, reel 38). These were important totals for the committee as they were equal to one another, and thus provided a ready check. The move inland created complication in the attempt to account for the new sub-posts (HBCA, reel 39).

The 1810 retrenchment system placed more emphasis on the accounting records (HBCA, reel 39). First, these records were to be denominated in pounds sterling, rather than the more than a century old practice of made beaver. Second, an officer was appointed at each factory with the title of “accountant”. Responsibilities included: preparing accounts, the accuracy of those accounts, correctly recording inventory of goods on hand at the end of the year at the factory and at each post within the limits of the factory, and correctly recording debts due by aborigines and employees. Third, the annual account for each factory was to have the format that was discussed as existing in the 1820s. Calculation of profit and loss continued to be a prime objective and outcome of the accounting system. Edwards (1996, p.34) described the preoccupation with the balance sheet as being due to “the fact that it was more useful in answering traditional stewardship questions ... such as the manager’s honesty and ability to account for resources entrusted to him”. Yamey (1977, p.19) argued that this type of balance sheet had been an established merchant practice.

The retrenchment included the committee’s attempt to standardise the collection and presentation of accounting information. The HBC’s London accountant, Edward Roberts, visited the bayside posts in 1810 to assist the newly appointed accountants (HBCA, reel 39). The earliest accounting instructions prepared by Edward Roberts were dated 1819 (HBCA, reel 508). They included the use of standardised forms (e.g. form number five was to be used for recording the stock on hand and form number seven was to be used for tracking goods supplied to other districts). The operationalisation of these changes took years according to comments recorded by the committee. In 1818 the committee reacted with, “We consider the sending of annual reports a matter of such importance to the concern that any officer neglecting to do so will fall under our displeasure” (HBCA, reel 39). A tracking of the changes at the Severn Post suggests that the account books took numerous years to fully adjust to the changes announced in 1810 (HBCA, reels 1M589 and 1M590). Made beaver was still used, to a limited extent, in 1819-1820 (HBCA, reel 1M590). The committee even sent account books to the posts with instructions for their maintenance:

We now sent printed and ruled books for the purpose of keeping the accounts in a district on a uniform plan. Full instructions and a performa account to show the manner in which the entries are to be made are sent in a separate memorandum (HBCA, reel 39).

Finally, in 1820 the committee sent Simpson to, among other reasons, improve the accounting and to obtain additional information on operations (HBCA, reel 39).

Another aspect of the move inland was the increased number of accounting books in use, rather than merely increasing the amount of detail within the existing books. This had started soon after 1774 when separate account books were kept for each new post. It expanded after 1810 when a further policy change resulted in the adoption of specialised books for tracking employees and inventory. The store balance book and invoice book of shipments were examples of new books. This practice of supplementary books was commonly recommended by textbooks during the latter part of the eighteenth century (Mephram, 1988, p.154).

The HBC had always closed its books at the end of each outfit. Trade goods and supplies were sent out annually and the furs received from those trade goods were sold one or two years later. Thus, the outfit books took two or more years before they were closed, and at any given time two or three sets of books might be open. Thus, the HBC frequently balanced its ledgers compared to the practice during the 1670 to 1820 period which emphasised irregular balancing because of "the apparently close connection between the owner and his enterprises" (Yamey *et al.*, 1963, pp.186-93). There were probably two related reasons for the HBC's practice of balancing its ledgers after each outfit. First, as one of the earliest joint-stock companies, the HBC had shareholders who were interested in profitability as the key source of dividends. Second, each outfit in mercantile fashion had a distinct start and end, and thus reporting on an outfit would indicate to the officers and shareholders the success of those responsible.

Operational data

These data were important in the 1820s for managing operations in physical terms. The use of operational information was reinforced by inland Governor Simpson. Rich (1960b, p.422) described Simpson as having "to see the problem on the ground and to discuss it with those engaged on it". Simpson constantly experimented with routes, the design of canoes and boats, and load weights to reduce the cost per pound shipped. Innis (1956, p.292) writes that careful planning increased the loads of York boats on the North Saskatchewan from 50 pieces in 1822, to 60 in 1825, and to 80 in 1833. In correspondence to the committee, Simpson discussed the advantage of visiting a post (HBCA, reel 195). He said "It furnished me with a great deal of valuable information which I trust will be turned to good account". Moreover, he presented some of the problems detected to the council in order to get their support in bringing about changes that would reduce expenses. He realised that employees were not always aware of shortcomings and that outsider observations were insightful. He once stated "it frequently happens that a stranger perceives many things which from custom escape the observation of long residents" (HBCA, reel 195).

The primary uses of operational data had been the planning for, and the monitoring of, the consumption of provisions and the exchange of furs for trade goods. These uses did not include efficiency and effectiveness measures, which became prevalent after the move inland. Prior to Simpson, this information was used but not as systematically as inventory and accounting records. Simpson made more use of operational data that was often documented as rules for co-ordinating activities among different parts of the organisation and in setting standards for travel and transportation activities in physical terms.

Discussion of transaction cost economics predictions

This section examines the development of HBC's management accounting techniques through the perspective of TCE. TCE is concerned with the replacement of market purchases with in-house production, and vice versa. This occurs in the instance, for example, if in-house production of a good or service is cheaper than its market purchase. Choosing the least expensive option (i.e. from make or buy alternatives) is called economising. To provide a comprehensive perspective for economising, TCE conceptualises intra-organisational production as a series of activities linked by transactions (Williamson, 1975, p.8). An activity is the partial production of a good or service. A transaction occurs when one stage of activities ends and another begins (Williamson, 1985, p.1).

TCE rests on two assumptions: bounded rationality and opportunism (Williamson, 1985, pp.44-61). Bounded or the semi-strong form of rationality is assumed, that is, economic actors are "intendedly rational, but only limitedly so" (Simon, 1961, p.xxiv). In accepting bounded rationality and the limits to the human ability to process information, comprehensive contracting is excluded. As contracting is incomplete, intra-activity interventions are possible and desirable. In this regard, TCE is primarily concerned with designing internal mechanisms that mitigate bounded rationality. Opportunism is self-interest seeking with guile (Williamson, 1985, p.47). This assumption refers to the incomplete or distorted disclosure of information by employees, especially calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse. Thus, employee opportunism is responsible for real or contrived conditions of information asymmetry. Nevertheless, it can be constrained by internal techniques that prevent inappropriate behaviour and report on how well performance meets expectations.

TCE maintains there are rational reasons for the choice of in-house production over market. Williamson (1985, pp.52-61) described these reasons as dimensions or attributes of the production situation, namely: asset specificity, frequency, and uncertainty. Asset specificity occurs when an asset has been customised. The customisation reduces production costs, but creates a unique, complicated asset that cannot be easily understood and controlled by the market. This further restricts the customised asset to in-house production, where

opportunism and maladaptation can be checked by internal organisation. Environmental uncertainty is the second TCE dimension. The existence of environmental uncertainty complicates writing and enforcing contracts since the environment shifts in unforeseen ways. The fundamental problem under the market mode is that even the best contracts are incomplete. In-house production is better able to cope because adaptation can be made as needed without revising formal agreements. The last dimension is what Williamson calls frequency, but it could be called size or large-scale production. Only when the potential demand is large is it worthwhile to invest in specialised assets and internal organisation. Thus, in-house production will be associated with frequency or large-scale production.

Roy and Spraakman (1996) and Spraakman and Davidson (1998) tested TCE using six hypotheses that were applied to the HBC archival evidence for the 1820 to 1860 and 1860 to 1914 periods respectively. In the 1820 to 1860 period, the HBC was subject to extremely high levels of asset specificity and uncertainty which declined subsequently from 1860 to 1914. Conversely, the HBC had experienced increased asset specificity and uncertainty from 1670 to 1820. Together the three periods provided the independent variables, asset specificity and uncertainty, with oscillations and opportunities for testing TCE theory and the six hypothesis.

H₁: Asset specificity and uncertainty were positively associated with the use of hierarchy for managing transactions.

Roy and Spraakman (1996) did not reject this first hypothesis with HBC archival evidence for 1820 to 1860 when asset specificity and uncertainty were high. Spraakman and Davidson (1998) could not reject the hypothesis for the 1860 to 1914 period where asset specificity and uncertainty declined. For example, Roy and Spraakman (1996, p.75) concluded: "(t)he findings supported the TCE-based hypotheses that the prevailing uncertainty and asset specificity would encourage the HBC to control the agency problem with in-house production using monitoring and directing mechanisms". For 1670 to 1820, the current study's period, the first hypothesis predicts that as the HBC increased its asset specificity and uncertainty with the move inland that governance would be conducted with hierarchy rather than market. This hypothesis, could not be rejected on the available evidence. All activities to do with the move inland were conducted by employees. Hierarchy was also maintained for operations that were in existence prior to the inland move.

H₂: Asset specificity and uncertainty were positively associated with the use of output incentives to supplement hierarchy.

Hennart's (1993) model for the selection of governance mechanisms was used by Spraakman and Davidson (1998) to become more specific about the impact of asset specificity and uncertainty. With the extensive use of hierarchy, Hennart predicted the use of output incentives because of diminishing returns to the use of hierarchy. The evidence reported by Spraakman and Davidson (1998) could not reject this

hypotheses. As extreme asset specificity and uncertainty declined during the 1860 to 1914 period so too did the use of output incentives such as profit sharing.

The evidence for 1670 to 1820 could not permit the rejection of this hypothesis. As asset specificity and uncertainty reached extreme levels with the move inland, numerous incentives were devised but none was successful or perfected until the 1821 deed poll which allocated 40 per cent of the profits to the two most senior levels of management (i.e. chief factors and chief traders) instead of salaries. This incentive worked successfully for about 50 years.

H₃: Asset specificity and uncertainty were negatively associated with the use of ex post management accounting information.

The third hypothesis was developed from Hart (1991) who argued that improved communications, from decreased asset specificity and uncertainty, would reduce monitoring costs and lead to increased consumption of monitoring or ex post management accounting. Spraakman and Davidson (1998) found some support for the hypothesis during 1860 to 1914. There was more frequent and more detailed ex post financial information prepared as asset specificity and uncertainty declined. However, the hypothesis was not supported in the case of the use of ex post operational information. Contrary to the third hypothesis, the present study of the HBC archives for 1670 to 1820 has found that use of ex post management accounting information (i.e. inventory, accounting and operating data) increased with the increase in asset specificity and uncertainty, thus leading to the rejection of the third hypothesis.

H₄: Asset specificity and uncertainty were positively associated with the use of ex post management accounting information.

With difficulties in communication that accompany increases in asset specificity and uncertainty, Casson (1991, 1995) suggested that directing would be more difficult and thus there would be an increased use of monitoring or ex post management accounting information. This is stated in the fourth hypothesis which is opposite to the third hypothesis. Hart's argument for the third hypotheses assumed that deterioration in communications would make the use of ex post management accounting information less effective. Casson's argument assumed that deterioration in communications would cause a shift away from directing while increasing the use of ex post management accounting information. Hart considered the impact on a single variable while Casson instead considered the substitution effect.

Conversely, as the third and fourth hypothesis are opposites, the fourth hypothesis could not be rejected for the 1670 to 1820 period. The HBC increased its use of ex post management accounting information with a lag. The move inland occurred in 1774, but the production and use of inventory, accounting, and operating data did not change significantly until the advent of the retrenchment

system of 1810. The changes were largely motivated by declining profits. Although a 36 year lag was long, it was consistent with prediction as outlined by Roberts and Greenwood (1997) who concluded that TCE is not a hyper-rational theory. More specifically, the existence of bounded rationality means management accounting techniques will only be changed when absolutely necessary and, consequently, with a lag.

H₅: Asset specificity and uncertainty were negatively associated with the use of personal directing.

With improvements in communication that accompany decreases in asset specificity and uncertainty, Casson (1991, 1995) suggested that manipulation (personal direction) by managers would be more effective and thereby the trade-off would be towards greater use of manipulation or personal directing and less use of monitoring or ex post management accounting information. This is stated in the fifth hypothesis, which could not be rejected by Sprakman and Davidson (1998) based on the evidence for the 1860 to 1914 period.

Prior to the move inland in 1774, the operations of the HBC, consisting of a few posts at the mouths of rivers flowing into the Hudson Bay, were explicitly and personally directed by the post master or governor at those establishments. With the move inland, personal directing as a portion of directing declined in favour of indents and standards of trade. Thus, the evidence for 1670 to 1820 did not permit the rejection of the fifth hypothesis.

H₆: Asset specificity and uncertainty were positively associated with the use of operational management accounting information and negatively associated with financial management accounting information.

Johnson and Kaplan (1987) suggested that reductions in asset specificity (complexity) and uncertainty reduce the use of management accounting operational information in favour of financial information. The HBC archival evidence for the 1860 to 1914 period did not lead to the rejection of this hypothesis. Similarly, it could not be rejected based on the evidence available for the 1670 to 1820 period. As expected, increases in asset specificity and uncertainty were accompanied by a greater use of operational management accounting information, specifically with regard to indents, standards, inventory records, and operating data. The evolution of each was to greater operational detail. Financial management accounting continuing to be produced, but with relatively less importance.

Conclusion

When the inland move occurred the HBC had a "management accounting" system dominated by the account book that used made beaver as the currency, budgeting comprising outfits and simple indents, a single standard of trade for all (bayside) posts, simple inventory records, and a unique made beaver balance sheet (operating

statement). The essence of this system was the explicit reconciliation of trading goods and supplies with furs, which appeared to work satisfactorily in ensuring that the bayside traders were responsible.

However, the focus on reconciliation did not work well with increased complexity that the HBC had to contend with after the inland move. Rather than merely reconciling, indents were used for planning (i.e. to have trade goods and supplies where and when needed). They were used with the inventory records so that the existence of inventories could be carefully considered when preparing the multitude of indents. A standard of trade was developed for each post to ensure each was profitable. Operational data became important for managing affairs. The balance sheets reported on profits by district and, by being stated in pounds sterling rather than in made beaver, they provided more accurate information on profitability. In summary, the move inland was facilitated by the expansion in the use of management accounting information for both directing and monitoring.

The evidence for the 1670 to 1820 period only permitted the rejection of one of the six hypotheses. The rejected hypothesis was the third which expected a negative association between the independent variables, asset specificity and uncertainty, and the dependent variable, the use of ex post management accounting information. The other hypotheses could not be rejected. There was found to be a positive relationship between asset specificity and hierarchy (H_1), the use of output incentives under extreme conditions for the independent variables (H_2), the use of ex post management accounting information (H_4), and the use of operational information (H_6); there was a negative relationship between asset specificity and uncertainty and the use of personal directing (H_5) and the use of financial information (H_6). These findings suggest some validity for the TCE propositions. They also provide preliminary support for a TCE theory of management accounting. The HBC archives provided an opportunity to test TCE, but greater understanding is needed on how the dependent and independent variables interact. A more detailed examination of the HBC archives could assist, but other archives and more contemporary case studies would need to be examined before a TCE theory of management accounting can be developed.

The questions of how the HBC came in the 1820s to employ its management accounting techniques can now be answered. Outfits were an established practice that the HBC merely adopted in 1670. Indents and inventory records were also available when the HBC commenced its operations; they were adapted for the needs of the HBC which changed over the 1670 to 1820 period. The use of made beaver standards was an extensive adaptation of a practice that existed prior to the commencement of the HBC. The made beaver accounting records, that were used until 1810, were a unique response to circumstances. Operating data were used infrequently during the entire 1670 to 1820 period, however they gained importance in the 1820s for resolving operating inefficiencies. This use of

operating data was an adaptation of existing techniques to the needs of the HBC for greater efficiency.

In conclusion, the management accounting techniques of the 1820s had their refinement in the HBC's retrenchment system of 1810, but it was not until the 1820s that Governor Simpson made them work as part of what appears to have been an effective system for managing a dispersed trans-continental company. The committee seemed to know what they wanted in 1810 but only Simpson was able to deliver the desired "system and certainty". Burley (1993, pp.62-3) wrote that the retrenching system of 1810 was the first real attempt to rationalise the business. She added that it was the opportunity not the desire to do so that was new in 1821 and that it was largely a matter of leadership: "the energetic and ruthless George Simpson provided the necessary hardheaded leadership that had been absent in 1810". Simpson was probably the most important component of the management accounting techniques during the 1820 to 1860 period. With his extraordinary energy and memory for details, he made the management accounting techniques work more effectively.

Appendix 1: Account Book Outline

I. Trade Good Accounts

A. Journal section (with commonly used subtitles)

1. "Trading Goods Remaining as per Balance of the Last Years Acct. are as Follows Viz." (beginning inventory)
2. "Trading Goods Received as per Invoice from on ... [ship name and captain's name],"
 - a. less goods invoiced but not received.
 - b. less goods damaged.
 - c. plus an goods shipped but not invoiced.
 - d. plus any goods made at the post.
3. "General Charge." (Inventory of goods available for trade, i.e. beginning inventory (1 above) plus goods received or made (2 above)
4. "Standard of Trade" (Official Rates of exchange).
5. "Men's Debts" (Goods given or used at the post).
6. "Expenses" (Goods given or used at the post).
7. "Being ordered to make up ye Acct to ...[end of year] by an Exact acct taken of ye trading room itt appears their hath been traded ... the following goods, Viz." (A list of all of the goods traded to the [aborigines]).

Appendix 1 - Account Book Outline (cont'd)

8. "Furs and Other Commodity's Receiv'd in trade for the aforesaid goods ..." (Itemised fur receipts).
9. "... by an over hawl taken of ye warehouse I find there is trading goods remaining as follows." (closing inventory of goods).

B. The Ledger

1. Alphabetical index to the ledger.
2. Reconciliation of Accounts to the General Charge.
 - a. Beaver Account (Fur Receipts)
 - b. Men's Debts Account (sales to men)
 - c. Expense Account (Expenditures of trade goods)
 - d. Profit and Loss Account (overplus and expenses)
 - e. Balance Remaining Account (closing inventory)
3. Reconciliation of Goods Accounts (guns, kettles, etc.)
4. Reconciliation of Beaver, Men's Debts, Expenses, Balance Remaining and Profit and Loss Accounts to the respective account totals
 - a. Beaver Account
 - b. Men's Debts Account
 - c. Expense Account
 - d. Profit and Loss Account
 - e. Balance Remaining Account

II. Stores Accounts (commodities and foods for factory use)

- A. "State of Provisions" (European foods)
- B. "Armourers Store" (Gunsmith)
- C. "Carpenter's Stores"
- D. "Cooper's Store"
- E. "Factory Store" (Silverware, dishes, etc.)
- F. "Gunner's Store" (defensive arms for post)
- G. "Harpooner's Store" (if whaling was an activity)
- H. "Bricklayer's Store"
- I. "Navel Stores"
- J. "Smith's Store"

Source: Ray and Freeman (1978, pp. 6-7).

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