

## The changing geography of the terminal elevator: a preliminary analysis

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**Abstract:** Prairie wheat cultivation has had a significant landscape impact outside the region, reflecting its location within Canada. This is particularly noticeable where terminal elevators have been constructed to ensure the efficient overseas export of grain. The construction of ‘Western’ terminals had its earliest impact upon the Thunder Bay cities of Port Arthur and Fort William. Later, however, Vancouver and Prince Rupert also became characterised by grain exporting. This paper details the rise of grain terminals in these centres, discusses the variable patterns of ownership of the structures, and explains the changes in the ‘balance of terminal power’ over the years.

### Introduction and Background

The contemporary international wheat economy makes up one part of what Immanuel Wallerstein has called the modern world system, which model provides a framework that describes and accounts for the extensive development of capitalist agriculture<sup>1</sup>. Although it is meaningful to study the world as a system, it is also important to look at the constituent parts of the structure. For as Taylor has pointed out, “in order to properly understand the world economy we must know the places that constitute its whole”,<sup>2</sup> and to understand these ‘places’ we must see their development over time and through space — for they are formed not by relative isolation and occasional diffusion, but by a constantly changing relationship with the rest of the world.

The Canadian grain trade contains many ‘places’ that need to be understood, ranging from the farmers’ fields to the country

elevator, to the city of Winnipeg, but one component of the system that deserves a new look is the part that physically connects Canada with the rest of the world - the terminal elevator system.<sup>3</sup>

The moving of the western grain crop “to the terminals” has been described as a “stupendous task” that “has no parallel in any part of the world”.<sup>4</sup> It involves the use of a complex transportation system for a relatively limited portion of the year - the grain moving season. For the balance of the year many of the constituent parts of this system may be virtually idle. The bumper crop of 1928 illustrates the magnitude of this problem quite well: between 1<sup>st</sup> August 1928 and 4<sup>th</sup> January 1929, receipts at The Lakehead were 306,545,807 bushels, at Vancouver were 40,748,845, and at Prince Rupert were 2,154,592. The total movement involved a handling of 286,023 car loads of grain by the railways — and, of course, by the terminal elevators.

During the peak (September to December) movement time, 111,475 loads were moved east from Winnipeg by the CPR, at a 77 working day rate of 1,447 cars per day. (Made up into 24 trains with an average of 60 cars, with the record day [September 30<sup>th</sup>] moving 35 ‘average trains’ - one every 41 minutes).<sup>5</sup> The magnitude of this task becomes more apparent when we remember that Winnipeg lies on the eastern edge of the grain belt, and is some 430 miles from the grain terminals of Lake Superior.

The development over time and over space of ‘the terminals’, on Lake Superior and of those on the West Coast, is the major topic of this paper. In both areas these exporting structures are a long distance from the lands upon which the grain is produced, as well as being far from the European markets upon which Canada depended at this time,<sup>6</sup> and these facts are critical to their character and their development. The years up to the early 1930s will be concentrated upon, as the major facilities were then in place, the major ‘happenings’ had ‘happened’, and the major trends were becoming clear—and the Depression had not arrived to make an analysis even more complex than it already is!

## **The Eastern Route**

### **The Early Days**

As with many facets of the grain trade, Great Lake transportation began with the USA, with a small cargo reaching Buffalo (a major lake-port, and where the first terminal elevator was built in 1841) from Grand Haven on Lake Michigan in 1836, and the first wheat being shipped from a Lake Superior port to the lower lakes in 1870.<sup>7</sup> The first Prairie wheat ‘export’ also found an outlet through the US (by rail, south from Winnipeg, and then east to Duluth from where it was lake-freighted to Ontario to be used as seed).<sup>8</sup> The first grain cargo from Western Canada to take an all-Canadian route was carried from the Head of the Lakes in the fall of 1883, following the completion of the CPR line. It was shipped by James Richardson and Sons — a company to loom large in the Prairie grain trade—in the steam barge ‘Erin’. It was loaded partly in bags, because no facilities existed at that time for bulk grain handling.

Between 1883, when the CPR first connected Thunder Bay with Manitoba by rail, and 1920, Port Arthur and Fort William handled practically all of the grain exported from the West.<sup>9</sup> Winnipeg, however, managed with great effort to maintain its position at the centre of the grain trade, as the principal city of the Canadian West, and “the converging point of a great wheat funnel, the spout of which [led] to the water-front of Lake Superior”.<sup>10</sup> Fort William, at the mouth of the Kaministiquia River dates back to La Verendrye, although its name only harks back to 1800 and the Northwest Company.<sup>11</sup> Port Arthur’s Landing (as the town was first known), lies directly to the east of Fort William. It took its title from the Duke of Connaught whose men landed there on their journey westward to help repress the 1870 “rebellion” in Manitoba (Figure One).

### **The Early Terminals**

The first western terminal elevator was completed in Port Arthur (which had deeper water) in 1884 (standing until 1923 when it was replaced), and the first shipment of wheat by an all-British route from Brandon to Glasgow soon followed; the second terminal

was completed in Fort William during the winter of 1885. Two large warehouses were also completed around this time, one at each location. Significantly, the CPR owned all of these structures, in contrast to country elevators and warehouses that were rapidly being constructed on the Prairies at this time, by other private companies. Although it avoided investing precious capital in the smaller structures,<sup>12</sup> it was to the obvious advantage of the CPR to make sure that the grain could get to market in the cheapest, easiest, and fastest way. This meant the construction of terminals.

Although early records are incomplete, it is likely that the cost of these structures, as well as the demand they generated for new marketing skills, initially precluded the entry of smaller operators into this end of the grain trade. In 1884 the two CPR terminal elevators could store 520,000 bushels; the average country structure held around 34,000 bushels, but most operators originally opted for 'flat warehouses' that were even cheaper to construct, and averaged some 15,000 bushels in size. In addition, this section of the grain handling system was completely located in Manitoba, which was much more accessible in every way to the small businesspersons who were dominant in the early grain trade.<sup>13</sup>

Although Port Arthur and Fort William are side by side, and for decades have functioned as essentially one harbour development, with diversified types of improvement over an extensive area of river channels and lake frontage protected by breakwaters, their origins and early evolution show variations. Port Arthur had deeper water than Fort William, and grain vessels were at first reluctant to go 'up-river' for cargo. In fact the first 'Fort William' grain had to be reloaded into cars and taken to Port Arthur. It was soon demonstrated, however, that a sufficient depth of water existed, and in June of 1885 the S.S. Algoma was loaded and sailed from Fort William with little trouble.

### **Terminal Development**

The capacity of the terminals at the Lakehead quickly increased as the cultivation of wheat was extended across the Prairies. In 1884 it had been 1,870,000 bushels in the four structures (Table One). By 1890, there were still only four buildings, one warehouse and three elevators, but they could hold 3.2 million bushels. The

closure of the remaining warehouse soon after, temporarily lowered overall capacity, but by 1892 the two elevators then licensed held over 4 million bushels. One, the original CPR structure now known as the “King” elevator (after J.G. King who operated it) held 325,000 bushels at Port Arthur. The second, an enormous CPR structure at Fort William held the balance.

With minor fluctuations this was the pattern until after the turn of the century. For a few years T. Marks and Co. operated a small (150,000 bushel) warehouse at Port Arthur, but in 1902 there were only five Lakehead terminal elevators. The “King” structure at Port Arthur was still being operated, and the CPR had four at Fort William. Together over 7 million bushels could be stored. As noted earlier, prior to 1902 “all the terminal elevators at Fort William and Port Arthur had been owned and operated by the Canadian Pacific Railway. In that year, however, the Canadian Northern Railway built a terminal elevator and leased it to a commercial company.<sup>14</sup> A further change took place in 1904, when elevator companies to be operated in conjunction with their own line elevators established at country points erected the first terminal elevators. Later the Canadian Pacific Railway gradually withdrew from the elevator business and leased its properties to commercial companies.”<sup>15</sup>

It is also worth noting that changes were constantly being made to these terminal structures in the form of repairs, renovations, and extensions, in order to accommodate the ever increasing size of the crop and of the lake vessels.<sup>16</sup> In 1902 a maximum length of 440 feet was established for the lake freighters, but in 1906 seven vessels in the 600-foot class took to the water. As a consequence the number of hatches varied, and thus elevator spouts and docks had to be adjusted to coordinate with the ships’ loading facilities, so that turnaround time could be minimised.

### **A New Order**

A major change in direction occurred in 1906 after Canada had “established a market that made it possible to hedge grain”. Frank T. Heffelfinger and Frederick D. Wells, sons-in-law of Frank Peavey, the US elevator king, leased the huge Canadian Northern-

owned grain terminal at Port Arthur, as well as signing a contract to build country elevators along CNor lines. Although not the first Americans to make their mark in the Canadian grain trade, the coming of the Peaveys showed that traders from south of the border had truly arrived in force, and the character of the grain trade would significantly change as a result. In 1906 18.5 million bushels could be stored at the Lakehead - ten times the capacity available two decades earlier. The year was also notable in that on May 26<sup>th</sup> 1906, the Ogilvie-owned elevator at Fort William slipped into the Kaministiquia River!! Not all change was positive.

More companies began to build terminals at the Lakehead as the first decade of the Twentieth Century unfolded. This development in the grain-handling system resulted from a number of causes. First, competition amongst large companies was increasing. Secondly there were more large companies - and particularly American companies - to compete. Third, grain handlings were increasing, and thus more terminals were needed.<sup>17</sup> Fourth, the advantages of vertical integration had become obvious, and the wealthier (who were generally the larger) traders hastened to take advantage of them. As the port and terminal facilities grew in size and number, the complexities of grain shipping increased, and in 1909 the Lake Shippers' Clearance Association was formed to act as a "clearing house" for grain, and to speed up the loading process.<sup>18</sup>

By 1911-12, when definitive and long-term records first appear, there were 15 terminals at the Lakehead, five at Port Arthur, and the balance at Fort William. This was an increase in terminal numbers of 66%, and in terminal capacity of 33% from 1906. At Port Arthur, there was one terminal elevator on the CPR, and four on Canadian Northern trackage. At Fort William, clearly the CPR's port of choice, there were nine terminals on lines owned by this company, and one on a Grand Trunk Pacific line (the Grand Trunk Pacific Elevator Co.). This latter terminal, owned jointly by the Railway and by American elevator operators<sup>19</sup>, later became part of the Peavey group after the latter company bought out the interests of its compatriots.

Ownership patterns were very different from earlier days. Although the CPR still owned three of the structures on its own

lines in Fort William, this railway serviced six private companies. Of these, one was run by Ogilvie Flour Mills, which was to have perhaps, the most completely vertically integrated pattern of ownership of any company in the Canadian grain trade.<sup>20</sup> Three of the others were owned by conglomerates, which were also heavily into country elevator ownership (the Empire, Western, and Consolidated Terminal Elevator companies).<sup>21</sup> Two seem to have been independents (Black and Muirhead, and Davidson and Smith). On CNor lines at Port Arthur, two terminals were owned by the Port Arthur Elevator Co. and two by other conglomerates, both of which (the Thunder Bay and National Elevator companies) appear to have had Peavey family connections.<sup>22</sup>

### **The Industry Adapts and Grows**

In 1912, as regulations were being clarified, an important distinction was made between “Terminal Elevators” and “Hospital Elevators”<sup>23</sup>, where the latter were used treating rejected or damaged grain with special machinery in order to make it saleable at a higher grade. Remarkably perhaps, but reflecting the lucrative nature of this end of the business, three of the existing terminals were immediately reclassified as “hospitals”, and five new hospital elevators were built (all at Fort William) - including one by N.M. Paterson Co., a family owned and operated outfit that was to become a major long term player in Fort William, as well as the grain trade in general. Another significant change at this time was the transfer of two of the Fort William CPR elevators (thereafter operated as one unit) to the Grain Growers Grain Company - the farmer cooperative that had been set up to avoid the tentacles of the private trade, and which was to become the United Grain Growers in 1917.<sup>24</sup>

Over the years, the terminal elevator scene demonstrated both growth and change. Growth took place in individual elevators that had their capacity increased, and in terms of numbers. Thus by 1915 there were 25 elevators at the Lakehead, by 1920 there were 32, and by 1925 the number had risen to 36, although by 1930 there were ‘only’ 32. This number remained relatively static until the mid 1930s when the total once again began to drop, reaching 28 in 1940, 26 in 1951, and 11 in 1988.

Although the rise of the West Coast terminals may have had some affect on numbers, these totals can, in themselves, be misleading. For the 43 million bushel capacity of 1915 rose through 64 million in 1925, to nearly 95 million bushels in 1930, and although there was then little change for about three decades (it was 93 million in 1961), the total was over 106 million in 1964, before dropping to some 90 million a decade later. Currently the 11 terminals can hold about 2 million tonnes.

### **Ownership Patterns**

Growth was to be expected though as Canadian wheat exports, as well as those of other grains handled by the terminals, continued to rise. Perhaps more interesting, however, were the changes in ownership that reflected the development of the trade from an unregulated free-for-all to a tightly controlled publicly influenced industry.

As we have seen, CPR ownership eventually gave way to the building of huge terminals by large conglomerates, made up mostly by groups of country elevator owners and grain traders. This reflected the development of the industry as a whole, and in many ways the changes at the Head of the Lakes continued to effect changes in the overall grain trade - with the 1912-13 entry of the Grain Growers Grain Company to Fort William being the first of many typical examples of this generalisation.

In 1917 another future trend was signaled when The Saskatchewan Cooperative Elevator Company added a Public Terminal Elevator in Port Arthur. (A change in definitions at this time had redrawn distinctions so that the Hospital elevators were essentially reclassified as Private Terminal Elevators, with the balance remaining as Public Terminal Elevators<sup>25</sup>). There followed many minor changes as terminals changed their category (e.g. Davidson and Smith became “private” in 1918, “public” again in 1919, and “private” again in 1921 before being sold in 1923), or were closed (e.g. Black’s in 1919).

There were also variations in ownership that reflected changes in the grain trade as a whole. As companies jockeyed for position with other operations, as general economic conditions changed,

and as increased farmer-ownership of elevator operations became more likely, some companies tried to consolidate their place in the grain trade by expanding at the Lakehead. Thus in 1921 the Horn terminal went to Edmonton-based Gillespie Grain, the Muirhead-Bole structure was sold to the Brooks Elevator Co., and the Merchants Grain building became owned by the Saskatchewan company of R.B. McClean. The Gillespie, Brooks and McClean companies were major country elevator owners, all originally from the USA, which were trying to extend their influence “vertically”, although the Brooks structure was sold again in 1922, as this company’s plans changed once more. Other country elevator owners such as James Stewart, Mutual, Bawlf Grain, McCabe Bros., and Wiley Low were all more or less successful in following the same routeway.

In 1926 the Saskatchewan Pool appeared, initially taking over the Saskatchewan Coop assets, but also by taking control other structures (e.g. from the Grain Growers Export Company in 1928), and particularly by building new terminals (e.g. one at Port Arthur in 1928). The Manitoba Pool (as the Manitoba Coop.) also appeared at Port Arthur taking control of two elevators in 1928 that had been previously licensed to Canadian Coop Wheat Producers. The Grain Trade mergers and take-overs of the late 1920s were also, necessarily, reflected in changes at the Lakehead. Thus a number of terminals became part of Federal Grain in 1929 (from Canadian Consolidated, Northwestern, and Stewart).

### **The Head of the Lakes in 1930**

If we look at 1930, a review of the terminals at the Lakehead gives a good picture of the overall grain trade at that time. There were 32 structures (a drop from the 1925 high-water mark of 36), 16 in both Fort William and Port Arthur, with a capacity of 94,597,210 bushels (up by nearly 50% from 1925). Most (28) were public or semi-public<sup>26</sup>, reflecting the sharp decrease in Private elevators (from 27 out of 32) since 1929 - in part because of another redefinition of terminology which sharply changed the ‘private’ definition, and introduced the ‘semi-public category’ to which many of the previously ‘private’ elevators were shifted.

Many of the major grain companies that were to be found owning country elevators on the Prairies, also appeared at the Lakehead. Thus Federal Grain, Ogilvie Flour Mills, Canadian Consolidated, Paterson, Western, Searle, McCabe, National, Union, and Reliance had their own terminals. The remaining privately owned structures were mostly quite small. In addition the farmer owned coops (the UGG, Saskatchewan Pool, and Manitoba Pool, with the Alberta Pool being conspicuous by its absence - and its presence on the West Coast) were also located in Port Arthur. The Saskatchewan Pool had four structures, the Manitoba Pool two, and the UGG one. The Saskatchewan Pool also had a Terminal in Fort William.<sup>27</sup>

Over the next decades, ownership was further consolidated, and as noted earlier the total number of licensed structures declined - while size increased. Perhaps most noticeable was the continued complexity of the pattern which makes the clarification of the story difficult for later researchers. For instance, in 1933 Manitoba Pool Terminal #2 (in Port Arthur) was sold to Canadian Consolidated Grain. This elevator was previously had previously been a Manitoba Coop elevator before company reorganisation and a name change in 1929. Prior to this it had been a Canadian Coop operation, and before this it was Gillespie owned, this company having bought it from Horn in 1921, which company had built it more than a decade earlier. This elevator was sold back to Gillespie in 1934, which company returned it to Manitoba Pool (as #2 once again) in 1935. It seems to have been demolished in 1936. The reasons for many of these changes remain unclear, but this is not an isolated example.

## **The Pacific Route**

### **Early Development**

Although connected by rail with the Prairies since the early 1880s, the Pacific route for grain exports was not a very important one before the opening of the Panama Canal. The construction of the Panama Canal caused far-reaching changes in the flow of ocean traffic - one of which was the development of shipments of Canadian grain destined for consumption in Europe through the ocean ports of British Columbia. This route gave the farmers of Alberta and

western Saskatchewan an alternative route for their exports, and this competitive factor helped to keep down eastern carriage rates.<sup>28</sup> The shipment of grain to the Orient also boosted Vancouver as an ocean grain terminal. By the late 1920s, one third of the grain from Vancouver was destined for the UK, and one third for the Orient, with the balance going to 'other countries'.

Initially grain was exported from Vancouver in 'parcel shipments' - 'bottom cargoes' in ships in liner service, and through this means the city managed to build up some momentum in the trade. This discouraged the early growth of grain terminals in for instance, New Westminster, which had no extensive liner traffic, although a small terminal was eventually built there in 1928. Victoria also built up a trade, and constructed a private company terminal in 1928, but its island location precluded extensive growth in this trade.

Prince Rupert, however, relatively flourished as it was chosen as the western terminal of the Grand Trunk Pacific Railway, with the Dominion Government building a terminal there, subsequently leased to the Alberta Wheat Pool, in 1925. This proved particularly useful to the Pool when pressures on shipments through Vancouver - such as grain 'blockades'<sup>29</sup> - threatened its contracts. Although 500 miles from Vancouver by the inside passage, the export trade route of Prince Rupert via Panama is only 280 miles longer than that of Vancouver - a small percentage of the total distance to Europe. Its more northerly location is somewhat offset by a better connection to the ocean, and a shorter distance to the Orient. In addition, although nearly 200 miles further from the wheatlands, CN traditionally maintained freight rate parity between Vancouver and Prince Rupert. However, predictions by CN President Charles M. Hays that 100,000,000 bushels of wheat would move annually through Prince Rupert proved to be overly optimistic (the largest amount shipped up to 1930 being 7.6 million bushels, in 1927-28).

### **The Growth of the West Coast Trade**

But the growth of the West Coast terminals did not come immediately after the opening of the Panama Canal in 1914. In addition to war-time problems, such as the scarcity of shipping,

which delayed its true testing, a considerable investment in eastern movement had already been made, the technical conditions of eastward movement were well known, and the organisation of grain exports were centred around the eastern route. The railways also made more money out of the longer eastern haul, and there was, therefore, no real economic motive for them to develop a grain traffic to the Pacific. Lastly, there was some doubt that grain could safely be shipped, in bulk, using a tropical route, without seriously deteriorating while in transit. There was, thus, what MacGibbon termed a natural disinclination to change.<sup>30</sup> It was only in the early 1920s that Vancouver became definitely recognized to be an important outlet for grain.<sup>31</sup>

Responding to pressure from the City of Vancouver however, the Dominion Government had built a terminal elevator on the harbour front, with a capacity of 1,250,000 bushels that was completed in 1916. At this time there were 26 terminal buildings at the Lakehead, with a total capacity of over 45 million bushels. In 1917 the Panama Canal route was tested, and passed with flying colours, with only 160 bushels of a cargo of 100,000 bushels being damaged.

Despite this success, however, there was little increase in Pacific port usage. Just less than 600,000 bushels were shipped in 1920, for instance, mainly to the Orient. This sluggish development reflected both high ocean freight rates that favoured the shorter Atlantic route, as well as higher westward rail freight rates that favoured the Lakehead. In addition, a lack of inward cargoes and the competition of exporters in the Pacific ports of the United States for outward cargo space restricted the growth of the grain trade in this area.<sup>32</sup> After 1920, however, these disabilities began to fade, and by 1922 14.5 million bushels were shipped out of Vancouver with 11 million going to Europe. From this time trade from the West Coast steadily grew. For the crop-year 1925-26, total B.C. shipments were over 53 million bushels (nearly half to the UK). By 1928-29 the total was nearly 95 million bushels, with nearly one third of the total being billed to the United Kingdom. The ability to ship during the winter months when the Great Lakes were frozen was a particular boost to the West Coast. This was an

impressive increase, but it must be noted that in the same year the Lake Shippers' Clearance Association shipped 376 million bushels.

### **Terminal Variations**

Apart from differences in shipment-size at this time, there were other differences between the two regions of terminals. Although the terminals of Fort William and Port Arthur were principally assembly points where grain was put into a condition for export (cleaning, drying, mixing, etc.), Vancouver had the added function of being a gateway through which grain moves to foreign markets. It thus combines the functions traditionally divided between the Lakehead and Montreal. Although there was initially a pressure to have only publicly-owned terminals at Vancouver, this did not occur, and soon the public terminals had been leased to private companies, in addition to other structures that were built by the private concerns; as a consequence, in terms of elevator type, Vancouver most closely resembled the Lakehead, having mostly private terminals.

In other ways, however, the terminals of the Lakehead and Vancouver differ. As Vancouver is an ocean port and requires the use of the foreshore of the harbour for other purposes, the elevators are built further back, with the grain being carried to the ocean vessels by belt conveyors carried over galleries. In addition, as storage capacity is relatively limited in Vancouver, a different permit-delivery system had to be devised to maximise efficiency.

### **Conclusion**

The development of the grain trade in Canada has been spectacular and exciting, and the growth of the terminal elevator system is characteristic of this progress. It had a lasting and positive influence, leading to some of the most distinctive cultural landscape elements in both areas studied. It transformed minor Lake Superior settlements into major cities, and helped Vancouver become (and remain) a world-class port. Many of the factors that led to the growth of the Canadian terminal elevator system originated in the United States, but when they diffused to Canada they took on a form that became characteristic of this region. Although our discussion terminates before the West Coast ports fully developed their grain

exporting capacity, and a more complete story of the later changes deserves telling, it was already clear by the early 1930s that the Pacific route had introduced a significant new factor into the Canadian grain trade.

## Endnotes

1. This line of thought is developed more fully in Peter J. Hugill and John C. Everitt 'Macro-landscapes: The cultural landscape revised by world-system theory' in S.T. Wong (Ed.) *Person, Place and Thing: Interpretive and Empirical Essays in Cultural Geography Geoscience and Man*, Vol. 31 (Baton Rouge: Department of Geography and Anthropology, Louisiana State University) 1992: 177-194.

2. Taylor, P.J. 'World-systems analysis and regional geography' *Professional Geographer*, Vol. 40, No. 3, 1988: 264.

3. Five Interior Terminals were built by the Dominion Government from 1914-1917, at Moose Jaw, Saskatoon, Calgary, Edmonton, and Lethbridge. One was also built at Churchill in 1930. These will not be considered in this paper.

4. MacGibbon, D.A. *The Canadian Grain Trade* (Toronto: MacMillan) 1932: 118.

5. MacGibbon, 1932: 118.

6. The world's largest market for wheat was England, whose food deficit continued to increase during the nineteenth century. By 1900 British farmers could supply domestic requirements for only two months out of every year (see J.C. Everitt 'The borderlands and the early Canadian grain trade' in R. Lecker (Ed.) *The Borderlands Anthology* (Montreal: ECW Press) 1991: 146-172.

7. MacGibbon, 1932: 238.

8. Naylor, R.T. 'The banks and finance capital' Volume 1 of *The History of Canadian Business, 1867-1914* (Toronto: J. Lorimer) 1975: 15.

9. In addition, a relatively small amount of grain was shipped to Duluth, for instance via the Great Northern-owned Brandon Saskatchewan and Hudson's Bay Railway. In the fall of 1928 this amounted to less than 1,000 cars (MacGibbon, 1932: 120).
10. Buller, A.H.R. *Essays on Wheat, Including the Discovery and Introduction of Marquis Wheat, the Early History of Wheat-Growing in Manitoba, Wheat in Western Canada, the Origin of Red Bobs and Kitchener, and the Wild Wheat of Palestine* (New York: Macmillan) 1919: 49.
11. The modern city is located on an estuary of the Kaministiquia River that bifurcates twice within 2.5 miles of the mouth. The two subsidiary outlets are known as the Mission and the McKellar Rivers. Dredging through sand bars at the river mouth has long been necessary to open and extend the navigable channels.
12. Everitt, J.C. 'The line elevator in Saskatchewan' *Saskatchewan History*, Vol. XLIV, No. 2, Spring 1992: 41- 58.
13. Although some large eastern Canadian companies, such as Ogilvie Milling, showed an early interest in Manitoba wheat, most of the initial traders in Winnipeg operated at a small scale. (See W.T. Thompson and E.E. Boyer *The City of Winnipeg, The Capital of Manitoba, and the Commercial, Railway, and Financial Metropolis of the Northwest: Past and Present Development and Future Prospects* (Winnipeg: The Commercial Press) 1886; and A. Begg and W.R. Nursey *Ten Years in Winnipeg. A narration of the principal events in the History of the City of Winnipeg from the Year A.D. 1870 to the year A.D. 1879 inclusive* (Winnipeg: Times Printing and Publishing House) 1879.
14. The Warner-McWilliams consortium that owned the Canadian Elevator company.
15. *Wheat Studies of the Food Research Institute* (Stamford University) Vol. 1, No. 8, July 1925: 235.
16. These vessels also carried ore and coal cargoes in order to maximise their usefulness throughout the year, and were often American-owned. This dependence caused occasional crises for the Canadian wheat trade, and led in part to the growth of Canadian

shipping operations, such as those of the Paterson, Parrish and Heimbecker, and Richardson (Pioneer) companies.

17. Wheat acreage on the Prairies was to rise from 2,495,000 acres in 1901 to 25,586,000 acres in 1931. It was 24,629,000 acres in 1961 (Tyler, 1967: 97).

18. MacGibbon, 1932: 232-238.

19. The Warner-McWilliams consortium that owned the Atlas Elevator Company, which operated on Grand Trunk rail-lines. These corporate connections were common in the grain and railway industries (see D.W. Holdsworth and J.C. Everitt 'Bank branches and elevators: Expressions of big corporations in small prairie towns' *Prairie Forum*, Vol. 13, No.2, 1988: 173-190.

20. Everitt, J.C. 'The early development of the flour milling Industry on the Prairies' *The Journal of Historical Geography*, Vol. 19, No. 2, 1993: 101-121.

21. The Empire Elevator Co. was originally owned by the Northern, Dominion, Canadian, and Winnipeg Elevator syndicates. By 1905 it was so successful that the CPR was worried that its elevators were losing out, and the railway company was trying to take steps to restore its previous success. (Whyte to Shaughnessy 15-11-05 [CP 79651]).

22. The various holdings of the Peavey Group were consolidated into the National Grain Company Limited in 1940. (see J.C. Everitt 'The line elevator in Alberta (Part One)' *Alberta History*, Vol. 40, No. 4, Autumn 1992: 16-22.

23. *Terminal Elevator* included every elevator or warehouse that received or shipped grain, and was located at any point declared by the Governor in Council to be a terminal. "Hospital Elevator" included every elevator or warehouse that was used for cleaning or other special treatment of rejected or damaged grain and which was equipped with special machinery for that purpose. (1912-1913 List of Licensed Elevators and Warehouses in the Manitoba Grain Inspection Division (Ottawa: Department of Trade and Commerce).

24. Everitt, J.C. "A 'tragic muddle' and a 'cooperative success': an account of two elevator experiments in Manitoba, 1906-1928" *Manitoba History No. 18*, Autumn 1989: 12-24.

25. Under this new definition a "Private Terminal Elevator" included every elevator or warehouse that was used for cleaning or other special treatment of rejected or damaged grain and which was equipped with special machinery for that purpose. This was essentially the same wording as for the old "hospitals". In addition, however, a paragraph was added that stated "under regulations governing sample markets, all grain received into such elevators must be their own property. Nevertheless the owner, or owners of grain may contract for the handling or mixing of grain in such elevators." (1917-1918 List of Licensed Elevators and Warehouses in the Western Grain Inspection Division (Ottawa: Department of Trade and Commerce)).

26. A further revision of definitions created the 'semi-public' elevator. "Semi Public when used with respect to an elevator, means any elevator, not being a mill elevator or a public elevator, the manager whereof is expressly permitted by the terms of his license as such manager to bin as he sees fit any grain except wheat graded in any of the four grades first specified in Schedule One to this Act." The 'public elevator' definition was revised to read "Public when used with respect to an elevator means any elevator other than a mill elevator, a private elevator, or a semi-public elevator." The 'private elevator' definition then read "Private when used with respect to an elevator means an elevator used by the manager exclusively for the storage or handling of grain belonging to him alone, or, when the manager is a co-operative association of grain growers, or is a company controlled by one or more such associations, is used by such association exclusively for the storage or handling of grain belonging to it or produced by or received from some one or more of its members." (1930-1931 List of Licensed Elevators and Warehouses in the Western Grain Inspection Division (Ottawa: Department of Trade and Commerce)).

27. In addition to their country systems, by 1935 the three Pools owned or leased seven modern terminal elevators at the Head of

the Lakes, and four on the Pacific coast, with a combined capacity of over 36,000,000 bushels, or more than a third of the total terminal storage on the eastern and western fronts of the grain belt of Western Canada.

28. The exact location of the 'grainshed' between the West Coast and the Great Lakes varies with the cost of shipping. In the early 1930s, "a calculable difference in shipping costs of one- eighth of a cent per bushel.... [would] deflect shipments from the Atlantic to the Pacific Coast." (MacGibbon, 1932: 273)

29. A grain 'blockade' occurs when there is more grain at a shipping point than can be moved by the transportation system.

30. MacGibbon, 1932: 267.

31. Macgibbon, 1932: Chapter X.

32. *Wheat Studies of the Food Research Institute* (Stamford University) Vol. 1, No. 8, July 1925: 258. Some tramp steamers did, though, travel the 35 days from the UK in ballast in order to pick up a cargo of wheat (MacGibbon, 1932: 272).