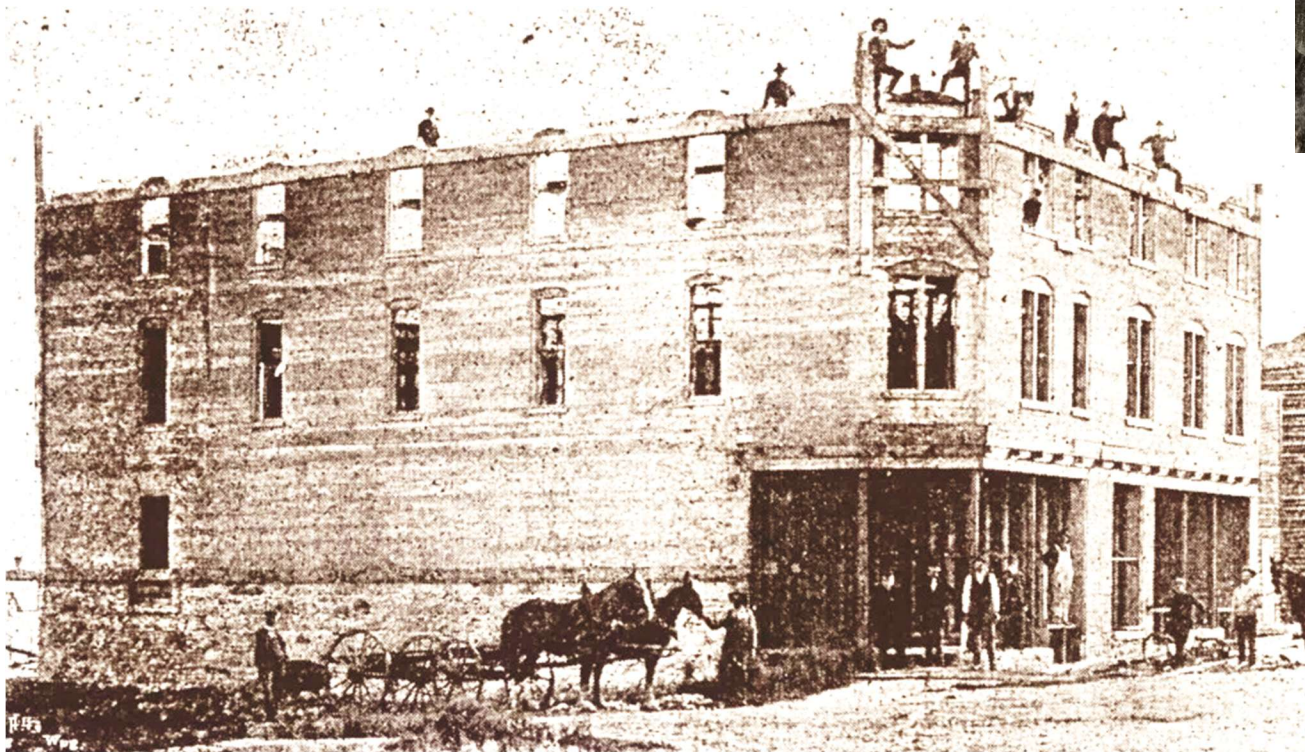


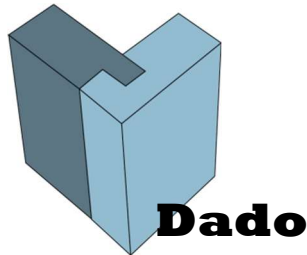
# THE POURED PROCESS

THE FIRST PRODUCTION OF CEMENT AND CONCRETE IN MANITOBA  
AND OUR FIRST CONCRETE BUILDINGS



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**The Poured Process: Early Cement and Concrete Production in Manitoba and Our First Concrete Buildings** has been developed by Dado Projects, a Manitoba heritage research initiative of David Butterfield and Maureen Devanik. These projects are supported by Heritage Manitoba, an informal coalition of municipal heritage associations dedicated to the appreciation and preservation of Manitoba's history. The project is part of a series focusing on Manitoba's early industrial development, especially in small-town or rural situations.

The title for this project is taken from several articles on the subject of concrete block construction in the *Winnipeg Tribune* during 1903.

This project had its genesis in 2007 via the Province of Manitoba's Historic Resources Branch (HRB), and with funding from a program of Parks Canada called the Historic Places Initiative. David Butterfield, then-Manager of Research Assessment Services of HRB, directed the project, with editorial and design oversight, and Randy Rostecki, a well-known private architectural history consultant, undertook the primary research for each entry.

On the Cover: Major image of the Patterson Block in Birtle; concrete block farmhouse near Nelson, North Norfolk; and section of an advertisement from the Canadian Petrified Brick and Stone Co., Ltd., focusing on one of their concrete block machines.

# Introduction

The pioneering phase of Manitoba's cement and concrete industries is an interesting and important aspect of the study of the province's construction practices in general. This project explores this early period in our history – from 1879 to 1914 – via four short articles:

- Early Concrete Production in Manitoba
- The First Poured Concrete Building in Manitoba
- Early Cement Production in Manitoba
- Early Concrete Block Construction in Manitoba

A chronology of the key events and developments that attended these themes is also included, putting this aspect of our construction heritage into a clearer picture.

Before turning to the particulars of the early use of cement and the production of concrete in Manitoba, it is important to appreciate the difference between these two materials, and also to have the briefest of histories of their uses in construction. Firstly, cement and concrete are not the same thing – concrete is the mixture of water, aggregate (typically sand and gravel) and cement, with cement being the active agent that reacts with water to create the rock-like bonds that make concrete so hard and durable. Cement itself is a mixture of ingredients – by the 20th century usually consisting of crushed limestone, clay, along with alumina, silica, iron oxide, and magnesium oxide. Huge factories were (and are) devoted to the production of cement, with the ingredients super-heated in kilns to attain its necessary reactive potential, and then ground to fine powder.

In terms of history, the ancient Romans had their own version of concrete – a mixture that included sand, gravel, water and potsherds or more often volcanic ash; and used it on many major public buildings and engineering structures, some of which still stand. The knowledge of cement and concrete was lost for at least 1,000 years, until scientists and engineers in the early 19th century in England and France began experimenting with mixtures of various materials to attain greater strength in large engineering works. In 1824 Joseph Aspdin observed in an 1824 patent application for his cement mix that the material had the same colour as a well-known and highly-prized stone quarried near Portland, England; the name Portland cement has endured to the present day.

While Portland cement ultimately eclipsed all other cement competitors, it was not immediately the dominant choice in the construction industry. It is notable that Portland cement was only introduced to the North American market in 1868, and that local production of Portland cement only attained a large scale in the 1880s, in Pennsylvania. For decades, in fact, it was natural cement, mainly mined and processed in New York state, that was the preferred additive option for concrete in the United States until the early 1900s. And in Canada, similar attention to natural cement deposits was keen in Ontario. Manitoba also had its own modest natural cement production, with that interesting story addressed in the entry in “Early Cement Production in Manitoba.”

## Early Concrete Production in Manitoba

By 1879 concrete had become a well-known building material throughout North America, and cement-making factories in Europe and eastern North America were providing eager builders with tons of the stuff. Winnipeg's first experience with concrete came in the form of the Winnipeg Pottery and Cement Tile Works, begun by an American, J.H. Thorpe, in 1879, and later taken over by Elijah Griffith. By the autumn of 1881, Griffith's operation was importing a great deal of Portland cement per week, and producing a large amount of artificial stone for building and pavement use (the *Manitoba Free Press* of 29 July 1879 reported that the Portland cement was actually produced by Griffith, but this seems unlikely, given the significant infrastructure and sophisticated technology required to produce that material). While also manufacturing tile and earthenware jugs, preserve crocks, milk basins, etc., the mainstay of this business was in concrete sewer pipes. A year later, Griffith was manufacturing building "stone" which was being sold at the rate of \$1,500 a week. The operation had recently been expanded with additions to his Point Douglas factory. It is not known which buildings used Griffith's products, though the sewer pipes saw some usage in Winnipeg as the city grew during the Boom of 1881-1882. Unfortunately, Griffith's firm did not survive competition from a nearby rival, and when the need for sewer pipe decreased with the end of the building boom after 1884, so too did Griffith's firm, and it was gone by 1886.

Griffith's rival in Winnipeg was the Manitoba House Building and Portland Stone Manufacturing Company Limited, which had its plant north of the Canadian Pacific Railway (CPR) tracks, on the east side of Gladstone Street in Point Douglas. This firm, commonly called the Stone company, had been formed in May 1882 by a group of businessmen headed by Honourable Gilbert McMicken and William Redford Mulock, and incorporated a couple of months later. In August 1882, architect James Hamilton Rowan called for tenders

on a block of three wood-frame buildings for the company's operations. The large two-storey structures, which cost about \$8,000, were 21'x120', 40'x80' and 20'x80' in size, and were in operating order by 11 December of that year. It appears to have been a fully-integrated operation from its inception, getting in sand and gravel from Stony Mountain and using imported Portland cement. They could supply artificial stone for almost every building application by the spring of 1883. Their showroom contained, among other things, door and window sills, slabs suitable for flooring, ceiling and partition crocks, brackets for cornices, coping stones, door steps and corbels, in different styles of architecture. They also produced a concrete chimney, monuments and vases. There are no descriptions of the production techniques or of the resulting materials, but one can assume areas of three buildings were devoted to raw material storage, mixing, casting of the wet concrete in moulds, drying areas and finally storage for the final product.

The Stone company came along just as Winnipeg's first building boom was ending, though construction activity continued in the city at a good pace until 1884. In that year the firm's products were used in the new City Hall, Mulvey School, Machray School and J.R. Clements' new office buildings at 496 and 525 Main Street. By early 1885 however, the firm was in decline, and the *Commercial* newspaper commented that the Stone company's affairs were "in a badly muddled, if not insolvent, state." The Federal Bank of Canada foreclosed on the Gladstone Street property that year, seizing the plant and removing products.

Opposite: Most of the concrete products produced by both Winnipeg Pottery and Cement Tile Works and the Manitoba House Building and Portland Stone Manufacturing Company were of a utilitarian nature—window sills, floor slabs, door steps and thresholds—but some were decorative (ceiling and partition crocks, brackets, coping stones, corbels) and perhaps had the appearance of these examples. (Courtesy WikiCommons)



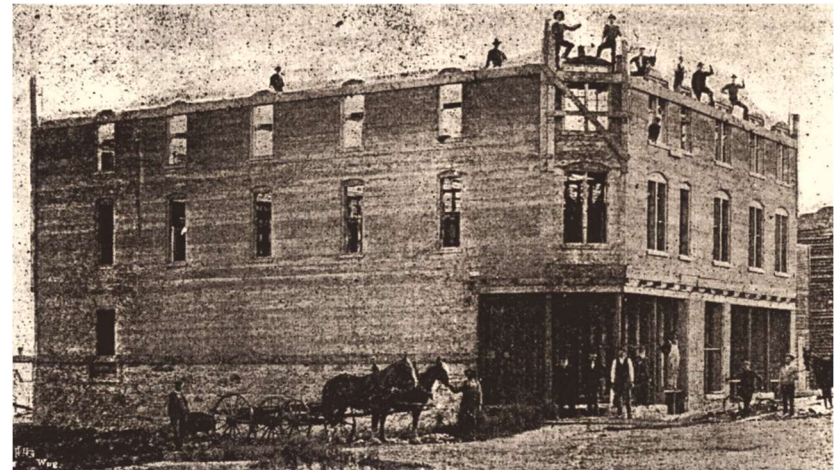
Opposite: This image shows one of Britain's largest Portland cement production operations – at Swanscombe. Begun in 1846, the plant was enlarged many times over its long life (closing in 1990), and is a reminder of the level of sophistication of European cement production at the time of the first use of cement and concrete in Manitoba. This image is from 1907, showing the enormity of the operation at that time, but the place would have been impressive even in the 1870s. Large scale use of its product began in the United Kingdom around 1860, when the plant was capable of making around 640 tons/week, using 23 small kilns, with much of the material being used in major French harbour projects. An 1872 valuation counted 32 kilns, and from 1877, there were added three huge ring kilns. (Courtesy Dylan Moore's website: "Cement Plants and Kilns in Britain and Ireland")



## The First Poured Concrete Building in Manitoba

The first poured concrete building in Manitoba was put up in Birtle in 1899. The Patterson Block, situated on the northeast corner of Main Street and Eighth in Birtle was constructed in 1899 for Thomas F. Patterson. According to an advertisement for Thorold Cement (in the *Nor'West Farmer*, 20 September 1899), which featured this structure, Mr. Patterson had set out to build a stone business block and got as far as the foundation before he changed the superstructure to concrete. The builder, N.B. Hagar, had never before constructed a concrete building on a stone foundation, but gamely took on the challenge. It was complete enough by late November of that year for its first tenants to move in.

This may be slightly surprising – that an innovation like the use of poured concrete would first be used in a small town (145 k; 90 miles north of Brandon), rather than in one of the province's larger centres (like Winnipeg or Brandon). But it is entirely possible that Mr. Patterson was inspired to undertake this project while attending one of a series of lectures given at a Manitoba Farmers' Institute meeting. These were presented by Isaac Usher, a farmer from Queenston, Ontario, who had constructed concrete-foundation barns for several years in that province. By 1898, he had been on the Ontario lecture circuit for four years, and had come west that June to spread the message. Usher had earlier built a concrete-foundation barn for W.F. Brown near Portage la Prairie, and his course of lectures took him back to Portage, as well as to Killarney, Morden, Crystal City, Neepawa, Carberry and Brandon. Attendance at Usher's lectures ranged from poor at rain-soaked Killarney, to excellent at Carberry, where it was reported that some farmers drove 20 miles to hear him and another speaker at Creamery Hall. His message was similar in all of his lectures – that most farmers had the skills and materials on their farms with which to construct superior buildings at a lower



The main caption in the *Nor'West Farmer* article reads: "T.F. Patterson's Cement Concrete Block, Birtle, Man. In course of construction, size 52x70x44 ft. high, built with Thorold Cement." A close look at the image reveals the long horizontal striations left by the wooden planks used for the forms into which the concrete was poured. Additional text advises that "the wall of the first storey is 13 feet high and one foot thick; that of the second storey is 10 ½ feet high and 8 inches thick. Mr. Hagar says he never built a concrete wall on a stone foundation before, as he always starts with cement concrete foundations." The building was demolished many years ago.

cost than what was then conventional brick or stone construction. Usher's ultimate effect upon the rural concrete scene cannot be judged, except to say that farm journals such as the *Nor'West Farmer* began to devote more space to concrete topics as well as advertising concrete and cement products in the next few years.

While not claiming the spot as the first poured concrete building in Manitoba, another structure—this one in Winnipeg—has a claim to being the first to employ a technological development that would become the standard for concrete construction thereafter: the use of reinforcing bars. Reinforcing bars, or rods (today widely called rebar), were well-known in the concrete-construction industry since at least the 1850s; in fact the ancient Romans used reinforcing in their concrete structures, using iron or wooden rods. Reinforcing bars are used to give concrete, which is stable in a compression situation (that

is, in a structure like a wall) greater strength and stability when in tension – that is when in the horizontal position. Built in Winnipeg during 1906 as a factory for the Bemis Brothers Bag Company, this six-storey factory was the first reinforced concrete building in Winnipeg and was designed by architect W.H. Lester. Bemis Brothers had been in business since 1858, and had factories in many large American cities. The factory at 311 Alexander Avenue (NE-Stanley Street) became their first Canadian venture. Remarkably, this structure was so successful that in 2006 it still housed a bag manufacturing concern – Endurapak. The Bemis building led a spate of reinforced concrete construction over the next several years in Western Canada that ultimately fostered the construction during 1912-1913 of the Canada Cement Plant (NW-Kenaston and McGillivray Boulevards) which was to become one of the major sources of Portland cement in Western Canada (see next section).



A newspaper illustration from ca. 1906 of the Bemis Bag Building, Manitoba's first poured concrete building to use reinforcing bars. (Courtesy Randy Rostecki Collection)

# Early Cement Production in Manitoba

The first concrete production in Manitoba, in 1879, relied on imported Portland cement, using local gravel, sand and water as the other components of concrete. And while there were undoubtedly ongoing calls for local building-trade entrepreneurs to take up the task of producing locally-sourced cement, it would take 20 years before activity on this front took hold.

As noted above, there are actually two options for cement production – natural, via a type of limestone known as clayey marl (more technically calcareous shale), which is simply mined and burnt with no further additions; and Portland and other “artificial” cements, which by contrast are produced from a man-made mixture of pure limestone, silicates and clays that resemble the chemical composition of marls. The main challenge with producing natural cement is obviously locating the necessary source of clayey marl, with lesser challenges involving the financing and expertise required to build chimney kilns and operate grinding facilities. The primary challenge with Portland cement production in Manitoba was not in locating the pure limestone, which is abundant in Manitoba – it was financial and technological; requiring substantial investments in sophisticated kiln technologies and then expertise in mixing and grinding processes to produce a high-quality final product.

Also as noted above, at this time in North America—that is the late 1800s—natural cement was just as popular as Portland cement, which was the predominant product in Europe. And so any substantial local deposits of clayey marl would have been immediately recognized as a prize for local exploitation. By the early decades of the 20th century, however, Portland cement, which produces stronger concrete, and which also hardens more quickly than natural cement underwater, was the only real cement available.

## The Arnold Cement Works

With this background in mind, we finally meet, in the summer of 1899, a group of investors, mostly Americans, who incorporated the Manitoba Union Mining Company Limited, to exploit a natural cement mine which they began to develop the following year at Arnold. This was a place about four miles west of Miami near Deerwood on NE 16-5-7W on the farm of John Spear (other sources note a Mrs. Ticknor). The cement vein had supposedly been discovered in 1898. Financing was handled through share sales in the spring of 1900 and by late May men were preparing the foundations of the plant with its machinery arriving by mid-August. A small village arose near the mine and was given the name Arnold by company officials. By April 1901, the plant had shipped its first carload of cement, followed by four more two months later. A complete description of the plant and its operations was to appear in an obviously-proud *Miami Despatch* at the end of June 1901. According to the local history (*Miami and R.M of Thompson Chronicles*), this mine’s product went into some area buildings, both as poured concrete and as concrete blocks. It supposedly operated until 1908, though Manitoba Union Mining was still making returns to the Provincial Secretary as late as the end of 1910.

There were actually several salient articles from the *Miami Despatch* that dealt with the cement mine at Arnold, the first from June 1901: “The high cost of building materials had always been a serious drawback to the prosperity of this province. It was felt that the cost was excessive, and many under ordinary conditions would have erected substantial farm buildings and town residences found the cost almost prohibitive; cement had to be shipped to Manitoba from the east at prices almost beyond reach. In about 1898, in a ravine along the escarpment, northwest of Miami, a deposit of shale was uncovered when the bottom of the ravine was being lowered for drainage. The peculiar character of the shale or rock was brought to the attention of J.R. Spear, supervisor of the Northern Pacific and Manitoba Railways who had specimens tested and established the fact that cement could be manufactured from the material. A

company with W.G. Vanderslice, superintendent of N.P.& M. Lines as president and J.R. Spear as secretary, and a board of directors including several well-known financiers in the province, was formed. Further prospecting indicated the extent and value of the cement deposit. The necessary buildings were erected and a first class plant secured. This plant, known as the Arnold Cement Mine was the first natural cement mine in existence in Western Canada. It was located one-and-one-half miles east of Deerwood Siding on the NE 16-5-7W. This quarter was homesteaded by John R. Spear in 1893, taken over by the Manitoba Union Mining Company from 1900 until 1908 and returned back to John Spear's ownership."

It was reported in the May 31, 1901 issue of the *Miami Despatch* that with George McCallum. as mine overseer, a carload of cement a day was being shipped from the Arnold mine. It was reported in June of that year that "four carloads of cement were shipped by Manitoba Union Mining Company last week and every effort is made to catch up with the orders, for at present, the demand is considerably ahead of supply." The price per barrel picked up at the mine was \$2. It was reported in the May 16 issue of the *Despatch* that "the discovery of coal in the vicinity of Altamont, should the deposit prove valuable, will add considerably to the interest taken in this district. With unlimited coal, cement, wood and brick clay the manufacturing possibilities are quite extensive. An iron mine is now desirable."

The local history, *Miami and R.M of Thompson Chronicles*, also contains valuable descriptions of the operation: "At the Arnold Cement works, the shale was found as horizontal beds about twenty feet thick. It was obtained by tunnelling into the bottom of the hill and was delivered by wheel barrow to an inclined bucket elevator which carried the clay up to the feeding floor of the vertical kiln. Remains of these buckets were found in 1966. The kiln was of the vertical up-draft type, a vertical shaft in a cylindrical shape, open at the top with a charging floor for the clay and the fuel. These were drawn into an inverted cone at the bottom where the clinkers, more or less perfectly burned, were drawn out, sorted and dumped into cars beneath, that carried them to the grinding room. The kiln at

Arnold was made of boiler plate lined with fire brick with the charging floor on a level with the railway track and spur line. In 1905 this plant was using lignite coal for fuel whereas most other mines used bituminous coal. Some local people who remembered the mine said that the mine burned wood before it burned coal. The clinkers were then ground or pulverized by passing through a stone crusher to reduce the clinkers to pea size. It was elevated once more to a pulverizer similar in action to a mortar and pestle which consisted of rollers rotating at 600 revolutions per minute. After passing through the roller-mill, the cement was "bolted" through a 2,500 mesh-per-square-inch metal screen. Then the finished product was conveyed to the warehouse to cool, after which it was put into sacks or barrels to await shipment. The Arnold Mine was in operation for over five years. A cement sample was found at the old mine site in 1966. The J. Walter Wells report favoured the operation and suggested that Arnold could be the testing ground for other samples of clay found in Manitoba. From an unpublished report by A. McLean in 1915, we find that the writer submitted this opinion - "Although the plant was abandoned, its failure was probably due to some factor other than the impossibility of turning out a good product."

The history continues: "Four different out-croppings of this cement were found around the Arnold mine site and also around Deerwood Siding. The cement was recommended for use in rough plastering, mortar for stone work and brick in place of lime. Cement for floors, walls and foundations as well as sidewalks were a recommended use. Arnold cement was used in bridge and culvert construction and a culvert was built on the Canadian National Railway line west of Altamont from this cement. Mr. Tom Whiter of Miami manufactured Hollow Block cement blocks from the Arnold product."

A view of the Arnold Cement Mine works, operational from 1901-1908/1910. (Courtesy *Miami and R.M of Thompson Chronicles*) Coordinating the information in this image with the description in the *Miami Despatch* suggests this operation: Raw cement was taken from the mine at the bottom of the ravine into one of the smaller buildings in the foreground, and then via a conveyor to the “tower” which surrounded the vertical kiln – where it was dumped. Wood or coal was brought via the elevated conveyor running from the track to the top of the kiln. The resulting clinker was taken out of the bottom of the kiln and moved via track likely to the large building (called the grinding room) in the mid-foreground; the track and trucks are not visible as this aspect of the operation was situated behind these buildings. From there material was moved up up another conveyor to the building at the top of the ravine, where it was allowed to cool, and finally put into sacks or barrels to await shipment. It is presumed that the Arnold operation was seasonal – that is, not active during winter months.



## The Manitoba Cement Company

A more spectacularly-promoted, though unsuccessful venture, was the Manitoba Cement Company, incorporated by a special or private act of the Manitoba Legislature in June 1900. This was meant to work a natural out-cropping of cement about 16 miles south of Morden on the bank of the Pembina River where it crossed the International Boundary. Its promoters were an all-star cast of Winnipeg business leaders, including William Whyte; William Blackwood, J.A.M. Aikins and A.M. Nanton. Tests on what was termed "1-6 Cement" (the site was on S½ 4-1-6W) showed splendid materials, and various newspapers (*Morden Chronicle*, *Morden Empire*, *Manitoba Free Press*) presented numerous articles promoting the project. Share sales took place over the next couple of years, even attracting English investors. The firm began surveying a rail line south from Morden in 1902, and bold predictions were made for the projected eight-acre plant which was shown in a company prospectus in January 1903. Two interesting sidebars featured in the January 17, 1903 promotional piece in the *Manitoba Free Press* are worth noting:

### "Objects of the Company

The Manitoba Cement Company has secured incorporation for the purpose of manufacturing a high grade Portland Cement. It owns one of the most valuable cement deposits in Canada, located south of Morden, S., ½ Sec. 4, Tp. 1 Rge. 6 west. The raw material has been thoroughly analysed by the highest authorities on cement and pronounced by them suitable for the manufacture of a superior quality of Portland Cement. When the plans shall have been completed the company will own material sufficient for at least 200,000 barrels of cement, and a mill capable of converting this material into cement of the highest grade, and by reason of its position and open market in the west, can without question manufacture and market its product at a maximum profit."

### "Use of Cement

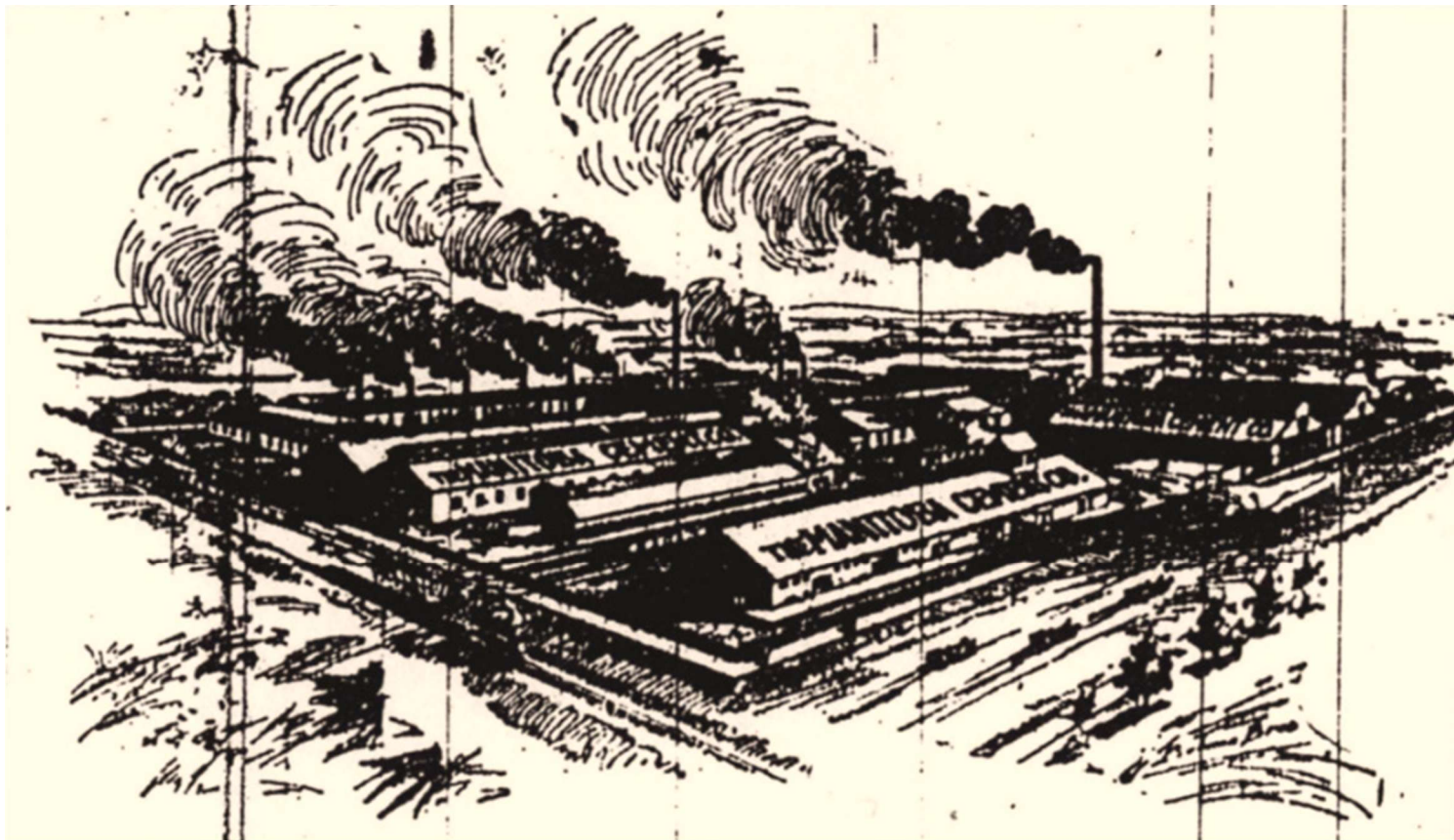
Cement is used in the construction of all the best buildings for foundations and walls. Hollow cement building blocks are much

cheaper and stronger than brick or stone. Cement sidewalks, bridge abutments, fence posts, fireproof vaults, cisterns, elevators, pipe mains, etc., are universally adopted now. It is estimated that the Nicaraguan Canal [Panama Canal] will require 30,000,000 barrels of cement. Manitoba and the Territories will require 350,000 barrels in 1904 in the erection of the St. Andrew's Locks and other water powers, dams, sidewalks, foundations for buildings, houses, barns, etc. The demand for cement in the west is increasing so rapidly that it cannot be secured in sufficient quantities to meet the requirements."

Over the next two years, the hopes of Morden-area residents rose and fell with each new announcement of pending construction, and then an inevitable hiatus. By Victoria Day 1904, local residents were seen launching a burlesque of the enterprise in their local parade, suggesting a certain fatigue with the promises. A visit by Lieutenant-Governor McMillan in company with important Canadian Pacific Railway (CPR) officials such as Wm. Whyte and Cement Company officers in September produced the now-familiar notice that the plant was proceeding immediately. It did not, and this final gesture was the last, with the spectacular promise never heard of again.

The failure of the plant project could possibly be linked to delays by the CPR in constructing the all-important spur track to "1-6", but also to difficulties with a promoter, E.G. Jaffray, who had rescinded all contracts with the cement group. But it is also possible that there was ongoing confusion about what was actually being proposed: a natural cement operation (as suggested by the focus on a natural out-cropping of cement about 16 miles south of Morden (not unreasonable given fairly nearby sources near Miami and Carman to the north), or as the article clearly states: Portland cement. It could be that potential investors looking more closely at the proposal were not convinced of the project's viability.

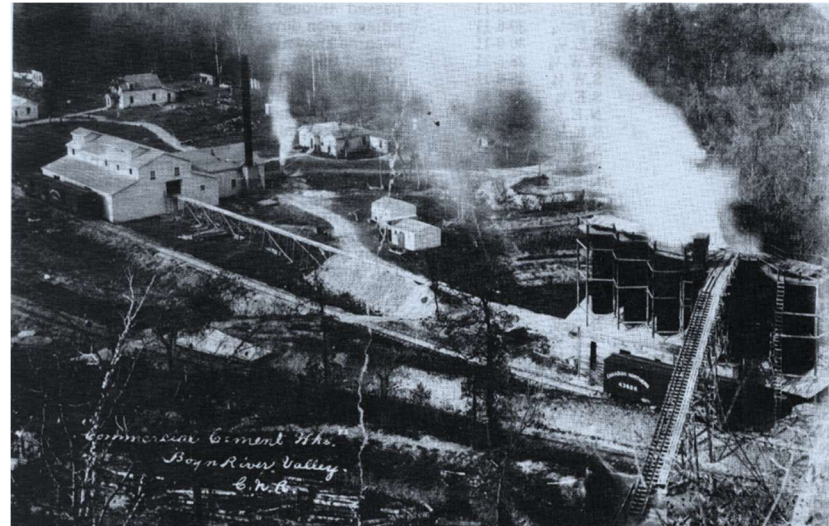
An image seen in the *Manitoba Free Press* from January 17, 1903 showing what was to be a major cement-manufacturing operation just south of Morden – a project that never came to fruition.



## The Babcock Cement Works

A third operation, this one also manufacturing natural cement, was located west of Roseisle and Carman, and operated from 1907 to ca. 1924, and was known as the Babcock Cement Works and also as the Commercial Cement Company. Information on the history of the Babcock Natural Cement is sketchy. There are two known textual references and a handful of archival photographs. There are also very modest building and feature remains at the old site. First, to the most significant textual resource, an entry in the local history book, *Memories of Lorne. 1880-1980*: "Babcock got its name from a man by the name of Babcock who owned land there. The Commercial Cement Co. began operating in 1907; closed down in 1924. The material from which the cement was made was taken from deep in the hill south of the railway, and was hauled out on horse-drawn carts on the miles of railway which were laid in the mine. Four kilns each 55 feet high were along the track. The material was pulled up the cable to the top of the kilns, dumped and fired. The resulting cement was carried by rail to a building where it was crushed, sifted and put in bags. The bags of cement were loaded on train cars on a spur of the railway which came into the building. The plant employed as many as fifty people at one time. A Mr. Gordon was Manager of the plant for several years. He was followed by a Mr. Underwood. In 1923 an inferior grade of cement was turned out and Canada Cement Co. (see next entry) had the plant closed down in 1924. Gradually the [remaining] buildings and station were removed and the little settlement disappeared."

Further research has revealed that the Commercial Cement Company was part of Alsip's Building Products of Winnipeg, whose focus was on brick manufacture, with five brick plants – two in Winnipeg and at three large rural sites. Otto Babcock was the General Manager of the operation; hence the common name for the place. He had overseen another natural cement factory near Concrete, North Dakota. This was a short-lived venture that he undertook with his brother Earle, who was the esteemed Dean of the College of Mining Engineering at the University of North Dakota.



Babcock Cement Works in 1911. (Courtesy *Memories of Lorne. 1880-1980*) This view, from the hillside to the south (and thus looking north-north-west), shows the processing building and other ancillary structures on site on the left-hand side, and the kilns on the right (note what appears to be five kilns and not the four noted in the local history article). It also shows the Boyne Valley rail line curving along the southern hillside and heading here east and west. This was obviously a significant operation, active from 1907 to at least 1924, with some sources suggesting 1928.

## The Canada Cement Company

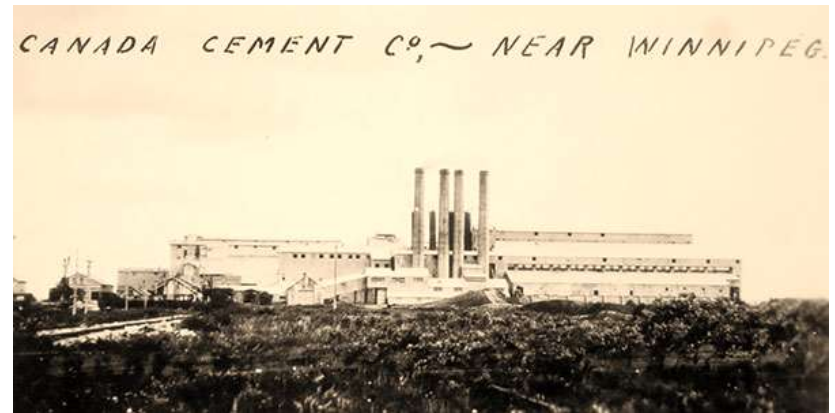
The final entry in this article does not actually deal with a pioneering operation producing made-in-Manitoba cement. In fact, the Canada Cement plant in Winnipeg, which shipped its first carload of Portland cement in 1914, marked a major turning point in Manitoba's cement manufacturing industry – as a major supplier of that material. But it seems a fitting final entry just to show how far the province had come in ten years, since the natural cement operation began at Arnold.

A major promotional article in the *Winnipeg Telegram*, of 28 April 1914, provides an overview of the operation, entitled "Most Modern Cement Plant Now Operating in Winnipeg," here slightly edited for the most salient points: "A new mill, No. 13 of the Canada Cement Company Limited, has been in active operation since Jan. 1, in the town of Tuxedo directly opposite the old Agricultural College. This plant has a capacity of 4,000 barrels and is the largest Portland Cement mill in Canada, west of the Great Lakes. It has been under construction for the past two years and is now completed, employing about 250 men. Portland Cement is made from limestone and clay. The stone is brought down from the company's quarry situated near Selkirk, Man, a point on the Canadian Northern railway, about 15 miles north of Winnipeg [actually from Steep Rock; an entry on the Manitoba Historical Society website also notes the sources of other ingredients: silica sand from a quarry at Beausejour; gypsum from Gypsumville, Amaranth, Silver Plains, or Harcus; and iron oxide from Ontario]. The clay is taken from the company's property at the site of the plant. The buildings cover about fifteen acres and are built of reinforced concrete. The process consists in making the proper mixture of limestone and clay, which is dried thoroughly, then pulverized into a powder. After being pulverized it passes through rotary kilns being four in number, 150 feet long, each kiln having a capacity of 4,000 barrels per day. The powder enters the upper end of the kilns, which revolve slowly, and are slightly higher at one end than the other. At the lower end of the kilns, finely pulverized coal is blown in, and burns like gas, the temperature

being about 2,600 degrees Fahrenheit. The process of heating becomes greater as the material progresses downward through the kilns, and by that time it reaches the fusion point and what is known as clinker is formed. This clinker then passes out of the kilns and goes through a cooling process and then is ground into finished cement. The fineness of the grinding is such that 92 per cent of it would pass through a sieve with 1,000 openings in the square inch. This is the finished cement. It is then conveyed into large reinforced concrete warehouses, which have a capacity for storing 300,000 barrels. From these warehouses it is conveyed by machinery to the packing department, packed by machinery into bags and the bags are trucked directly into the cars for shipment to the company's various customers. This mill will supply the customers of the company in Manitoba and Eastern Saskatchewan. Further western customers are looked after by the company's mills at Calgary and Edmonton. The Canada Cement Company Limited owns thirteen plants and with the exception of the No. 1 plant, Montreal, this is the largest of them all. But from the standpoint of being modern, etc., it is said that there is not a mill in Canada or elsewhere more up-to-date and more complete in every respect than the Winnipeg mill. It is equipped with the latest and most improved machinery throughout. The results of the installations of this mill should prove of great benefit to the cement customers throughout the territory which it serves as customers can get quick shipments on short notice, thereby eliminating the annoyances that have occurred in the past, resulting from delays in water transportation, and the uncertainty of the opening of navigation each spring. The Canada Cement Company Limited owns thirteen plants, located at Montreal, Que, Hull, Que, Belleville, Ont., Lakesfield, Ont., Port Colborne, Ont., Shallow Lake, Ont., Calgary, Alta., Eashaw, Alta., and Winnipeg, Man., with one under construction at Medicine Hat. The total capacity of these plants is about 10,000,000 barrels. The general offices of the company are in Montreal with branch sales offices at Toronto, Winnipeg and Calgary."

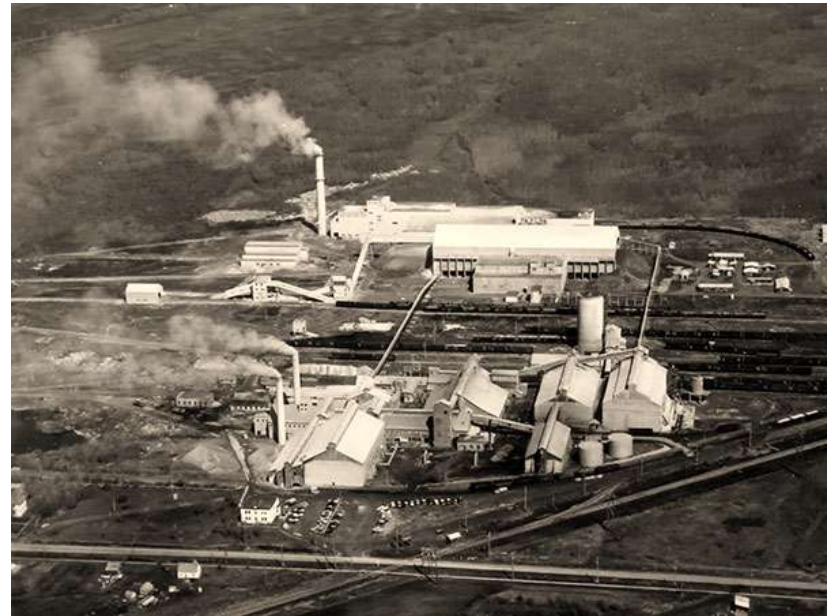
The article also featured panoramic views of the buildings and structures at the plant, but those images are nearly unintelligible in

the available materials, making it difficult to discern buildings and details. But captions are clear enough (reversed here to more accurately reflect operations at a cement plant): the first image shows Clay Storage, Wet Clay Department, Kiln Drier Stacks and Raw Mills; the middle image shows Stock House No.2 and No. 1 (Capacity 500,000 barrels); then Coal Storage; Coal Mill, Rotary Kilns and Rotary Driers, Clinker Storage and Rock Storage; with the final image showing Sack House, Pack House, Stock House No. 2, and Office.



Above: Canada Cement Plant in 1927. (Archives of Manitoba) By this date the operation had been transformed, with new chimney stacks and the addition in huge buildings of new rotary kilns.

Below: Aerial view of the Canada Cement Plant in 1956. (Archives of Manitoba)



## Early Concrete Block Construction in Manitoba

As shown in the entry entitled “The First Poured Concrete Building in Manitoba,” the series of lectures in smaller Manitoba communities conducted by Isaac Usher in the summer of 1898 extolling the virtues of poured concrete, and the construction of the Patterson Block in Birtle the following year, indicated to many the value of concrete construction – versus the more traditional (and expensive) options of stone and brick. The push for a commercial concrete-block technology that was readily available to the builder would come early in 1903 when stonemason-contractor Thomas Sharpe undertook to produce stone by the “poured Process,” as noted in several articles on the subject in the *Winnipeg Tribune* during 1903. Sharpe had seen the then-new process in Chicago, and obtained the Canadian patent rights. As a showcase for his products, Sharpe commissioned the construction of the three-storey Afton Apartments at the southwest corner of Ellice Avenue and Carlton Street in Winnipeg that year. The Afton apparently featured mostly smooth-faced concrete blocks, balconies and ornamental cast-concrete panels (there are no known photographs of the building). Designed by architect Samuel Hooper, the blocks were made of finely crushed “native stone” and imported Portland cement with a pure white facing material from Louisiana. This pioneer example, the only one known at present to have been built by Sharpe, was demolished in 1974 to extend the Winnipeg Free Press parking lot.

A rival to Sharpe’s efforts also came into existence during 1903. This was The Cement Building Block Company, a subsidiary or off-shoot of the older Manitoba Cement Company with its proposed Morden plant (See “Early Cement Production in Manitoba”). As the Morden plant was in limbo for a number of years, the Cement Block company built a separate facility at Bird’s Hill, northeast of Winnipeg. This plant made hollow blocks which created an air space that helped moderate inside temperatures (at least in summer,

winter apparently was something else). The plant had five block machines with a capacity of 750 blocks per day. Each block was said to be equal in size to 42 ordinary bricks. By the spring of 1904, this firm was also selling concrete block machines in addition to their products, as noted in the article “Make Your Own Building Stone,” in the *Canadian Thresherman*, of February 1904. According to one article, The Cement Building Block Company had constructed a warehouse on Henry Avenue at Sherman Street for McColl Brothers, as well as a warehouse on Notre Dame Avenue and Erin Street for the Winnipeg Oil Company. They had also supplied 6,000 blocks for use in Holy Ghost School, 333 Selkirk Avenue, as well as blocks for the W.D. Dunlop store at Yorkton, Saskatchewan.

The Cement Building Block Company’s keynote building was a Winnipeg apartment block. Called the Boniveen Block, at 185 Spence Street, the structure was erected in 1905 and designed by architect Herbert Bell Rugh. The Boniveen concept was a cooperative one, similar to present-day plans for condominiums. A company was formed to carry out the tasks of organizing and construction. Interestingly, two of the incorporating parties, Herbert Mulholland and Henry Garfield Driskell, were involved as officers with The Cement Building Block Company, while Albert Townshend Hawley had been one of the principals in forming both the Block Company as well as the Boniveen. Mulholland and Driskell also had suites in the new building. In addition, Mulholland wrote a laudatory article about concrete in the March 1905 issue of the *Canadian Thresherman*. In short – these gentlemen were “all in” for concrete, and thus it seems certain that the smooth-face and rock-face blocks which form this building were a product of The Cement Building Block Company. The blocks at the still-surviving Boniveen measure 32x12x9 inches in size, and are still in fair condition despite the spalling taking place on some of the window lintels. This is likely the oldest concrete block building in Winnipeg.



Boniveen Block (left and above - detail of side wall), 185 Spence Street, Winnipeg, built in 1905. The building still stands, although heavily remodelled externally over the past five years.



**The ONLY Make**

where One Lever Operates the Entire Machine removing cores and opening sides ready for removal of stone.

The Machine on which you can make blocks of the following dimension:

from 4½ to 9 inches high  
 " 1 " 32 " long  
 " 6 " 16 " wide

Also Chimney Blocks and other classes of Special Work.

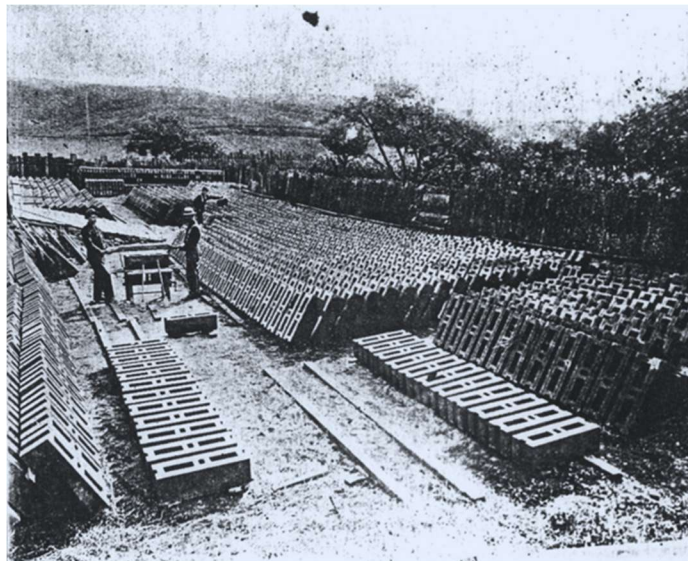
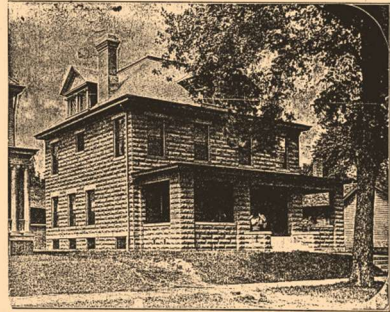
Will be pleased to have you visit our Works where an actual working test of machine can be made, a number of them being in operation there manufacturing blocks for the Winnipeg trade.

**Canadian Petrified Brick....  
 .....and Stone Co., Ltd.**

OFFICE  
 917-919 Union Bank Bldg., Winnipeg, Man.

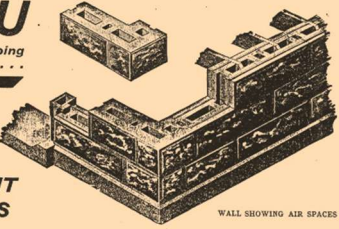
WATERLOO AUTOMATIC

Above and right: Local advertisements from the early 1900s for cement block products from the Canadian Petrified Brick and Stone Co., Ltd and The Cement Building Block Co., Ltd., both situated in Winnipeg.

**YOU**  
 Who are going to Build . . . . .

You should look into the advantages of



**CEMENT BLOCKS**

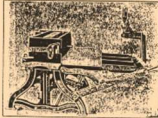
WALL SHOWING AIR SPACES

WHY? Because they make the warmest, most substantial, finest appearing and the cheapest house. And the

**NORMANDIN MACHINE**

makes the best blocks at the least cost. It is adjustable to TEN different standard sizes, too, and has all the attachments for making everything necessary to a wall.

Write us and let us tell you all about it. We'll be glad to answer you.



NORMANDIN MACHINE

**The Cement Building Block Co., Ltd.**

PRUDEN & SANDELL, 2 Pender Bldg., Vancouver, B.C.      67 Merchants Bank Bldg. WINNIPEG, Man.      J. A. HUNTER, 42 Yonge St. Arcade, Toronto, Ont.

Mention The Canadian Thriftman.

Lower Left: A call for investors for The Manitoba Cement Company, which hoped to locate in Morden, but ultimately was not successful in its venture, included an image showing mass concrete-block manufacture, presumably from an Ontario location. Given the claims from the Cement Building Block Company for production of 750 concrete blocks per day, a similar scene was likely possible at that yard in Winnipeg.

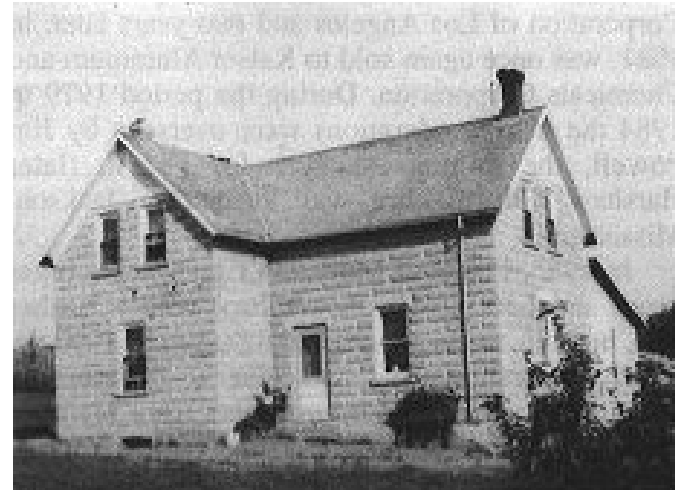
By the spring of 1904, The Cement Block Company was beginning to face stiff competition from other block machine vendors, as well as block manufacturing outfits. Of course, each claimed to have a better product than the next company. With block machines of various makes on the market, small-town builders and lumber yards began to branch out into masonry construction. It is notable that none of these concrete blocks were of a standard measurement. One has seen the large size of the blocks at the Boniveen Block, and there was considerable variance in sizes, as well as designs, given that moulds differed greatly, while colours were also available. But one feature came to be commonplace – the outer face of most blocks typically had a stone-chiseled appearance, obviously to give the impression in the final building of a much more expensive exterior material.

One facet of the province's concrete block construction history that likely will never be known is what type of cement was used in any of the mixes – that is Portland or natural. It is assumed that most projects would have featured imported Portland cement, with that material only available from local production after 1913 (via the Canada Cement plant in Winnipeg). Those places around Miami and Carman, where natural cement was "mined" (specifically at Arnold and Babcock) and manufactured in good quantities will surely have had concrete block buildings truly made with all-Manitoba materials – that is, the cement, the gravel, the sand and the water. Only the moulds into which the concrete would have been poured would have come from elsewhere.

In 1904-1905, a concrete block elementary school was built at Foxwarren, north of Brandon, and the next few years saw scores of other public buildings – town halls, post offices, churches – put up using concrete blocks throughout Manitoba. After 1905, the concrete-block industry was emerging from its brief pioneering phase. A four-acre site in Elmwood (in Winnipeg) housed the Canadian Petrified Brick and Stone Company, which claimed to be the largest in Canada. That firm had Waterloo automatic concrete block machines and turned out a variety of other concrete products. There were, of course, many small firms that acquired one block machine, and

proceeded to build structures in their area. One of these was the Arden Cement Block and Building Company, formed at that community early in 1904. According to an article in the local history, *Legacies of Lansdowne* (1984), the block machine used at Arden was still in use as late as the 1950s.

Though the concrete block gained some legitimacy as a building material for higher-end projects, through its use by architects such as Samuel Hooper and Herbert Rugh, the material and technology remained a standby mostly of small-scale builders and contractors, and was extremely popular in rural and small urban centres. It is hard to estimate how many concrete block buildings were put up between 1905 and 1920, the heyday of the technology, but even a cursory review of local histories shows scores of urban and rural houses, hotels and small commercial buildings, and various public buildings that were clearly made of concrete blocks. It cannot be an exaggeration to suggest that many hundreds of these buildings were put up over two decades or so, with many still standing, straight and sturdy to this day – a tribute to the materials and the builders.



These images only suggest the variety of concrete-block buildings in Manitoba: Top left: Tenby School; Middle-left: Baptist Church, Emerson. (both Courtesy Manitoba Historic Resources Branch); Below left: Arden Town Hall. (Courtesy Manitoba Historical Society); Top right: Farmhouse at Nelson, North Norfolk. (Courtesy Manitoba Historical Society); and Lower right: Perce Mustard Farmhouse, Miami area, made from natural cement mined at Arnold. (Courtesy *Miami and R.M of Thompson Chronicles*)

One final note for this section concerns two buildings in the Town of Russell and area that occasionally are noted as being early—even the first—concrete block buildings in Manitoba. This story begins in August of 1890, when the *Manitoba Free Press* enthusiastically reported that: “Concrete houses are becoming a fashionable rage at Russell and vicinity. There is a good supply of the necessary materials in the locality: such houses are cheaper to build and in addition, present a better appearance than frame buildings. Mr. E.A. Struthers, manager of Dr. Barnardo’s Home, has had plans prepared for a handsome dwelling, which is to be built at Cherry Hill [NW 28:20:28W], of concrete with boulder stone decorations.” And then in 1893 the *Minnedosa Tribune* reported that Charles Arkholl Boulton began building what became known as “The Manor” at 322 Memorial Avenue South (then Mountain Avenue), in the south end of Russell. This was begun in the summer of 1893, with Boulton following what he called “the Russian plan of building,” with the article referring to the building material as “Russian brick,” whose exotic description suggested it might be concrete. About 500 blocks were made each day, and some 12,000 blocks were made in this fashion. By the autumn of 1893, the walls of a two-storey house sat atop a surface stone foundation. It was planned to complete this large home with a roof and interior fittings during 1894.

Over the years both of these claims have come under scrutiny, at least for their claims of concrete or concrete-block construction. The easier to dispel is the Boulton reference. Apparently (according to the *Minnedosa Tribune*), Senator Boulton had made contact with two Russian immigrants from Odessa who were building a nearby house of sun-dried brick. Boulton used a clay bed on his property, 18’x 50’ in size, from which he extracted the materials. The “bricks” were made in a mould 17 inches long, 8 inches wide and six inches deep—this being about the size of a present-day concrete blocks than the usual and much smaller brick dimensions. This fact undoubtedly suggested that the building was of concrete-block construction. Additionally, in 1912 the “Russian” bricks, which likely had seriously deteriorated over 21 years, were removed and replaced with more conventional concrete blocks. This presumably added to

the confusion, with many observing the building after 1912, aware of the 1893 construction date, and assuming the blocks were original. All of which is not to say that the Boulton House is not interesting—significant even, given its connection to Boulton—only that it was not originally of concrete-block construction.

As regards the Cherry Hill House of Mr. Struthers, the claims for concrete are murky. A 1966 photograph reviewed in 1987 by staff of the province’s Historic Resources Branch showed what was purported to be the house with a concrete block first floor, no stone details, and a wooden second storey and roof — features that did not match the 1890 descriptions of the building, and suggests later reconstruction, perhaps with the addition of concrete block at a later date, as was the case with the Boulton House. And so it likely will always remain unclear whether the Struthers House originally featured concrete – poured or of block.

# Chronology

This report has been organized according to four themes that defined the early use and production of cement and concrete in Manitoba. And while developments in each theme have been presented chronologically, an overall chronology of events and activities is useful, putting this interesting early aspect of our construction heritage in a clearer picture.

**1879** – The Winnipeg Pottery and Cement Tile Works is inaugurated by an American, J.H. Thorpe, and is later taken over by Elijah Griffith. By the autumn of 1881, Griffith’s operation is importing 600 cubic feet of Portland cement per week, and producing a large amount of artificial stone for building and pavement use.

**1882** – The Manitoba House Building and Portland Stone Manufacturing Company Limited opens for business in Winnipeg’s Pont Douglas area. This firm, commonly called the Stone company, was formed by a group of businessmen headed by Honourable Gilbert McMicken and William Redford Mulock.

**1899** – The first poured concrete building in Manitoba is put up in Birtle. The Patterson Block, situated on the northeast corner of Main Street and Eighth in Birtle is constructed for Thomas F. Patterson.

**1900** – The Manitoba Cement Company is incorporated by a special or private act of the Manitoba Legislature in June. This project is meant to work a natural out-cropping of cement about 16 miles south of Morden, and is touted as the first made-in-Manitoba cement operation. By 1904, however, it is clear that the project will not be realized, and what would have been a spectacular operation never comes to fruition.

**1901** – A group of investors, mostly Americans, incorporates the Manitoba Union Mining Company Limited, to exploit a natural cement mine which they begin to develop at Arnold, just west of Miami. In April 1901, the plant ships its first carload of cement, followed by four more two months later. It supposedly operated until 1908, though Manitoba Union Mining was still making returns to the Provincial Secretary as late as the end of 1910.

**1903** – The first commercial concrete-block operation came early in 1903 when Winnipeg stonemason-contractor Thomas Sharpe undertook to produce stone by the “poured Process,” as noted in several articles on the subject in the *Winnipeg Tribune* during 1903. Sharpe had seen the then-new process in Chicago, and obtained the Canadian patent rights. As a showcase for his products, Sharpe commissioned the construction of the three-storey Afton Apartments in Winnipeg that year.

**1903** – A rival to Sharpe’s, the Cement Building Block Company, also began production in 1903, with their operation at Bird’s Hill, northeast of Winnipeg.

**1904** – A concrete block elementary school was built at Foxwarren, north of Brandon, and the next few years saw scores of other public buildings—town halls, post offices, churches—put up using concrete blocks throughout Manitoba.

**1905** – The Cement Building Block Company’s keynote building was a Winnipeg apartment block. Called the Boniveen Block, at 185 Spence Street, this structure was designed by architect Herbert Bell Rugh. It is presumed to be the oldest surviving concrete block building in Winnipeg.

**1906** – The first use of reinforcing bars, which is to become standard practice for concrete construction, is seen in Winnipeg at a factory for the Bemis Brothers Bag Company. This six-storey factory is designed by architect W.H. Lester.

**1907** – Babcock Cement Works (also sometimes called the Commercial Cement Company) begins manufacturing natural cement at a site located west of Roseisle and Carman. It operates from 1907 to 1924, with some sources suggesting 1928.

**1914** – The Canada Cement plant in Winnipeg (whose development began in 1911) ships its first carload of Portland cement, with that action marking a major turning point in Manitoba's cement manufacturing industry – as a major supplier of the material.