

MANITOBA'S BRICK INDUSTRY

Processes and Technologies

As noted above, the Leary Brick Factory is unique in Manitoba – the last of nearly 200 brick-making operations that dotted the Manitoba landscape, or hunched in urban industrial areas. In order to more clearly appreciate just how significant Learys is, it is important to establish the context in which it operated – to see what else was out there, and what else was going on.

As was also noted above, this project is greatly indebted to the work done to develop *Manitoba Brick: A History of Brick Manufacturing in Manitoba, 1860-1990*, by David Butterfield. That overview of Manitoba's brick industry was based on comprehensive and detailed brick-factory inventories carried out in 2010 by architectural historian Randy Rostecki for the province's Historic Resources Branch, with supplementary inventory information developed in 1992 by Hugh Henry for the Manitoba Museum. That report is available on-line via the Heritage Manitoba Website: heritagemanitoba.ca.

Mr. Butterfield's analysis and overview is focused on four distinct periods of activity—Pioneer (1860-1880), Establishment (1881-1896), Consolidation (1897-1917) and Decline (1918-1990). The Leary site is actually featured in two of these periods, first in the Consolidation era, when the factory was set up by George Leary, and then in the Decline era, when son William resumed operations for several years.

Given that this current project is focused on the Leary site as an artifact of technology, the following summary of the Butterfield study will focus on the evolution of that important aspect of brick production in Manitoba – thus processes, technologies, machinery and buildings. Issues of production, brick quality, finances, labour, etc., are featured in the next section.

It is presumed that the first bricks to be fired in a kiln in Manitoba were developed by Charles Land, around 1860. Land apparently made 50,000 bricks in the “Yorkshire fashion” (likely meaning in a simple clamp kiln; see image opposite) at a site on Portage Avenue (now the location of the University of Winnipeg's Richardson College for the Environment). It is reported that Mr. Land sold the bricks for use in chimney construction, with the understanding that the bricks were too rough to be used in a larger structural situation – like a whole building.



Historic image of an English clamp kiln. A clamp kiln was a temporary structure, essentially a pile of stacked fresh bricks, angled upwards for stability. Firing from sources at the base of the pile would “burn” the bricks, with those within most likely to attain the quality necessary for sale. Outer-layer bricks were typically re-used when the clamp was rebuilt for the next burn. It is thought that at least a fifth of bricks in a clamp kiln had to be re-fired to meet acceptable standards.

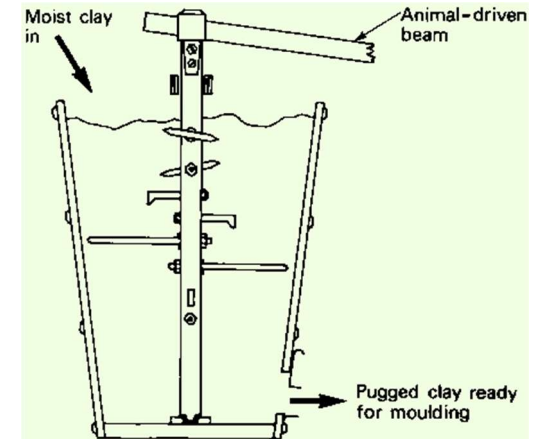
While Manitoba's first bricks were unsightly, it did not take long for local brick-makers to adopt much more sophisticated processes and technologies, reflective of the prevailing industrial standards in eastern North America and the United Kingdom, from whence nearly all of the settlers arriving the 1870s and 1880s originated.

Brick-making activities (forming and firing) at this time followed a time-worn pattern. Brickyards were naturally located at the site of acceptable clay deposits, with only certain kinds of clay suitable for brick production. This kind of clay is identified as friable – meaning a type of clay that has a notable sand content, making it slightly more crumbly than normal clay, and when fired in a kiln at high temperatures capable of being transformed into a rock-hard block. Many brickyards were also situated near a source of water, with that element an essential component of brick production. Throughout the 19th century, brick making certainly evolved, but for many operators there was a familiar routine and limited range of technologies that defined the industry.

It is important to note here that Manitoba's climate imposed severe restrictions on brick-making activity. In some climates, brick making could proceed as a year-long activity, but in Manitoba, the cold winter months and deep snow cover meant that the first step of the process—the extraction of clay—could only be started in the spring, often in April, as the frost left the ground. The season then would usually proceed until October, when once again the onset of winter shut things down. During the course of this seven-month season, many brickyards were still able to burn three to four kilns, and if they had multiple kilns to reach major productive capacity of millions of bricks a season. More typically, a single-kiln operation would generate a half million bricks a season, via three firings.

With the chosen clay bed secured, machinery purchased, and personnel identified, the process unfolded as a steady routine. The first order of business was to dig out the clay, which was often done by hand (with shovels of course) and then to move it to the second stage, where the clay was mixed with a small amount of water and perhaps some sand in a machine called a pug mill. This machine was ubiquitous on any brick-making site; without it, the labour involved in transforming raw clay into the malleable consistency for brick forming would have undone any profits sought in the operation.

Once the processed clay was determined to have the correct consistency (according to the oversight of a temperer), it was moved by wheelbarrow to a moulding bench, where the brick-maker, often the main skilled worker on site, undertook to press the clay into wooden moulds,



A pug mill (shown here in a sectional drawing) was a wooden tub with horizontal knives or blades attached to a revolving central shaft and activated by a horse harnessed to an attached beam. The knives cut and kneaded the materials as they were thrown in at the top and forced out at the bottom as a homogenous paste.



Top Left: An image of British re-enactors at an old brickyard shows the brick-maker at his moulding bench, taking clay from the heap provided to him by the temperer, the person responsible for mixing the clay to its required consistency.

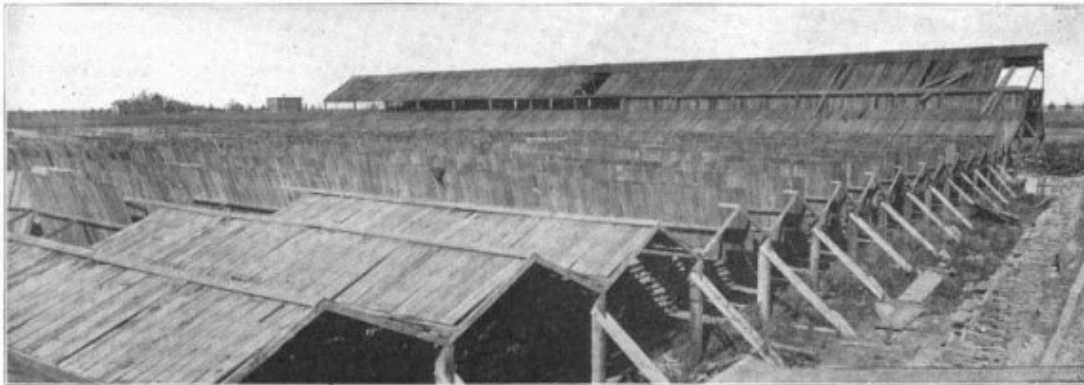
Below: An old single-brick mould, the type used throughout the 19th century for the production of bricks at small yards.



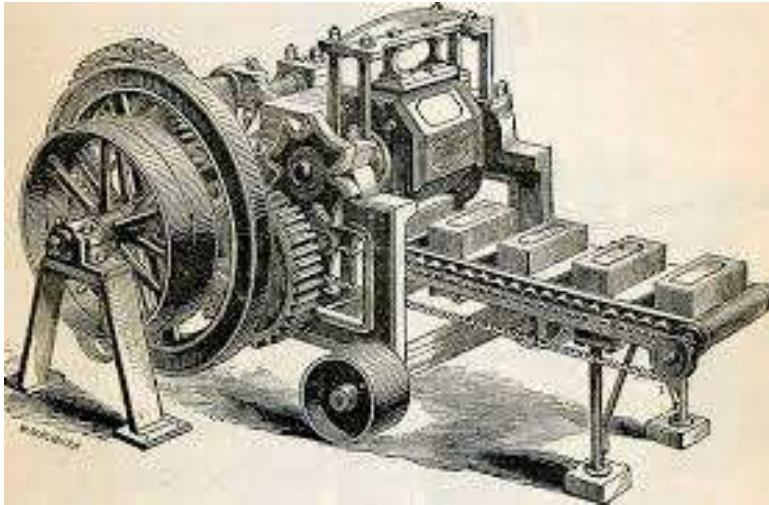
and as quickly as possible to set them onto a nearby table for transport to drying racks.

It did not take long, during the course of the Industrial Revolution that was at its height ca. 1850, for the labour (and time) involved in brick moulding to be eliminated by brick-pressing machines. In Manitoba, nearly every operation after 1880 had some kind of mechanical brick-press on site, perhaps several for a larger operation. These machines were typically situated in some kind of enclosure – either a simple roofed structure or in an actual building.

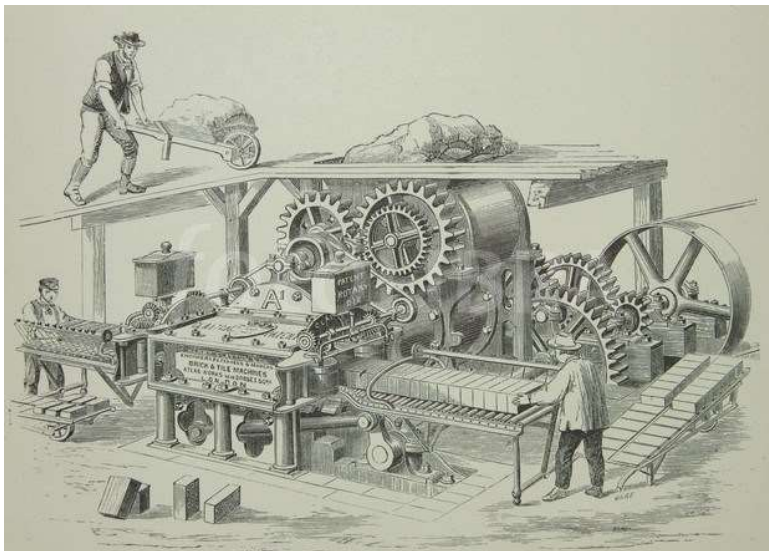
A key step in the brick-making process involved drying the formed bricks. It was this activity that took up enormous space on a brickyard site, with racks and racks of bricks set out to dry on rough wooden forms – often for several weeks. Brickyard operators usually devised covers for the drying sheds to protect the raw (or “green”) bricks from rain.



Left: An impressive collection of brick-drying sheds at East Grand Forks, Minnesota, ca. 1900. The rudimentary nature of the structures is apparent here.



Top: A small mechanical brick machine, patented in 1880 by Henry Clayton of London, was a wire-cut brick extruding machine. This kind of small and compact machine would have been commonplace on many Manitoba brickyards by the 1890s.

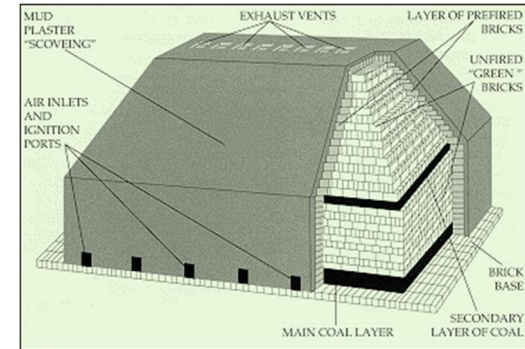


Below: The enormously complex brick-making invention, also from Henry Clayton, of the Atlas Works, London, was used by the South Eastern Railway Company, which erected a set of these brick-making machines adjoining their station at Folkestone for the manufacture of bricks for use by the company. An average of 25,000 bricks were produced daily with the attention of two men and four boys. (From: The Mechanics' Magazine: Journal of Engineering, Agricultural Machinery, Manufactures, and Shipbuilding, 1859.)

Once the bricks had dried sufficiently, usually after several weeks, they were moved to the final step in the process – the kiln, where bricks were fired over high heat. For many brickyards, this was the one highly visible sign of operational activity, large and substantial enough to warrant public attention. Two rudimentary kiln approaches would have been common in Manitoba even up to the turn of the 20th century – the clamp kiln for the earliest or more rudimentary operations (see above), and the scove kiln for many small operations.



Archival view of an English scove kiln in operation, ca. 1900. The scove kiln was a permanent structure loaded with green bricks and then fired via small doors at the base. This type of kiln produced much better results compared with the clamp kiln. In both cases several thousands of brick could be burned at a time, over several weeks of operation for a single “burn.”



A schematic view of a scove kiln. The “green” bricks were arranged with a series of connecting spaces or flues that allowed the heat to circulate upwards from fires lit at the bottom. The monolithic structure would have small fire-holes at the base to allow for the heat sources, with openings at the top to encourage the up-draught required for effective burning, and also to release steam and gases. Such a kiln could contain as many as 80,000 bricks at full capacity. Raw bricks were arranged in the kiln so as to leave narrow gaps in between each brick to ensure an even burn.

Even after several weeks of drying, there was still 10-15% water content in the green bricks and as a kiln was slowly heated, from about 150°C to 600°C, the clay lost its remaining water content, and a white vapour or steam (called water smoke) would be emitted from the top of the kiln. Once the vapour and gases had cleared, more fuel was added to increase the intensity of heat within the kiln. As the kiln temperature started to rise over 600°C, chemical changes began to occur in the clay. Temperatures of 900°C and above caused vitrification to occur, in which small quantities of glass-like material within the clay began to form, causing all other elements to fuse together. It is after the point of vitrification that the brick would be at its hardest and most resistant, ideal for its purpose as a construction material.

The intense fires in a kiln had to be maintained around the clock for about a week. The knowledge and experience of the brick master dictated when the fire-holes of the kiln would be bricked over to ensure a solid seal, with the heat allowed to slowly dissipate for another week or more. It might take an additional week for the burned bricks to be sufficiently cooled to allow for their removal. For clamp kilns it was at this stage that the entire kiln was dismantled and brick removed and sorted for quality.

The physical property of heat movement in a clamp or scove kiln, in which the heat radiated up from a ground-level source, led to these kilns being defined as up-draught kilns. Clamp kilns were notorious for iffy results, and the inability to control the temperature and wind drafts often resulted in wildly variable production: bricks at the centre of a kiln tended to be melted, whereas bricks at the edges were often left unburned. Updraught kilns were also wasteful of fuel, because a large proportion of the energy produced was simply vented into the sky.

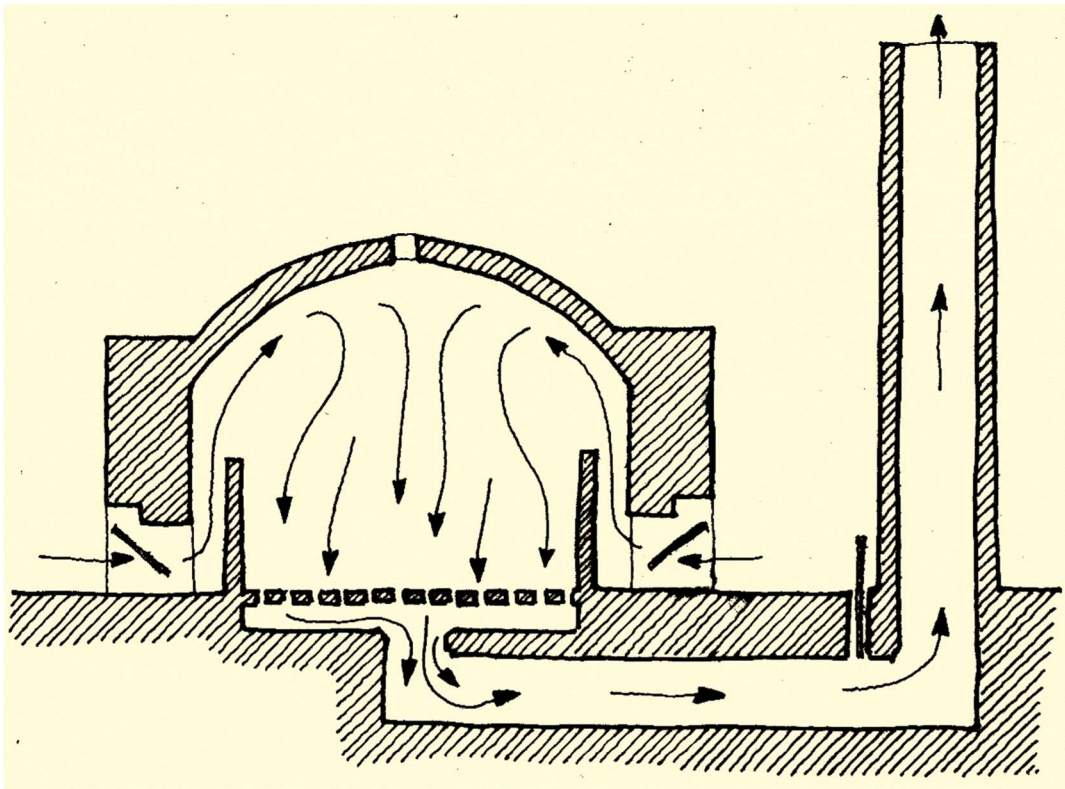
As with the brick-moulding process, the burning stage was subject to ongoing attention and invention during the latter half of the 19th century. And so, over the course of about 30 years, three distinct kiln technologies were developed and perfected: the beehive kiln, the tunnel kiln and the continuous kiln. The beehive and tunnel types were employed on nearly all of Manitoba's larger operations.

These three kiln types were developed on the down-draught approach, in which heat was directed upwards along the outer edges of the kiln, and then forced down, and out, via chimneys a slight distance from the kilns – this process ensured more even burning, and much less wastage compared with clamp and scove kilns.



A view of multiple beehive kilns and chimneys at the brick factory at Clay City, Washington, 1910. Combining a number of beehive kilns and chimneys was a common way to develop an especially large clay or shale deposit at this period of the North American brick-making industry.

The distinctive shape of a beehive kiln was based on fires being produced outside of the kiln and carried in through flues. The kiln consisted of a single domed chamber in which the unfired bricks were placed, and with curved walls at whose base a number of fire-mouths (or fire-boxes) were located, where wood or coal was burned. Beehive kilns were usually reinforced with exterior steel bands to keep the brickwork from deteriorating through periodic cooling and heating. The kiln's design and physical properties of heat movement ensured that combustion occurred near the top, or crown, of the kiln, and was drawn downwards through holes in the floor, which via suction led to flues connected with an independent chimney. These down-draught kilns sometimes had short chimneys built in connection with the fire-mouths, and several kilns could be joined together in a row or group having their bottom flues connected with the same tall chimney.



A cross-section view of a typical beehive kiln operation. In addition to providing a screen between the flame and the bricks, the firebox walls channeled heat towards the top of the kiln. By placing the flues beneath the flooring and connecting them to a nearby stack, heat would be drawn down through the set bricks. Upon completion of firing, the kiln would be cooled for two to three days. Following this, the temporary doors to the kilns were dismantled and the bricks transferred to a storage lot.

An innovation on the down-draught concept saw many kilns built as vaulted brick tunnels. These kilns also had external heat sources, along the kiln's extent, and a slightly removed chimney that drew the heat upwards and over the raw bricks, ensuring a more even burn. Like the beehive kiln, which required encircling iron bands to maintain stability, with the ongoing heating and cooling of the structure, tunnel kilns were invariably built with distinguishing brick or metal buttresses along the outside walls, with connecting beams or iron chains along the top that kept the whole structure stable. In some cases the heating ports were actually devised as small chimneys along the length of the kiln providing the necessary heating along its length.

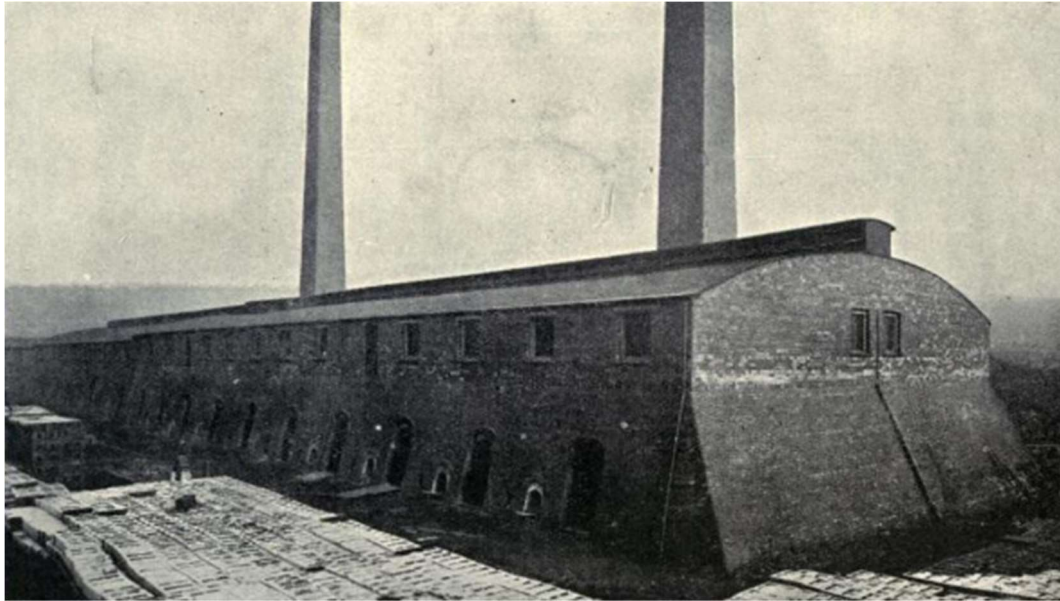
The method of using one tall chimney to work a group of down-draught kilns, and especially the example of the basic tunnel kiln, led to the invention of the continuous kiln, the earliest form of which was developed by Friedrich Hoffman, in 1858. The inventive principle of the continuous kiln was the utilization of the "waste heat" from one section of a kiln in heating up another section, and thus using lesser heat for other purposes, in particular for drying. At the same time, cooler air that was drawn in when bricks were unloaded, travelled in the opposite direction and cooled down the already baked bricks in the preceding rooms. It has been noted that the fire in such a kiln was "chased" around the building in a never-ending process that was extremely energy-efficient. It has also been observed that the principle of the Hoffman kiln anticipated twentieth century mass production, but instead of the product being brought to the process, as happened on a Ford automobile assembly line, the process was brought to the product.

The original Hoffman kiln was elliptical in plan, but that complex form was more often adapted to a basic rectangular form, with chambers set side by side in two parallel lines. These chambers were connected at the ends by other kilns so as to make a complete circuit. Continuous kilns produced a more evenly fired product than the intermittent kilns, and at a much-reduced cost for fuel. And they were enormous, holding up to 300,000 bricks for a single firing. Depending on the size of the kiln, it could take between one and six weeks for the "fire" to complete a full circle. These kinds of kilns were also only ever developed by the largest and most sophisticated brick-making operations, and mostly only in the twentieth century. There were none in Manitoba – the largest operations here used tunnel kilns.

It is important to note at this point that besides clay there was another raw material that came into occasional use in brick factories in the early 20th century – shale. Shale is actually a version of clay, but also containing tiny fragments of quartz and calcite. Shale's great benefit



Example of a tunnel kiln at the Ochiltree-Burnfoot Tile Works in Scotland. The distinctive barrel vault and metal support structure are visible here. The large arched door would have been bricked in when a burn was underway. (Scottish Brick History)



Example of a continuous Hoffman kiln, only used at sites with an industrial capacity. The chambers of this kind of kiln were filled with bricks (some 25,000 of them at a time) and fired one after the other. The heat in one chamber was not only used to bake the bricks inside, but also to preheat the still-to-be-fired bricks in succeeding chambers. These kinds of operations might employ 100 people and produce more than 12 million bricks a year.

over clay is that it does not need to be dried out to same extent, although there is often some pre-production drying involved. This means that the huge expanses of a typical clay brickyard devoted to drying racks were not required. On the other hand, the typical shale-brick production, which was called dry-press (versus wet-press of clay-brick production), required more sophisticated grinding and pressing technologies than were involved in clay production. At the same time, it was often noted that a dry-pressed brick was of superior quality to typical clay bricks, being harder and also with sharper, crisper edges.

This distinction is significant for the current project, because the Leary site was one of the few in Manitoba that was able to exploit an adjacent shale bed. Other nearby operations that used shale for their bricks were at La Riviere and Carman, which are presented in a following section, Manitoba's Brick Industry: Key Brick Operations, 1897-1917.

MANITOBA'S BRICK INDUSTRY

Production, Labour and Finances

Besides the technological aspects that defined brick production in Manitoba between 1860 and 1914 in Manitoba, there were several other technical qualities that attended the development of the brick industry over these 54 years. These included claims for brick production (via per-day brick pressing and then kiln output), brick quality, labour and skill-sets, brick prices and even sometimes marketing and sales. It is notable that various costs and capitalization values (to set up a yard) are rarely noted, except in rare cases, or where a spectacular operational failure made the news.

Once again it is Mr. Butterfield's *Manitoba Brick: A History of Brick Manufacturing in Manitoba, 1860-1990* that provides key highlights about these important aspects Manitoba's brick-making history. Selected passages featured here will help place the Leary operation into this slightly different context, and also help where it will be necessary to explore this kind of information to address absent information for the Leary operation.

By 1880 Manitoba's brick-making industry had evolved from modest, rudimentary production, with bricks often only suitable for chimney construction, to yards that were firing kilns of 100,000 bricks at a time, to be used in the kind of impressive new masonry buildings rising in Winnipeg and a few of the province's other communities, themselves just recently established.

By this date, the industry had gradually moved from a slightly ragtag collection of one-season operations to the kind of professional activity that a newly energized community, and province, could promote with gusto – and with real, impressive numbers. Newspaper accounts of the day were happy to report, for example, that Mr. Russell in Morris (in June of 1875) was expected to burn a kiln of 100,000 bricks; and that in 1879, in Winnipeg's Point Douglas area, the John E. Mould yard was turning out 18,000 bricks per day (from his press); and that by early June the same firm was preparing to burn 200,000 bricks.

There is also a sense of the sizes of operations, of the kind of current brick-making technologies being employed, and hints of skill-sets required for these kinds of activities. At the Mould yard in Point Douglas we are advised that in 1879 there were 20 employees for the season. Accounts of the James McDonald yard in Point Douglas provided even more details –

by mid-June of 1880 a new brick machine was operating at the yard, obtained from E. & C. Gurney of Hamilton, Ontario, which was said to be capable of producing 25-30,000 bricks per day. McDonald also had three machines, each of which produced 10-12,000 bricks per day. At this time, the McDonald operation employed 30 workers. The Portage Road Brick Yards had by 1880 four brick machines, using 20 to 25 employees and three or four horses.

And at least in one instance we get a sense of the level of skills that were new being invested in all of this work – with arrival in Winnipeg in 1877 of Mr. Foxley, a brick-maker in long standing, with 25 years' experience. This slightly sketchy information is suggestive of the technical nature of the industry in Manitoba at this time. It is clear that there are various technologies at work – hand-made bricks turned out in wooden moulds, horse-powered pug mills, hand or steam-powered pressing and moulding machines, and presumably both clamp and scove kilns.



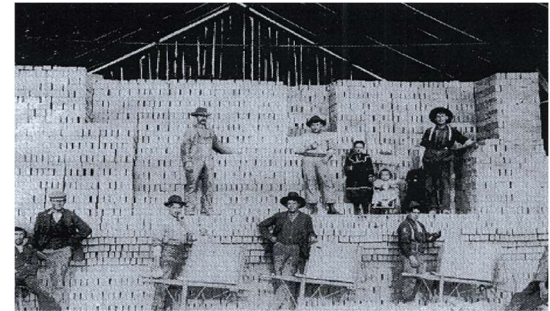
A view of the clay pits at the Rapid City Brickyard of R.D. Hales, ca. 1905. The clay deposit was obviously a major one. In the middle background can be seen the many drying racks and behind those the scove kiln and gable-roofed building housing the brick presses. (*Our Past for the Future*, p. 14)

We are also getting a sense of the business end of the industry – with issues of brick quality being identified, and prices being established. There are several observations about preferred brick colour – the Emerson yard of Peter Phillippe, of 1878, was producing fair cream-coloured brick, while the Manitoba Brick and Pottery Company, in August of 1873, according to the *Free Press*, had fired brick that was “hard, well-shaped and of a beautiful and uniform colour,” apparently similar to the famous cream-coloured brick of Milwaukee, Wisconsin.

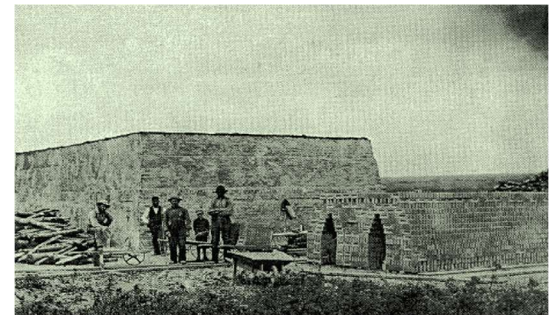
An aside here addresses the issue of brick colour, a common question regarding brick-making. In Manitoba, there are ongoing references to a limited variety of brick colours offered: yellow (or buff), white, pink, salmon and red. The colour of bricks depended upon three variable factors: the composition of the clay (or shale), the intensity of the kiln heat, and the amount of air they were exposed to during burning. The presence of iron oxide in different proportions in the clay was responsible for the various shades of red in bricks produced in many parts of the province. Under-burning and exposure to air also changed the colour of the bricks, especially those burned in clamps.

In terms of bricks prices, the Disbrowe-Foxley operation in Winnipeg was noted in 1877 newspapers as selling “all round brick” for \$10.00 per thousand; veneer brick for \$12.00; and pressed brick, “an extra quality expressly for fronts” at \$15.00 per thousand. Mr. Russell’s yard at Morris was selling bricks of a “superior quality” for \$10.00 per thousand in the summer of 1875. It is important to keep in mind that a typical chimney would have required about 500 bricks, and one of the larger brick commercial or public buildings of the day might take half a million bricks in its wall construction.

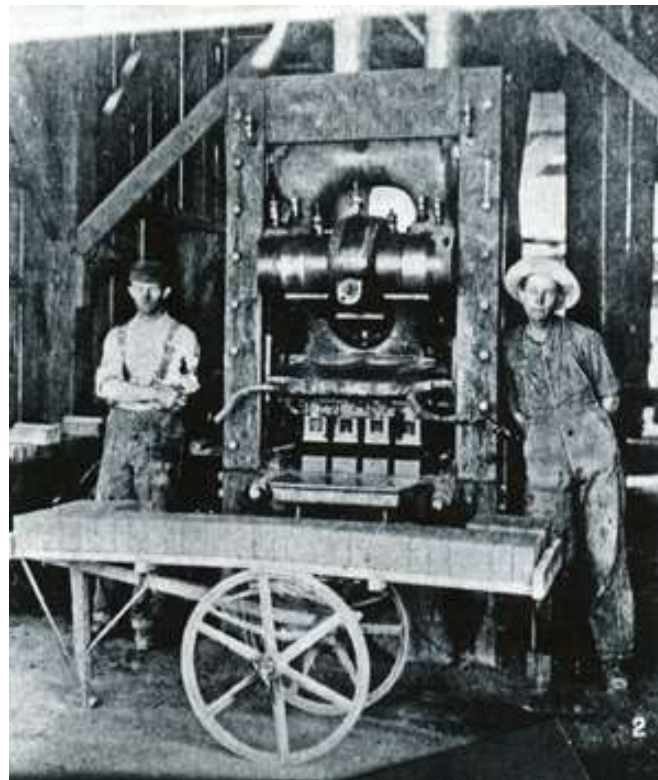
An accounting from Alexander Begg, in his *Ten Years in Winnipeg*, from 1879, contains important references to brick quantities and values used in the construction of the new Winnipeg City Hall (begun in 1876): a total of 480,487 bricks were required, at cost of \$30 per 1,000, and so valued at \$14,415.00. The price here is notable, when compared with known local values – and so suggests that these bricks were presumably from the United States, with quality and freight rates built into the much higher cost.



Workers at the Longbottom’s Somerset yard showing off the thousands of burned bricks removed from the kiln, ca. 1905. (*Reflections-Reflets-Somerset*, p. 163)



A view of the large scove kiln at Rapid City, ca. 1905. (*Our Past for the Future*, p. 14)



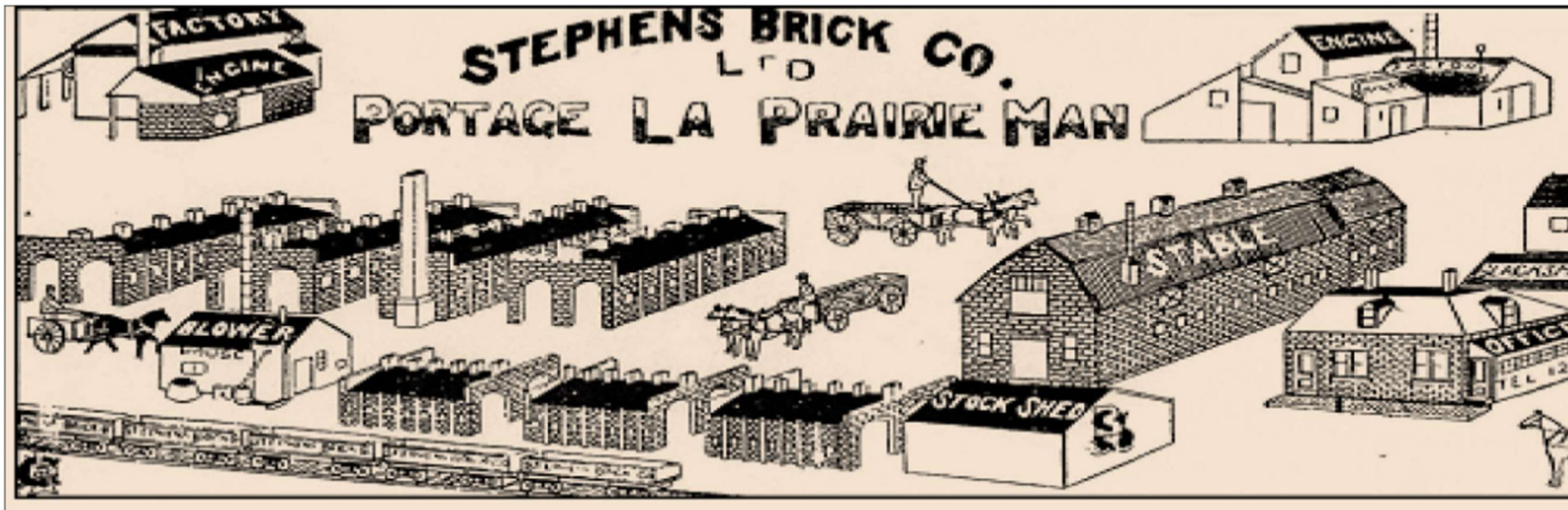
These three images suggest some of the aspects of a typical early 20th-century brickyard workforce – of the typical gang size, work dress, and tools and machinery. Top left we see the crew required for a small brick operation in England, ca. 1920. Lower left we see two workers standing by the brick press they likely operated as a team – this at Gabriola Island in British Columbia. And above right we see a worker at an Ohio yard, also ca. 1920, tending to the firebox of a beehive kiln. We can also imagine the nature of the work – hard, long days, and while not dangerous, certainly strenuous.

The situation is much-changed by 1896, and Mr. Butterfield's account of the state of the industry at that time is instructive.

The 15 years of activity from 1881 to 1896 saw Manitoba's brick-making activity gain new heights. With the arrival of the Canadian Pacific Railway main line in 1881, and its extension across the province by the end of 1883, followed by the explosion of growth in Winnipeg and throughout the southern stretches of the province, the requirement for brick was strong, and the response for Manitoba brick-makers was up to the task.

The great real estate and building boom in Winnipeg, through 1881 and much of 1882, enticed many brick-makers to set up shop in the city and in nearby communities. During these two fevered years seven yards were operating in Winnipeg, 11 in St. Boniface and 10 in small urban and rural situations. Many of these were gone by 1884, including Dominion City Brick Company, the most spectacular failure of this period – silent by August of 1883, having wiped out the investment of \$150,000 by a consortium of Nova Scotia businessmen. Using the Bank of Canada Inflation Calculator (and interpolating from options), this is the equivalent in 2018 to a loss of about \$4 million.

Drawing of Harry Stephens's Brickyard, Portage la Prairie, ca. 1909. The image shows four large tunnel kilns, three smaller tunnel kilns, a large brick stable, brick office building and engine and factory buildings.



There does not seem to have been a major advance in processes, equipment or kiln technology during these 15 years of brick-making activity. We are hearing the same kinds of production numbers as before, with for example 20,000 per-day brick machine production, brick kilns with 200,000 capacity for one burn (likely of several linked tunnel kilns), and seasonal activity of a million bricks at many yards. It is presumed that clamp and scove kilns were still being used, with clamps likely in remote or short-lived situations. It is notable that the Winnipeg yard of David Saul appears to have had five scove kilns lined up in a row, with concomitant production levels (at least for the few years it was in operation). We are hearing of the same kind of personnel requirements noted in the pioneer era – often of 20-50 men and of course of many horses to power some of the machines and to move the many wagons of material and product. But it is also clear that the industry was getting more sophisticated in terms of labour attentions – with several farm-site operations including boarding houses, ensuring on-site accommodation for a full season, typically from April to October.

The price lists that were established in the 1870s and early 1880s were sustained into this period—\$10 per thousand for common brick and \$12 per thousand for veneer brick. And while there was no promotion of any brick operation's value or profit, it is now possible with many longer-lasting operations to get a sense of the wealth that might be generated by a well-run yard over many years. The fairly common million-brick-per-year value, noted for several yards and over many years, could be tabulated as \$12,000 annually (assuming \$12 per thousand). And even with labour and operating costs subtracted, this kind of output might have netted a canny operator more than \$8,000 (2018 value of nearly \$75,000). Ten years of such output would have made an operator a wealthy man.

The output from Manitoba yards in the later years of this period was impressive – millions and millions of bricks. And the new availability of rail connections ensured that all producers could get their product to nearly any place in the province, and even to points further west. But in fact there was not nearly enough Manitoba-made brick to satisfy the construction industry's demand. And so the major import of brick from the United States, and the inherent competition that engendered, continued apace, with train-loads of brick coming north and then west through these years. Some Manitoba brickyards fought back, offering many new brick options (glazed, base, octagon, ornamental) and colours (yellow, buff, white, grey, red, pink).

BRICKS
FOR SALE.
THOS. BOOKER,
WAWANESA, MAN.
Contractor, & Bricklayer
Has constantly on hand a supply of
HARD PRESSED BRICKS
which he will sell in large or small quantities
at the lowest prices. Apply to
THOS. BOOKER,
Wawanesa.

An advertisement for the Wawanesa operation of Thomas Booker, Contractor & Bricklayer, noting his supply of hard pressed brick, "which he will sell in large or small quantities at the lowest prices." (Courtesy *Wawanesa Enterprise*, 6 October 1893, p. 3)

Media attention to the brick industry continued through this period, especially focused on small-urban and rural operations. Reports of activity and output were welcome content for newspapers of the day. And there were even occasionally photographs of operations that animated the coverage, providing readers a sense of the nature of the industry. An interesting aspect of brick marketing that appears more frequently at this time focused on awards for brick quality. To cite just two examples: in 1883 Creasy J. Whellems of Rapid City was reported as sending samples of his deep red brick to an exhibition at Kingston, Ontario; and in 1889 we find bricks from William Currie's Neepawa yard winning first prize at the nearby Carberry Agricultural Fair.

The final stage of Manitoba's most productive period, which takes us to 1917, is the last noted here for comparison. As Mr. Butterfield notes, over the course of 20 years, from 1897 to 1917, Manitoba's brick-making industry matured into a comprehensive and ambitious entity. Major operations, with industrial-scale production and the most up-to-date machinery, kilns and processes were attendant on several of the province's biggest yards – at Portage la Prairie, La Riviere, Sidney, Edrans and Carman, and in Winnipeg and St. Boniface at Alsips and S.A. Marion. Ever-growing demand for brick, for the slew of new buildings that were to replace the first generation of smaller and often more modest buildings, ensured that the province's brick-makers were busier than ever.

Throughout this period, 11 of the yards started in earlier years were still going strong, and at least 65 new operations entered the fraternity. Seven of these were in Winnipeg and St. Boniface, with the other 58-60 in small-urban and rural situations. And while the trend to short-lived operations continued during this period, with 23 closed fairly shortly after formation, about 40 were active and productive. St. Boniface was a powerhouse of brick production, with other concentrations of yards outside the city in a rectangle of clay and shale beds that included Portage la Prairie on east, La Riviere on the south, Gladstone on the north and Sidney/Edrans to the west.

While there are still familiar levels of production and technological aspects at many yards, there are also increasing examples of phenomenal production, and of new and improved pressing and burning approaches. We are much more commonly hearing of 20 million-brick-a-year operations. And the exploitation of shale beds (rather than the more familiar clay beds) was undertaken in south-central Manitoba, notably at La Riviere, Carman and Learys, with new extraction and grinding technologies, and of course new dry-pressing brick manufacturing machinery which typically produced more fine-edged and harder brick.



An advertisement for Wood's Brick Company, ca. 1920. Note the option to purchase "White – Red – Buff" with the emphatic reminder: "up to 10,000,000 – ten millions." (Courtesy *Western Canada Contractor*, June 1920, back cover)

The most obvious change on many brickyards was the introduction of new kiln technologies and attendant forms. The most apparent was the beehive kiln, with its evocative domed form made entirely of brick. New tunnel kilns were also being used at many yards.

Even with greater sophistication of operations, the hugely increased demand meant that most yards still required a significant staff contingent, and so there are observations about dozens of men working at most yards of any size – at least for the typical season, still from April to October.

The great size of some of these operations obviously translated into significant profits for a few. As was suggested above, with prices per thousand still averaging \$12.00-\$15.00, it would be possible for some of the owners of larger yards, in the years just before the outset of World War I, to earn net profits of \$100,000.

This impressive rendering shows the Aslips yard in Winnipeg's Elmwood-St. Boniface area at the height of its brick-making activity, ca. 1919. The view is looking northwest, with the City of Winnipeg in the distance, and the CPR mainline running along the bottom of the image. The rendering shows a host of buildings and structures, the largest ones both being for mixing, brick-pressing and kiln-burning. Brick-drying racks are on the far left of the image. Other buildings were used for sand drying, stables and miscellaneous production and storage purposes.



MANITOBA'S BRICK INDUSTRY

Key Brick Operations, 1897-1917

The few years before the turn of the twentieth century, and the first 15 years of the new century, saw Manitoba's brick-making industry attain new heights of production and operational sophistication. It was during these years that the largest and most technologically advanced operations in the history of the industry were attained (except for the very late entry of Lockport's Red River Brick and Tile into the industry in 1971). And production was phenomenal. It was during this period that the first Leary operation was active (from 1902-1917), and it is instructive to place it in this context, especially with other small-town and rural sites.

The following six entries, drawn from David Butterfield's *Manitoba Brick: A History of Brick Manufacturing in Manitoba, 1860-1990*, highlight some of the larger operations in rural and small-town situations, suggesting the technological and productive competition in which Learys operated. Some of this information will also be useful, to draw on comparisons whenever there are gaps in the understanding of certain aspects of the Leary operation.

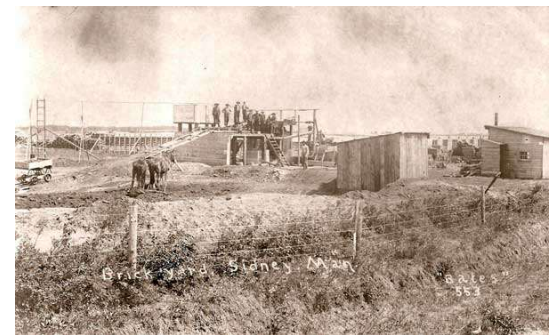
Sidney Brick & Tile, Sidney

In the spring of 1909 a well-financed player arrived in the Sidney area, already well known for its clay beds and fairly active brick production (in the early 1890s). Named Sidney Brick & Tile Company, Ltd., the operation was under the management of Albert Edward Hilder (formerly of Winnipeg Clay Products at Winnipeg). The brick-maker was George Stenhouse. Work on the new plant began in April, with a well being dug, and several cars of lumber arriving shortly afterward. It took 10-12 men to build the brick racks, while the yard machinery arrived in late April. Sidney Brick & Tile began operations in early June. A siding was built into the yard by mid-August, and by that time the firm had burnt its first kiln of 140,000 bricks, while its machine produced 25,000 more bricks every day. So successful was its first year that early in January of 1910 Sidney Brick & Tile was able to declare a 10 per cent dividend that was equal to 20 per cent of the moneys invested. A new boarding house for the employees was one of the features of the 1910 season at this yard, and by late May it was reported to be in "perfect running order." Sidney Brick & Tile kept chugging along, presumably with good results until the outbreak of World War I in 1914. This particular iteration of the Sidney plant was shut down in the spring of 1915, after six seasons of operation – the site was revived in 1920 and was active on and off for several years, until 1928. In that

year, Alsip Brick, Tile and Lumber Company purchased the Sidney plant, and operated it for a few years as a branch of its Winnipeg plant. By the mid-1930s Alsips had demolished the plant, but continued to remove 75 cars of clay per year to be manufactured into brick at its Winnipeg plant.

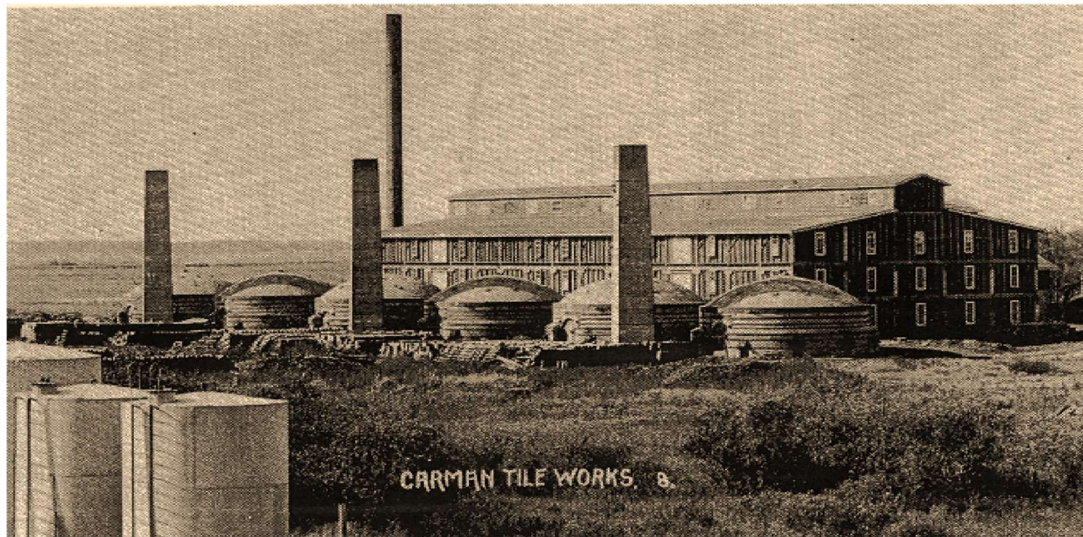


Views of the Sidney operation – left of the plant ca. 1915, below a view of workers (taken by photographer Edward Bates (date unknown), and below right of the general yard. (Courtesy Manitoba Historical Society, Source: Rob McInnes)



Canada Tile and Fire Proofing Company, Carman

The Canada Tile and Fire Proofing Company, in Carman, promised to be the largest and most productive brick-making operation in Manitoba at this time. In December 1912 the company was incorporated by a number of Winnipeg businessmen, and during late February of 1913 public meetings were held at Carman to acquaint the public with the firm's plans. The new plant was to have two phases. The first was to cost \$100,000 and employ 40-50 men. A second phase would come when expansion warranted, in a couple of years, and would cost \$175,000 and employ 60 more men. As there was no usable clay or shale at Carman, it was noted that the firm presumed to use beds that lay near Learys, some 18 miles west, with raw clay brought to the plant over a Canadian Northern Railway line. The plant began production in late March of 1914, and the firm decided to proceed with phase two of their plan. But in July of 1914 World War I commenced, and Carman's foray into the big leagues of brick production was over – after only a little more than a year. The factory site was finally sold to unnamed owners in 1923, who proceeded to knock down the 10-year old complex. The Town of Carman bought \$1,000 worth of brick to rebuild its power plant, and in 1924 also took plant demolition waste, mostly brick, to fill in Carman's streets.



View of the ill-fated Canada Tile and Fire Proofing Company plant, ca. 1914. The large clay-mixing and pressing building is in the background, with the six kilns and their chimneys in the foreground. (*Up to Now*, p. 173)

La Riviere Press Brick & Tile Company, La Riviere

The establishment of a brick yard in La Riviere was first made public in 1902, when tests made on local clay and shale deposits proved positive, and a deal was struck for the preferred site, just to the east of the town. The firm was called the Press Brick & Tile Company, Ltd., and was under the leadership of Elisha Frederick Hutchings, a wealthy Winnipeg entrepreneur. It was quickly determined to go ahead with the \$20,000 brick plant. A manager was found in Minneapolis in May, and by the following month local workers were being hired. By July, when Hutchings visited the site, men had installed a brick yard dam, and a railway spur to the site was nearly complete.

Early in September the plant made its first brick. The American manager, J.W. Carmichael, had the plant running “full blast” by mid-month, with a kiln of 250,000 bricks being burned and another 250,000 awaiting the fires. The following season (1903) saw the firm invest \$10,000 in erecting four new beehive kilns and other improvements. Eleven cars of machinery were ordered, including an engine, numerous castings, a blower, 100 dryer cars, and other equipment. By late May the kilns were nearly complete, including an arched subterranean passage linking all four. The large dryer with its numerous brick divisional walls only lacked a roof at the time, but had a 40-foot high stack. Four more kilns were under construction by mid-June. Later that month the newly-installed machinery was tested. During mid-July, shale was being taken from the hillside source by night blasting, and then put on a carrier that took it down to the crusher where it was pulverized. Reports from the spring of 1905 show most of the old employees back at work, and improvements included a remodelling of the oldest kilns and the construction of a “lofty and strong” trestle from the mill across the creek to the shale ledge. In January 1905, a number of men were at work at the brick yard, sorting out and shipping the one million bricks on hand at the plant in preparation for the coming season.

But something had happened with the firm’s financing, and the plant was suddenly up for sale on 20 July 1906. William Brydon, an unknown commodity, acquired control, and the next six years of the plant’s operations are somewhat shadowy. In 1910 samples of brick “of a beautiful colour and finish” were on display locally, and an advertisement in July 1910 showed that the plant had acquired a new manager—James Johnstone—as well as a new name: The Phoenix Brick-works. In April 1911 it was noted that the plant machinery was being fitted up, and a kiln was filled; given that there were at least eight kilns, this appears to be a modest production schedule. In June, Dominion Government geologists visited the plant, and observed that the brick-making process then included a disintegrator along with two short pug mills and a



A view, 1908, looking up to the shale deposits on the hillside, and showing track and kilns of the site. (Archives of Manitoba, G.T. Barber Collection)

Bradley and Craven semi-plastic brick machine. Evidently some type of production was happening that summer, for it was also noted that salmon-coloured to dark-red bricks were being produced. It is not clear if the plant was in operation in 1912. It certainly was sold in 1913, to a Mr. Martin, who intended to renovate the complex, install new machinery, and place it on a sound footing. But that did not occur, and the plant was abandoned by 1914. There is no trace of it today.



A view, ca. 1905, looking southeast showing the extent of La Rivière's Press Brick & Tile Company. The shale deposits on the hillside were drawn by rail cars down to the mixing and brick-pressing building and then burned in one of the seven beehive kilns. (Source PAM)

Edrans / Edrans-Brandon Press Brick Company

J.A.C. Blackwood established a brick yard at Edrans (about 10 miles north of Sidney) in the summer of 1901. By September the new yard was rushed with orders, shipping its first carload of brick in early October. When it closed for the season a month later this first year was considered a success. Blackwood was back for 1902, burning his first kiln of bricks by mid-July, and regular production continued for the next two years. Late in 1904, L.J. Oakes, a Nova Scotia brick expert, made tests of the Blackwood clays, sending the samples to the Boyd Press Brick Company of Chicago where a few test bricks were made. The results were apparently of the highest standard.

The tests were perhaps in anticipation of the creation of a new firm which would exploit the Edrans clays more efficiently. This ultimately took the form of the Edrans-Brandon Press Brick Company Ltd., which was incorporated at Brandon in July 1905. Members of the Blackwood family were principals in its organization. While its business office was at Brandon, the plant was built at Edrans.



The yard at Edrans, ca. 1910. In the background is the mixing and pressing building, a typical form for this kind of activity, with a pile of raw clay in the right-foreground. We can also see the distinctive tunnel kilns, here with buttress chimneys that created a much more even burn within the kiln. (*The People of the Big Plain*, p. 14)

The new plant was constructed in the summer of 1905 on the 12-acre site with its “remarkable clay formation” which was a mound about 40 yards long by 180 yards wide. The yard was served by a CPR siding, and initially bricks were made on site in order to build the large, permanent tunnel kilns, each with 14 chimneys. A 60-horsepower engine was installed for power, along with a 60-foot high smoke stack, as well as a large shed for clay storage. The main building was about 50 feet high and covered with corrugated sheet metal.

The new plant, with its capacity of 20,000 pressed bricks per day, was fired up for the firm’s Board of Directors on 3 November 1905. Production started in earnest in the spring of 1906, when the first of four kilns were finished. When completed the plant entered an era of regular production. During 1914, the yard was fixed up after a short period of closure, and was once again producing “good quality bricks.” The Edrans plant was likely shut down early in World War I, but was back in operation in 1924. New owners, National Clay Products Company, Ltd., had its headquarters in Winnipeg, but was actually a creature of the Hales brick-making family, which had operated earlier plants at Rapid City and Brookdale. In this case, W. E. Hales, the son of the founder was the President of National, and kept the operation going until at least 1931.

Portage la Prairie – Harry Stephens

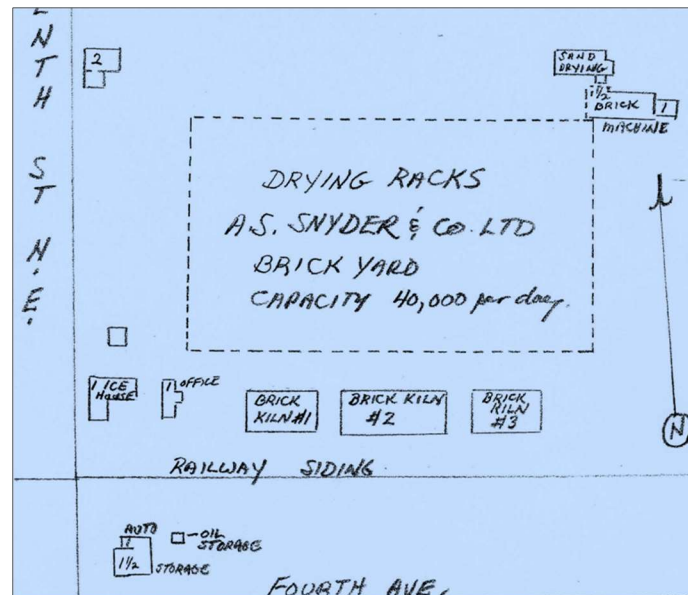
Two Portage la Prairie brickyards were amongst the most successful in Manitoba history – long-lived, productive and highly respected. Harry Stephens started his Portage la Prairie Brickyard Company about 1899, and between 1902 and 1904 the capacity of his yard had trebled to meet the demands of the western Canadian building boom. The Stephens plant was about a quarter mile east of town, and had a capacity of 40,000 bricks per day with two soft-mud machines in use. By 1906 Stephens had 12 “furnaces” (beehive kilns) for burning brick, with each one holding 100,000 bricks. Eight and half million bricks were produced in the 1909 season. Stephens employed 80 workers and had his own CPR spur track. A 1911 visit by a Dominion Government geologist found this to be “one of the largest and best managed [brick companies] in Manitoba.”

In 1912 Stephens acquired a new yard in the vicinity, and was able to produce 14 million bricks between the two yards annually. Nineteen-twelve appeared to mark the height of production for Stephens, whose operation, like all others, was beginning to feel the effects of a construction decline, and would certainly suffer during and after World War I. Stephens Brick, however, carried on in a much-reduced form until 1928, when its incorporation charter was finally cancelled.

Portage la Prairie – John Snyder

A capable competitor for Harry Stephens was John Alexander Snyder and his family-operated brick yard. Indeed, the Snyder name would outlive that of Stephens in local building supply circles until its affairs were taken over by Winnipeg's Alsip Brick & Tile in 1945. In turn Alsip would remain on the Portage la Prairie scene until 1972, when it appears to have ceased manufacturing brick. If this was the case, then the old Snyder yard at Portage la Prairie was the longest-running brick plant from its outset, thus 68 years, beginning in 1904.

Initially known as Snyder Brothers, by 1907 the firm was renamed A. Snyder and Company, with 200 acres of land. Its Martin brick-press was capable of producing 40,000 bricks a day, and the site required 35 workers. Its output that first year was a very impressive 3,250,000 bricks. The Snyders acquired a second yard at Gilbert Plains in 1907, and by 1912 that yard was burning in its several scove kilns about 250,000 per kiln, to a total of about 5 million bricks a year. The Gilbert Plains operation was silent during World War I but was active again in 1919, and was intermittently operational until 1929. The whole Snyder empire was renamed Snyder Brick Yards, Ltd. in 1930, and the Portage operation continued under Mr. Snyder, until his death in June of 1937.



Site Plan of A.S. Snyder's Portage la Prairie brick plant, traced from original Western Canada Underwriter's Insurance Plan, June, 1920, Sheet 56. The drawing shows a large area for brick-drying, three brick kilns, a sand-drying site and beside it the brick-making factory.