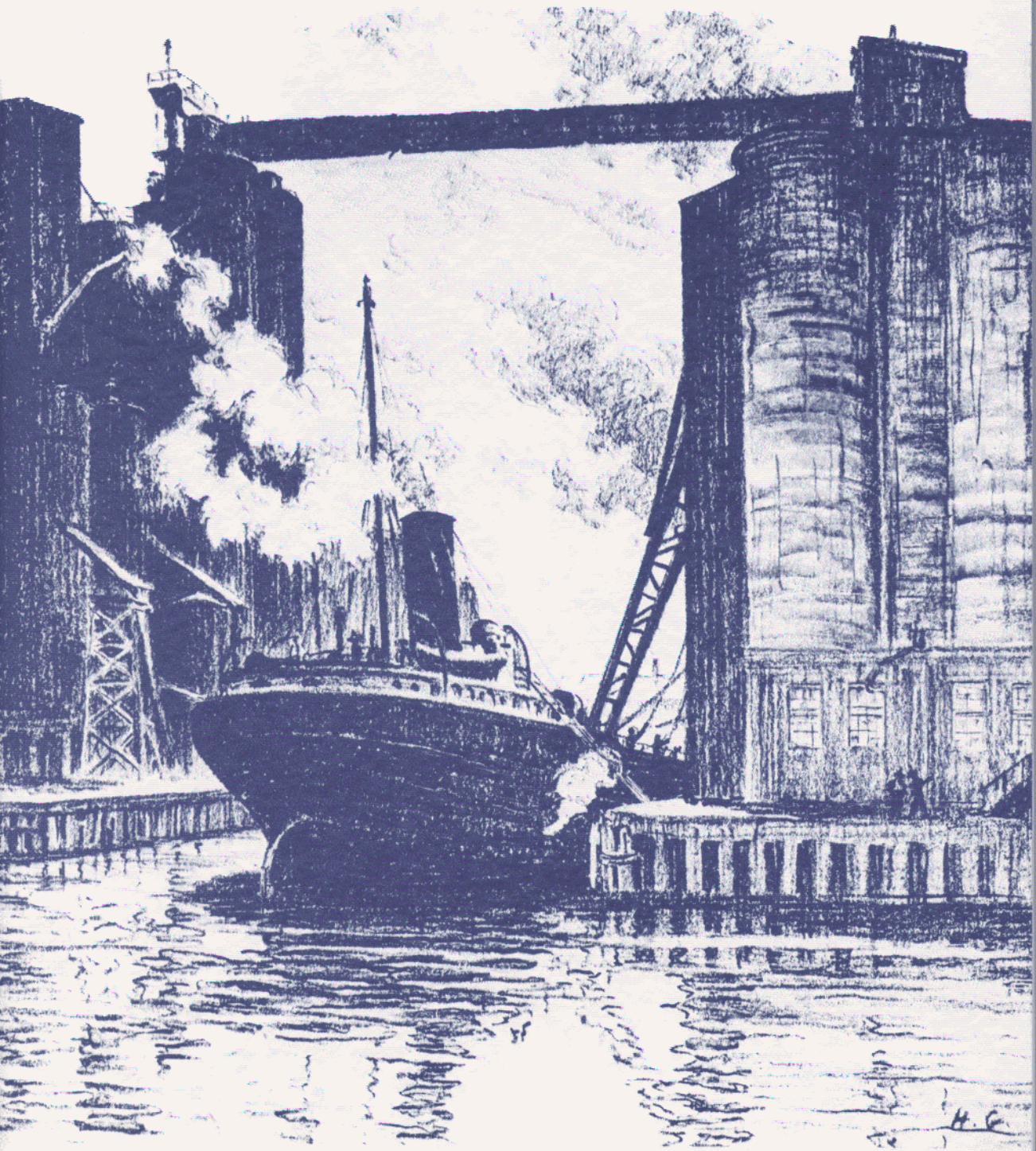
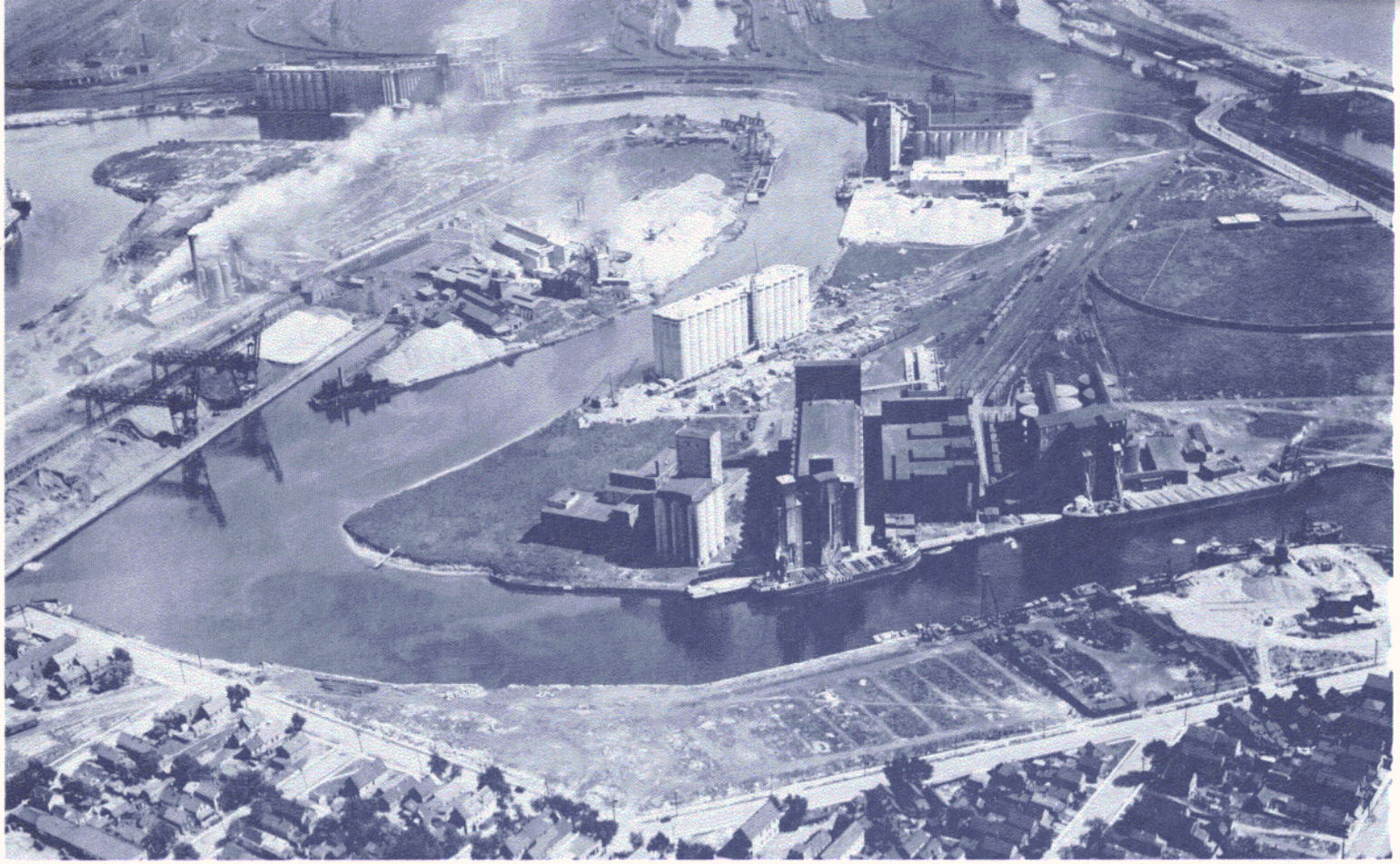
GRAIN ELEVATORS

by Henry H. Baxter



ADVENTURES IN WESTERN NEW YORK HISTORY
Published by the Buffalo and Erie County Historical Society
volume xxvi



Aerial view of Buffalo River upstream from Ohio Street, 1924. Grain elevators are: Top left — Concrete Central, 1922, far left — Superior, 1918-20-22; top right — Archer-Daniels-Midland, 1920, now dismantled; above center — Marine "A," 1924; center — Perot Malting, now American Malting, n.d.; just right of center — American Elevator, now part of Peavey Flour Mills, n.d.; right of center — Electric Elevator, 1897. Other areas to note are: Left center — The Union Furnace, now dismantled, and background — Lehigh Valley Basin now the Tifft Farm Nature Preserve

Front cover: *Unloading Grain at Buffalo Harbor* by Helen G. Durston.

BUFFALO'S GRAIN ELEVATORS

by Henry H. Baxter

What will people of the twenty-first century think of those silo-like structures standing along the waterways adjacent to Buffalo Harbor? Perhaps they will think of them as cylindrical apartment houses, abandoned by their former residents. Or will they see them as launching pads, used to send twentieth-century missiles on their way?

Actually, the structures are grain elevators. They stand today as symbols of Buffalo's rise and decline as a grain port. This rise and decline can be traced on the line graph printed on the inside back cover. The graph shows the total number of bushels of grain received in Buffalo for each year between 1825 and the present as well as the storage capacity of Buffalo grain elevators for each year during the same time span.

THE EARLY GRAIN TRADE

Prior to the year 1827 there was no grain handled in Buffalo. Surplus grain grown in the American Midwest reached markets in the East only after transportation over long and difficult routes. Grain grown in Ohio, for example, had to be shipped on flatboats down the Ohio and Mississippi Rivers to New Orleans. There it was transferred to sailing vessels that carried it to its eventual destination in the East or in Europe. Or it could be carried by land in wagons along the rough roads that passed through the rugged terrain of the Appalachian Mountain chain.

As an alternate to carrying raw grain in wagons, it was sometimes fed to hogs that could walk to market. Or, more likely, grain might be turned into whiskey and carried in jugs to markets on the other side of the mountains. Whichever way was chosen, transportation charges for midwestern grain averaged $100 a ton to reach market.

JOSEPH DART'S ELEVATOR

The opening of the Erie Canal in 1825 represented a revolution in transportation. The Canal was the first efficient transportation system to breach the Appalachians. Now midwestern grain could be shipped by lake boat to Buffalo, the western terminus of the Erie Canal, and by canal boat to New York. Soon freight charges dropped from $100 to $10 a ton for grain.

There was one major difficulty, however. Even the smallest lake boats were too large for the canal, while canal boats were too small for lake traffic. Thus, grain had to be unloaded from the lake boats and transferred to canal boats at Buffalo. Handling the grain by hand was slow and inefficient, causing delays and congestion of people and boats in Buffalo Harbor. In 1830, workers handled 146,000 bushels of grain at Buffalo. Little more than a decade later, the total handled was ten times that great. At least 500 workers, most of them Irish immigrants, were required to unload or load this volume of grain by hand.

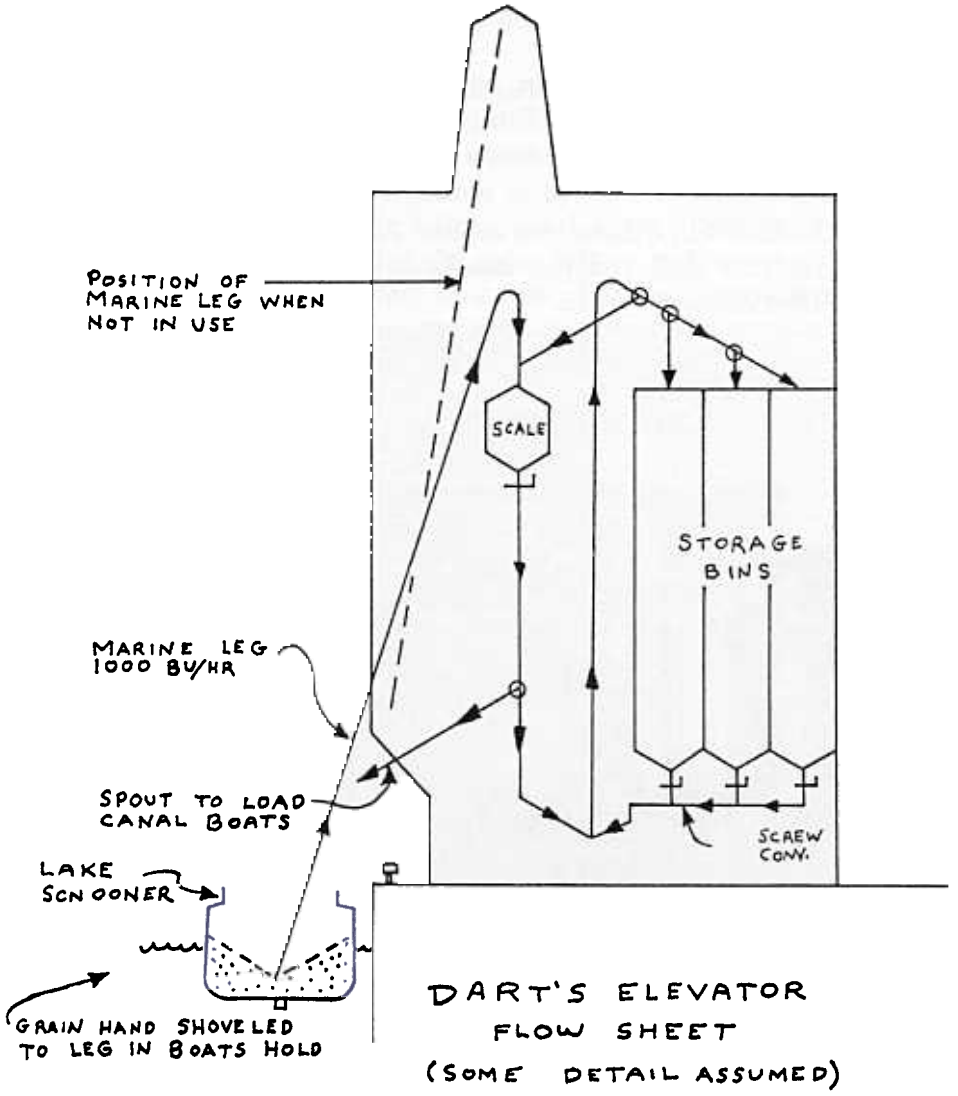
Joseph Dart.

It was at this time that Joseph Dart constructed the first grain elevator and storage warehouse in Buffalo. Begun in the autumn of 1842, it stood on Buffalo Creek at the junction of the Evans Ship Canal. Powered by a steam engine, Dart's bucket elevator raised grain from lake boats to bulk storage bins where it remained until being lowered for transshipment or for milling purposes. Some Buffalo grain dealers had doubts about Dart's innovation. "Dart, I am sorry for you," one of them said. "It won't do. Remember what I say—Irishmen's backs are the cheapest elevators ever built."

In spite of these doubts, Dart's pioneering effort was quickly and widely imitated. Less than fifteen years after his was built, there were ten grain elevators in operation near Buffalo Harbor. They had a storage capacity of more than 1½ million bushels. By this time Buffalo had become the world's largest grain port, surpassing Odessa, Russia; London, England; and Rotterdam, Holland.

In a paper read before members of the Buffalo Historical Society in 1865, Joseph Dart paid tribute to Oliver Evans as the person who first worked out the principles for handling grain mechanically. Evans, an American inventor and millwright, devised a system whereby grain was raised to a high point and then moved by the force of gravity through a series of operations. But the Evans system was used in flour mills. Joseph Dart adapted the same principles to another purpose in his grain elevator. "I believe it was the first steam transfer and storage Elevator in the world," he told members of the Historical Society. "It was the first successful application of the valuable inventions of Oliver Evans to the commercial purpose for which it is now extensively employed."

The diagram shows how Joseph Dart's grain elevator worked. His first one was a primitive affair compared with what came later. "I began with buckets 28 inches apart, holding about two quarts, and raised without difficulty a thousand bushels an hour," he described his original operation. Then he put the buckets that scooped the grain from the boats closer together "till 1800 or 2000 bushels an hour were raised." Dart said in 1865, "In some of the elevators now in use the buckets hold eight quarts and are only one foot apart and will raise 6 or 7,000 bushels an hour, weighing it correctly." Dart's first elevator had a storage capacity of 55,000 bushels but that was doubled within three years. Eventually, elevators capable of storing seven million bushels of grain were built.



DART'S ELEVATOR FLOW SHEET
(SOME DETAIL ASSUMED)

Grain elevators make ideal structures for the storage of grain. In the elevators' bins, grain can be kept dry, cool, free from vermin, and safe from pilferage. Moreover, elevators make it possible to weigh and sample grain to determine the quality, quantity, and grade as a basis of payment. Elevator-stored grain can be improved by drying, cleaning, grading, and blending. Finally, elevators can be used to assist in the milling of flour and the manufacture of animal feed and barley malt for breweries.

ELEVATORS BUILT OF WOOD

Joseph Dart's elevator was built of wood. This material, plentiful in the Buffalo area, was used for construction of grain elevators for half a century. The earliest elevators were located on or near the water and served only lake or canal boats.

A unique feature of the Watson, one of the early elevators, was a slip or waterway that led underneath it. This permitted a canal boat to be positioned inside the elevator and directly below the bins. In this way, loading of the

The Watson Elevator had a distinctive cupola. To the left is Buffalo Creek, to the right is the City Ship Canal or Blackwell Canal. Note a typical water taxi being sculled across the creek.

boat could be done rapidly by gravity flow. The picture shows another distinctive feature of the Watson — the cupola on top which set it off from other grain elevators.

Some early grain elevators had no tops on their bins, only a roof over all to keep out the rain. Explosions or fires could easily spread from one topless bin to another. Moreover, topless bins increased the chances of workers falling in, especially when they were hampered or blinded by dusty conditions.

The Wollenberg elevator at 133 Goodyear Avenue was in 1979 the only surviving wood elevator in the Buffalo area. The Wollenberg had an interesting beginning, being constructed from wood left when the Kellogg "A" was torn down in 1912.

In 1865, when Joseph Dart read his paper before the Buffalo Historical Society, there were 27 grain elevators built on land, plus two "floaters" — all 29 being built of wood. Followed by a string of canal boats, floaters could travel to a lake boat in the outer harbor or in the Erie Basin. Floaters then unloaded grain directly into the waiting canal boats. Other early elevators called "transfer towers" provided the same service as floaters except they were built on land and therefore immobile. Neither floaters nor transfer towers provided storage for grain, and neither type existed much after 1900.

GRAIN TRADE AT THE END OF THE NINETEENTH CENTURY

On the charts you can see the names and storage capacity of Buffalo's grain elevators at the end of the nineteenth century. Only one of the transfer towers stored grain and none of the floaters did so. For this reason, they are listed separately from the other elevators. Note that the Great Northern and the Eastern had the largest capacity of all. At about this time elevators charged 5/8 of a cent for elevating, weighing, and discharging one bushel of grain. The charge for storing one bushel of grain for 10 days during the navigation season was ¼ cent.

When winter put an end to the navigation season, Buffalo's grain elevators were generally full to capacity. Therefore, lake boats making their last run in the fall to Buffalo kept their grain on board until elevator space became available. Known as the "Winter Fleet," these boats made Buffalo Harbor a busy place even in the winter and spring as they were shuttled around for unloading.

Throughout the nineteenth century Buffalo's grain business consisted mostly of transshipping of storage. Changes were noticeable at the beginning

of the twentieth century, however. Up until that time most grain shipped to Buffalo was sent on to another destination. The only exceptions were a small amount of wheat used in the city's tiny flour-milling industry and a larger amount of barley for the numerous malthouses that supplied local breweries.

ELEVATOR STORAGE CAPACITY.

The following statement shows the names and storage capacity of several grain elevators, transfer towers and floaters of this port:

ELEVATORS.

Name.	Capacity, bu.
Bennett	800,000
Brown	250,000
Buffalo Lake Shore Transfer	90,000
Connecting Terminal	950,000
Dakota	850,000
Eastern	1,500,000
Erie Basin (unused)	
Erie Canal (Bl'k Rock)	140,000
Evans	400,000
Exchange	500,000
Frontier	650,000
National	65,000
Husted*	200,000
International (Black Rock)	650,000
Kellogg	600,000
Lyon (unused)	.....
Marine	650,000
National and Globe Mills	100,000
Erie	720,000
Niagara A	800,000
Niagara B	1,200,000
Niagara C	200,000
Ontario	450,000
Queen City, A, B and C	450,000
Richmond	250,000
Schreck (unused)	.....
Sternberg (unused)	.....
Export	1,000,000
Electric	1,000,000
Great Northern	2,500,000
Swiftsure (unused)	.....

ELEVATORS.

Name.	Capacity, bu.
City A	600,000
City B	800,000
C. J. Wells	550,000
Coatsworth	650,000
Union	130,000
Watson	600,000
Wheeler	350,000
Wilkeson	400,000
William Wells (unused)	
Total 40 Elevators	21,045,000

TRANSFER TOWERS.

Name.	Capacity, bu.
Hefford	40,000
Chicago	.....
Merchants'	..
Northwest (unused)	..
Western Transit	..
Raymond	..
Total, 6 Transfers	40,000

FLOATERS.

Cyclone	..
Buffalo	..
Free Canal	..
Free Trade	..
Ira Y. Munn	..
Empire	..
Ryan	..
Dispatch	..
Total, 8 Floaters	..

* Destroyed by fire No. 23, 1899; re-building, will be finished by June.

From Annual Report of the Buffalo Merchants Exchange, 1899.

TWENTIETH-CENTURY CHANGES

During the first years of the twentieth century, flour milling and the animal feed industries began their rapid expansion in Buffalo. Inexpensive electrical power, first made available by the Adams generating plant in Niagara Falls, was a major reason for this expansion. Inexpensive power permitted electrification of the grain elevators, which formerly had operated

with steam power. The newer, cheaper power also encouraged grain processing. In addition to flour mills and animal feed industries, cereal mills and oil seed crushers became significant contributors to Buffalo's reputation as a grain processing center. By the 1930s, Buffalo stood as first city in the United States in flour milling and in the production of animal feeds from grain.

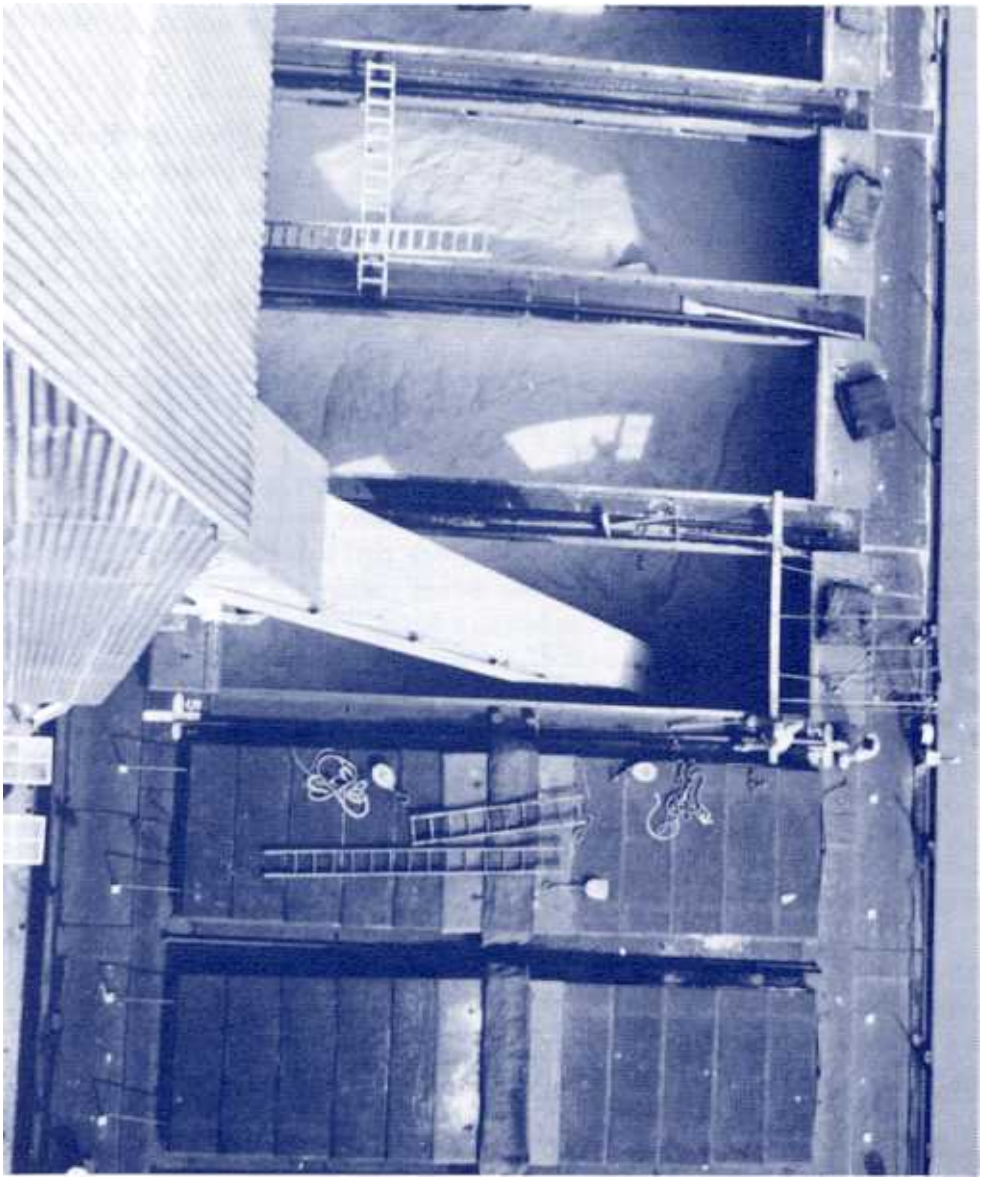
First to use electric power in Buffalo grain processing was the George Urban flour mill. It "electrified" soon after the Adams generating plant started up in 1895. Then in 1897, the Electric and Great Northern grain elevators were built to use electric power. In this way they eliminated steam boilers, engines, chimneys, numerous workers, and the necessity of bringing fuel to the elevator or mill site. The paraphenalia of steam power had occupied separate rooms and considerable space. Now only one or two large electric motors were needed to supply power for the operation of an elevator.

The advent of the twentieth century also marked the end of the use of water power in Buffalo's grain industry. Formerly water power had been used at some of the flour mills in Black Rock that had small grain elevators as adjuncts. Those were based on the 8-foot difference in water level between Black Rock harbor and the Niagara River. There were also grist mills at the "Hydraulics" located near Hydraulic and Seneca Streets. They used water from a canal originating at a dam on Buffalo Creek. But as Buffalo turned to inexpensive and convenient electrical power, most of these direct hydraulic power sources appear to have ended by 1900 or thereabouts.

Why wasn't the power of the wind harnessed for the Buffalo grain industry? The possibility existed because there were windmills in other parts of Erie County and across the Niagara at Windmill Point, Ontario. Probably the answer lies in the fact that wind as a primary source of power is insufficiently reliable to serve where speed, promptness, and large volume of output are essential. Windmills, in other words, could be used in small operations but they were unsuited to the big business of Buffalo's grain industries.

One more change in Buffalo's big grain business came about in the early twentieth century. During earlier times most grain had come to Buffalo from the lower midwestern states. After the 1850s much of it was shipped to the grain elevators by rail. But in the early 1900s increasing amounts of grain came from the northern prairies of the United States and from the Canadian provinces across the border from them. Grain grown in these areas usually was shipped from Duluth, Minnesota; Superior, Wisconsin; or Thunder Bay, Ontario. All these locations were favorable to a Great Lakes

water route to Buffalo instead of the railroad routes for grain from the American Midwest. As one indication of this change, as many as 185,000,000 bushels of Canadian grain passed through Buffalo in the 1920s.



Marine leg of the Wheeler Elevator (GLF "B") built c. 1906, rebuilt in 1955 to become the largest leg in Buffalo at 50,000 bushels/hour. Leg is shown on the "dip," the unloading period when a sufficient amount of grain in the hold can flow into the leg by gravity. Scooper's gear may be seen on the deck of the boat.

HOW GRAIN ELEVATORS WORK

From the beginning Buffalo's grain elevators were built in a variety of shapes and sizes. They sometimes differed one from another in their functions. Still, their principles of operation were similar, no matter what their size, shape, or function. And, without doubt, their greatest days as participants in Buffalo's flourishing grain industry came during the first half of the twentieth century.

Imagine a grain elevator standing 250 feet high along the Buffalo waterfront. It receives grain by lake boat, let us say. The boat is unloaded into a "marine tower" by means of a "marine leg" that resembles an elephant's trunk thrust into the hold of the boat. Inside the marine leg are buckets attached to a moving endless belt. The buckets scoop up the grain and carry it into the marine tower.

Marine towers could be in a fixed position or moveable on car wheels. Picture a 150-foot high building on wheels! With a fixed marine tower the lake boat must be moved so the marine leg can get all the grain from the holds. The moveable tower can reach a number of holds, but not all of them, so some ship movement may still be required. Power shovels can be used to drag grain the length of the boat's hold in order to reach the marine leg. "Scoopers," or grain shovelers, may operate this power shovel but they may have to shovel and sweep by hand the last grain from the hold into the buckets that raise grain into the elevator.

In the early days grain ships arriving in the harbor hired a "scooper boss" to furnish gangs of scoopers made up mostly of Irish immigrants with about 26 men to a gang. Usually a scooper boss owned a saloon and perhaps a boarding house. After a week's work he paid off the men in his gang at the saloon with deductions for bar bills and the boarding house if they made use of these facilities — and they usually did. As late as 1895 the average scooper earned only about $292 a year, minus deductions paid to the scooper boss. In that year Buffalo had a high density of saloons; 7.81 saloons for every 1000 people.

Temperance, charity, and church organizations agitated in the 1880s and 1890s for an end to the scooper boss system. Buffalo newspapers took sides for and against the situation. Finally a long strike by the scoopers in 1899 did away with the scooper bosses. From then on scoopers were paid directly by the operators of the grain elevators. Payment was on the basis of the quantity of grain handled. Scoopers were still organized in gangs of about

26, however, and were paid on the basis of grain handled.

In 1899, scoopers received $1.85 for each 1,000 bushels handled. Until 1864 all shoveling in the ship's hold was done manually, but in that year the power shovel first came into use. By 1935 pay had risen to $3.40 per 1,000 bushels. By this time scoopers were organized in the Grain Shovelers Union Local 109. Still, men of Irish descent were most prominent among them. In 1940, usually 9 out of every 10 scoopers was a South Buffalo Irishman.

As early as 1905 some marine legs in Buffalo elevators used the "pneumatic principle," a system of air flowing through a tube that sucked up grain like a giant vacuum sweeper. One large Buffalo elevator had four marine legs that could unload grain at the rate of 100,000 bushels an hour. Along with the marine leg, the marine tower contained a scale for weighing grain. There was also a device called a "lofter leg" that lifted the grain to the top of the bins and discharged it directly into them or on to conveyors. Like the elevators, these bins came in various shapes and sizes and were built from a variety of materials.

At first, bins were built of wood and usually lined with iron. After 1890 steel bins were built in a number of different arrangements. Since that time reinforced concrete has been used. Round bins were the most common shape though some were rectangular or shaped like a four-pointed star.

Bins holding from 20,000 to 50,000 bushels of grain have been the most common size. It is necessary to have some smaller ones, however, so that a small amount of a particular grade of grain will not tie up a lot of bin capacity. Monster flat-bottomed bins have been built to hold up to 1,000,000 bushels of grain. But these are difficult to unload so they generally are used to store bulk grains for an extended period.

Most bins have "hoppers" at the bottom which permit unloading the grain into canal boats, railroad cars, or conveyors. Spouts or chutes may also carry grain from one operation to another in an elevator or mill.

Grain elevators have a "workhouse" at the top that may be 250 feet or more above ground level. The workhouse has room for lofter legs, shipping scales, cleaning and shipping equipment. Workers could climb ladders or ride personnel elevators to the top but either method would be costly and time-consuming. Consequently, grain elevators use an ingenious method called a "man lift." This is an endless moving belt stretching from basement to the top with 12-inch square platforms attached every 25 feet or so. To go up or down a worker has only to step on a wooden platform going in his direction and hold on.

The Standard Elevator built in 1928. The elevator's transfer function is illustrated by the lake boat being unloaded at the same time that Erie Canal barges are being loaded.

BUILDING THE GRAIN ELEVATORS

Building Buffalo's grain elevators required special skills and a special kind of engineering. One bushel of wheat weighs 60 pounds, so a 1,000,000 bushel elevator contains 30,000 tons of grain. This creates an average load on the foundation of about 10,000 pounds per square foot. Land along the Buffalo River was reclaimed marshland with low load-bearing capacity. Elevators built there before the 1920s had timber piling driven down to rock or other firm material. Sometimes this would be from 15 to 80 feet below ground level so that the elevator would have hundreds of debarked tree trunks underneath. Away from the water, soil was better and piling not required. Moreover, steel and concrete foundations were used on some projects after the 1920s. For example, the Agway elevator on Military Road stands on a concrete mat 3 feet thick which in turn rests on a natural foundation of stiff clay.

Once the foundation was in, construction of the elevator itself could begin. In 1907, the American Elevator (now Peavey) was built of reinforced concrete. After that time this was the material used for constructing most

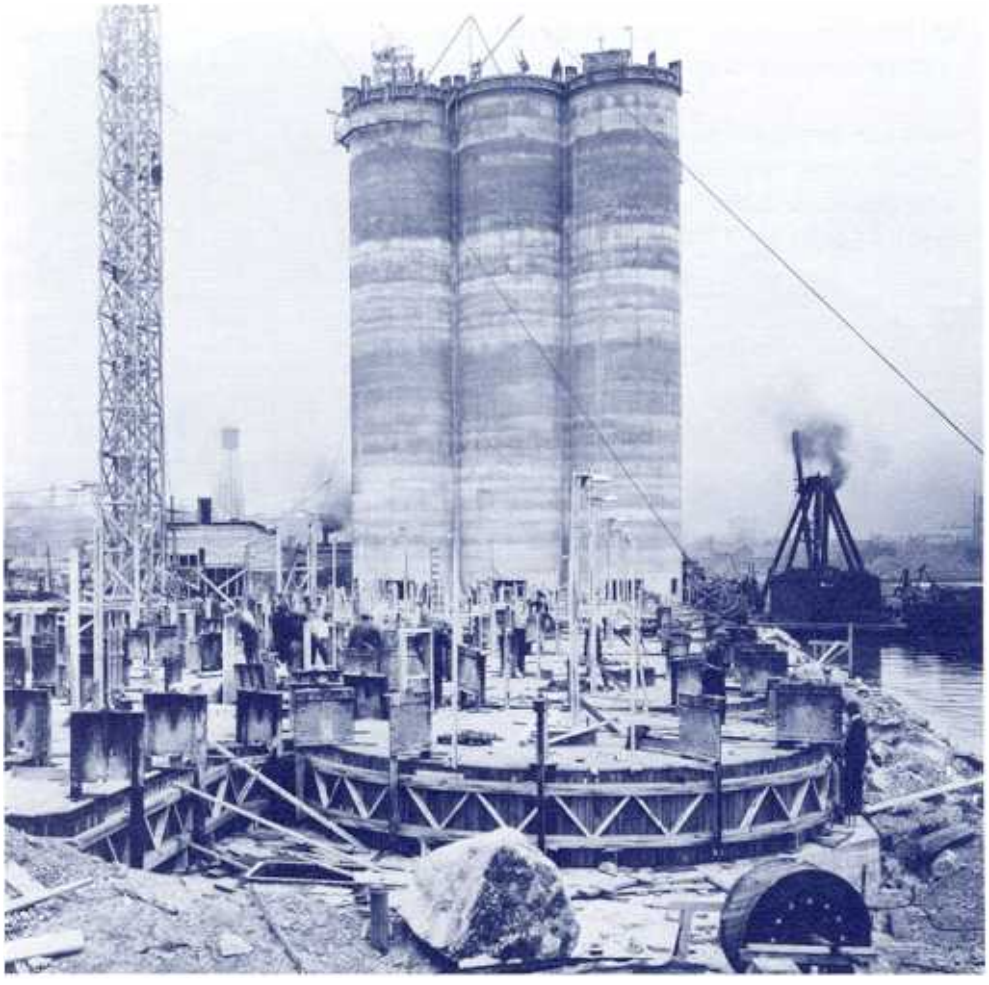
Buffalo grain elevators. Steel rods embedded in concrete provide the reinforcement. Steel keeps the bins from bursting open due to the outward pressure of the grain while concrete carries the massive loads down to the foundation. Concrete also forms a fire resistant coating over the steel.

The "slipform method" was generally used to build reinforced concrete bins. At the beginning, a form usually four feet high was built on the foundation slab. Screw jacks placed at intervals of about seven feet were used to raise the form. Workers operated the jacks at a rate calculated to raise the form about six inches an hour. This rate gave concrete time to set at the bottom before being exposed by the slowly rising form.

On the opposite page is a picture showing the beginning and the end of the slipform method. In the foreground one can see the wooden form and the screw jacks in place as construction begins. In the background are nearly-completed storage bins with the wooden forms in place at the top. Using this method it took about ten days for the Standard Elevator to reach the height of 125 feet. This was the average height of the bins. After completion of the bins, the workhouse was slipformed up until the structure reached a height of about 200 feet. Being more complicated than the bins, the workhouse was often built of structural steel rather than reinforced concrete.

The top or deck of a grain elevator under construction was an extremely busy place. Placement of steel rods, pouring of concrete, and jacking of the form were continuous processes. Generally, each jack man had twelve jacks to tend to. A whistle sounded as a signal for each man to make one turn on each jack. Raising the form six inches required 24 whistle signals each hour. During that time a jack man would make 288 turns — almost five a minute — on his jack. Understandably a jack man occasionally got tired enough to miss a few turns. This caused his section of the form to be lower than the rest, resulting in considerable stress on the form. Such an imbalance brought distress to the job superintendent.

Supervising and inspecting the construction of a grain elevator by the slipform method was a formidable task. Concrete had to be poured properly. Steel rods needed to be placed so as to provide the required strength in the bin walls. Before construction started workers stored sufficient reinforcing steel at the job site. After the job was completed, considerable steel might be left over. This led to the suspicion that some steel reinforcing rods were left out, possibly at critical points. Therefore, left-over steel indicated that the structure might not be up to design strength. According to folklore of the grain industry a great deal of steel ended up in the Buffalo River to cover up omissions or weaknesses in construction.



Elevator being built using the slipform method.

Even with some truth to this folklore, bin burstings and structural failures were uncommon. Fires, explosions, and collapses for other reasons occasionally occurred, however, and these provided some of the most dramatic events in the history of Buffalo's grain elevators.

SPECTACULAR EVENTS

Fire destroyed a number of the early wooden elevators. Newspapers related the story when the National and Globe Elevator on the Evans Ship Canal burned to the ground on an October Sunday in 1963. The National and Globe had been built one hundred years before and was out of use at the time it burned.

The Ontario Elevator on the Evans Ship Canal after it collapsed in 1904.

After the 1890s, construction with steel and reinforced concrete reduced the problem of fire, except in the grain itself. Spontaneous combustion of grain may cause a slow, smoldering fire deep in the interior of a bin. Using water to douse the fire would spoil the unburned grain, so other methods have been developed to deal with this problem. The bin may be "turned over;" that is, the grain run out to another bin to cool it off or dry ice can be placed on top. This generates heavy carbon dioxide gas that sinks into the grain and smothers the fire below.

Grain dust can explode violently. One such explosion occurred in 1913 at the Husted mill and elevator. The explosion killed 33 people and injured 80 others. Agway "B", one of the first concrete elevators built in Buffalo, has topless bins, like some of the older wooden elevators. When Agway "A" and the Eastern States elevators were built later, they had individual concrete covers for each bin. The theory was that in case of an explosion a cover would blow off without disturbing the other bins, much as a safety valve protects a steam boiler. In this way designers of the elevator hoped to limit damage from an explosion. Even so, such a cover (actually a concrete disc 20 feet in diameter and weighing 4 tons) would cause considerable harm if blown into the air. Fortunately, no explosions have occurred at Agway "A" or the Eastern States, so none of the concrete tops have been lifted forcefully from the bins, and this explosion relief idea has not been tested.

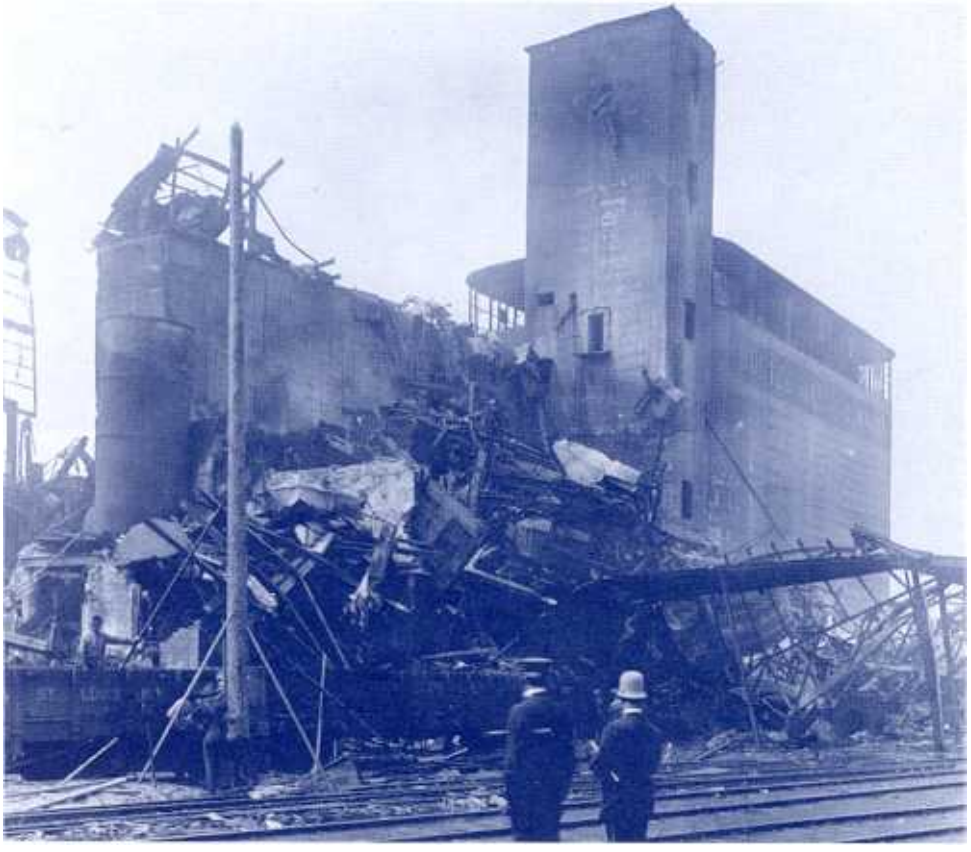
Exact causes of fires or explosions are sometimes difficult to determine. Sparks from electrical equipment have been blamed. So, too, has static

electricity built up on moving belts. Overheating of poorly adjusted or badly aligned machinery can cause fires. Careless smoking is always a hazard.

As years passed, safety and health measures have reduced dangers. Specially built enclosures prevent the escape of sparks or fire from electric motors, switches, and lights. Smoking is strictly controlled. Workers now may wear face masks to guard against inhaling grain dust. Cats attack hungry rodents while fumigation takes care of invading insects.

Modern grain elevators include other ingenious devices that improve safety or health conditions. Among these are temperature sensing devices consisting of cables in each bin. Their purpose is to relay dangerously high temperatures to a central point so action may be taken in time to prevent spontaneous combustion or other damage to the grain. Large bins may have ports near the bottom through which air can be blown to cool off the grain.

Husted Mill and Elevator explosion, 1913. Later rebuilt, it is now not used.



Dust control equipment and explosion suppressors have become increasingly important. Finally, modern elevators use up-to-date communications equipment. Noise of operations, distances of hundreds of feet, and grain handling rates of from 10,000 to 30,000 bushels each hour make rapid, accurate communications essential.

In spite of all these precautions, small accidents and occasional large ones do occur. A large one took place in 1973 when an explosion badly damaged Pillsbury's bulk flour storage bins. This accident put the mill out of operation for more than a year.

To the left is the almost complete Spencer-Kellogg (now Schaefer) Elevator which replaced the Coatsworth Elevator in 1909. In the center is the Kellogg Wood Crib Elevator "B." Note the "Turret" style vessel from Newcastle, England, being unloaded.

DECLINE OF THE GRAIN TRADE

Buffalo's grain trade reached one of its high points during the 1920s when receipts exceeded 300,000,000 bushels a year. World War II plus the necessity of helping to feed western Europe in the post-war years continued to stimulate the grain trade. As a result, the late 1940s saw several years

when grain received at Buffalo elevators and mills approached or exceeded the 300,000,000 bushel level.

Since that time the decline in Buffalo's grain industries has been steady and severe. Grain receipts now are scarcely 20% of the amount received in the late 1940s. Consequently, many grain elevators have been abandoned or are being used to less than their full capacities. Elevator storage capacity has declined from a high point of 58,400,000 bushels in 1942 to a low point of 22,650,000 bushels. And the winter fleet that once numbered hundreds of vessels is now nearly extinct.

The reasons for this decline are complex but three of the most significant are clear. The Welland Ship Canal (fourth one built in the Welland, Ontario, area) opened in 1932. With its opening full-sized grain boats coming from upper Great Lakes ports could by-pass Buffalo, delivering their cargo to Prescott, Ontario or Oswego, New York, for transshipment. Virtually no Canadian grain has been transshipped from Buffalo since that time. Next, completion of the St. Lawrence Seaway in 1952 gave moderate size ocean

A ship in the Buffalo River is unloading at the GLF (Agway) Elevators "A", "B", and "C."

The Great Northern Elevator, built in 1897 by James J. Hill, is now called the Mutual Elevator and is an adjunct to the Pillsbury Flour Mill. It is of a unique design having steel bins enclosed in a brick sheath.

vessels access to the interior of North America by way of the Great Lakes. This ended Buffalo's grain transshipment business completely.

While the transshipment business was coming to an end, Buffalo's animal feed industry was likewise declining. Decentralization occurred in this industry during the years between 1955 and 1970. Grain and other animal feed ingredients were no longer shipped to the large feed mills in Buffalo. Instead, smaller mills were built within trucking distance of the regions in which cattle, hogs, and horses consumed the animal feed. As a result, nearly all of Buffalo's feed mills ceased operation, the single exception being the Wollenberg, which produces only bird seed. At one time Buffalo's mills annually ground over 100,000,000 bushels of grain and other ingredients into animal feed. With the feed industry gone, Buffalo's grain traffic suffered still another drastic decline.

The end of transshipment and the closing out of the animal feed business meant more than a decline in the grain trade. It meant a serious loss of jobs. At one time thousands of men and women worked in some capacity associated with the grain elevators and the grain business. Now their jobs are gone.

Buffalo remains prominent only in the milling of grain into flour. Even this prominence is threatened by new developments in transportation and business organization. Buffalo badly needs a modern Joseph Dart to apply new or even old technology to enchance the natural advantages that a large lake city has.

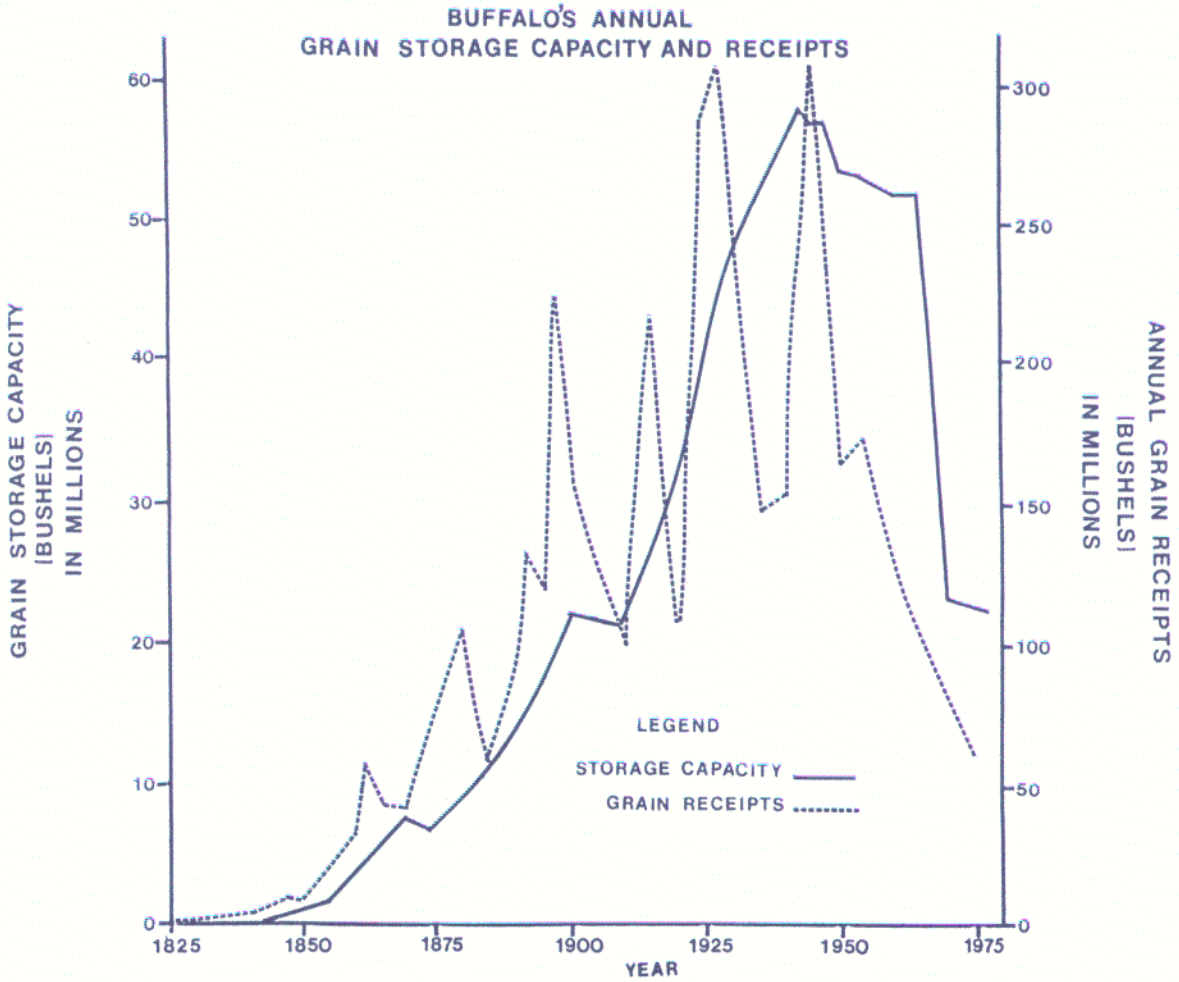
Years ago the poet Carl Sandburg wrote that fog comes "on little cat feet" and sits looking "over harbour and city on silent haunches" before it moves on. Buffalo's grain industry was bustling and noisy, not silent like the fog Sandburg wrote about. Moreover, unlike the fog, Buffalo's grain industry has left evidence of its presence "over harbour and city." Grain elevators and mills, even those now empty and abandoned, are the evidence of the time when Buffalo's grain industry flourished — and then moved on.

ACKNOWLEDGMENTS

Harold Ahlstrom & Laurence Burke — Lower Lakes Marine Chapter, suggestions and editing.
Edward D. Baxter, review construction aspects.
Gloria I. Baxter, typing.
Dr. Richard C. Brown, suggestions and editing.
Buffalo Corn Exchange, statistical data.
Buffalo and Erie County Public Library.
Buffalo and Erie County Historical Society Library and Iconography Department.
Lockwood Library, State University of New York at Buffalo.
Wollenberg Bros., data on their elevator.

HENRY H. BAXTER, P.E., a graduate of Cornell University and a licensed professional engineer, has been employed as Associate Engineer by the Plant Department of the Buffalo Board of Education since 1968. From 1946 to 1968, he was associated with the A. E. Baxter Engineering Company. From its founding in 1896, this company specialized in the design of grain mills.

He is on the board of directors of the Canal Society of New York State and is a member of the Society of Industrial Archaeology. With Erik Heyl, he coauthored *Maps, Buffalo Harbor 1804 - 1964.*


BUFFALO'S ANNUAL
GRAIN STORAGE CAPACITY AND RECEIPTS
GRAIN STORAGE CAPACITY
(BUSHELS)
IN MILLIONS
ANNUAL GRAIN RECEIPTS
(BUSHELS)
IN MILLIONS
0
10
20
30
40
50
60
0
50
100
150
200
250
300
1825
1850
1875
1900
1925
1950
1975
YEAR
LEGEND
STORAGE CAPACITY
GRAIN RECEIPTS