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SILOS IN MANITOWOC COUNTY, WISCONSIN

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PREFACE: *Richard Otto Wiegand, author of this study, was born and raised on a Centerville, Wisconsin farm. He has farmed there and is active in Centerville Settlement, Inc. in an effort to maintain the rural flavor and German heritage of that area. He earned a B.S. in Dairy Science, and M.A. in African Studies and is presently studying for a Ph.D. in Dairy Science at the University of Wisconsin-Madison. He has served in the Peace Corp in Africa and South America.*

SILOS IN MANITOWOC COUNTY, WISCONSIN

"And now I can see silos again!" rejoiced Bryan Fitzgibbons, a little boy from Denver, Colorado, when he visited his grandparents in Manitowoc County in 1988. He was fascinated by all of the varieties of shapes and sizes of the silos in the Midwest. He pointed them out and discussed them at length during his stay. Many share Bryan's interest.

Silos share the unique beauty of cows in pastures, barns, farmhouses, and sweeping fields in Wisconsin landscape. Often carrying warm nostalgic memories of the past, they are, indeed, fascinating structures with a unique history and important purpose. They are more than concrete towers standing behind barns.

The good pungent sweet-sour smell of corn silage in modern dairy barns still evokes pleasant memories for visitors with farm backgrounds.

Origin of Modern Silos

Silos, as we understand them today, are a relatively recent phenomenon. The word "silo" comes from the Latin "sirus" or "silus" meaning "cellar." The original "silo" was a pit or type of underground container designed to store grain to keep it dry and hide it from enemies. Such types of silos were used for thousands of years (Fish, pp. 159-61). Silos seen today, generally round, above-ground structures for storing wet feed for animals, have been with us for only about a hundred years.



1910 photo of silos on Louis Wiegand farm in Centerville. Fieldstone silo in rear was built in 1900, and may be the oldest in Manitowoc County. Note chimney on brick silo (1910) which may have been used for ventilation or heating. Both in excellent condition today.

The impetus for the modern silo came from Europe in the mid-1800's. Adolph Rehlein of Germany took large dent corn seed from America back with him. Because of a shorter growing season, he could not get it to ripen. He searched for some way to store the entire maize (corn) plant for feed. Borrowing a Balkan/Hungarian idea for storing sour grain, he buried his green maize in pits. His cattle liked it, and in 1861 he published his findings. Auguste Goffart of France independently experimented with "ensilage" in the 1850's. He published a book on his work in 1877 which was translated to English the next year (Fish, p. 161 and Noble, p. 11).

There is some dispute as to who built the first silo in the United States. Dr. Manly Miles of Michigan had traveled in France and by 1875 was experimenting with silage at the University of Illinois. Francis Morris built a pit silo in Maryland in 1876. John M. Bailey of Massachusetts published a silage book in 1879. Most of the first silos in the United

States were constructed in New York and New England (Fish, pp. 161-62 and Noble, p. 11). It is not clear from the literature when the first above-ground silo was built, but it was likely a vertical extension of the pit silo.

Silos spread very quickly in the United States. In an 1882 survey, the United States Department of Agriculture could find silos on only 91 farms. By 1895, there were 50,000 silos. By 1900, there were 100,000. In 1924, Wisconsin alone had 100,000 silos or one-fifth of all silos in the United States, with New York, Michigan and Ohio adding another 150,000. A 1949-50 survey showed 680,000 silos of which 614,000 were the tower type. At that time, 87% of the 44 million tons of ensiled material was corn silage (Fish, p. 159; Noble, p. 12-14; Hendrix, p. 1).

The silo offered tremendous advantages for the dairy industry. It took corn northward and, with it, dairying. Corn matured in about 140 days at the turn of the century restricting it as a useful crop to only those areas that would

allow a mature grain harvest. Some farmers raised and shocked corn for feed but on a small scale. Silos enabled farmers to use the entire plant at an immature stage. One was, thus, able to harvest a green succulent feed and store it over a long period of time. In the days before alfalfa, the main wintering feed was grass hay. Cows would milk little or stand dry during the winter. The best feed usually was fed to horses. Silos and corn silage allowed year-round milking. These structures enabled farmers to make low-quality forage more palatable, to cut the crop earlier and avoid weather loss, and have a more consistent feed. Silos and silage-making brought with them a whole technology of labor-saving equipment related to corn harvesting and silo filling (Fish, p. 159; Garfield, pp. 5.1-7). Another advantage was that the silo structure itself, especially the stone or concrete type, was largely resistant to the whims of weather, fire and pests (Reichert Manufacturing Co., p. 24).

SILOS IN WISCONSIN

Wisconsin was an ideal home for silos and adopted them readily. Dr. L.W. Weeks of Oconomowoc built the first above-ground silos in the state in 1880. Using the Goffart model, he built two square stone and concrete silos which were twelve feet deep and eight feet above the ground. His farm later became part of Pabst Farms. Dean William A. Henry built a silo at the University of Wisconsin the next year. John Steele of Dodge County built



Fieldstone square silo built in 1933 from old stone fence and other stone on Bill Christel farm south of St. Nazianz. Bill, 80, and neighbors built it themselves with muscle and sweat.

a pit silo in his barn in 1880 and extended it up into his haymow the next year.

As early as 1882, the United States Department of Agriculture had recommended round silos because of a spoilage problem in the corners of the square silos. John Steele, a member of the Wisconsin Legislature in 1880, worked closely with Dean Henry to fund and promote silage experimentation. In 1888, Steele built an 18' x 30' round silo of wooden staves. It became popularized as the "Steele Silo." Similarly, Prof. F.H. King of the Wisconsin Experimental Station introduced his round "King Silo" in 1891. William D. Hoard (later Governor) of Fort Atkinson and Hiram Smith of Sheboygan County were also very influential in the promotion of silos. By 1889, there were 2,000 silos in Wisconsin, mostly stone or wooden structures inside of barns (Fish, pp. 165-67; Garfield pp. 5.1-9; Noble, pp. 11-14).

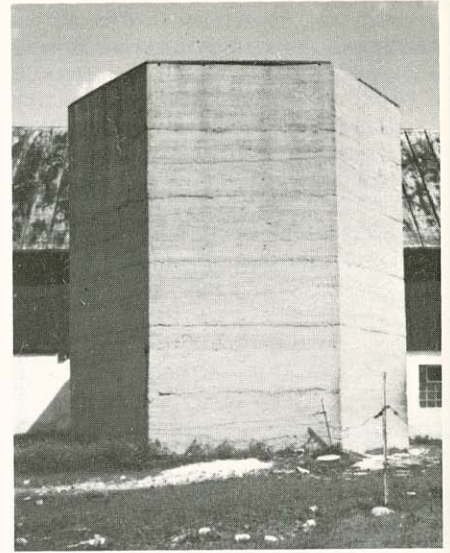
The importance of silos in Wisconsin cannot be overstated. With the decline of wheat and the growth of the dairy industry in the late 1800's, silo technology ranked right up there with the introduction of the dairy cow, alfalfa, and the tractor in its contribution to agricultural production in the state.

Silo Character

There are many types of silos, but they can be put into two general categories: horizontal and vertical. The horizontal silos include the trench type, (built into the ground), the bunker type, (above ground), the stack silo, and the bag silo. The pit silo, the original silo of the modern era, could be considered a variation of the trench silo or an underground vertical silo. Horizontal silos have become again somewhat popular due to low construction cost. Improved technologies and silage preservatives have helped to reduce spoilage losses which can be considerable in horizontal silos (USDA #810, pp. 15-24; Wooley, pp. 221-25).

The most popular silo today and for the past hundred years is the vertical round or tower silo. There are many types. The wooden ones, constructed in the late 1800's and early 1900's, included the very popular wood stave silo and the less common wood hoop silo. Field stone, brick, clay or tile block, tile stave, concrete block and sheet metal have been used. A few had double walls. Monolithic or poured concrete silos were probably the most common type during the first half of the 1900's. The most dominant silos today are the concrete stave and the sealed glass-lined metal types (USDA #810, pp. 1-15; Wooley, pp. 221-25).

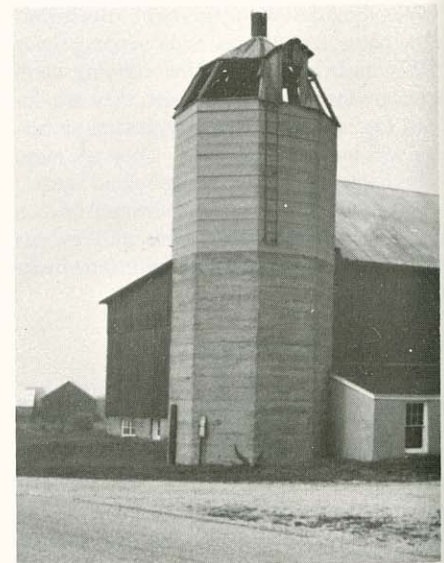
The location of the silo is very important. Early silos were placed out of the wind, although today, they may be used as windbreaks. Location had to be considered for feeding and filling convenience. Early silos were often placed at the end of the barn. Later, it was found that such a location could limit expansion of the barn, so silos became



Hexagonal silos are indeed rare and precious! James Grimm farm north of Two Rivers.

more popular along the side of the barn. Sometimes a farmer will place a silo exactly where it is needed. Others prefer to have their silos in rows. The location of early silos may have been related to the turning area of a team of horses to run the horse power or the length of a tractor drive belt which powered the feedcutter. Later, locations depended on accessibility for chopper wagons (Wooley, pp. 219-20).

Silos were only as good as their respective construction and design. The stability of the structure depended on having a sturdy foundation based below the frost line in the correct subsoil. Silos had to be drained using a gravel or concrete floor with drain tile. The design had to consider silage pressure, especially toward the bottom. Silage at the top of a silo may weigh 15 pounds per cubic foot, while at



Octagonal silo. Harold Hoffman farm, Steiners Corners near Mishicot. The lower part built around 1910. Extended upward in 1942.

50 feet deep it may have a density of over 60 pounds per cubic foot due to pressure. A 45-foot silo needs a foundation with a load-bearing capacity of at least two and one-half tons per square foot. Pressure against the lower walls of a tall silo is tremendous (USDA #1820, pp. 6-7, #810, pp. 3-4; and Wooley, p. 221). Early silos contained no more than 40-50 tons of silage when filled. Today's large silo can pack in 600 tons.

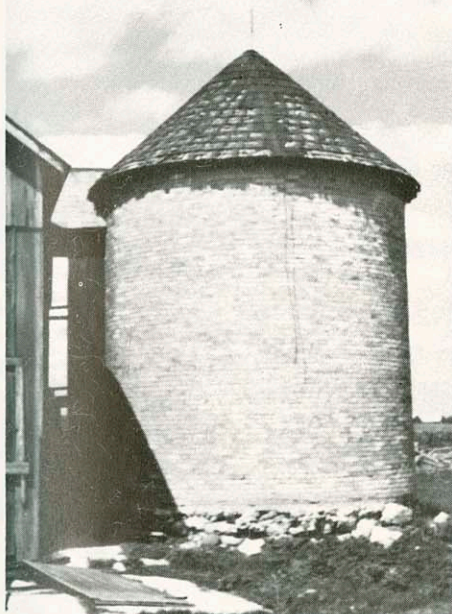
Less critical but no less important were several other features of the silo. Types of doors or silo boards, chutes and ladders, filling holes, windows, roofs and filling method had to be considered. Early silos were filled using elevators. Later, silos needed blower pipes that were usually put up and taken down each year. Today, they have permanent metal or plastic blower pipes. Silos had flat, dome,

nesota and became known as the "Minneapolis Silo." It could be bought as a prefabricated kit and erected by the farmer himself in about a day. J.P. Christensen of Oshkosh invented a double layer silo which could be heated with a fireplace to prevent freezing (Garfield, pp. 5.8-9).

Silos would seldom, if ever, freeze to the center, but would often freeze along the wall, especially on the cold side. Walls of frozen silage that thawed in the spring would sometimes collapse and fall on the farmer, or were even known to have knocked over the silo! To alleviate this, farmers would locate their silos on the south or east sides of the barn for wind protection and for sun exposure. Silos located inside of the barn would freeze less, but if they did, would take much longer to thaw out in the spring. ' Spoilage was always a threat to early



A beautiful concrete block silo. Joseph Baumgart farm north of Mishicot. Popular in northern part of county.



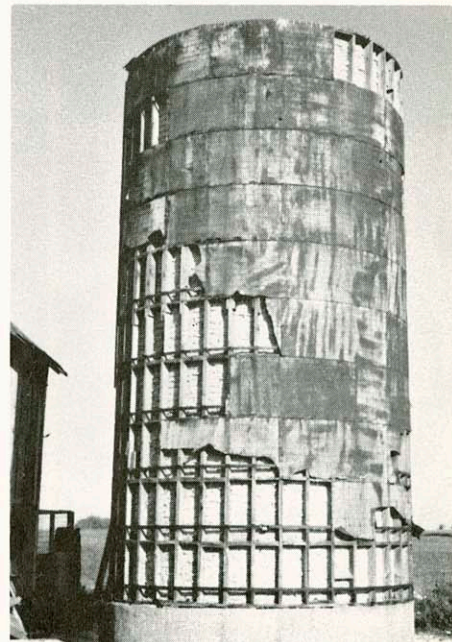
Old brick silo on old Ringmeier (later Kampf) farm north of Two Rivers. Very good condition.



Doors of brick silo on Kampf farm.



Early twin silo with common roof. Kewaunee County.



Extremely rare brick silo with wood framing and metal sheeting. Ray Valenta (old George Bernhart) farm north of Two Rivers.

cone, or gambrel-shaped roofs. Early silos had roofs of wood, later concrete, and now metal. Some had no roof at all. Sometimes twin silos had a common (also called double) roof. Such twin silos might have had a single top unloader which could be raised out of one silo and transferred under the roof into the other. Newer silos have bottom unloaders. For many years, silage was forked out by hand (sometimes called "armstrong" unloaders!) using a special "silage fork."

Some Problems in Silage-Making

In the early days, there were many innovations in silo design necessitated by freezing, spoilage and convenience. As mentioned, spoilage in the corners of square silos eventually led to round silos. Some hexagonal and octagonal silos were also built. A grooved wooden-stave silo was developed in Min-

silage makers. It was found that top spoilage would occur if less than one and one-half inches were taken off per day in winter and less than three inches in summer. It was common for early day farmers with fewer animals or wider silos to partition the silos. Some wall spoilage was accepted in certain silo types. This could amount to a loss of 5-20% of the silage. Spoilage could be reduced by well-plastered walls in concrete silos, packing the material while filling, adding water or cutting the crop earlier. Some farmers would take the whole family into the silo periodically to walk or stamp on the silage to pack it tighter, or would walk a horse around on the silage in horizontal silos.

One needs to remember that silage-making is first a science and often an art. Early silage-making was an experimental stage and mistakes were made. Silage put up too dry would spoil by oxidation and overheating. It would

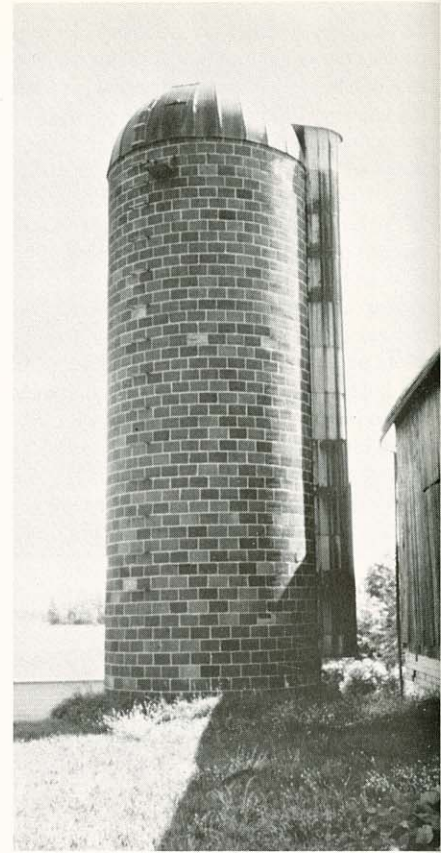
sometimes catch fire. Silage put up too wet or immature might be sour or too many nutrients might be lost in seepage. A silo fire could crack weak walls. One with acid-damaged inside walls could burst. The taller the silo, the greater the pressure against the lower walls. Looking at a concrete stave or old wooden stave silo, one can see that there are many more hoops or rings around the silo at the bottom. The staves in a wooden stave silo would dry and shrink after the silo was empty, leaving the structure vulnerable to windstorms. Farmers were supposed to tighten the hoops. But if the hoops were too tight when the silo was refilled, the staves would expand with moisture and could buckle inward. With experience and new technology, these problems were corrected (Fish, pp. 166-69; Wooley, pp. 218-21).

Silo gases continue to be a danger for farmers who enter the silo during and after filling. The initial stages of fermentation consume the oxygen in the silo and produce carbon dioxide. Lives have been lost in silos due to suffocation. Older structures with deep pits were especially hazardous because gases could not seep out. Farmers were advised to lower a lighted lantern on a pole into the pit before entering. If the light went out, it was not safe. One could stir the air with a blanket or basket on the end of the pole and repeat the test. Another hazard is nitrogen dioxide, a heavy yellowish-brown gas which, if inhaled, combines with water in the lungs to form nitric

acid. Permanent lung damage or death can result. Gas formation is a problem in the early stages of a fermentation process that normally lasts for a few weeks. Some farmers leave their crop blower set up for a week or so after filling. If they need to enter the silo, they can run the blower which will stir the air and expel the bad gases (USDA #810, p. 27).

Silos and silage-making, as a new technology often does, came under considerable criticism in the early days. There were failures in technique and structure causing some farmers to give up. Critics expected that silage would rot cow stomachs and teeth or cause calving problems. Effects on milk taste and quality were mentioned. Up to 1908, cheesemakers in Walworth and Rock Counties in Wisconsin refused silage-fed milk (Fish, p. 168).

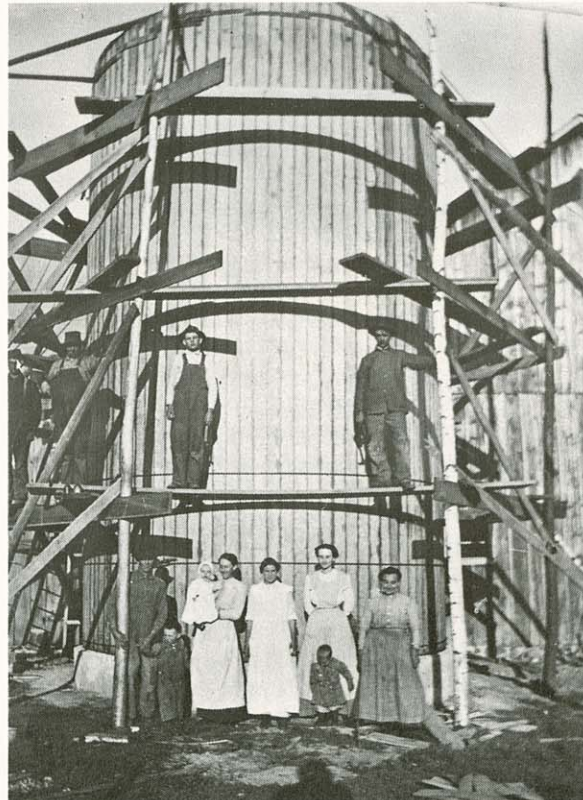
The arguments for silos were numerous and many have been already mentioned. One of the more interesting ones was that silage gave the farmer more feed, more animals, and therefore, up to 50% more manure for fertilizer. As there were few or no commercial fertilizers at that time, potential generation of manure was quite important. A second notable argument had to do with space. A ton of dry hay would occupy 400 cubic feet. That same space would contain eight tons of corn silage. Therefore, silos were promoted as more-efficient and less-costly methods of storage. (Smalley Mfg. Co., pp. 3-4).



Glazed or tile block silo on Robert Filipczak, formerly Oscar Eis, farm north of Two Rivers. Features exterior ladder and dome metal roof.



Sheet metal silo south of St. Nazianz. Rare.



Construction of a wood stave silo on the Fred Sand, Sr. farm, presently owned by Lee Sand, on Highway 42 north of Two Rivers. Cost of prefabricated kit in 1900 was about \$100. Could be erected in a day.



Wood stave silo on Roy Schmidt farm north of Two Rivers. Now part of Farm Museum.

Silos in Manitowoc County

The author and some of his county agricultural colleagues estimated silo number and types in Manitowoc County in 1988. They considered number of farms, cows, silos needed per cow, acres in agriculture, silos in a square mile and actual observations. The total number of silos was put at 5,000-6,000 of which approximately two-thirds are being used. Of the number being used, there may be 500-1,000 sealed units, most of them of the blue Harvestore type. The remainder of the silos in use are largely of the concrete stave type.

The unused silos are mostly the older types found on farms no longer part of the agricultural mainstream. Prevalence of certain types of silos in the county depended on who was selling them in that area, the level of agricultural development, the materials available and other factors. There may be 25-50 stone silos mostly in the southern part of the county. They survive, in part, because they are hard to remove. Some 50-100 wooden silos are scattered throughout the county. Many have been removed for fencing or other recycled uses over the years. Silage acids have a detrimental effect on concrete, but preserve wood quite nicely. The most common types of wood used in silos were redwood, pine, cedar and fir. They may be 20-30 brick silos, again mainly in the southern part of the county. The Village of Cleveland once had two brick yards. The old cream city bricks still have some value for recycling. Perhaps 50 glazed or tile block silos are found throughout the county. Concrete block silos may number 20-30. Double-roof twin silos may number only 4-5 in the central and western parts of the county. There are no more than 5-10 hexagonal or octagonal silos north of Two Rivers. Silos inside of barns are hard to estimate, perhaps 20-50, made of wood, stone or brick. There may be 5 sheet metal silos. Monolithic concrete silos, some used and some not, could exceed 500.

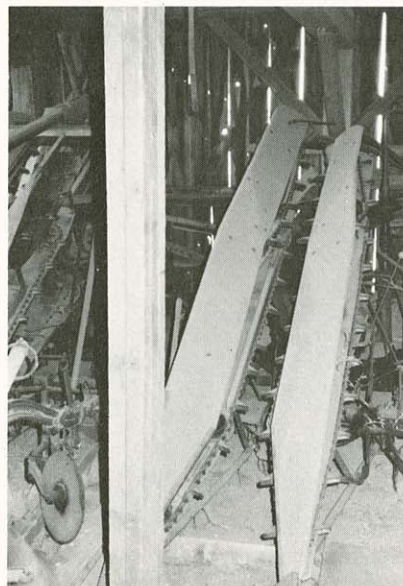
The surviving older types of silos are often found today on hobby farms or secondary farms. Getting the age or history of these silos is difficult because original owners have left or passed away. Silos came to Manitowoc County shortly after they came to Wisconsin. The Smalley Company was building wooden silos in the area by 1880. The oldest type of vertical silo in the county was likely made of stone or wood and may have been built inside of a barn. Which is the oldest surviving individual silo in the county is unknown. In the research done for this article, no silo has yet been "officially" dated before 1900.

Builders of Silos in Manitowoc County

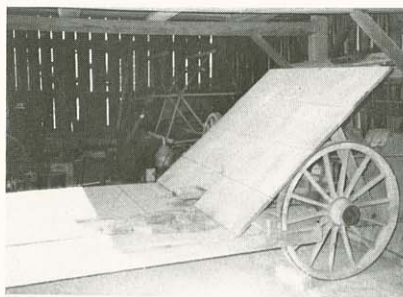
The Smalley Manufacturing Company, operated in Manitowoc between 1857 and 1989. For many years, it has made agricultural equipment and once made prefabricated wooden stave silos. Smalley literature and catalogues between 1890 and 1910 indicate



Mrs. George (Linda) Sekadlo, 91, Mishicot, graciously provided stories of silage making and inspection of corn harvesting equipment.



Horse drawn corn binder in Sekadlo barn.



Sekadlo corn wagon. Variations of this style were used to haul corn bundles to feed cutter.

that a silo could be purchased for \$75-200, a No. 10 feed cutter for \$37, a carrier (elevator) for \$26, a two-horse sweep drive with drive shaft for about \$30 and two-horse treadmill with governor for \$135. Smalley made steam engines in 1906 with or without wheels for \$250-450. Silos were usually erected by the farmer himself; if he needed help, Smalley would send a technician for \$2.50 per day. At the 1892 Chicago Worlds Fair, Smalley filled the round silos there with their equipment, putting up 360 tons of corn silage in 43 hours and 37 minutes.

Smalley published several testimonials by farmers who used their products. One such was by Otto Krueger of Reedsville in 1888. He stated, "Yes. I built a silo in 1886, 21' by 12', and sixteen feet deep, built of matched boards inside of barn and tarred paper, cost me complete not to exceed \$75, holds 80 tons. Have filled it the past two years and am more than pleased with the results. Have fed cows and young stock, and they do better than on any other fodder I have ever tried. Have cut straw, hay and, in fact, cut everything for my stock the past 12 years, and would not think of doing without under any circumstances. I have learned the value of fodder cutting in Germany, and I know what I am talking about. I used my old No. 3 Smalley Cutter bought over 12 years ago, and I don't have to take a back seat for any cutter I have ever seen. Used carrier that I fixed up myself, and it works first rate." Other testimonials for Smalley were provided in the same year by Adolph Cloupek of Kossuth, H. Beyer and H.M. Hittner of Mishicot, and Hiram Smith of Sheboygan Falls.

August Ehnert and Sons of Kiel built around 3,500 concrete silos from 1913-1980. The first silos were poured concrete. In 1946, they started building concrete stave silos. Ehnert and Sons was at one point the oldest and one of the largest silo manufacturers in Wisconsin. Harvey Ehnert related several silo building stories. On a rare occasion, a new employee, discovering a fear of heights, would "freeze" and have to be carried down from the silo. "Many older silos were removed," he stated, "not because they were in the way, but because they were still taxed."

A.O. Smith of Milwaukee began manufacturing Harvestore Silos in 1949. They had pioneered a process of fusing glass to steel in the 1920's and had been using it for beer tanks.



Sunlight peeking in on a round wood stave silo, inside the barn at the Vernon Schreiber farm north of Two Rivers. Silo doors were removed as silage level was lowered.

A farmer visiting the company after World War II commented that such a tank would make a good silo. An idea was born! A glass-lined silo could avoid acid damage to the inside walls. A sealed unit could allow drier silage (under 50% moisture) and avoid excessive seepage loss common in conventional silos with higher-moisture silages. A bottom unloading system similar to coal mining equipment was devised. A breather bag system was developed to allow silage to slide down without taking in oxygen or damaging the structure. Some 75,000 Harvestore units have been erected on 40,000 farms in North America since that time. Sealed unit silos have greatly contributed to the making of alfalfa silage and high moisture corn.

Manitowoc County Anecdotes

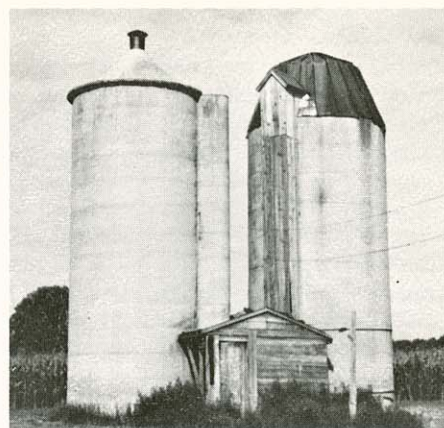
The old silo filling procedure was as follows: Fields were "opened" by cutting outside rows with corn knife. Corn was cut and bundled with a horse-drawn corn binder by the farmer. Neighbors exchanged help, wagons, and teams on silo filling day. Wagons were loaded by hand in the field. Horses pulled wagons beside an unloading platform next to a feedcutter. Farmers fed the bundles into this machine. Before safety features were added, this was a dangerous job and in an earlier day, these feedcutters took an occasional hand or arm. The cutter was belt-powered by the tractor or a stationary engine. Large blades swept the chopped corn up a pipe to opening to the top of the silo.

"Throwing down silage" with silage forks was often the farm boy's chore before school. Silage was first carried to the herd with a large basket; in larger modern barns a cart was used.

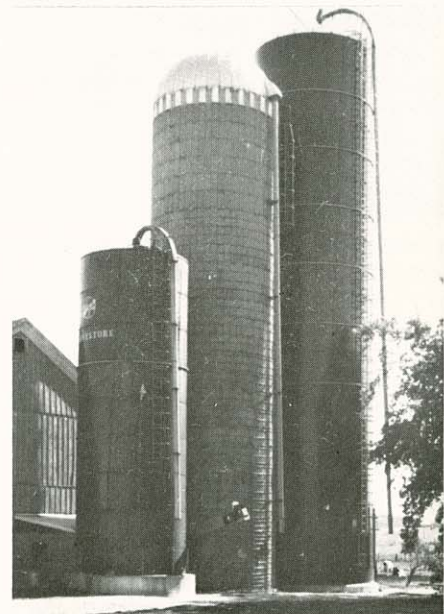
Art Zierzow, Jr., was raised in Two Creeks Township. He remembered, "I couldn't wait to get home from school into that silo during silo filling time." Youngsters often worked in the silo during filling to level out the silage as the leaves had a tendency to separate from heavier stalks. Here was the chance for the farm boy to proudly join the adult workforce.

Mrs. Linda Sekadlo, 90, well remembers preparing meals for neighbors who helped fill silo. Residing on her 4th generation century farm, Mrs. Sekadlo can share a wealth of history. The machine shed on the Mishicot area farm holds much agricultural history. Many old implements in prime condition are neatly stored there. Two corn binders, a corn wagon and a gravel wagon are a few. "I remember how handy the corn wagon was. We loaded it with potatoes, melons, and other produce." Corn wagons were also handy for picking stones or hauling firewood because of the low bed. Like the old stone boat, it has been lost from the farm scene and memory.

Roy J. Schmidt of rural Two Rivers has been most helpful in the preparation of this material. His 85 years in the farming community, enthusiasm and unselfish sharing of his artifacts and files helped immensely. Mr. Schmidt agreed that the advent of the silo (his father, Adolph, sold silos for Smalley) was a great step ahead for agriculture. "Prior to this time, we had corn shocked in the field and would bring in bundles on a stone boat and run it through the feed cutter as we used it. Later, corn was brought in near the barn and shocked in long single rows to be close and handy in winter." In discussing early methods and problems of filling silo with an elevator or conveyor, he related that a neighbor had his teenage daughters carry silage into the silo



Two lonely sentinels on Bruno Leist farm now owned by Wesley Pfefferkorn. Both monolithic concrete types with conical roof on left and gambrel wooden roof and wooden chute on right. Foundation has 1912 inscription. May have originally supported a wood stave silo.



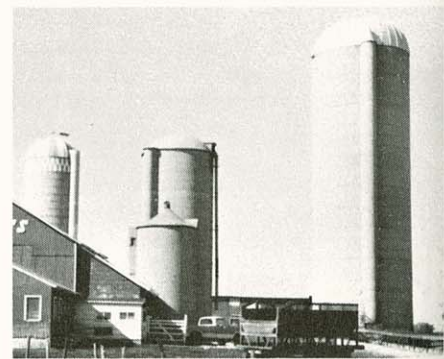
Randy Bender farm, Town of Meeme. The smaller Harvestore on the left was built in 1950 for less than \$3000. Believed to be the oldest Harvestore in Manitowoc County.



Wooden silo complete with wooden roof, filling hole, chute and vent pipe at Highway K and I-43 east of Kellnersville.



Square wooden silo built into the southeast corner of the Willis Voss barn, Town of Centerville. Most common type of the original silos built in Wisconsin.



Alan Barta farm, Two Creeks. A contrast of sizes and ages of concrete silos. Bunk feeder attached to the large silo on the right. Note almost flat roof on the medium silo in center.

with bushel baskets! Mr. Schmidt has converted his wooden silo into a museum.

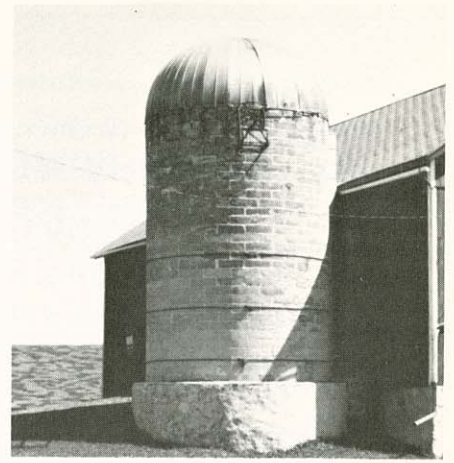
Another old-timer tells of pleasant memories of filling silo. "Silo filling in the old days was, in my memory, a warm neighborly time. The more intense threshing operation was past. The barns and graineries were full. The work was not as hot and dirty. The fresh sweet smell of new silage permeated the area. The weather was cool and idyllic. Fewer neighbors were needed, but kids were needed to spread the silage blown into the silo. So we felt needed - we were part of the work crew! Work for the usually overburdened farm wife was a bit easier. By now she was making pies and "kuchens" from the tarty late-bearing apple trees. But everyone who remembers silo filling cannot forget the years when heavy rains made the fields a quagmire. The mud was deep, the corn bundles heavy and wet, and work was not easy for man and horse. The farmer had to skirt the low areas of the field with the corn binder, and he or family used a corn knife to cut this corn."

The latest technologies have not done away with wet fall quagmires. But silage making and handling has changed in many ways since it came about 100 years ago. Today, 20' x 80' silos are loaded by pushing buttons. Many farmers have conveyors, bunk feeders and motorized feed carts to feed the cows. Tractors are over 100 horsepower and can blow silage 90 feet upward with power-take-offs running at 1000 rpms. Silage does not freeze much anymore. Various preservatives, inoculants and additives can help give the kind of silage desired. A self-unloading wagon can unload six tons of silage in less than 10

minutes. Distributors spread the silage evenly in silos. Farmers need not enter silos anymore. The cost of this technology is also modern. A new sealed unit silo may cost as much as 100 acres of land. Of course, there are still exceptions. But what is said here today will and should sound old a few decades from now. Such is progress.



Roy Schmidt, retired farmer and historian: "Silos--a great step ahead for agriculture."



Double-wall block silo. Roland Schnell farm, Highway X, Town of Schleswig.



Example of twin silos with a common roof and top unloader. When one silo is empty, the unloader is raised and transferred into the other silo. Concrete stave type built in the late 1950's. Harvey Guse farm, west of Maribel.



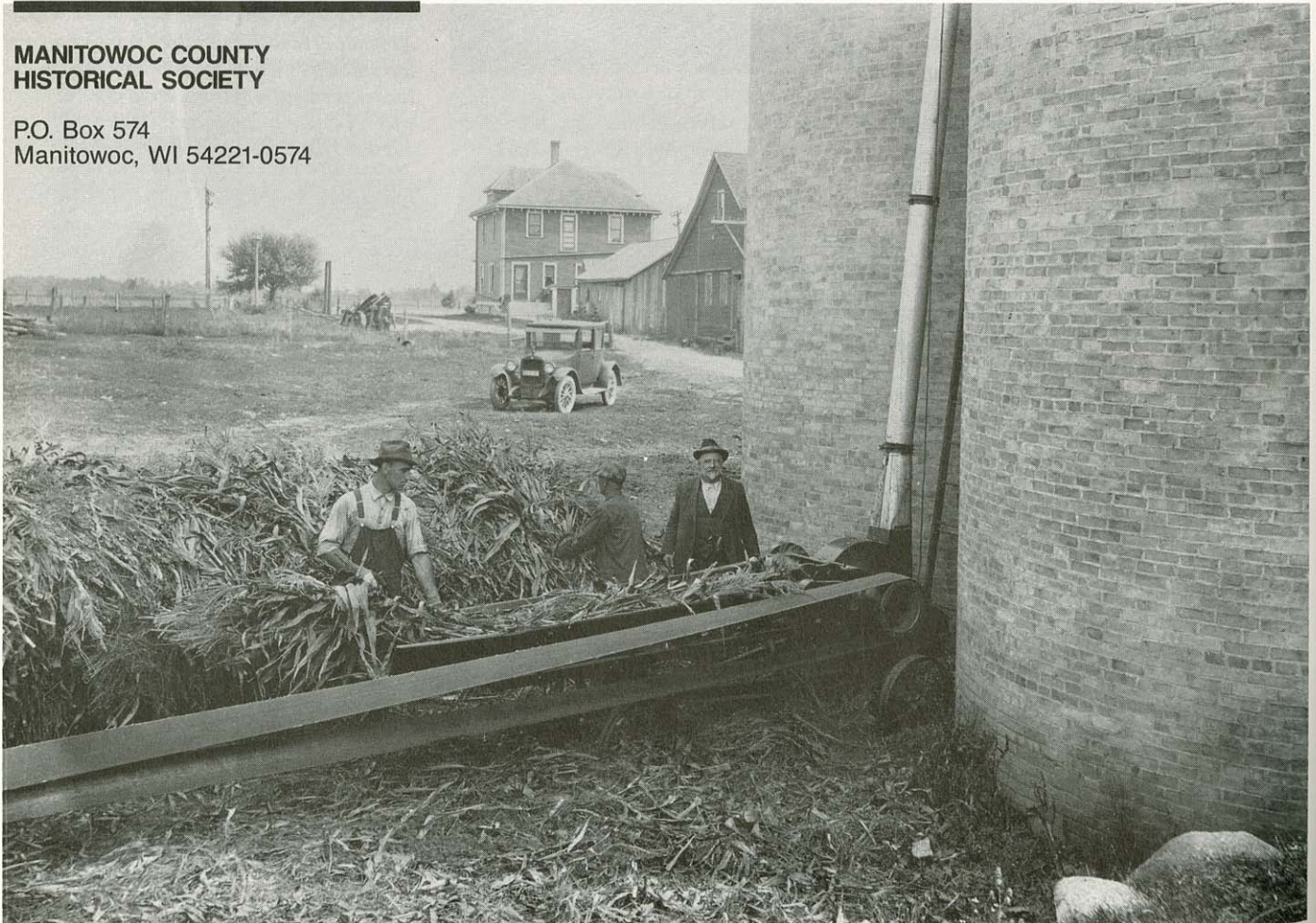
Filling silo using regular hay rack. 1940's. Horses stood quietly next to noisy machinery. Farm unknown.

REFERENCES

- Harvey Ehnert, information and interview, formerly August Ehnert & Sons, Kiel, Wisconsin, 1988.
- N.S. Fish, "The History of the Silo in Wisconsin," Wisconsin Magazine of History, 8 (2) pp. 159-170, 1924.
- Leonard Garfield, "Feed Crop and Grain Cultivation," Cultural Resource Management in Wisconsin: Volume 2. Madison, State Historical Society of Wisconsin, Historic Preservation Division, 1986, pp. 5.1-17.
- A.T. Hendrix, "Equipment and Labor Requirements of Different Methods of Storing and Feeding Silage," Agricultural Research Service, USDA, University of Georgia, Athens, Georgia, 1955.
- Allen G. Noble, "The Diffusion of Silos," Landscape 25 (1) pp. 11-14, 1981.
- Reichert Manufacturing Company, "Reichert Adjustable Circular Equipment (for Monolithic Concrete Construction)," Milwaukee, Wisconsin, 1916.
- Smalley Manufacturing Company, various publications and catalogues, Manitowoc, Wisconsin, 1890-1910.
- A.O. Smith Harvestore, "A New Way of Preserving Feeds."
- USDA, "Silos, Type and Construction," Bulletin No. 1820 by J.R. McCalmont, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 1948.
- USDA, "Farm Silos," Publication No. 810, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 1960.
- John C. Wooley, Farm Buildings, First Edition, University of Missouri, McGraw Hill Company, Inc. 1941.
- For additional information on silo-filling equipment see Monograph 8, "Manitowoc County - A leader in Manufacture of Farm Machinery." (Description of early feed cutters, horse-powers and conveyors.)
- Miscellaneous References: Scott Hendrickson, Manitowoc County Agent; James Hansen, former Manitowoc County Dairy Agent; Bryce Larson, Instructor, Lakeshore Technical College, Cleveland, Wisconsin, 1988; Dr. Brian Holmes, Professor Agricultural Engineering, University of Wisconsin.

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Filling brick silos. Ed Hessel farm, 1930. (L. to R.) Ed Ewen, Ed and Frank Hessel. (Courtesy Smalley Mfg. Co.)