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ICE HARVESTING IN RETROSPECT
A Review by Kenneth Merrill

HARVESTING ICE In The Good Old Days

Ice has seldom been used for preservation of food over the past millennia because of a lack of availability. Salting and smoking of meat and drying of fruit sufficed to preserve food supplies. Western Europe had somewhat mild winters and cool summers, compared to North America. When the first settlers came over to North America and the English colonies, they became mostly an agrarian society dotted with occasional villages and urban communities. Perhaps the greatest need at the time for harvesting ice was the greater development of the dairy industry and the fact that we in Northern United States and New England had such hot summers and cold winters, making nature's ice more available.

Even though a farm family was a self-sustaining entity, dealing usually in a barter and trade system, they still had to depend on the outside to sell their goods such as wood, milk and other agricultural products for a cash income. This was necessary for paying taxes and purchasing goods they couldn't produce at home.

Iron and steel rod and bar stock started to become available after the Revolutionary War from overseas and domestic sources through the local hardware store and blacksmith shop. At first, they depended on the local farrier for horse shoeing. The industrious and enterprising farmer gradually developed his own blacksmithing skills and created his own tools, nails, etc.

The tinsmithing shops put out more vessels and containers that could be used for milk and other storage. Most farms had a spring house at the foot of a hill perhaps fed by a wooden or lead pipe for continual flow of cool water, about 50 degrees year round. The milk containers were kept submerged, except the top, where they would be pulled out and loaded into a milk delivery wagon just before sunrise and taken under canvas with some ice to the local village for delivering house to house. There was a quart and pint measuring dipper to fill the various pots and containers the housewives brought out. This system worked quite well as the daily route and time was fairly short, but while the population in villages and urban communities increased, routes were extended and more time needed. This presented a problem in the hot summer months. Ice had to be the solution to the dilemma!

Most farms were located within a half mile or less of a pond or lake. Rural labor had its slack season during the winter, except for chopping wood and other chores. Between older male members of the family and the hired hands, there were plenty of helpers for the ice harvesting that was to come. Often two or more farm families and their hands would join operations to help each other with the entire harvest. This was not only necesary for survival, but was also urged on by the early American religious work ethic to help one another.

Usually, most tools available at the end of the eighteenth and beginning of the nineteenth centuries consisted of a long chisel bar, a pointed bar, ax, grapple hooks or tongs and pikes (ice hooks). All could be made by a local blacksmith or bought at the hardware store, usually the General Store. Pick-axes and other wide-bladed types of that nature were forged by more sophisticated blacksmithing operations. Although the Revolutionary War had come and gone, wrought iron and other ferrous metal stock was sometimes difficult to come by until the end of the 1700's.

Meanwhile, back at the farm, the first step was to prepare a place for storage of the ice in the barn cellar. The ice was usually kept away from the manure in a quite cool corner with two adjacent stone walls

and boarded up in front and side, after storage, in an area about 10'x10'; this would store around nine to ten tons. Old hay, swamp or marsh grass was placed on the dirt floor and spread around thickly, then thick planks were placed on top and packed down. This prevented heat penetration from coming up through. This ice should have lasted at least until early the next winter!

An ice working area on the pond, approximately 22' square, would yield about eleven tons, allowing for some waste of 10% or 15% in cutting. This would take care of one farm. The area had to be far enough from shore to be over deeper water to eliminate more air bubbles from the freezing ice. When the ice was close to three inches thick, any snow accumulation should have been removed as any thickness of snow insulates the ice and retards freezing. The desired type of ice is almost crystal clear or "black ice." "White" or snowy ice, "honeycombed" with many air bubbles, deteriorates rapidly in the ice house.

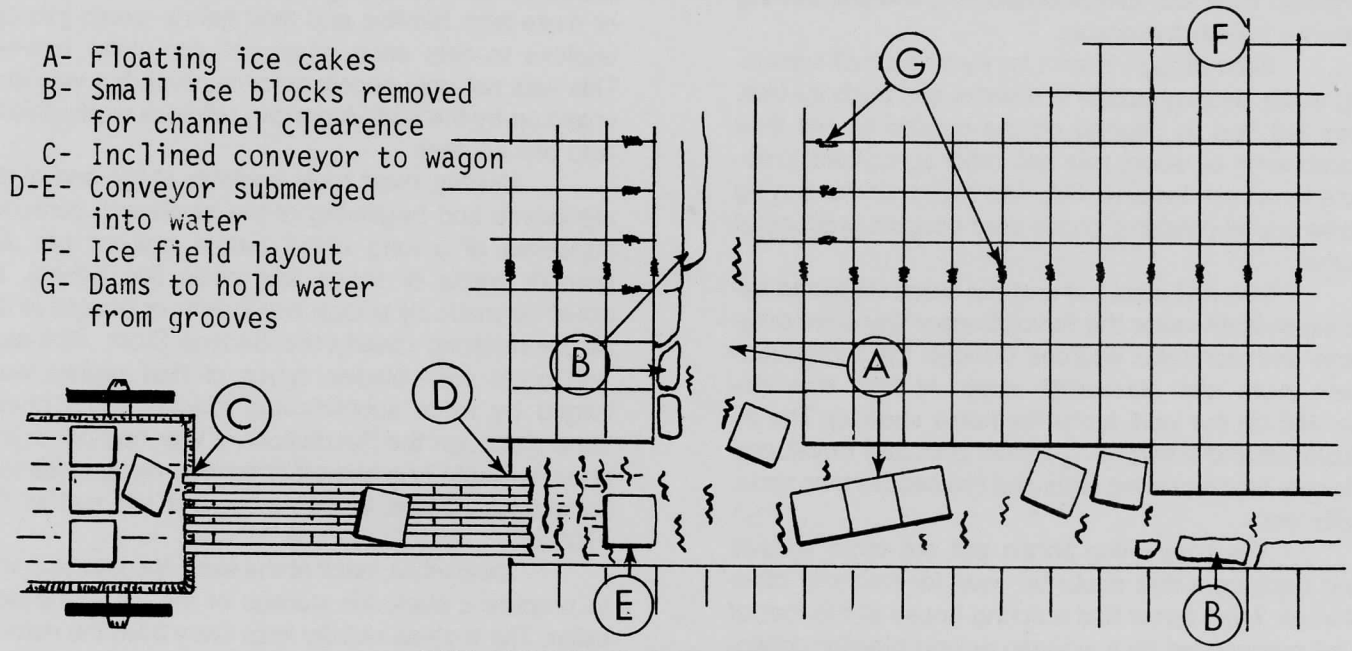
An inch of snow could be removed easily with a board or pusher much like a push broom. Any deeper snow could be removed with a wooden horse-drawn scoop to be tipped up and over at the edge of the ice working area. If the edge of the pond had an open clearing leading to the shore, this could be done by the horse being led with a long rope without having to be on the ice. However, it was dependent on the farmer's ingenuity along with the terrain and local conditions of the area. It was advantageous to have as smooth an ice surface as possible for working.

Using round figures, a cubic foot of water weighs 62.5 pounds, while a cubic foot of dense, crystal clear "black" ice weighs close to 60 lbs. This leaves 2 1/2 lbs or so of buoyancy for floating. Nine-tenths of a block of ice is below the water line, regardless of the size of the block; one-tenth remains above. Assuming 12" thickness, it takes a little over 2 1/2 lbs. of added depression or weight per square foot of area to submerge the ice in a state of suspension just below the surface of the water. Extra weight of heavy snow or equipment around the perimeter of the ice cutting area could depress it down enough, causing flooding or "puddling" of the surface making for impossible working conditions.

This flooding was often taken advantage of by drilling a few holes scattered in the area with either a narrow bar chisel or an auger. This allowed the water to flow freely over the surface for an inch or so and to freeze solid again in a couple of days to form a new smooth surface.

At a corner of the ice harvesting site nearest to what was going to be the wagon location, a long straight board was laid down along the edge of the work area on one side, from the corner, and scored or marked with a chisel or bar point for 10' or 15' or so. The same would be done a few feet from the same beginning perpendicular, forming an "L". This pattern began the whole operation.

A reasonably square hole was chopped out a few inches larger than a cake of ice, but within the "L" shaped area, to create a channel 10' to 15' long alongside the harvesting area. Also, the other channel would be chopped, creating the remainder of the "L" called the "header." This was necessary for each subsequent cake to be cut out on two of its adjacent sides only, like a postage stamp, and floated to the open water of the channel. In the early days, this was accomplished with a bar chisel and ax. The first square



ICE FIELD HARVESTING LAYOUT

hole was chopped out in rough chunks and waste pushed under the ice surface. Smaller pieces were scooped out with a shovel device with coarse meshed wire, and the first cakes had to be chipped as square as possible.

The marking and cutting would be started off with a series of puncture holes similar to an ice pick. A few blows with a chisel bar or ax blade along straight lines would cleave enough to split the cakes apart with fairly even sides. The two channels were more difficult to chop out because of trying to salvage the full size ice cakes while disposing of the fractured chunks as previously stated. There is some speculation as to exactly how they went about this in the late 1700's.

When the ice saw came into prominence in the early 1800's, chopping and cutting by chisel bar and ax alone ended.

Ice saws became more numerous with the availability of rolled flat steel used in the manufacturing of "up and down" vertical saws in the lumber industry. It is believed the home harvesters may have used some of these old saw mill blades as the first ice saws. The regular ice saws were usually about 54" long, 7" wide at the top, 5" wide at the bottom, and 1/8" thick. The teeth were usually 1 1/2" from tooth point to tooth point, with a depth of 1 1/2". A double wooden crossbar handle was attached to the top wide end, with a vertical bar strap. Sharpening angle and "rake" was the same on all teeth as cutting was equal for both up and down strokes.

The saw cut evenly with good perpendicular square sides without breaking off chunks or chipping and wasting. Chisel bars were improved and two and three "tyne," even four tyne breaker bars, were later developed. Chisel bars had a forged knob on top of the bar for better gripping, while breaker bars had a forged ring or square grip handle.

For saw cutting, the ice layout needed to be more precise, using a large wooded square with three boards using the 6", 8", 10" method. For you geometry buffs: 6' opposite, 8' adjacent, and 10' hypotenuse, exactly!

This is a repetition of the method used in the early days and explained in a previous paragraph, but with more refined layout methods. As large commercial ice harvesting grew during the following century, surveyors and engineers were brought in to plot the entire ice fields.

Criss-cross lines or checkerboard squares 20" or 22" would be extended from the side of the wooden square to a long board used as a straight edge or a string-line was used. The pattern of squares was marked as previously stated.

The first saw cut was along the outer layout of the "L" with the bottom slanted or tapered slightly outward away from the channel strip. The next cut was straight down, a few inches in from the first cut at the line along the first row of cakes. The long narrow strip resulting was broken into small chunks and pushed down to be disposed of under the outer ice field as related previously. This was the beginning of the open channel so the sawing of the cakes could begin.

Using 12" thickness as a standard to make the mathematics simpler, an 18"x18" square cake weighs around 125 lbs.; 20"x20", 160 lbs.; and 22"x22", 200 lbs. With limited optional facilities, these were more practical for handling.

While the men were cutting the cakes away and floating them along the channels, they were standing on battens or boards along the edges of the channels and saw line areas, trying to keep their feet dry and off the cold ice surface.

All ice harvesting tools, along with other farm equipment, were religiously cared for. Perhaps the greatest of the commandments was the eleventh: "Thou shalt not carelessly allow thy tools to drop to the bottom of the pond!!," and the twelfth was like unto it, "Thou shalt tolerate no tomfoolery or irresponsible behavior while working on the ice harvest!"

It should be noted at this point how essential it was to keep warm and dry. In the late 1700's, heavy leather shoes or boots were completely impregnated with heated mutton tallow and with thick soles sometimes made of wood; creepers were also worn. Thick woolen stockings were necessary, with felt inner soles along with layers of paper sole cutouts. Corrugated cardboard hadn't been invented yet. Mittens were knitted wool covered by soft outer leather mittens. Boots and mittens may have had some fleece lining. Heavy woolen breaches and "great" or overcoats with 'coonskin hats kept the icy wind out. Although some form of rubber existed early, vulcanized rubber as we know it today did not come about until the middle or late 1800's.

At last the actual ice cutting was about to get underway, right after sunrise sometime in January. It became time to fetch the horse and wagon, or sledge, to be backed or led around to the edge or partially on the ice, parallel to the open channel perhaps nine to ten feet from the channel's edge. Sleighs and stone boats were also used. Oxen were probably used in some situations, but little is known about their use on ice harvesting.

Back at the pond, a run or inclined ramp 15' or so long was fastened to the back of the wagon which was chocked in place so it wouldn't move. The elevator was inclined about 15 or 16 degrees from the bed of the wagon down to the top edge of the ice channel and extended down into the open water and submerged with the bottom end just below the ice thickness. This was necessary so the floating cakes of ice could be pulled directly to the elevator and pulled up the incline into the wagon. Pikes (ice hooks) were used for pulling and pushing ice cakes around with their double hook arrangement. Tongs were handy for maneuvering and packing the cakes in place on the

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HORSE DRAWN ICE PLOW

wagon. Two layers of cakes on a wagon bed four feet by eight feet, for example, will weigh over three and three-quarter tons, assuming good dense or "black" ice.

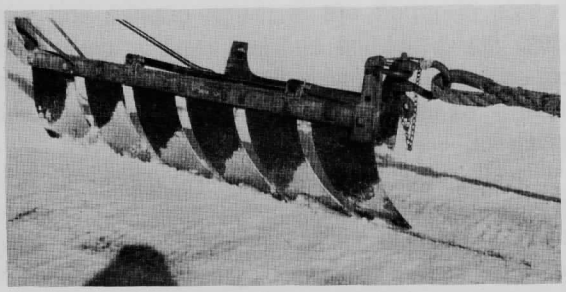
The incline or "run" may be approximately two or more feet wide with varying length according to circumstances. The very first run was no more than a length of plank inclined from the wagon to the surface of the ice. The usual method was probably two long planks eight inches to ten inches wide, spaced six inches to two feet apart, and held together with short crossboards on the underside similar to a ladder. This was made of light wood for easier handling. Long narrow steel strips were often nailed along the planks about 12" apart so the cakes would slide easier. A home built ladder with a long plank up the center was likely used and often a ladder-type rack with long narrow strips of heavy furring running up the center.

With the men back at the pond cutting away the ice cakes and floating them into the ever-widening channel, the wagonload of ice started its journey to the previously prepared storage area under the barn.

The horses had to be equipped with special "winter" shoes with steel protrusions called "caulks" to keep from slipping on the ice. The first caulks were permanent structural protrusions on the shoes. Later they became removable and replaceable depending on changing travel conditions.

Meanwhile up at the farm, the wagon, being as close as possible to the storage bay, was being unloaded with the cakes sliding down a plank or run with the help of short pikes and tongs. The cakes were packed in together on the prepared plank surface with slight spacing between them to eliminate fusing or freezing together. Some farmers immersed every cake in practically an envelope of sawdust.

The cakes of the next layer were slid across the first and placed likewise. A 10" or so space was maintained around the stacked ice pile next to the walls to be filled with packed hay or sawdust. In the early days, hay was more abundant. One or both side walls and back were usually boarded up permanently while the front was built up like flashboards as the stacking progressed. It also maintained a 10" space for insulation. The top would be packed down with two



ICE PLOW DETAIL

feet of hay or swamp grass. During the next few months, the cakes would fuse together between the layers. Starting from the top, as ice was being brought out of storage, a chisel bar or ax with a hammer was needed to cleave them apart.

Many rural farms had small ice houses built partially into the hillside with the back entrance at a lower level in the rear and upper in front. This created a double story capacity of anywhere from 20 to 30 tons depending on the usage. The dimensions could be in the neighborhood of 12'x12' or 10'x15'. The walls had eight-inch studding boarded both inside and outside, probably with chestnut or any durable and plentiful wood, and filled with sawdust. The exposed outside walls were painted white with thick wooden shingles on the roof.

The wagon, sleigh or whatever, loaded with ice, would be maneuvered as closely as possibly down to the back entrance and unloaded as previously stated. When the cakes were packed to the walls, layer upon layer (no sawdust) halfway or more to the upper level, the back would be closed tightly. Coming around to the upper front level, the unloading is similar to the back with the chute or run inclined down through the doorway to the lower ice surface. Stacking and packing would continue the same as before in the lower section with each layer of cake directly on top of the previous layer. Placing of the ice was done by two or more men with short pikes and a bar chisel for trimming any excessive protrusions. This was to continue right up to the eaves of the pitched roof.

The front and back entrances were like three walls. When the door was closed, there was often a "double" wall of loose boards which were put up like a "flash-board" arrangement, eight inches apart and filled with sawdust as the layers of cakes progressed upward. Directly over the front door was a short separate door at the gable end just above the eaves line where the men could crawl out after packing down at least two feet of hay on top of the ice.

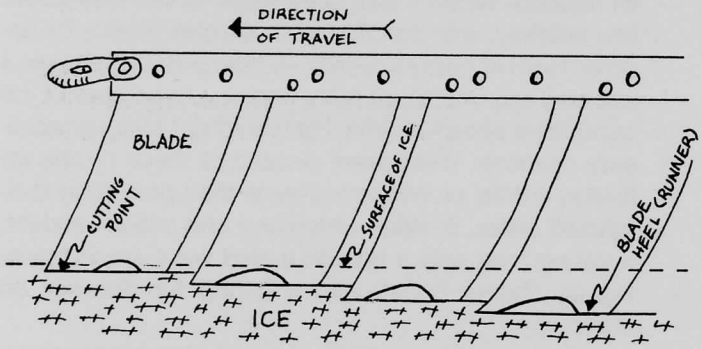
As ice tools improved, the chisel bar was made in different varieties. One of them known as the "summer bar" or summer chisel, was curved slightly on the flat side of the chisel to permit a man to stand up on a layer of ice and force the chisel blade directly between two top and bottom cakes to break them

apart. Every time a house is opened to fetch ice in the summer months, the insulation must be put back in place immediately as warm air, especially muggy air, causes fat deterioration and fusing between the ice. A loss of 15% to 20% is acceptable.

There was some controversy over having sawdust mixed in with the ice. The general consensus is that in larger commercial ice houses, it was a hindrance. A well-built and properly insulated house provided proper ice storage.

Finally, by around the late 1800's, an "ice marker" and workable "ice plow" were invented which gave tremendous impetus to the ice harvesting industry. Previous types had been tried but proved inefficient. By this time, the commercial ice companies were becoming a multi-million dollar industry; thousands of hand sawyers were employed. Forty-five sawyers were laid off for every "plow" that came into use.

The ice marker was used to cut or "score" grooves about one and one-half inch deep using the layout system as previously mentioned. It consisted of six or more 3/8" thick steel plates and a "nose" plate bolted in a straight line on a five or six foot longitudinal



THE FIRST BLADE CUTS A SHALLOW DEPTH WITH EACH FOLLOWING BLADE A LITTLE DEEPER

steel beam two inches square. The "nose" or front plate maintained the marker level on the ice surface. Each of the six or so plates had a leading cutting edge, often with inserted hardened steel tips with an upward backward curve or "rake" for chip and shaving removal. The cutting tip was flared about 1/2" along with the curve of the rake for clearance of the individual plates. The rear of each plate had a heel with an open arch between it and the cutter tip to allow for bottom clearance behind the cutter tip. The heel served as a bottom level guide just in front and 1/4" above the tip of the next plate to guarantee no more than 1/4" at a time, and the same with succeeding plates. The alignment of the plates also guaranteed a nearly straight line while following the ice layout.

The back of the marker, and also the plow, had two wooden handles like a garden plow with a hook or ring in front to be pulled by a horse hitched to a 10' rope. On top of the longitudinal steel frame were two lugs bolted three feet apart with a bolt hole in each, parallel with the frame, where a "guide" bar was attached like a hinge.

The "guide bar" is a "T"-shaped steel plate three inches long, curved slightly outward across the face or top of the "T" with a front and rear "tongue" on the ends of both sides and with an arched relief space in between each set. The bottom of the "T" is hinged to both lugs with two rigid connecting thick steel bars and can be swung from one side to the other to slide along in the previous groove so as to keep the marker parallel, at about 22" or so, while cutting the next groove.

Presume the first 1 1/2" groove is started at the layout on the right side of the area. The horse drawn marker would go to the end of the marked field and turn around for the return trip after swinging the guide to the left into the first groove while cutting the second one. After the return trip, the horse and marker would then turn around again with the guide being swung around to the right into the second groove and proceed to the other end again.

This procedure was repeated all the way to the left side of the cutting area. The next operation was to return to the beginning from the perpendicular layout following the same procedure, scoring perpendicular grooves and finishing the grid work pattern of squares.

The guide was now removed from the marker which was to go back just beyond the first original groove, six inches or ten inches, making another slot. This narrow strip along the edge of both channel layouts would be chopped out later to widen the channel.

With the criss-cross grid of 1 1/2" grooves completed, the next step was for the ice plow and a team of two horses to be brought out on the ice area. The "plow" is similar in principle to the marker except the plates are vertically longer and each succeeding plate cutting 3/8" below the heel of the preceding one. Slot depths anywhere from three inches to six inches could be obtained depending on the number of plates. The guide was no longer necessary as the plow would commit itself to the previous grooves of the marker making them deeper. Under thick ice conditions, the plow might have to go over the area twice. For a 12" thickness of ice, there would be required a depth from five inches to six inches, or 1/3 to 1/2 of thickness.

The "secret" of this invention is the idea of each cutting edge removing only an exact amount of ice at a time. Weight distribution was spread over all the plates rather than one blade taking the entire bite all at once, thus preventing a serious accident for both man and horses, especially if caught in a stress crack across the pond. It would no doubt be impossible in

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the first place with chipping and cracking the cakes!

With the grooving or slotting completed, the next important function was to gather ice shavings or snow to fill in each slot a few inches, in line with slot after slot, a few squares distant from the channel line and tamp with a "calking bar" before opening any channels. It was necessary to keep the slots "dry" with no water seepage allowed which would freeze between the cakes. If they froze up again, especially on a bitter cold day, the grooved field would be rendered useless as it was impossible to bring the horses back to re-groove the area over again because of the open channels. If it was a mild day and the harvesting progressed fast enough, this wasn't a large problem.

Now the channels were about to be opened, floating the cakes toward the loading area which could be the incline up to the wagon or the larger inclined elevator into an ice house on the shore of the pond. In case of storage in the ice house, a grapple hook attached to a long rope and pulley arrangement was hitched to a horse being led back and forth on one side of the house and enabling this arrangement to pull up four to five cakes at a time into the house at different levels, adjusted according to built-up layers of storing heights.

Back on the ice, the first corner block was being chopped out with a chisel bar and hand ice saw to get the first part of the channel open. When the opening of the entire channel was completed, the first single line, a dozen or so cakes, was chopped at three or four places along the first slot by men with at least "three tyned breaker bars" and floated into the main channel where it was split into individual cakes and sent up the incline.

On larger commercial operations, sections of three or four cakes wide by ten cakes long, called "sheets," would be floated off and split into single rows and then into individual cakes at the head of the channel to be sent up a large steam-powered elevator with an endless chain belt with cogs. The typical block of commercial ice weighed 300 lbs.

In this procedure, it was necessary to begin harvesting at the far end of the ice field and to move the cakes up a side channel to the loading area. This provided a firm ice platform near the loading station for the men to work on as the harvesting field diminished. Or, simply expressed, "like painting oneself into a corner!"

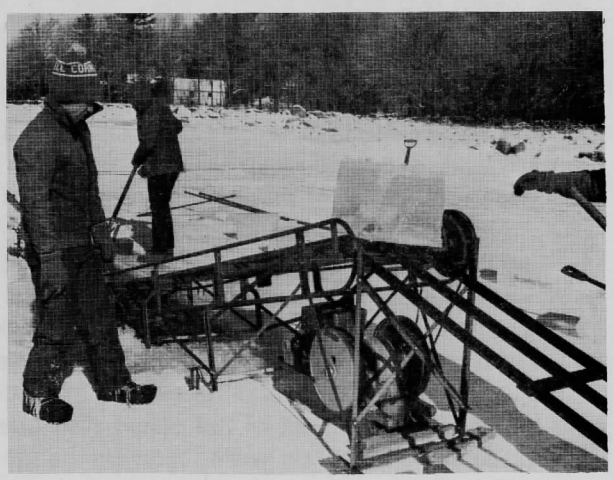
We have come a long way from the chisel and ax operation of around the Revolutionary War times to the 1930's. This multi-million dollar business, employing thousands at a time, sprang up from Maine to New York and beyond. The commercial ice business came into being gradually about the same time as the domestic farm cutting industry.

Wages for a good hand sawyer in the first half of the nineteenth century were probably around 50 cents per day. Around 1880, with post Civil War inflation and stronger economic demands, a sawyer could make $1.00 per day; a man with his own team of horses (2) would receive about $2.25 per day for his living and feed for his horses during the winter. During the rest of the year, he was a "teamster" who was proud of his occupation.

Contrary to many stories of horses falling through the ice and drowning, it was very rare for this to happen. When it did, they were usually pulled out immediately, with the help of ropes and planks, by another team of horses nearby. A man with his team was not an irresponsible person, and would be sure of ice conditions ahead of time. He would not take unnecessary chances. There were dozens of these on the ice field at a time, plowing grooves in their previously designated areas. Besides waterboys and snack vendors, a young man with a box on a sled went around picking up "horse buns" with a scoop for disposal on shore.

Later, about 1915, the gasoline-powered engine and circular saw put most of the horses and ice plows out of business, laying off ten men and teams for each power saw. The power saw was mounted on

MANPOWER ICE SAWS



GAS ENGINE POWERED CONVEYOR

a sled with a four cylinder "Metz" or similar engine, with a circular blade suspended below the front corner onto the ice with a depth limit gauge. There was also a sliding guide bar for keeping parallel at a set distance between grooves. There were also handles in back similar to the plow.

The ever-growing ice industry was no doubt the most efficiently run business in the country; it had to be. Sporadic seasonal changes, along with competition and demand, became very intense. Every man plus equipment was needed at the exact place at precisely the right time to get the maximum from his skills and effort. It is called "industrial engineering."

The old fashioned religious work ethic of farm families coming to one another's aid withered away between the largest companies because of cutthroat competition which sometimes led to violence. The "Massachusetts Ice Harvesting Commission" was suddenly brought into being to regulate and allot harvesting areas to the number of ice houses on the same lake. Also, along with federal authority, there was a need for control in the distribution system. The free market place was in trouble and the national welfare of consumers had to be addressed; this pertained to large houses of 10 to 25 thousand tons capacity and up. Many storage houses in Maine and New York were much larger.

The Boston market was the largest in the world at one time, shipping all the way down the coast to the Caribbean area and sometimes overseas. Although the total harvest in the U.S. in any year has never been determined, in about 1880 it was conjectured as being over eight million tons. This includes domestic ice and waste. This is the equivalent of nine square miles of ice field twelve inches thick! This is a drop in the bucket to the actual amount of ice existing in nature in the U.S. during our winter season.

Getting back to Sutton, the occupation of ice harvesting was commonplace among the early farmers, whether a joint venture or single family enterprise. The joint venture was perhaps most commonplace. What comes to mind was the cooperative effort of the Stockwell and Brigham farms adjacent to Leland Hill. It is known that combined ice harvesting activities between the two began with Amos Stockwell and Dr. John W. Brigham. This was passed on to the next generation of Tyler Stockwell and Son Dairy, with an established milk route, and Dexter A. Brigham, who had a vegetable route and also milk cows.

The ice house was on the south side of what is now called Leland Hill Road, built into the hillside up against the side of the road across from the Brigham residence also known as "Calmer Farm." Two of the ponds used were one at the foot of the hill on Pierce Road, east of the George Lincoln place, and the other on the south side of Armsby Road, directly across from the private schoolhouse eventually turned into a

ICE HARVESTING ON MANCHAUG POND

shop, at the Newell Wedge Farm. The agreement was to fill Mr. Wedge's ice house first for the use of his pond. The rest of the ice was stored at the Brigham place. Also, some sort of arrangement was probably made for the pond at the George Lincoln place. The ice house at the Brigham farm was approximately 18'x20' inside dimensions. Ice was stacked 12 to 18 layers high, depending on thickness of the cakes, amounting to 125 tons. Most of the ice was horse-drawn with sledge and wagons over a mile of rough icy roads.

As we gradually pass to the next generation, Tyler Stockwell turned the dairy business over to his son William T. Stockwell in 1915, and it became "Stockwell's Dairy Inc." Dexter A. Brigham passed his farm down, along with many up-to-date tools including an ice plow and blacksmithing facilities, to his son John D. Brigham and family. Meanwhile, the Newell Wedge Farm, known as "Wedgewood," was taken over by his daughter, Mrs. Sarah Wells, when her husband David Wells died. The harvesting was still carried on in the same usual manner with the same agreements as the previous generations. With the addition of the circular ice saw and trucks, the task was less burdensome.

However, as home ice boxes were being replaced with electric refrigerators, the commercial ice dealer depended more on such as dairies and retail and wholesale food establishments for his business. It became no longer practical or economical for the farmer to cut ice. Next was the development of artificial ice-making which could turn out 300 lb. blocks, 365 days a year. The ice cutting stopped for the Wells, Stockwells and Brigham farms at least by the late 1930's. Harris Ice Co. of Millbury became one of the nearby producers of artificial blocks of ice.

The only sizeable commercial ice operation in Sutton was the "Miller Ice Company" in what was known as Woodburyville. Charles Miller Sr. bought the property on both sides of Buttonwood Avenue at the corner of Boston Road across from Woodbury Pond, which included the house on one side and a shoddy

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mill on the other, with legal access to the pond. He moved with his wife and son, Charles Miller Jr., from Rhode Island in 1914 and set up the old mill to manufacture batts; he also built an icehouse next to it. The dam went out in the flood of 1927, taking the ice house with it and damaging the mill. A new house was built and the ice business resumed. The capacity of the new house was approximately 2,000 tons, plus the old house was much larger. When Charles Miller Sr. died in 1934, Charles Miller Jr. and wife Alice carried on the business.

The ice operation location was set up to float the cakes through a sluiceway under the bridge of the dam, after splitting into single blocks, nudging up a slight rise over the flash board to glide down a chute or runway into the house where a couple of men would store them. When the house was filled nearly to the pond level, a grapple hook attached to a rope and pulley was pulled up and down by a horse led back and forth along the dam, or later an old Model "A" Ford. As the number of layers inside the house kept rising, the elevator incline was adjusted to the different levels. Four to six blocks at a time were hauled up in one load.

Perhaps the most dangerous job was that of the "switcher." As heavy cakes slid down a chute from the entrance of the house, a man had to switch or push the heavy blocks with a pike away from the chute one at a time as fast as possible to the other men who were placing them. In very large ice companies with powered elevators, the 300 lb. blocks were coming at them nearly one a second sometimes.

It was very essential that all cakes have a uniform thickness. A surface planer operated by one man and pulled by horse or other means, was used to scrape off any unusual bumpiness. In large storage houses, the blocks of ice would go through a special powered device on top of the elevator planing or shaving both top and bottom sides to guarantee exact thickness. Otherwise, sliding cakes around inside the house over uneven heights of tops of layers would be difficult if not impossible. Thickness of ice on the pond had to be watched carefully.

A coupie of times in 30 years, the winter was too mild for good thick ice. Ice six inches thick was not practical for storage. If there was snow, the pond was "opened" or snow removed to the side as usual and two inch holes drilled about 50 feet apart to allow the water to flood over the area. This was known as flooding or "puddling" the pond. The weight of the snow, if any, would depress the ice a little to help the process. An extra flashboard could raise the water in the pond a little. The flooding built up an inch or so of water on top, which, when refrozen, was smooth and the marking could go on as previously explained in this article.

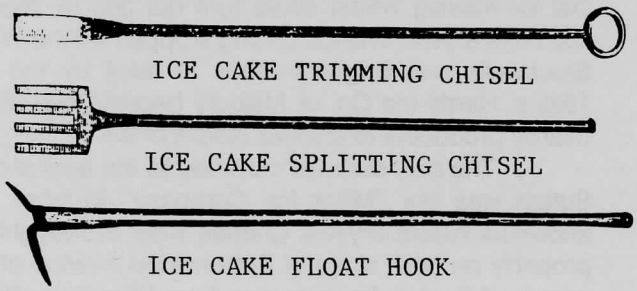
Opening of the channels could proceed after removing the flashboards. The first line of single cakes were split away from the second line and were pulled out with pikes and tongs. They were completely turned upside down on top of the second row. The two wet surfaces of top and bottom cakes would fuse or freeze together in minutes. The second row, with first row on top, was to be cut away free and floated into the channel as 12" or better thick cakes. This could be done only with clear "black" ice. This method was time consuming, with limited production and very difficult. Extra ice had to be hauled in from the North to compensate, usually from Gardner.

The ice was dispensed through the year from the back of the ice house by means of a vertical elevator on to a waiting wagon or the truck of an independent dealer who would drive on to the scales empty and drive off when loading was completed. The Millers had their own route business but sold mostly to other dealers, wholesale. Square cars were put up in customer's windows with numbers along each side such as 15, 25, 50, 75, etc. The number showing on top designated the price or size, and pounds of ice wanted.

Toward the end of the ice harvesting era, the Millers sold exclusively to inns, restaurants, and food stores. As artificial ice making completely took over, the entire harvesting industry collapsed. Food industries and homes had their own refrigerating equipment.

What seems rather ironic is that all of the ice enterprises were focused on preserving perishable foods at temperatures down to, but no further than, the freezing point (32 degrees F). When the frozen food industry, along with domestic freezers, came upon the scene, our whole concept of food preservation and life style changed completely.

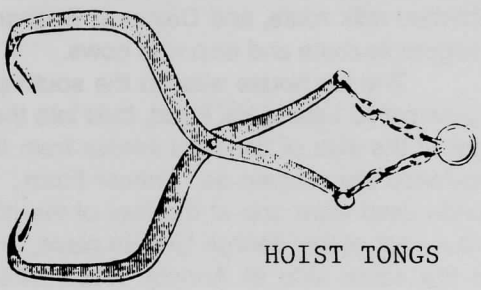
Gone are the days of giant ice storage houses, from 10 to 20 thousand tons capacity and more, with their thick walls of heavy studs 10" wide x 8" thick at top to 20" wide x 16" thick at the bottom.



ICE CAKE TRIMMING CHISEL

ICE CAKE SPLITTING CHISEL

ICE CAKE FLOAT HOOK



HOIST TONGS

Some were 40 feet high, sheathed on both inside and outside and filled with sawdust or other insulating material. This was necessary to protect the lower layers of ice, being under tremendous pressure from melting. Also gone are the thousands of men, including itinerant workers, in mid New England alone, many living temporarily in barrack type structures having three or four bunks high for sleeping. They would work for one company, then move to the next during the season.

No longer will we need the ice box out in the old wood shed next to the coal bin keeping it away from the hot kitchen stove. No more rotting floors under it because someone forgot to empty the pan of melted ice water underneath.

Imagine, if you will, the enjoyment of youngsters running out to meet the ice man with his wagon, to pick up pieces and chips of wet, cold, crystal clear ice to suck on during a hot July afternoon!

SUTTON - A Billion Years Old !

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

MICHAEL S. DUKAKIS
GOVERNOR

JAMES S. HOYTE
SECRETARY

MEMORANDUM

DATE: August 13, 1987

TO: Malcolm Pearson

FROM: Joseph A. Sinnott
Mass. State Geologist

SUBJECT: Figure on local Granite

We wish to thank you for the opportunity to examine a suspected fossil occurence on a piece of local granite.

We find the figure to be a Dendrite* of manganese dioxide. It is a common form of deposition of Mn from a chemical solution.

It is not associated with any biological (organic) phenomenon.

* See descriptions in addenda

Locally- in Massachusetts the pattern is not common. Your specimen is a fine example of dendrites.

Local Bedrock- is properly called "Hope Valley Alaskite Gneiss". It is a granite type of rock, white, deficient in dark minerals, gneissic (layered) and having narrow parallel fracture and cleavage characteristics

Age- Approx. One Billion Years

When used in construction it is commonly called "Sutton Stone". Major use is in walls and fireplaces.

Joseph A. Sinnett, State Geologist for Route 149, rendered the above report after examining this rock sample. It was collected from the ledges blasted out near Route 146 and Central Turnpike. He explains that fossils in stone are unlikley to be found in this area. However,the amazing aspects of the report is that SUTTON has bedrock formation ONE BILLION YEARS OLD OR OLDER- some of the oldest on the North American Continent!

Apr. 1988

EDITORIAL COMMENTARY- First, regretably the author's credit name in our December issue was family related, but not accurate. It should read: STEPHEN E. LECLAIRE.
Second, in this issue the ice harvesting article to some readers maybe somewhat technical in content. However, before the skills of this craft become too obscure, your Society as an ongoing historical response media has published a documentary which was skillfully researched and it has resulted in a fully detailed report by a dedicated author.

MONTHLY MEETINGS -

JANUARY - The Society met at the GRP Hall. President, Daniel Griffith introduced a guest, Richard Dinjian of Southboro who is researching the life of David Harwood, one of two Sutton delegates to the State Constitution Convention in 1788. He also announced receiving a number of Sutton items from the Worcester Historical Museum. Stephen LeClaire showed Video tape of scenes he took during the Blackstone Valley Heritage weekend program.

FEBRUARY - The Society met at the GRP Hall. Stephen LeClaire gave memorabilia from his Grandmother, Mary Benjamin, to the Society and a Davidson Family genealogy was presented by Nancy MacLeod. Marie Maddocks in costume, who worked 35 years at the old Sturbridge Village Museum told about many amusing and other episodes during her service at the village and showed slides. The Society sponsored an oldtime ice harvesting operation on Manchaug Pond February 7.

MARCH - The Society met at the GRP Hall. Bud Gurney detailed plans for the Wagon Trek in June to the Washburn-Norland Farm in Maine and reported on development of plans relating to future Waters Farm programs. The speaker, Richard Dinjian discussed his research and re-enactment of the Constitutional Bicentennial.

APRIL - The Society met at the GRP Hall. On April 10, the Society co-sponsored with the Millbury Historical Society a hayride and refreshments in Sutton. Outside painting of the building of the Manchaug Baptist Church (Society owned) and the General Rufus Putnam Hall was approved for assignment to the lowest bidder. Letters were mailed to Society members seeking donations toward the maintenance fund. Davin Kurtz, a member of the contemporary Massachusetts Light Artillery, dressed in a Civil War Uniform, showed relics and discussed the daily lifestyle of that War.

JANUARY TO APRIL - WELCOME NEW MEMBERS

Cynthia Kingsbury Aucoin
Waldo and Patricia Forsythe III
Margaret Waters Harrell
Violet Waters King
Donald R. Luther
Mitchell and Edna Yurkiewicz

From

SUTTON HISTORICAL SOCIETY
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BLACKSMITH SHOP 1893
SUTTON-LOCATED 1704-MASS.

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