The Home Forum

How they used to save winter for summer

kid eds

GOT ICE? Sure, go to the freezer and help yourself. You may even have a fridge with an ice-dispenser in the door. Just put your glass under the spout and push a button. Clink, clink clink.

It's so easy, most of us never think about a world without refrigerators. A winter trip to Stonewall Farm in Keene, N.H., though, can give you a taste of the past.

Fourth-graders from the Westmoreland (elementary) School near Keene recently got more than just a taste. They "harvested" ice at this farm and educational center in the southeastern part of the Granite State.

The farm teaches many school groups about old-time farming practices, including how to cut blocks of ice from a frozen pond. The students use equipment that dates to the 1800s. Among them is a large coarse-toothed saw that looks like something lumberjacks might employ.

Before mechanical refrigeration (invented in 1805) became more commonplace in the late 1800s, ice harvesting was common on New England dairy farms. Farmers stored blocks of ice in special ice houses made of wood and insulated with hay and sawdust. The ice was used during the warm months to cool milk and cream so that it wouldn't spoil on its way to city markets. Just as a farmer needed to harvest a certain amount of hay in the summer to last the winter, he also needed to harvest a certain amount of ice in the winter to last the summer. Half a ton of ice per cow would see him through.

Today, the children in Mrs. Durling's fourth-grade class are divided into two groups. The girls get to try cutting ice first, while the boys learn more about ice inside.

For the harvest to be worthwhile and safe, the ice in a pond needs to be at least 12 inches thick. That's thick enough to make good-sized blocks. It's also strong enough to support human workers and teams of horses on the ice. Thanks to an unusually cold winter, the ice in this pond is at least 18 inches deep.

Gabriel Lee, the farm's assistant education director, explains the process and the need for good teamwork.

The girls take turns at different tasks, but the one they like most is cutting the ice (with Mr. Lee's help).

One pupil at a time steps onto a wooden-plank walkway, positioned next to a narrow channel of open water. This improves the footing for students. (Old-time farmers omitted the platform and wore spiked boots instead.)

Along the channel, parallel lines have been scored in the ice roughly one foot apart. The shallow grooves – cut with a tool that's like a hand plane on a stick – mark the width of the blocks to be cut. Students saw off one block at a time, cutting into the long edge exposed to the water. **(See photo, far right.)** The children use both hands to pump the saw blade up and down.

PHOTOS BY MELANIE STETSON FREEMAN – STAFF

COOL HISTORY: Fourth-graders learn about ice harvesting at Stonewall Farm in Keene, N.H. They cut the ice with a saw (r.) and a 'breaker bar' (above). Then they hoist the block over a fence using tongs and a rope (top).

WHEN the block is free on three sides, it is broken off along the length of the uncut side with a long-handled tool called a breaker bar. The breaker bar is slammed down on the lightly marked line. Done just right, the tool produces a fairly even block. (That's because ice, like wood, has a grain. It breaks rather cleanly if you're going with the grain.) The more even the blocks, the easier it is to stack them later.

Once the block floats free in the frigid water, a long pole with two metal spikes on one end is used to push the block along the channel. The block of ice might weigh 30 pounds, so the more it can be pushed, the better. In the past, ice blocks might have weighed twice that much.

At the end of the channel is a wooden ramp. Tongs, with a rope attached, are clamped onto the block, which is pulled up the ramp by other students. To lift the block over a fence, a hoist has been fashioned from a tree trunk and a horizontal swing arm. Students hoist the block over the fence and lower it onto a ramp, where it slides to the ground before being stacked in a pile.

Old-time ice harvesters chiseled or scraped off the layer of snow-ice (hardened snow) on the block, leaving only clear ice. Clear ice is relatively free of air pockets. When well insulated, clear ice takes a long time to melt.

When the students go inside to inspect a collection of ice-harvesting implements, they see a photograph that demonstrates how ice resists melting. It's a picture of what was left after a huge icehouse burned to the ground in 1912. Hay and sawdust, while good insulators, are also very flammable. In the picture, nearby railroad tracks have been twisted by the intense heat of the fire. But the ice itself seems to be intact.

To illustrate the power of insulation, the children do a delicious experiment. Each one makes a mini-version of a famous dessert called "baked Alaska." They put a scoop of vanilla ice cream on a graham cracker, then cover the ice cream with meringue. Meringue, made of beaten egg whites, provides insulation.

The desserts are put in a 500-degree F. oven to cook the meringue. It takes a few minutes. But when the students bite into their treats, the ice cream is still frozen!

Ross Atkin

Frozen water created a splash

THE IDEA OF TRANSPORTING ICE by sailing ship to the other side of the earth must have sounded ridiculous in the 1800s. Boston businessman Frederic Tudor, however, didn't think so. By the 1830s, he was shipping ice from New England lakes and rivers to as far away as Calcutta, India. The ice survived (well, some of it melted) the 16,000-mile journey through tropical heat.

The feat, told in Gavin Weightman's new book "The Frozen-Water Trade" (Hyperion), explains how Mr. Tudor became an ice tycoon. Until he came up with the idea, no one had seen the potential for carving up ice that Mother Nature produced naturally – for free – and selling it to people in warm climates.

MELANIE STETSON FREEMAN – STAFF

BLOCK PARTY: A Westmoreland, N.H., fourth-grader adjusts the ice tongs gripping a freshly cut block. Note that the clear ice is topped with a layer of hardened snow.

Tudor shipped ice to such cities as New Orleans and Charleston, S.C., as well as to sweltering Havana, the West Indies, and Calcutta.

By 1890, the United States was exporting 25 million tons of ice each year. The ice was used to cool drinks, keep foods fresh, and make ice cream. The US was a pioneer in the ice trade.

The trick was to keep the ice frozen for months, especially when it was aboard ship. The answer was to store the ice in insulated icehouses and transport it aboard well-insulated ships.

One of the best insulators available at the time was sawdust. Air trapped between the particles of sawdust kept the warm, outside air from melting the ice. Sawdust was an abundant byproduct of New England's busy sawmills. The sawdust would be shoveled around the perimeter of the stack of ice blocks, and then a thick layer added on top of the stack.

Harvesting ice by hand (see story on facing page) is hard work. To make it easier and more profitable, mechanical conveyors were devised. Special horse-drawn implements helped to cut the ice into large, neat blocks. The more even the blocks, the tighter they could be stacked. And the more tightly the blocks were stacked, the harder it was for warm air to penetrate the stack and melt the ice. A well-insulated, well-stacked pile of ice blocks reportedly could stay frozen for several years.

Most ice harvests occurred in January and February, when temperatures were coldest and ice was thickest. Farmers looking for off-season cash supplied much of the manpower. Workers would line their boots with old newspapers to try to keep their feet warm while working on the ice for as long as 13 hours at a stretch.

Someone would be assigned to row a boat all night long to keep the open water from freezing over and slowing down the harvest. Children worked as "spooners," cleaning up the messes left by teams of horses.

As reports of water pollution grew, natural ice's reputation for purity came into question. Then electrically powered refrigeration units began to change everything in the early 20th century. The first home refrigerator was introduced in the mid-1920s. By 1931, millions of units were being made and sold.

Before home refrigerators became common, brawny icemen, bearing hunks of ice slung over their shoulders, went door-to-door, delivering ice blocks weighing from 25 to 100 pounds. They wore waterproof aprons on their backs to keep icy water from saturating their clothes.

The blocks would be placed in the top compartment of "iceboxes." Since cold air is heavier than warm air, a cooling air-circulation pattern occurred inside the icebox. Dripping water collected in a pan at the bottom of the icebox.

Children, hoping to grab a shard of ice on a hot summer's day, listened for bells that let them know the ice wagon had arrived. The bell tradition continues with ice cream trucks today.

THE ice industry is still going strong, selling to hotels, restaurants, even concrete companies (keeping concrete cool helps it from setting too fast and cracking, in warm climates). The industry had a record year in 2002, thanks to plenty of steamy weather.

But today ice is machine-made, and only a handful of plants make 300-pound blocks. The big blocks are used in ice sculptures and such.

The rest is so-called "tubular" ice (there are no cubes sold anymore) or "fragmentary" ice (irregularly shaped pieces) sold by the bag in convenience stores. Fragmentary ice isn't crushed, by the way: It begins as a frozen sheet of ice that's 6 feet by 10 feet by about 1/2 inch thick. The big frozen sheet is dropped about four feet onto a hard surface and smashes into countless pieces.

R.A.