

HARVESTING THE ICE CROP: FROZEN WATER IS ONE OF OUR MOST IMPORTANT ...

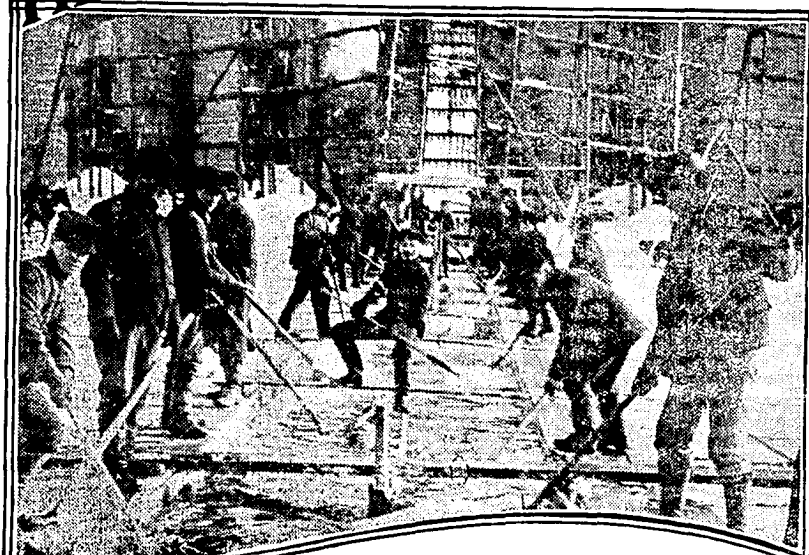
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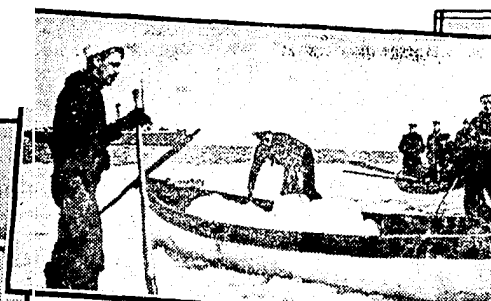
HARVESTING THE ICE CROP



Harvesters Separating the Sections of Ice with Long Spears



Stowing Out a Float of Ice



Filling Ice Boxes off the Grand Bank



Plowing an Ice Field



Directing the Cakes to the Elevator which Carries Them into the Ice House

Frozen water is One of Our Most Important Products—Natural Ice a Successful Rival of the Artificial Kind—How It Is Gathered for Market.

By Robert Tighe

ICE is as much a kind of rock as is granite or marble. Luckily for ourselves, it has a very low melting point. In its molten state we call it water, and it furnishes us with the drink which is necessary for the support of our existence.

In these days ice is a necessity for the preservation of perishable foods, in the household, during transportation, and under other circumstances. Up to very recent years we depended upon the natural supply, derived from lakes and rivers; nowadays this is largely supplemented by artificial ice produced in manufacturing plants, the requisite cold being engendered by evaporation of ammonia.

Artificial ice can be made anywhere, even in tropic latitudes. There is therefore no expense for its transportation. But its manufacture requires the employment of costly machinery and other apparatus—which is the reason why natural ice is able to compete with it in the market. In the latter case the raw product is cost-free, requiring only to be harvested.

A Better Product

Nevertheless, the quality of the natural ice that comes to market has been markedly improved by the competition of artificial ice. Greater effort is made

nowadays than formerly to harvest from rivers and lakes the purest ice obtainable, to prevent contamination on its way to the consumer, and to deliver it clean in appearance and regular in form.

The natural ice supply of the eastern United States is for the most part derived from rivers in Maine (notably the Merrimac and Penobscot), from lakes and rivers in Massachusetts and New Hampshire, and from the upper Hudson. Further west, the cities and towns usually get their ice from streams and lakes on the banks of which they are located.

The business of gathering the annual ice crop engages immense capital and the services of hundreds of thousands of men. Huge buildings are used for storing the product, and a highly developed system is employed, with specialized implements and mechanical apparatus for doing the work. The buildings are usually of wood, but concrete, which has the advantage of being fireproof, is now being employed largely in this kind of construction.

As a matter of course, the storage house is always on the bank of a lake or river, and all that is required to produce the raw material is low temperature. When the water space has

frozen over, an area on its surface is marked out large enough to fill the icehouse with a single cutting. The usual practice is to allow one acre with a thickness of one foot for each 1,000 tons of ice to be cut. Thus 20 acres may be expected to furnish 20,000 tons.

Wetting Down

It is seldom that a "field" freezes to the desired thickness without having one or more falls of snow upon it. If the weight of snow is not sufficient to sink the ice, resort is had to the expedient of "wetting down." A gang of men, each provided with a long narrow-bladed chisel, proceeds in line across the field, punching holes through the ice as they advance, at intervals of six to ten feet. Water that comes up through the holes saturates the snow, converting it into ice.

Sometimes, when there has been a light snow, horse-drawn scrapers somewhat resembling gigantic dust-pans are used to remove it. This accomplishes a double purpose, inasmuch as freezing will progress much more rapidly when the snow blanket has been removed. Such a blanket has a tendency to keep the ice beneath it relatively warm.

To get rid of "snow ice" on the sur-

face, an implement called a "field planer" is used. This is likewise drawn by horses, and carries on a transverse bar a series of sharp teeth which cut away the snowy upper layer. What the market demands is clear and translucent ice, and it pays to deliver to the consumer a first-class product.

Marketable ice should be not less than a foot thick, and its thickness in the field must be accurately determined before the harvesting of the crop begins. This is ascertained by boring holes in many places with a huge auger, and plunging into these holes an iron measuring rod with inches marked on it. Commonly the thickness of ice varies considerably in different parts of a field.

Field Is Accurately Laid Out

The field has next to be "lined out." For the first line, a stake is driven at each end for a guide. A long plank with a straight edge is put in line with the stakes, and a toothed cutting tool is run along its side, after which the plank is pushed forward and the groove extended.

Next, a cross line is run at exact right-angles with this groove, the mathematical determination being made by the help of a large wooden

"square" made of planks. With these two lines for a starter, the whole field is divided up into parallelograms, each one of which represents a cake of ice. The grooves defining the parallelograms are made with a toothed marker pushed by a man who stands between two handlebars at the rear. Attached to the implement is a "swing guide," the edge of which runs along a groove while the teeth of the tool cut a new groove parallel to it. The same process is then conducted crosswise of the field until the marking out is finished.

Now we have an ice field divided up into parallelograms by lengthwise and crosswise grooves. Horse-drawn toothed plows are next used to separate the cakes, following the lines of the grooves. They do not cut clear through the ice, but only about two-thirds of the way. Sometimes circular saws in gangs, driven by a gasoline engine, are used for this purpose. In other cases a long hand saw is used.

This being accomplished, the ice is detached from the field in large sections called "floats," which are pulled with ice-hooks into clear water and divided into strips one cake wide. For this purpose a channel of clear water is made through the field, and from this channel another one, much nar-

rower, is opened at right angles, leading to the ice storage house.

Huge two-tined forks are used for splitting the floats from the field, helped by hand sawing. Sometimes horses draw the floats toward the "house channel," into which the strips are fed, to be thereupon broken into individual cakes. The cakes are usually 22 by 32, or 22 by 42 inches in size.

Into the Storehouse

They are carried into the storehouse by an elevator, operated by a gasoline engine or electric motor. As they pass up an incline, they strike a "planer" whose teeth bite off some inches from the upper surface of each cake. By this simple means any snow or impurities that may be on top of the cakes is removed, and, what is very important, the cakes received into the storehouse are all of exactly the same thickness.

By making the cakes uniform in thickness level layers are secured in the storehouse, and the storing is done more rapidly. After completing each stored layer, and before starting another, the surface is dressed down to a level by using a "floor shaver"—a toothed tool run over it by hand. The closer the cakes fit together, the less will be the loss by melting.

Cakes of regular shape, obtained by careful grooving and cutting, are more

easily handled, and pack better in the house. Also, they cut up with least waste when delivered to the consumer. At best, the loss by melting (termed "shrinkage"), is about 50 per cent. In other words, two pounds of ice must be harvested in order to deliver one pound to the ultimate consumer.

In very cold sections of the United States resort is had to the expedient of running water into the icehouse and letting a layer of it freeze. This is repeated until the house is filled with ice. It is then covered with sawdust, and the house is closed until the ice is needed. But ice stored in this way is not very convenient for use, inasmuch as, when wanted, it must be chopped out with an axe.

In the summer time great numbers of icebergs, the product of glaciers along the west coast of Greenland, float down through Davis Strait into the North Atlantic, endangering navigation. Some of them are veritable mountains, and, if a few could be brought into port and chopped up, they would be worth a lot of money. This, unfortunately, is impracticable. Nevertheless, on occasions ships are able to procure supplies of ice from floes similarly derived. Fishing vessels off the Grand Banks of Newfoundland often keep their cargoes fresh with floe ice that costs them not a cent.