But Why: A Podcast for Curious Kids

How did people keep food cold in olden times?

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Jane 00:20
This is But Why: A Podcast for Curious Kids. I'm Jane Lindholm. We love exploring the world of ideas with you. And today we get to talk about history and science, and a historical tradition that's still alive and well in a few neat places.

Jane 00:38
For most of us these days, when we want a cold drink, we can probably reach into a refrigerator we probably have inside our house and pull out a carton of milk or juice. But electric refrigerators haven't been around all that long. And people have been keeping their food and drinks cold for longer than there have been refrigerators. How? A few of you have asked us to help you get to the bottom of this. And that's what we're going to do today.

Violet 01:06
Hi, my name is violet. I'm, I'm five years old. I live in Maryland. And my question is, what was life like when refrigerators weren't around.

Ellinor 01:23
Hi, my name is Ellinor. I'm six and a half years old. I come from Sweden. And I want to tell you a question. How did they make ice in the old times?

Jane 01:38
We wanted to learn more about how people managed to have ice in the summertime, and how people who live in places where it never got cold could still get ice and keep food cold before electric refrigerators were invented.

Gavin Weightman 01:50
My name's Gavin Weightman. And a few years ago, I wrote a book called The Frozen Water Trade.

Jane 01:57
Gavin Weightman's book is all about ice and how keeping things cool became big business. So he seemed like a good person to go to to get some insight. And he even has some personal experience with this.

Gavin Weightman 02:09

I was born in 1945 and brought up in London and we did not have a refrigerator till I was about 11. They weren't very common in England unless you were very wealthy. The big houses had them. But they were much more common in America. In fact, the popularity of ice as an everyday thing is an American thing. It's an American invention, basically. And it is an amazing story.

Jane 02:35
One of the main purposes of a refrigerator is to keep food safe to eat for longer. For certain foods, being cold allows them to stay fresh. Before people had refrigerators and freezers, there were a lot of different ways to keep food fresh, to preserve it. Food can be dried, salted, smoked, fermented, or pickled, or kept in naturally cool places like root cellars. In parts of the world that have winters, people realized a long time ago they could store ice in underground pits year round. And over time, they realized they could store ice above ground if they did a good job of insulating it. Insulating means keeping the outside temperature from getting in and the inside temperature from getting out. So they figured out how to keep ice in an ice house so they could have it all summer long. But they only did that in places where there was natural ice in the winter time to begin with. It makes sense, right? They had frozen lakes and ponds that they could get the ice from in the winter time. And they figured out how to store it to use it in the summertime. But then this one guy thought maybe he could convince people who lived in places where it was warm all year round that they needed ice, too.

Gavin Weightman 03:51
This chap was called Frederic Tudor. He wanted to make a fortune out of something, which is often the case with inventive people: they don't know what they're going to invent, but they're going to invent something. And his family had an ice house in their in their Massachusetts estate, I suppose. They cut ice in the winter, or probably their staff cut at the ice of the winter and kept it for them in the summer. And he's just got the idea that other people would love it. But his big problem was how will it survive a journey? Because ice melts, as we know, and particularly if you're sending it to a very hot country, it's gonna melt even quicker. So he did all sorts of experiments with...he had a big tub but he put different things in it. He put sawdust in it and he put straw in it and eventually, it was a very interesting thing in America. The old aristocratic way of keeping ice was to dig a cellar and keep it underground in the belief that if it was underground, it wouldn't melt so quickly. But actually, American farmers, who used to have ice...so when they took the butter to market it it wouldn't melt, they built straw ice houses above ground, very, very thick walls, stacked the ice there in the winter. And it survived through the summer. And he began to build ice houses like that out of wood, very large ones. And when the business got going, against all the odds, everyone thought he was crazy. All the newspapers said, you know, "Can you believe it? A ship's left Boston, loaded with ice for the West Indies." You know, "Good luck to them" sort of thing.

Jane 05:35
Did you get that? Basically this guy, Frederic Tudor, had an idea that if he could find a way to get it there, people in far off warm places would buy ice cut from ponds near Boston, Massachusetts. So he worked to figure out how to make it a reality.

Gavin Weightman 05:50

In 1833, he sent a ship from Boston to Calcutta. That's 3000 miles, twice across the equator, and packed with ice from a pond in Massachusetts, insulated with straw and wood chips and that sort of thing. And enough of it survived to be a sensation.

Jane 06:15
Tudor made himself very rich shipping ice, and a whole industry sprung up. In cities, people would get daily deliveries from a person they called the ice man. They'd put those chunks of ice into an icebox, which was kind of like a refrigerator, except it didn't use electricity. The ice was what kept things cold. And when the ice had melted, they'd get a new chunk.

Gavin Weightman 06:37
It was the start of people expecting to have ice, which they didn't expect in the past.

Jane 06:43
The ice harvesting industry died out when people figured out how to make ice in big factories. And then when refrigerators were invented, people had even less need for ice deliveries. But a few places still do ice harvesting the old fashioned way. And coming up next, we'll visit one.

Jane 07:01
This is But Why: A Podcast for Curious Kids. I'm Jane Lindholm and today we're learning a little bit about how people kept food cold before refrigerators were invented. We've been learning about the history of ice harvesting with Gavin Weightman, who wrote a book all about it. A few places still carry on this old fashion tradition. So we reached out to one of them. Rockywold-Deephaven camps in Holderness, New Hampshire is a resort where families go to have a kind of summer camp experience for the whole family. They stay in cabins or cottages right on Squam Lake. They eat their meals in a big dining hall with all the other families so they don't really need to keep much food in their cottages. But they still might want to have snacks and drinks that are kept cold, right? And instead of refrigerators, all the cottages have old fashioned ice boxes. Here's how maintenance Director Dave Lacasse describes them.

Dave Lacasse 07:55
There's all kinds of ice boxes, but they're designed typically for the ice to be on the top side of it and the cold--of course cold air drops. And they have circulation baffles in them at times. And it keeps their drinks and stuff very cool. But you can't get it down to 34 degrees. There's no--unless you just put your drink right on top of the ice chunks. Most of them are wooden, the doors and stuff those hinges and stuff, they're all scrolled and old school and the handles are beautiful and stuff. So most of them are wood and some of them are metal, and those seem to work the best. Some of them are 20 inches wide by a foot deep by three feet tall. Others are the size of an armoire. They're huge. They're up to your neck, and they're four feet wide and 18 inches deep and solid oak so they're heavy heavy. Every day, ice is delivered to every ice box probably 10 to 15 pounds.

Jane 09:11
In order to fill up the ice boxes all summer with daily ice deliveries, Dave and his crew and some volunteers harvest 200 tons of ice every winter from the lake the camp sits on One ton is 2000 pounds.

So 200 tons is 400,000 pounds of ice! Usually a lot of volunteers help out but right now, because of COVID, they have a smaller crew doing the work. And Dave says it takes a lot of work.

Dave Lacasse 09:41
Every year, sometime between the end of December and pretty much the middle of February, we end up icing. That's all we call it: "We gotta go icing." Starting in November, typically, we start watching the ice form, hopefully form. This year was a little late. It was kind of warm in November this year. Usually we have a cold snap in November, that helps it seize up. But once it gets to be four inches, five inches, then we can walk on it. And we slowly move our way out onto the ice, drilling holes, measuring and making sure we're safe. You're always measuring and measuring and keeping your fingers crossed, it's not going to snow, or rain or do a lot of, you know, the weather things that happen in New England all the time. So if it does snow, and we can get a snowblower on to the ice, we will try to get the snow off of it because snow is an insulating blanket, and it slows down the formation of the thickness of the ice. Once we get to 12 inches, we have a lot of equipment to put on the ice. And one of them is a raised bridge, that we attach a ramp to. And that ramp, we cut a slot in the ice, and that ramp goes down into that slot. And usually once that's in the water, we start the next day.

Dave Lacasse 11:27
We have this giant saw. It's gas operated, and that's a big three foot blade, just like a skill saw. And it goes up and down with an actuator. And once we mark out where our lines have to be, it has an outrigger with skate blades on it. So you make the initial cut, then that outrigger goes down, and you move the saw over a little bit and the skates go in that initial cut. So all the lines are the same and they're straight. And then you have to go the opposite way. So it's.. that's the tricky part of the whole operation. But we don't cut all the way through the ice.

Jane 12:20
Oh, you don't.

Dave Lacasse 12:21
Because that saw weighs, I think it probably weighs 6 or 700 pounds. It's big. It's probably eight feet long. We can't cut through the ice because if you did, there'll be no support for that machine. So we try to leave two inches of uncut ice down the bottom. Once that is all cut that, grid is cut, then the guys take chain saws and open up a little channel. And then they cut around the outside perimeter, and then it's floating. And then we just take ice picks and break off the blocks. And they end up going down the chute.

Jane 13:08
So Dave is harvesting about two football fields worth of ice. Once they've cut that ice into a grid with that giant saw, they use big ice picks to pull the ice chunks into a channel of clear water. And they float those blocks of ice down the channel and then have to haul them up out of the ice to get them into the ice house for storage. Here's how it works. Oh, and we have sound for this! As I said we didn't get to go see them harvest the ice this year. But Dave let us use the sound from a video the camps produced that shows people what the process is like. So even though you can't see it happening because this is a podcast, let these sounds help paint a picture in your mind.

Dave Lacasse 13:49
So up on top of this bridge, there's a winch. It's a gas operated winch--used used to be horses, and then pickup trucks, but it's just a gas operated winch with a line and a hook. And once we cut an ice field and break off the ice, it goes down this channel about just a little bit bigger than the ice blocks are. We take five blocks at a time and bring them up on this bridge. A pickup truck comes to the other end. The bridge is tilted somewhat so the ice slides down and into the pickup truck. And the pickup truck heads for the ice house. And then somebody has to break all the ice apart from the pickup truck and it goes down another chute into our ice house. And then there's guys in the ice house; they grab these 150 pound blocks and slide them around and make a floor and then they they go up another layer and we end up going up about 10 layers. It's a lot of work.

Jane 15:06
So if I wanted to grab one of these blocks of ice, how heavy is it? And how big--let's say I have the arms of an 11 year old--could I get my arms all the way around it and lift up one of those blocks of ice?

Dave Lacasse 15:18
Not if you're 11, no. I mean, it's 20 inches long by 16 inches wide by 12 inches deep. The ones we did this year were 16 inches deep at the end. So that's a lot more ice than normal. And those blocks were 150 pounds. Now. I don't know if an 11-year-old can pick up 150 pounds, but I would say no.

Jane 15:48
I'm not sure I could pick up 150 pounds.

Dave Lacasse 15:51
I can, with ice tongs, get it off the ground. But I'd just as soon slide it!

Jane 15:58
Yeah, yeah, sliding it. That's the way to go, right? Okay, so you've harvested the ice. You have this big saw, specialized saw, that can cut the ice into these blocks. And then you've cut a hole into the ice so that the ice blocks can plop into it and go down this kind of river or channel of open water and get winched up with this machine. So because again, these blocks are super heavy. So people are helping to get them on to this ramp. And then they go from the ramp onto a truck. And the truck is on the ice and goes, drives on the ice to your ice house. And then you slide them off the truck into the ice house and other people are stacking up all of these blocks of ice, each one is 150 pounds. And you said you had what 200 tons of ice that you're putting into your ice house. Great. In January and February in New England, it's really cold; that ice isn't going to melt. But starting in March, April, May, it gets pretty warm. And by July and August, when you really want some ice to make sure that you're keeping your sodas cool, or you have some ice to drink, it's really warm out. So how do you keep that ice from melting?

Dave Lacasse 17:09
So once all the ice is in the ice house, the ice house has a four walls a big long door and the front. From the floor to the top of the wall is about 12 feet. Inside that wall there's sawdust that's been in that wall for I don't know how long, but probably more longer than my age, which I won't divulge. But so

that's the insulating material we use. Once all that mass of ice is in the building, we have a stockpile of sawdust that we take and we put about a foot of sawdust on top of all that ice. And we make sure that if there's any pockets on the sides, which they're always are, that's all filled with sawdust. That sawdust is probably one of the best insulators in the world. And we have never run out of ice all the way into the end of September.

Jane 18:18
So there you go, that ice, harvested in the coldest part of the winter, will stay frozen in the ice house, even in the warmest part of the summer.

Jane 18:27
Now, you may actually have seen ice harvesting, if you've ever watched the movie Frozen. In the opening scene of the movie, they're actually harvesting ice from the lake using saws.

Jane 18:39
So what is the point of doing all this hard work and keeping the ice from melting all through spring and the hot days and nights of summer, when we have refrigerators? Is it just kind of like playing dress up pretending you live in the olden times. Dave Lacasse says he doesn't have an ice box at home. He'd rather grab his cold drinks from his own refrigerator. But he does think there's something kind of neat about having this connection to local history.

Dave Lacasse 19:07
I think there's a value. I mean, to know where it came from and how it was way back. New England was built on ice. A lot of it was built on ice harvesting. And you wouldn't even think about it that much because we have electricity and refrigerators but they used to fill ships up and send it all the way to India. And they'd do it the same way, with sawdust. And they'd take ice from up here, ship it to Boston by rail. Then it would leave Boston and go all to all the islands in the Caribbean. And now our customers here, they think it's the cat's meow.

Jane 19:55
I guess, you know, it connects you to the past whether you're a staff member or a volunteer in the winter or a family staying here for part of the summer, you're connected to the past, you understand how challenging it was to have ice and how much of a business it was not just a way to have a, you know, a cold glass of milk. So it's pretty impressive that this is still going and that people can connect to what was happening 100 years ago or more.

Dave Lacasse 20:23
Right. And it's exactly right. The people here that come here, even when we have people come in from outside like contractors and stuff to help out with our maintenance and stuff, they marvel at the thought that we pull 200 ton of ice out of the lake every year, and they want to see they want to see our ice houses. And they want to...they want to hear about how we do it. And it's pretty cool. They just sit there and their mouths just drop. They go, "200 ton; are you crazy?"

Jane 21:05

Of course most of us don't need ice boxes anymore. Gavin Weightman, the historian we were talking to at the beginning of the episode, says harvesting ice started getting difficult later in the 1800s. For one thing, the climate was changing. Also, water was not always pure. So with those factors, and the increasing demand for ice, it was hard to have enough ice harvested from lakes and ponds. Eventually, new technology allowed factories in cities to make ice. And then, in the early 1900s, the refrigerator was invented. It still took some time to get into every home. But by the early 1940s, about half of the families in the United States had a refrigerator. It took even longer for most families in the United Kingdom, where Gavin grew up, to get one. And he remembers what it felt like when his family first plugged it in.

Gavin Weightman 21:57
To get a fridge was absolutely magical. Just kept going and looking at it. And thinking of things to put in it.

Jane 22:08
Yes, you probably had what every child has, which is their parents saying, "Close the door of the fridge!"

Gavin Weightman 22:13
That's right. You almost wanted to climb inside it in hot, in really hot weather.

Jane 22:19
It's kind of amazing to realize how much things have changed just in the course of one person's lifetime. Imagine it: when he was a kid, Gavin Weightman didn't even have a refrigerator. And now we have all of this amazing technology. What do you think is going to be very, very different when you are an older person from what you are experiencing today?

Jane 22:42
Anyway, thanks for the great questions, Violet and Ellinor. I hope you all learned a little bit about history and science. Thanks to Gavin Weightman. His book is called The Frozen Water Trade. And thanks to Dave Lacasse, from the Rockywold-Deephaven camps in Holderness, New Hampshire.

Jane 22:59
Is there something about history or art or culture you'd like us to cover in a future episode? If you have a question, have an adult record it. It's easy to do on a smartphone using a voice recording app. Then you can email the file to questions@butwhykids.org. Be sure to include your first name, where you're from and how old you are. We wish we could answer every question we get and we can't but we do listen to them all. And we are so excited to hear what you're curious about. It helps guide our decisions about what episodes to do.

Jane 23:31
But Why is produced by Melody Bodette and me, Jane Lindholm, at Vermont Public Radio, and distributed by PRX. Our theme music is by Luke Reynolds. We'll be back in two weeks with an all new episode. Until then, stay curious!