Frederick Tudor- “The Ice King”

- Native of Boston, MA
- Credited for creating the concept of large commercially owned icehouses and first person to ship naturally harvested ice outside the US
- 1806 Tudor sent ice from MA to an island in the West Indies
  - Incurred a large amount of debt but continued to improve the techniques
"It is a matter of certainty that the love of cold drinks & refreshments in warmer weather is nearly universal & that the prejudice against them [cold drinks] wears away more & more every year at places where ice is at first introduced ... & that in the course of years the use of such things will inevitably become general."

-Frederick Tudor
The Ice Industry

- Located throughout Hudson River Valley
- Most were found between Catskill and Albany
- Few were located in the middle and southern portions of the valley
The Ice Industry

- Icehouses were privately and corporately owned
- The Erie Canal had a major impact on the industry
  - Trade was easier and faster
  - Opened the area to new markets
  - Led to a greater demand for fresh vegetables and meat
    - Increased the need for harvested natural ice which led to the building of more icehouses
Companies

- Increasing demand for ice led to the creation of many different companies
- Large icehouses were often a consolidation of smaller icehouses
  - Knickerbocker, a popular larger company, was created when several small companies consolidated
Companies

- Ice companies would sell their ice to rail companies to keep the cars cool during transportation
- Some companies had to deal with shipping ice internationally
Icehouse Components

- Icehouses usually contained
  - Wooden icehouse
  - Adjoining wooden or brick powerhouse
  - Iron or brick chimney stack
Icehouse Design

● Well maintained icehouses helped prevent loss due to melting
  ● 50% of the harvest was often lost from harvest to delivery, but the design of the icehouse could help limit this to 20%
    ● Customers paid by the pound of ice delivered. Less loss meant greater profit.
● Double walled with insulation in between
● Painted white or yellow
  ● Reflected sun rays to prevent melting
Icehouse Design

- Originally made of wood but the introduction of railroads led to brick or tile icehouses
  - The sparks from the tracks could cause the wooden icehouse to catch fire
- Room design limited air movement
  - Dampness would lead to melting
- Ice was placed 3 to 6 feet off the ground with drainage
Adjoining Powerhouse

- Also made of brick to prevent fires from railroad sparks
- Contained boilers and steam machines to power conveyor system
  - Because these created heat, the powerhouse would be located away from the icehouse
  - Workers often stopped here during lunch and breaks to heat up
Tools

- Originally ice was harvested using only man/horse pulled snow scraper, saws, wooden planks for marking the ice, wooden poles with hooks to guide harvested ice to a conveyor system
- With improvements in technology came the use of powered/steam driven cutters
How it was Harvested

- Ensure that the ice is thick enough
  - Weather dependent
  - Ideal thickness was 14-16 inches but due to weather they sometimes had to settle for 8-12 inches
- Scrap off the snow via scrapers pulled by horses
  - Shine sleighs would then be used to remove any horse urine or feces and formaldehyde was used to clean the ice
How it was Harvested

- Drill holes 200 feet apart to show where cuts were to be made.
- Use planks with sights to line up the saw that is used to cut half an inch deep to mark out cutting lines.
- Horse drawn cutters deepen those initial cuts and handsaws were used to separate the ice.
How it was Harvested

- Ice is floated to the conveyor system
- Load ice into icehouse via channels to the conveyor system

- “The cakes were separated and guided by workers onto floating aprons at the shoreline. The aprons were connected to steam-powered elevators that hoisted cakes to the sloping wooden ‘runs’ leading to narrow vertical doors extending the full height of the ice house”

-Cragsmoor Consultants
Loading the Icehouse

- Large companies
  - Ice was cut to a standard height and width to maximize efficiency of storage
  - Used a steam powered conveyor belt
- Small companies
  - Man or horse power carried ice into the icehouse
Transporting the Ice

- There were 2 methods
  - Ice was transported from the icehouse to a small ship which would carry the ice to a large barge
  - Ice was loaded on to railcars

- Using railroads was less common because few icehouses were located next to railroads
  - Most icehouses were located along the Hudson River so using ships was easier and meant less melting in the process of transporting from the icehouse to the ship
Ice barges were pulled by tugboats when full.

- Usually carried 400-800 tons of ice.
- 110-140 feet long, 26-34 feet wide and 9-10 feet deep.
- Made of white oak (frame), yellow pine (planking and decking), white pine (housing)
  - Prevented melting.
Ships

- Ice was stored below deck
  - Being closer to the cool water helped prevent melting
  - If it couldn’t be stored below deck it was stored in a cargo house which was double walled and insulated
- Bilge pumps removed any excess water
Delivery

- Ice was delivered to companies and private homes
  - Most deliveries went to New York City
- Ice was unloaded from barges, shipped to a warehouse, and then loaded into ice wagons when ready for delivery
  - Horse drawn wagons were used until the creation of the internal combustion engine
Delivery

- A card placed in the window of a house indicated how much ice the customer wanted
Employees

- Workers were from many different backgrounds
- Some had their own farms but needed to work for supplemental income
  - Wages were quite high due to long hours, the dangerous working environment, and cold working conditions
- Wage labor often led to disputes among employees of different racial backgrounds
Economic Impact

- Employed thousands
  - Employees were needed for cutting, moving, transporting, loading, etc
  - Employees were needed for the harvesting season, but some were also needed for the off season to maintain the buildings and equipment
- Some companies would contract out their shipments
- Workers often spent their paychecks at local businesses
The End of the Industry

- As time passed the industry was able to adapt to change
  - Began using steam-powered ice cutters and trucks
- The industry could not adapt after the industrial revolution
  - The creation of industrial cooling and cooling coils led to a decrease in the need for natural ice
  - The refrigerator and freezer were invented
The End of the Industry

- By WWI the ice industry was nearly non-existent and by the end of the war it had disappeared completely.
- Icehouses were abandoned or destroyed and their parts used as scrap or were recycled.
Video of Interest

- Note: there is no sound to this video
Bibliography

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Pictorial Bibliography


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