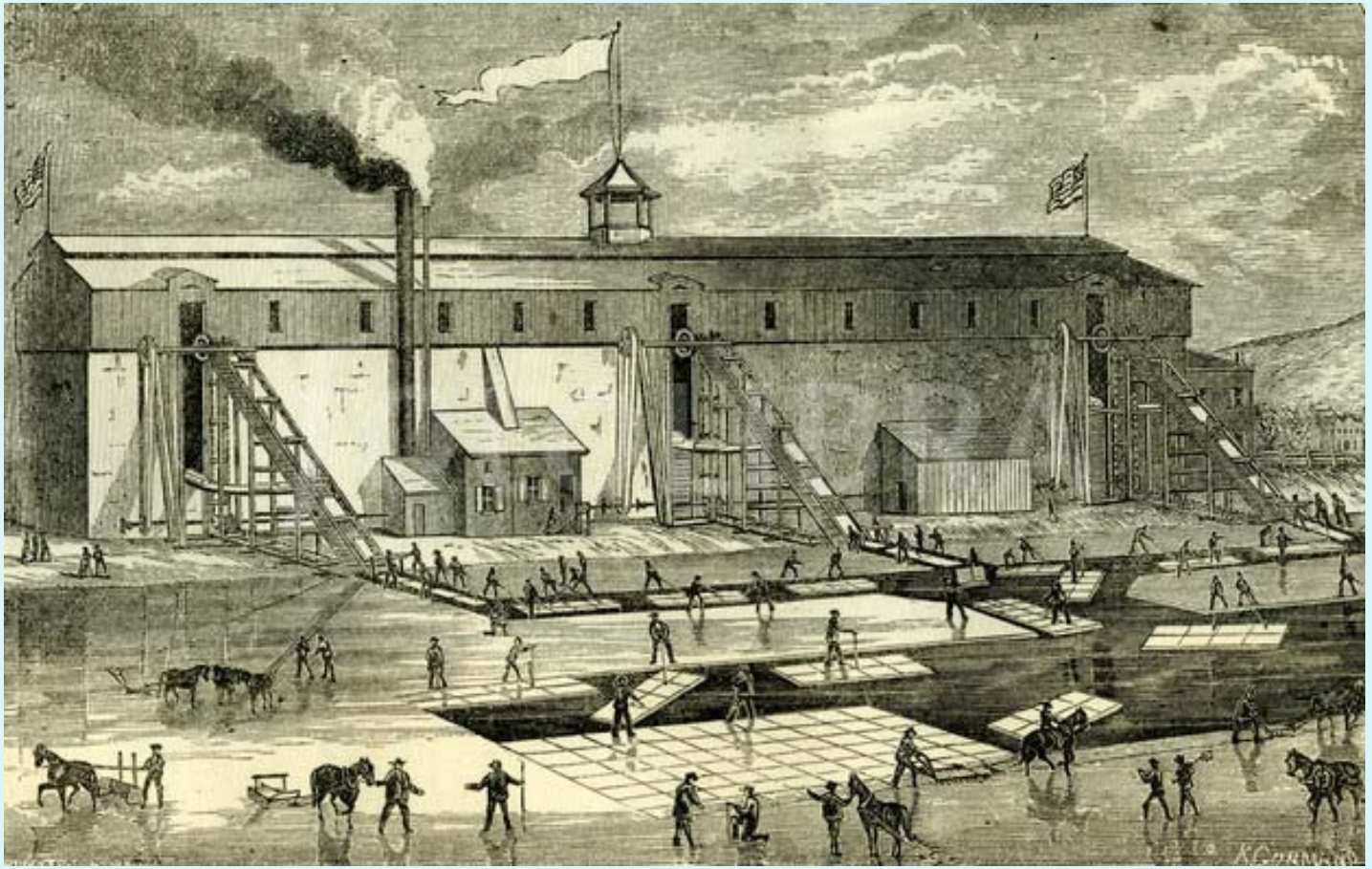
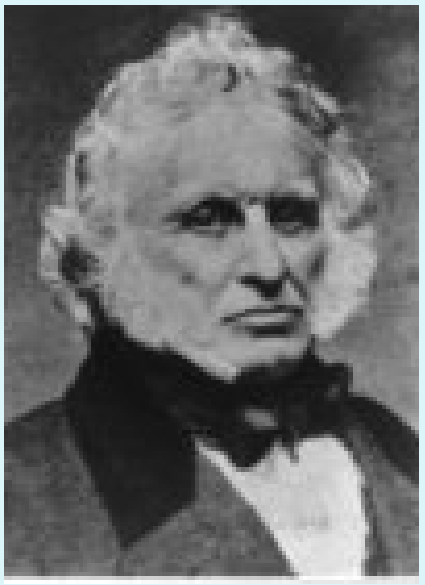
Hudson River Valley Icehouses and Ice Industry



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

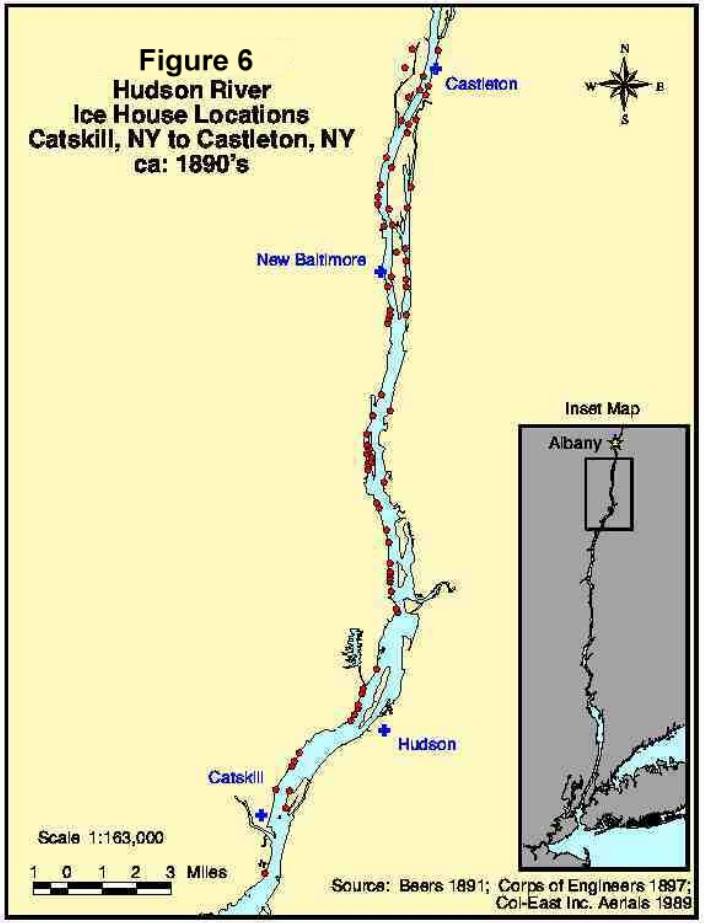


Frederick Tudor- A Word from the Wise

"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

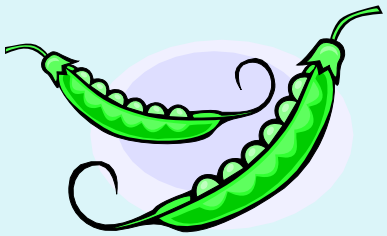
The Ice Industry



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

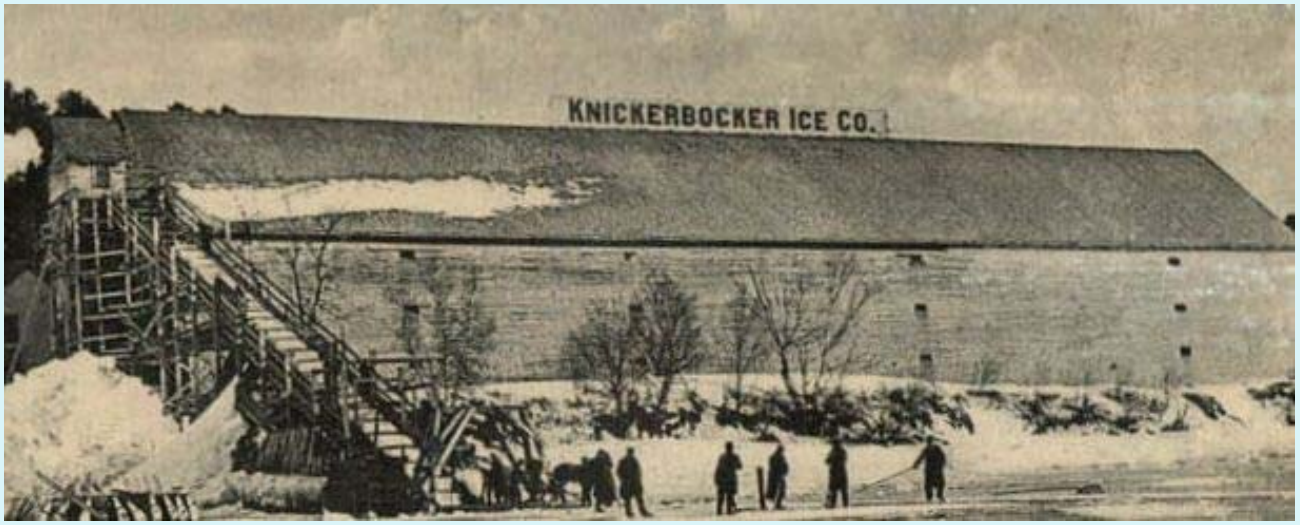
The Ice Industry

- 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



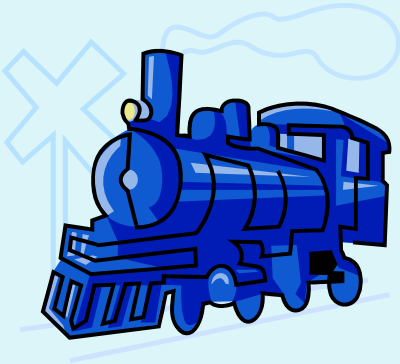
Companies

- 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

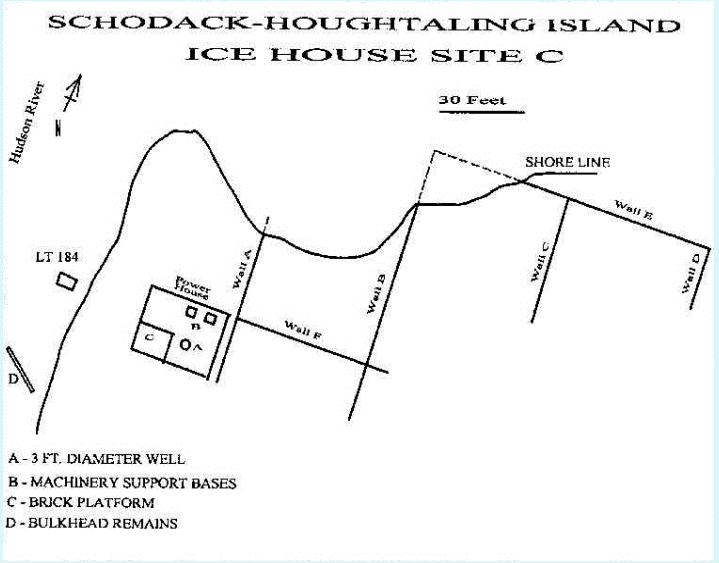
- Icehouses usually contained
  - Wooden icehouse
  - Adjoining wooden or brick powerhouse
  - Iron or brick chimney stack

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 were 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

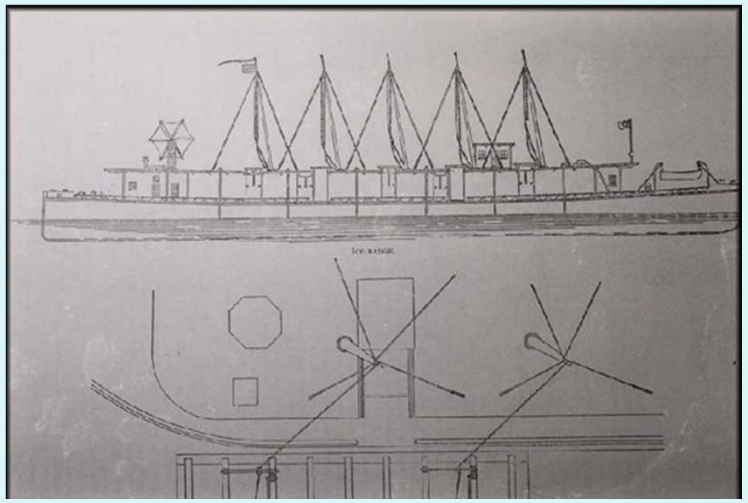
- There were 2 methods
  - Ice was transported from the icehouse to a small ship which would carry the ice to a large barge

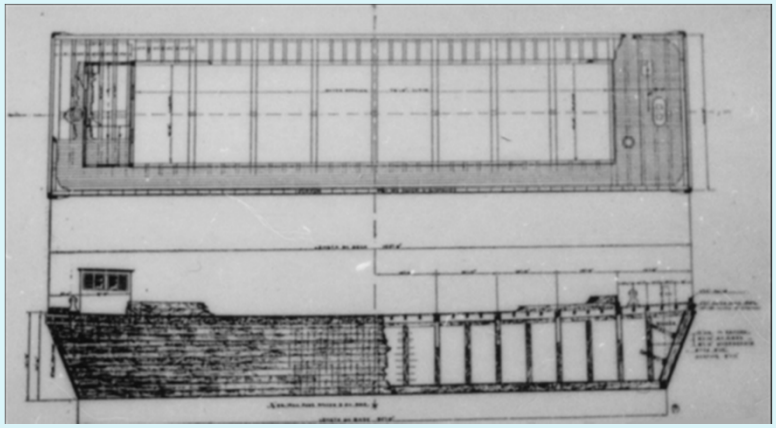
  Or
  - Ice was loaded on to railcars

- 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

Ships

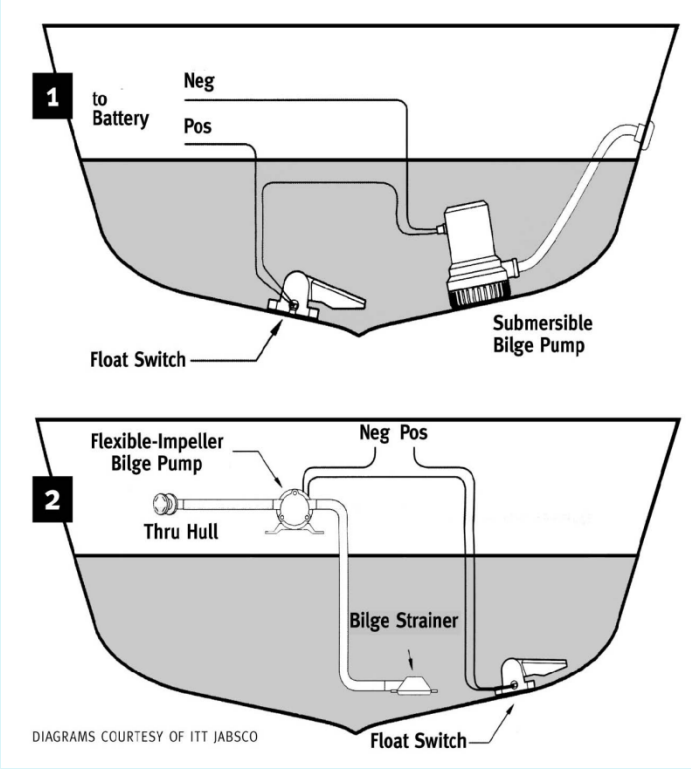
- Ice barges were pulled by tugboats when full
- Usually carried 400-800 tons of ice
- 110-140 feet long, 26-34 feet wide and 9-10 feet deep
- Made of white oak (frame), yellow pine (planking and decking), white pine (housing)
  - Prevented melting





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

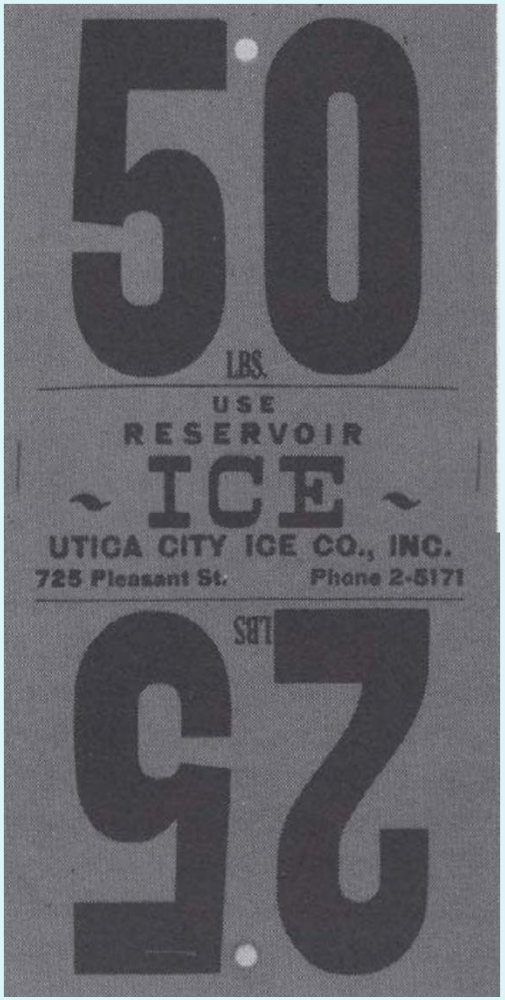


Delivery

- 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

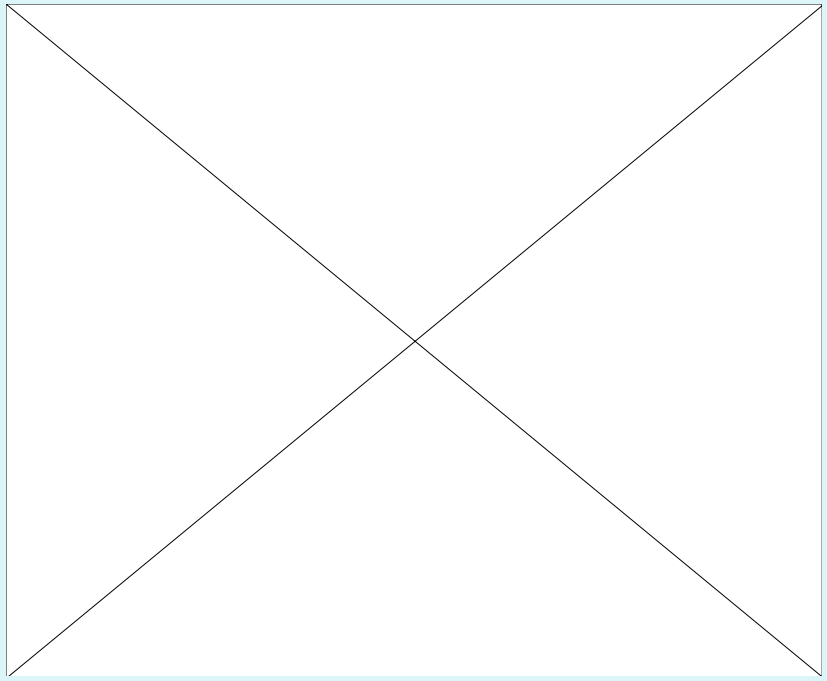
- As time passed the industry was able to adapt to change
  - Began using steam-powered ice cutters and trucks
- The industry could not adapt after the industrial revolution
  - The creation of industrial cooling and cooling coils led to a decrease in the need for natural ice
  - The refrigerator and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

- Bradshaw, Sarah. “State of the Hudson: Industry Once Thrived.” Poughkeepsie Journal. <http://www.poughkeepsiejournal.com/hudson/index.shtml>.
- Carmer, Carl. *The Hudson*. New York, New York: Fordham University Press, 1989.
- Ghee, Joyce C. and Joan Spence. *Poughkeepsie Halfway up the Hudson*. Charleston, South Carolina: Arcadia Publishing, 1997.
- Harris, Wendy Elizabeth and Arnold Pickman. “Landscape, Land Use, and the Iconography of space in the Hudson River Valley: The Nineteenth and Early 20th
- Century.” members.aol.com/cragscons2/cneha98. December 1996. <http://members.aol.com/cragscons/acsci.html>.

Bibliography

- Harris, Wendy Elizabeth and Arnold Pickman. "Slip-Slidin' Away: Archaeology and the Reconstruction of the Hudson River Ice Industry." members.aol.com/cragscons2/cneha98. October 1998. Hudson River Valley Institute. <http://members.aol.com/cragscons2/cneha98.htm>.
- Harris, Wendy Elizabeth and Arnold Pickman. "Towards an Archaeology of the HudsonRiver Ice Harvesting Industry." *Northeast Historical Archaeology* 29 (2000): 49-82.
- Hill, Dewey D. and Elliott R. Hughes. *Ice Harvesting in Early America*. New Hartford,New York: New Hartford Historical Society, 1977.
- Holodook, Joseph. "Joseph Holodook In Old America." Portersfield Fine Art. <http://www.porterfieldsfineart.com/josephholodook/theiceharvest.htm>.

Bibliography

- Hood, J. E., and Donald Weinhardt. "Working the Sturbridge Graphite Mine." *Old Sturbridge Village*. Web. 07 Feb. 2012. <http://www.osv.org/explore_learn/document_vewer.php?DocID=572>.
- Huey, Paul R. "Historical and Archeological Resources of Castleton Island State Park, Towns of Stuyvesant, Columbia County, New Baltimore, Greene County, and Schodack, Rensselaer County, New York: A Preliminary Phase I Cultural Resources Assessment." New York State Office of Parks, Recreation and Historic Preservation. May 1997. <http://unix2.nysed.gov/edocs/parks/castleto.htm>.
- Keller, Allan. *Life Along the Hudson*. Tarrytown, New York: Sleepy Hollow Restorations: 1976.
- "Living Valley Panoramas: Rockland Lake State Park, river front." Hudson Valley Network. <http://www.hvnet.com/panoramas/rocklandlakeriver.htm>.
- O'Connell, Patricia. "The Birth and Death of the Ice Age." Business Week Online. February 2003. <http://www.businessweek.com/bwdaily/dnflash/feb2003/nf20030218_9685.htm>.

Bibliography

- Ramanan, Karthik. “The Hudson River’s Industrial History.” The Hudson River: An American Treasure. <http://www.marist.edu/summerscholars/99/eco/kr02.htm>.
- Ross, Alice. “Ice.” The Journal of Antiques and Collectables. February 2004. <http://www.journalofantiques.com/Feb04/hearthfeb04.htm>.
- Stark, Craig. “The Great Emerald.” Book Think. <http://www.bookthink.com/0003/03uice.htm>.
- Weightman, Gavin. *The Frozen-Water Trade: A True Story*. New York, New York:Hyperion, 2003.
- Zasky, Jason. “Cool Costumer: Frederick Tudor and the Frozen-Water Trade.” Failure Magazine. <http://www.failuremag.com/arch_history_cool_customer.html>

Pictorial Bibliography

- Bryer, Peter. "Putting Your Company's Futures Planning on Ice? Foresight Now... or Face Extinction." *Peter Bryer: Mobile Foresight*. 1 Sept. 2011. Web. 07 Feb. 2012. <http://www.peterbryer.com/2011/08/putting-your-future-plans-on-ice.html>.
- "Choosing and Installing Bilge Pumps for Your Boat." *Ask Boat*. 8 Dec. 2010. Web. 07 Feb. 2012. <http://www.askboat.com/choosing-and-installing-bilge-pumps-for-your-boat/>.
- "Cutting Ice." *American Centuries: History and Art from New England*. Web. 07 Feb. 2012. <http://www.americancenturies.mass.edu/collection/itempage.jsp?itemid=15910>.
- "Frederic Tudor 1783-1864." *Library of Congress Home*. Web. 07 Feb. 2012. <http://www.loc.gov/pictures/item/2003670541/resource/>.

Pictorial Bibliography

- Harris, Wendy E., and Arnold Pickman. "Towards an Archaeology of the Hudson River Ice Harvesting Industry." *Cragsmoor Consultants*. Web. 07 Feb. 2012. <http://cragsmoorconsultants.com/cnehaart/article2.html>.
- "Ice Harvesting." *American Centuries: History and Art from New England*. Web. 07 Feb. 2012. <http://www.americancenturies.mass.edu/collection/itempage.js p?itemid=15914>.
- Mark. "On the Rocks." *Sailor Twain Or The Mermaid In The Hudson*. 3 Oct. 2001. Web. 07 Feb. 2012. <http://sailortwain.com/blog/2011/10/03/sailortwain285/>.

Pictorial Bibliography

- "Natural Ice." *Illinois State Museum*. Web. 07 Feb. 2012. <http://www.museum.state.il.us/RiverWeb/harvesting/harvest/ice/natural_ice.html>.
- "Photo Archivist's Selection of the Month: January 2005 Ice Harvesting in Stamford – The Diamond Ice Company." *Stamford Historical Society*. Web. 07 Feb. 2012. <http://www.stamfordhistory.org/ph_0105.htm>.