Society for Industrial Archeology · New England Chapters

Volume #43 Number 1 2022

Contents

Contributors

Rick Ashton, Rick Coughlin, Betsey Dexter Dyer, David Dunning, Matt Kierstead, Robert Timmerman, Sara Wermiel

Newsletter Editor

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NNEC—SIA President's Report

David Dunning

Things are finally getting back to normal with a fall tour and a winter conference completed. What is becoming the *new normal,* however, is that the same few members are doing all of the work. I've often said, jokingly, that we need term limits. Look at our history of NNEC presidents.

David Starbuck	1980-1982	3 years
William Taylor	1982-1984	3 years
Dennis Howe	1984-1989	5 years
Walter Ryan	1989-1993	4 years
Woody Openo	1993-1996	3 years
Katherine Donahue	1996-1998	2 years
Krista Butterfield	1998-2000	2 years
David Starbuck	2000-2003	3 years
Dennis Howe	2003-2006	3 years
Dave Coughlin	2006-2011	5 years
David Dunning	2011-present	10 years

Dave Coughlin has been serving as a VP for 10 years. Dennis Howe has been secretary about that long. Rick Coughlin has been treasurer for 8 years. *Which of you are going to take a turn next???*

NNEC-SIA Treasurer Report– Spring 2022

Rick Coughlin – Treasurer

Bank Balance on March 30, 2022	$3,841
Bank Balance on September 30, 2021	$4,351

Thus, the bank balance has decreased $510 in the past year.
2022 Annual Paid Membership as of March 30, 2022: 25. Life Members: estimated at 30.
Submitted on March 30, 2022, by Rick Coughlin.

SNEC-SIA Treasurer's Report for 2021

Sara E. Wermiel, Treasurer/registrar

In 2021, the Southern New England Chapter of the Society for Industrial Archeology (SNEC) had 100 dues-paying and life members. This was 28 fewer than in 2020.

As usual, most of SNEC's income comes from dues and donations. Annual dues last year, for those who sent them to me before February, were \$10/year for regular members and \$8/year for new members and students. Some very generous members, including life members, sent donations. In 2021, income from membership dues and donations to SNEC totaled \$752.60.

SNEC's main costs last year were printing two newsletters, for \$289.80, and mailing them to members who want hard copies, for \$288.16. In addition, SNEC paid for the memberships of our two officers, Leonard Henkin and me, in the national SIA (\$100).

All told, SNEC received \$753.79 in income last year and had \$714.82 in expenses, meaning our income exceeded expenses by \$38.97. On Dec. 31, 2021, the balance in SNEC's bank account, kept at Fidelity Investments, was \$11.489.84.

SNEC activities in 2021 were curtailed because of the coronavirus pandemic: no tours, in-person meetings, or other activities. SNEC's Management Committee met via Zoom a few times, in particular to assist Robert Timmerman, the new editor, with the chapters' newsletters.

We would like to begin to offer tours and programs, and we look to the membership for suggestions and help with organizing events. If you have ideas for activities, please contact Management Committee member Betsey Dyer, bdyer@wheatonma.edu

Thanks to the members of the Management Committee – Betsey Dyer, Leonard Henkin, Ron Klodenski, and Robert Timmerman – and to Marc Belanger, who kindly, from far away in Reno, NV, handles the website and email distributions for the New England SIA chapters.

NNEC–SIA Spring Tour
Saturday June 4, 2022

This year's Spring Tour will be in the town of Wakefield, New Hampshire. Within Wakefield are several historic villages. In the village of Sanbornville at Turntable Park, we will view a 60-foot-long railroad turntable and nearby historic buildings. We will then travel a few miles east to view the Newichawannock Canal, a 1,800 ft. long stone canal built in the mid 1800's that is still in use. It was built to supply water to mills downstream. We will also visit the village of Union to see the 1912 train station, freight house, old B&M wood water tower, a 1902 railroad snowplow, and more. Additional tour sites and information will be in the tour flyer available in May, via e-mail. You can view many of the places we will visit at the website www.historicwakefieldnh.com. At the top of this website are links to various buildings, structures and places in Wakefield we will see. Save the Date!

For tour questions contact Rick Coughlin at 53Stucom@gmail.com or (207) 384-2645.

33rd New England Conference on Industrial Archeology

View this on the NEC website for clear color photos and links to background information.

This was a very successful conference. Everyone was glad that it was closer than Plymouth, N.H. The rainy Saturday in Concord didn't dampen the interest or enthusiasm. However, the rain did cut the attendance from what was anticipated. The McAuliffe-Shepard Discovery Center was ideal. The first presenter was Robert Timmerman, our new newsletter editor.

Power for the Mills, 1810 to 1860

Robert Timmerman, PE

While portions of this presentation were given as a Mill Talk at the Charles River Museum on October 22, 2020, this talk is based on considerable new research, especially on coal and early steam engine builders.

America around 1810 was still essentially agrarian. Water powered grist mills were common since the colonial period. The craftsmen of the day could build water wheels with wood and a little iron, and simple hand tools, plus the blacksmith's forge. Building dams to divert the ample rivers in New England was a larger scale proposition, but not out of reach for a large gang of laborers, equipped with the latest Ames shovels and someone to direct them.

Things began to change in the 1820s. Anthracite coal was discovered in Pennsylvania, and several canals were built to bring the coal to market. Coal allowed development of an iron and steel industry, providing materials for engine builders. Some of these engines were used to supplement waterpower during summer droughts. In the 1820s, the textile industry began to grow beyond its roots, increasing the need for power. In that time frame, Paul Moody improved the transmission of power from water wheels to mill machinery.

Experimentation with water turbines began around 1844 and continued into 1900 or so with the refinement of the Francis turbine.

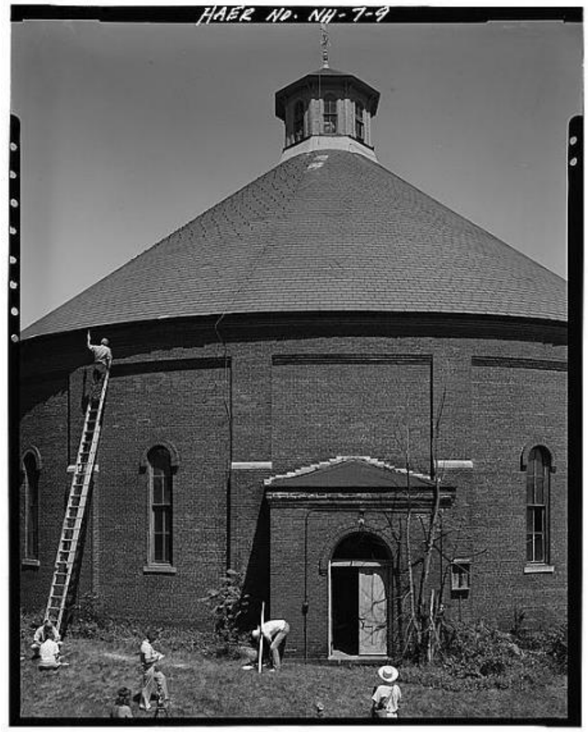
The steam engine industry began to grow in the 1830s, with early horizonal engines. The big breakthrough was the invention of engines with variable valve timing, due primarily to George Corliss. The greater efficiency of the Corliss engine freed mills from being dependent on sites with waterpower and supplemented water during summer.

Concord Gasholder Stabilization Underway

Jennifer Goodman

An emergency stabilization project, facilitated by the N.H. Preservation Alliance working closely with property owner Liberty Utilities, is underway; and it is the first step towards the preservation and revitalizing of this nationally significant and highly vulnerable structure. SIA members helped document this important structure for the Historic American Engineering Record (HAER) in 1982 and supported its preservation after Liberty proposed demolition in 2020.

This initial phase of the restoration project features placement of structural scaffolding to secure the roof and the broken compression ring that runs around the base of the roof. The major goal of the work is to prevent a catastrophic loss of this last-of-its-kind landmark while providing time for additional planning and fundraising. Structures North, the engineering firm which drafted the preliminary assessment of the building in December 2020, has created the design for the stabilization. Yankee Steeplejacks Company is performing the work with construction management by Milestone Engineering and Construction.



HAER photo of the Concord Gasholder

Stabilization underway February 2021

A preservation/redevelopment feasibility report underscored the importance of Liberty's commitment to make the preservation project financially viable, the necessity of using a mix of private and public funds, and the proximity of the gasholder site to downtown, the Merrimack River, residential neighborhoods and two highway exits.

The Gasholder, listed on the National Register of Historic Places, is considered the last of its kind in the U.S. Neighbors, civic and business leaders, and preservationists from across the state and country, have emphasized not only the importance of its preservation, but also its potential to serve as a catalyst for community development in Concord's southern corridor.

Please see www.saveourgasholder.org for more information.

The Dole Mill Restoration, From the Brink of Collapse to the Verge of Profitability

Sky Bartlett

The Dole Mill has had a long history in the town of Campton, N.H., producing wool products for over 150 years. Sky Bartlett and his wife Jessye purchased the closed Dole Mill in 2017. Their goal was to get the doors open again so the building could once more be brought to life. They have restored it, after a lot of time and effort and money. Now they rent out portions of the building to other people or groups for their own fun (and *profit*?). These web links show the history of the mill, what it looks like now, and Sky and Jessye's story. [No photos available]

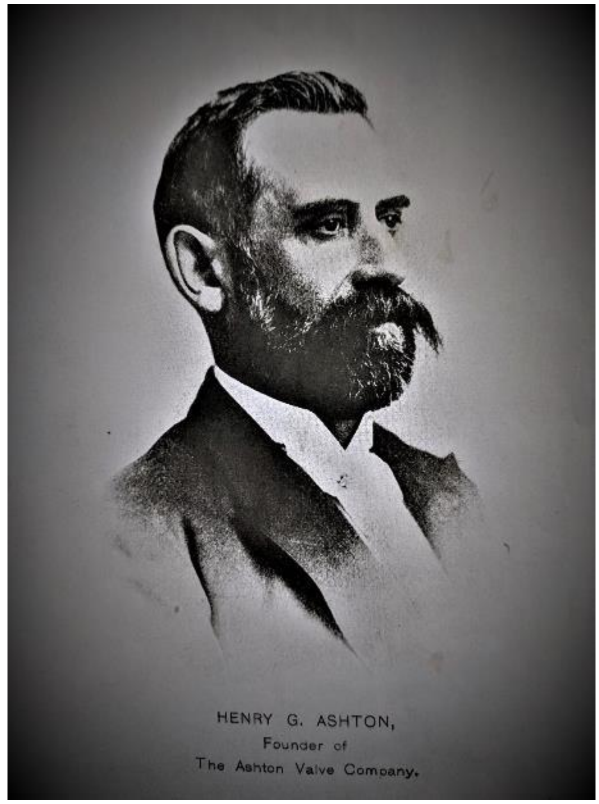
https://www.nhhistory.org/finding_aids/finding_aids/Dole,_E._and_Company_Records.pdf

https://www.nhpr.org/arts-culture/2019-08-06/the-once-and-future-mill-camptons-dole-mill-from-1826-to-1965

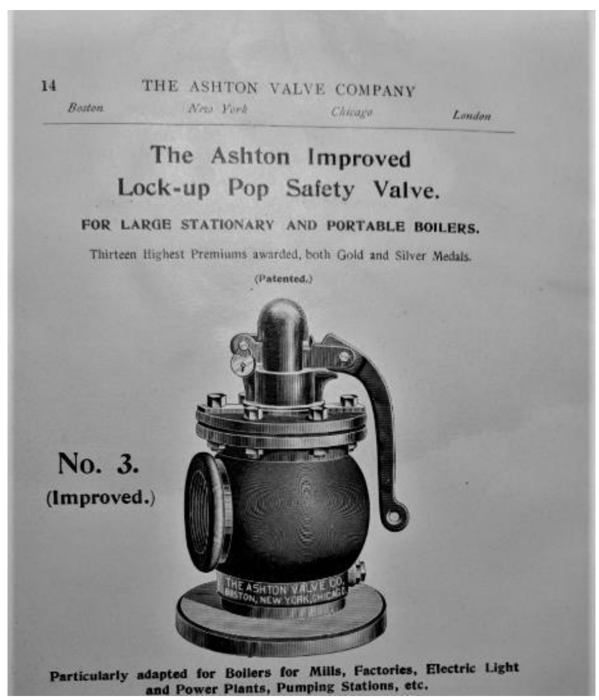
Ashton Valve Company

Rick Ashton

Rick Ashton talked about the history of his great great grandfather's business, the Ashton Valve Co. After Henry Ashton invented his lock-up pop safety valve in 1871, the company spent the next 100 years producing safety products for railroad locomotives, steam ships, and power plant boilers. They also ventured into the pressure gage market in 1892, a perfect complement to the valves they were producing.



Henry G. Ashton



Ashton Safety Valve

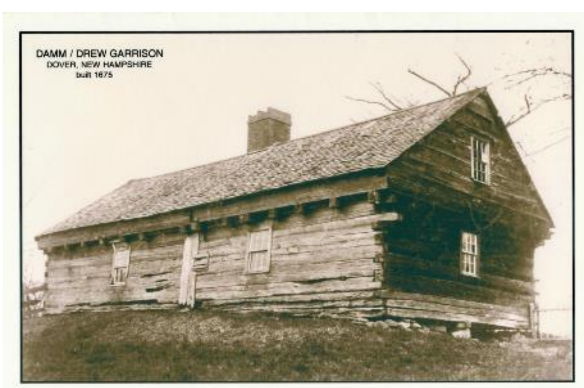
It wasn't all smooth sailing as the four major fires the company experienced attests to. The company ceased to be a family run company after being purchased by the Defense Plant Corporation in 1942 and producing safety valves and gages for the WW II effort. The talk featured pictures of the family employees, buildings the company occupied, and some of the products manufactured.

[https://www.newenglandhistoricalsociety.com › the-ashton-valve-company-saves-lives/](https://www.newenglandhistoricalsociety.com)
(If this doesn't work, Google it.)

The Miller's Tale:
Mysteries on the Raid of the Cochecho Garrisons, June 1689
Nelson Lawry

The late June 1689 raid on the Cochecho Garrisons, during which miller Major Richard Waldern and 28 other Dover, N.H., residents lost their lives, was an early episode in the nine-year-long King William's War. Lawry's talk included the workings of the subsistence mills—gristmills, fulling mills, and sawmills—located on the rivers of the Piscataqua estuary shared by New Hampshire and Maine. Aspects of the defensive garrison houses and then modern flint-on-steel firelocks arming the militia were discussed.

The mysteries arising included two possible routes taken by the Newbury, Mass Bay, militia company commanded by Captain Thomas Noyes, in reprisal against the main Penacook tribal village, the site now within the city limits of Concord, N.H..

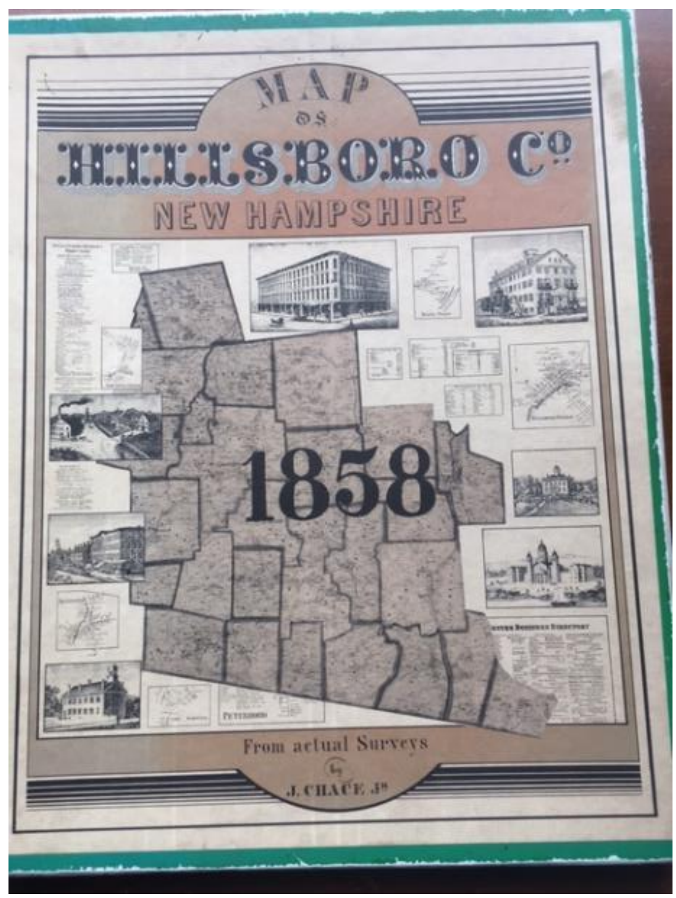


Damme/Drew Garrison, Dover, New Hampshire

First Muster—Massachusetts Bay Militia

Sawmills and Gristmills of
Hillsboro County, N.H., in 1858
Dave Coughlin

Throughout New England, brick textile mills with steam power were being built in cities and towns. However, 28 towns and two cities in Hillsboro County all depended upon water to power their small sawmills and gristmills.



Map of Hillsboro County, New Hampshire

From the smallest town in Hillsboro County to the largest city there were water-powered sawmills cutting local hardwood and softwood logs into lumber in 1858. Windsor, a tiny triangular town with a population of 172, had a single sawmill near the center of town. Manchester, the largest city in the state, with a population of 20,000 in 1858, had four sawmills and two gristmills, two of them were combined sawmills/gristmills.

Flowing west from Manchester is the Piscataquog River. Over 40 sawmills were located either on the river or on its tributaries in the towns of Goffstown, Weare, and New Boston. At this time, a railroad line came into Goffstown from Manchester and continued through Weare and into Henniker. Lumber from the 12 sawmills in Weare and the 11 in Goffstown could be loaded onto freight trains and brought into Manchester for city use or transferred to other freight trains and sent southerly into Massachusetts or to more distant locations.

New Boston, which had 20 sawmills, the largest number of sawmills in the county, did not have a rail connection. The lumber would have been brought by wagon to Parker Station on the west side of Goffstown and loaded onto the freight trains there.

It would be expected that most of these sawmills were run by turbines at this time. The John Goffe's sawmill in Bedford had a turbine by 1845, which is 13 years earlier than the 1858 map this study is based upon.

The lumber would have been primarily white pine with a lesser amount of mixed hardwoods. Although the circular saw had been around for decades by this time, the old reliable up and down sawmill may still have been the more common type. This was because larger diameter logs can be cut with the up and down sawmill. Replacement parts were locally available due to closing of the older sawmills form floods as the years passed.

Experienced sawyers likely preferred the slower up and down sawmills over the more dangerous fast circular saws. Circular saws would have been utilized in the two steam sawmills in the county.

After the Civil War, water powered sawmills began to decline rapidly. By 1892, New Boston, which had 20 sawmills in 1858 and possibly more in previous years, had only had six sawmills. Yet, there are still a few small water-powered sawmills running in New Hampshire, although none in Hillsboro County, today.

Announcement: Amesbury's Industrial History Center Opens for the Season

The Industrial History Center in Amesbury, Mass., reopened for the season on April 2 with a new exhibit: *People of the Millyard.* The exhibit tells the stories of ten millwrights, mechanics, industrialists, inventors, labor leaders, and mill workers associated with Amesbury's millyard on the banks of the Powow River falls.

The list of featured persons includes Jacob Perkins (1766-1849), who invented one of the earliest nail-making machines and went on to develop steam engines and mechanical refrigeration. Another is Paul Moody (1779-1831), who worked with Perkins in Amesbury and later became an important name in textile manufacturing in Waltham and Lowell.

The new exhibit is alongside the center's orientation exhibit, "A Productive Story: Industry and Work Life in Amesbury." It traces the industrial history of Amesbury from Native American tools and activities to today's reuses of the town's former textile mill buildings.

The center's hours are Thursdays, Fridays, and Saturdays from noon to 4 p.m. It is operated by the Amesbury Carriage Museum and opened for the first time in late 2021. For more information, visit AmesburyCarriageMuseum.org.

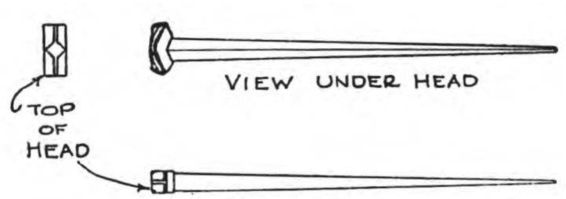


Diagram of a 1799 Perkins-manufactured nail. From Jacob Perkins, His Inventions, His Times, and His Contemporaries*, by Greville Bathe (1943)*

Coal in Rhode Island and Massachusetts

Robert W. Timmerman PE

Early Discoveries

Coal was discovered in Rhode Island around 1760 [1], significantly later than it was discovered in

Virginia, but before it was discovered in Pennsylvania:

Virginia	1701 [2]
Rhode Island	1760 [3]
Pennsylvania	1766 [4]

The discovery of coal in Virginia was exploited early on, but was initially limited by transportation; in Pennsylvania, transportation was built early on to bring the coal to market [5], in Rhode Island, the coalfields were near the market, but little coal was mined. [5]

Early New England Mines

There were mines in a number of locations in Rhode Island and southeastern Massachusetts, as well as Worcester, Massachusetts.

The following is a list of some of them: [6]

Portsmouth, RI
Cumberland, RI
Valley Falls, RI
Cranston, RI [7]
Mansfield, MA [8]
Worcester, MA [8]

The following paragraphs will attempt to contrast coalfields in the three states and the differences in approach to mining and use.

Geology

Bituminous coal was generally laid down in more or less horizontal layers. Folding and compressing of these layers converted bituminous to anthracite coal and made the seams of anthracite pitched at an angle to the horizontal and therefore hard to mine. This process is at an extreme in Rhode Island and Massachusetts, with the coal squeezed into a series of irregular pockets. This squeezing has also resulted in a coal that is irregular from place to place, ranging from anthracite to graphite. This makes mining more expensive than in Pennsylvania, as each pocket has to be mined individually. [9]

This difficult geology did raise mining costs in actual practice. The early mining companies invested more in mining than they recovered in sales of coal. Serial bankruptcies were characteristic of most of the mines.

Characteristics of the coal

The coal in Rhode Island and Massachusetts was of poor quality and did not burn well on a grate. It had high ash and moisture and so gave off less heat than competing Pennsylvania anthracite.

The preliminary assay of coal is for the following:

Fixed Carbon: the pure carbon in coal
Volatile Matter: what comes off when the coal is heated
Ash: what is left when the coal is burned
Moisture: the loss in weight when the coal is dried
Heating Value: amount of heat the coal gives off

The heat from coal comes from the fixed carbon, and in most cases (but not Rhode Island and Mansfield anthracite) the volatile matter. The moisture and ash contribute nothing to producing heat, and evaporating moisture takes heat away from burning coal.

In analyzing the Rhode Island anthracite, the USGS investigators concluded that the volatile matter was mostly carbon dioxide, which did not burn to give off heat. Thus, the fixed carbon was the only source of heat in the coal. The following table will illustrate this. It is a compilation of several tables in the USGS report. [10]

Coal	Fixed Carbon	Volatile	Ash	Water	BTU
Portsmouth	56.4	2.8	23.5	17.1	8,103
Cranston	68.4	2.6	22.4	6.5	9,673
PA Anth	84.3	10.7	10.7	5.4	12,970
W Va Bit	76.4	18.5	2.7	3.2	14,760

Of the coals, Portsmouth and Cranston are Rhode Island anthracite, Pennsylvania anthracite is an average of samples, and West Virginia bituminous is from the New River field in West Virginia, one of the best fields of coal to this day.

The fixed carbon in the Rhode Island coal is the lowest of all coals. The volatile matter is the lowest of all coals, and even that low value does not appear to contribute any energy to the coal. The ash and water are the highest, they contribute nothing to energy, and are just "going along for the ride." The moisture could be removed by drying the coal, but removing the ash would require treatment that is done today on some coals, but was probably unknown in the heyday of Rhode Island coal.

There is only one documented large-scale use of the Rhode Island, at the Taunton Copper Company, which presumably bought the mines in Portsmouth, around 1860. They used it for smelting copper from Cuba and South America and were in business from about 1860 to 1883, when tariffs on imported copper and the death of the founder caused the firm to close.[9]

The USGS report sums up the reasons for the failure of Rhode Island coal:

> "The coal of Rhode Island is extremely variable in character and quality, ranging from anthracite to graphite and containing moderately high ash to very high ash, and usually a high percentage of moisture when first mined. Because of its peculiar characteristics, all the coal requires peculiar handling to be used successfully, and the extremely graphitic portions can hardly be used as fuel. The attempt to burn or treat it as other coals have been treated has usually been unsuccessful, but if properly prepared and properly used, it appears to have possible uses.….
>
> "The coal beds appear to have been originally of moderate thickness, but they have been folded, compressed and squeezed by pressure until the coal has been forced into great pockets in places, and nearly or quite squeezed out elsewhere. …Mining will be cheap in the pockets and expensive where the coal is thin, the net cost of mining probably running considerably higher than in the anthracite field of Pennsylvania. The possibility of using the associated clay rock for making paving brick, tile, and like products suggests itself, and such use may offset a part of mining in certain localities.
>
> "The apparent failures to mine the coal profitably appear to be due to four causes—first, improper preparation of the coal at the mines; second, attempted use in and with furnaces and apparatus built for use of dissimilar coals; third, the relatively low duty obtainable from the coal per dollar of cost, and the special and particular handling required; and, fourth, stock jobbing…" [9]

During the energy crisis of the 1970s, there was some additional consideration of Rhode Island coal, but nothing came of it.

Footnotes

[1] Ashley, George H, Rhode Island Coal, Department of the Interior, United States Geological Survey, Bulletin 615, Washington, Government Printing Office, 1915 (Henceforth, Ashley), pg. 7

[2] Virginia Energy/Geology and Mineral Resources/Energy Resources/Coal webpage

[3 Ashley, pg. 7

[4 Fox, Martha Capwell, Geology, Geography, and Genius, 2019, Easton, PA, Delaware and Lehigh National Heritage Corridor, pg. 2

[5] Fox, op. cit., pg. 8, ff

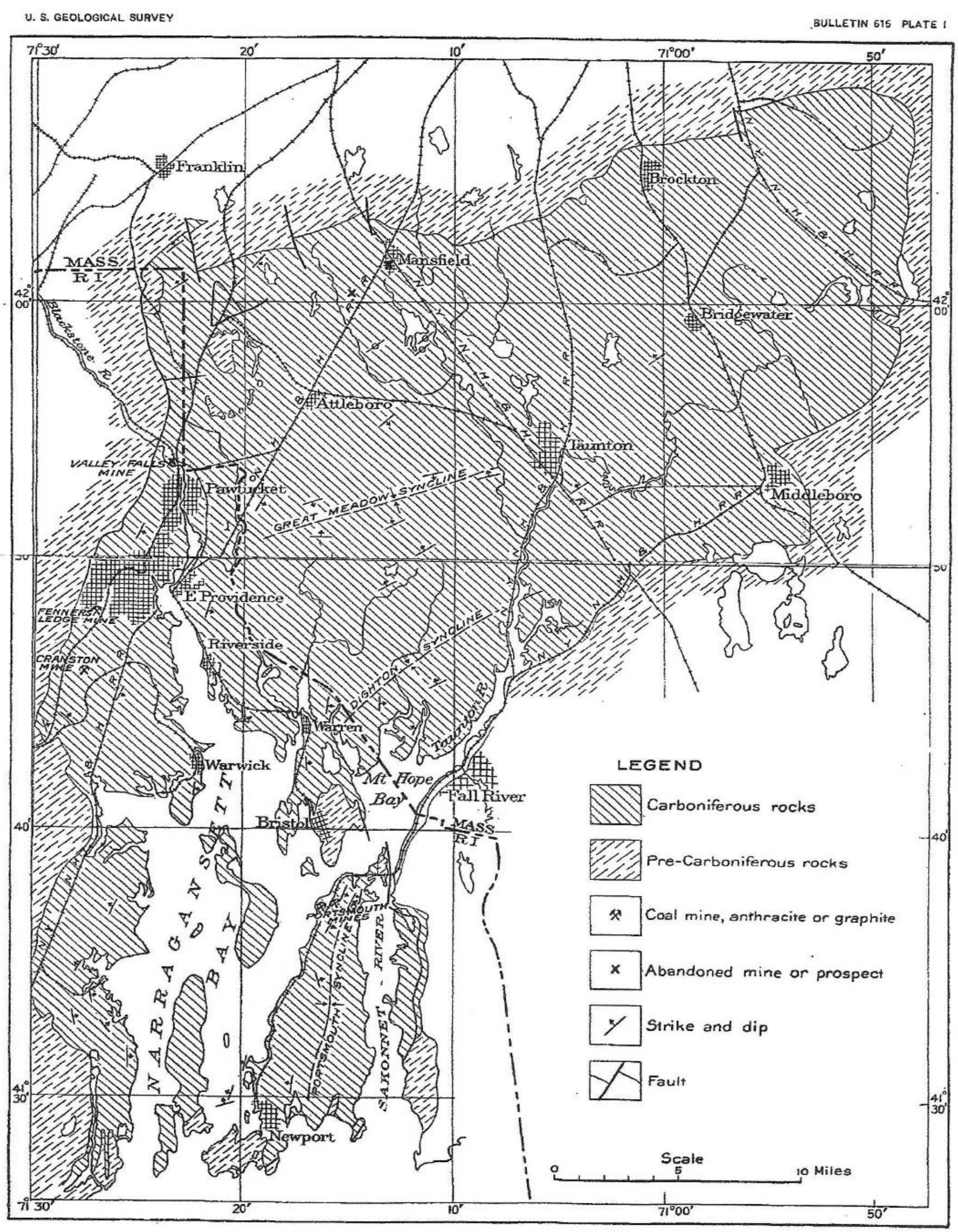
[6] Ashley, pp. 7-11

[7] How curious, a coal mine in Cranston, The Online Review of Rhode Island History, 15 Jan. 2016

[8] Website, Office of Surface Mining, Reclamation, and Enforcement, Massachusetts

[9] The rest of the work is from Ashley. The table on coal properties is from Fig. 2, pg. 24

[10] This table is based on information in Figure 2 in Ashley



Sketch Map of the Coal Fields in Rhode Island and Southeastern Massachusetts

Of Wonderful Purity: Harvesting Pond Ice on Morey's, Diamond, Smith's and Clark's Ponds in Walpole Massachusetts

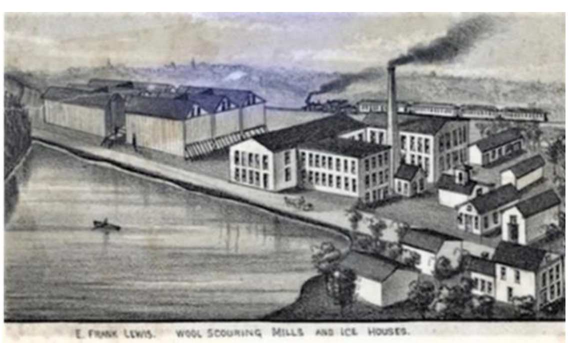
Betsey Dexter Dyer

This book on ice harvesting in Walpole, Massachusetts spans approximately 1880-1940. It is an account mostly of four ponds and their associated ice houses and the yearly activities in bringing in an ice crop. Certainly, there are excellent books already to explain all about how ice cutting and storing was done. The Ice King by Carl Seaburg and The Frozen Water Trade by Gavin Weightman were great influences on this book.

What is new and different about Walpole? Like any small town, we did it our way: find out why it was really only four ponds that were harvested (out of more than a dozen ponds in town); learn something about which creative, entrepreneurial families were most involved with ice harvests; and finally, get a fairly exhaustive account gleaned from Walpole newspapers about every ice cutting season in Walpole for sixty years. Surprise digressions include chapters on Olympic ice skaters on Turner's Pond and a troupe of vaudeville actors living at Clark's Pond.

You may purchase a book for $20.00 by contacting Betsey Dyer at (508) 668-9619 or bdyer@wheatoncollege.edu

Books also are available to purchase at the Walpole Historical Society, 33 West Street, Walpole Mass., opened Saturdays 1-4 pm.



E. Frank Lewis' ice houses and wool scouring mill on the banks of Morey's Pond, Walpole, Mass., 1882. Soon after, Lewis left town due to an acrimonious lawsuit concerning his pollution of the river. He resettled in Lawrence, Mass., and prospered there.

Worldwide Tide Mill Data Now Available Online

A new tide mill database has recently been made available to the public online, on the Tide Mill Institute's website, TideMillInstitute.org. Most of the sites identified so far are in New England, but the database includes locations and detailed data for more than 600 tide-powered mill sites in North America, western Europe and Australia.

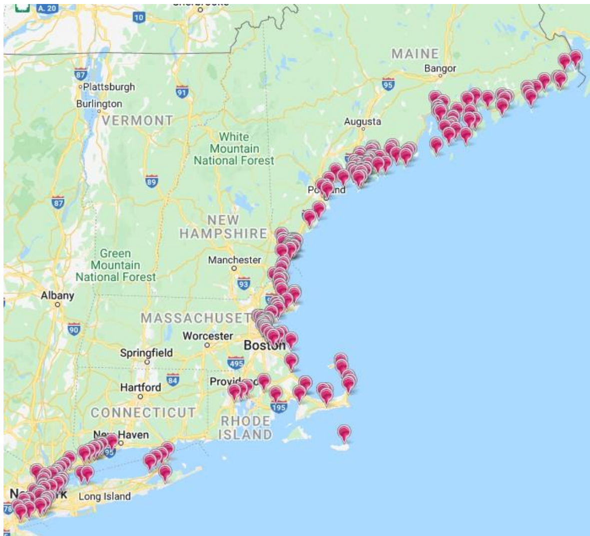
The database is easy to browse, with sites indicated by markers on a Google map of the world. As with other Google maps, the viewer can zoom in and out and choose a map or a satellite view. Clicking a site marker displays available text information, photos and links to documents and related external materials. Sites can also be searched by name. The information in the database will be valuable to researchers and those curious about tide mill locations and history near them or in other locations around the world.

TMI volunteer and leadership board member Bob Gray of Kittery, Maine, donated his time and expertise to developing the software, structure and interface for the new database. He also gathered and organized data from several sources, including a partially developed database started by Tide Mill Institute several years ago.

Despite Bob's extraordinary effort, the database is not yet complete. TMI is accepting tide mill information from mill enthusiasts, scholars, mill historians and local historians, both professional and amateur. Anyone with tide mill data to contribute can email portal@tidemillinstitute.org.

The database also contains information about mill-related events and people. These features are still under development and will require more hours of data entry. Anyone willing to volunteer a few hours should contact Tide Mill Institute at the email address above.

Note: Many of the sites shown are on private property or can be reached only by crossing private property. **Please do not trespass to visit sites.** Be respectful of owners' privacy and property rights and always obtain permission before entering private land.



Map of tide mill sites NY to Maine

Elizabeth Mine Interpretation Completed

Milestone Heritage Consulting recently completed the public education components for the U.S. Army Corps of Engineers/Environmental Protection Agency Superfund cleanup at the Elizabeth Copper Mine in South Strafford, Vermont. The Elizabeth Mine operated from 1809 to 1958 and was the largest copper mine in New England. Runoff from the abandoned mine contaminated the Connecticut River watershed. The EPA designated the mine one of the largest Superfund sites in New England in 2001 and completed site cleanup in 2021. Milestone provided EPA with cultural resource services for the Superfund project including creation of a book and interpretive panels about the mine history to help EPA fulfill its obligations to address cleanup impacts on historic resources under the National Historic Preservation Act.

The 2014 book, *From Copperas to Cleanup: The History of Vermont's Elizabeth Copper Mine,* presents the story of 150 years of industrial activity at the Elizabeth Mine and how the EPA and its project partners documented and reclaimed its legacy on the landscape. Milestone also created a dozen on-site interpretive panels explaining the mine's history that were recently installed at three locations overlooking dramatic reclaimed mining landscapes. To view and download the book and interpretive panels, visit: https://www.milestoneheritage.com/. [*Editor's note: this link to their website will lead to another link with the whole report*]


Strafford, Vermont Historical Society members enjoying the newly-installed Elizabeth Mine history interpretive panels on Mine Road in South Strafford. The panels overlook the site of former World War II-era copper ore mill flotation tailings piles where the mine waste was gathered and capped as part of the EPA Superfund cleanup. The cap now supports a large solar electric panel array, continuing this historic Green Mountain copper mine's industrial legacy as a modern green energy source. Photot: Matt Kierstead

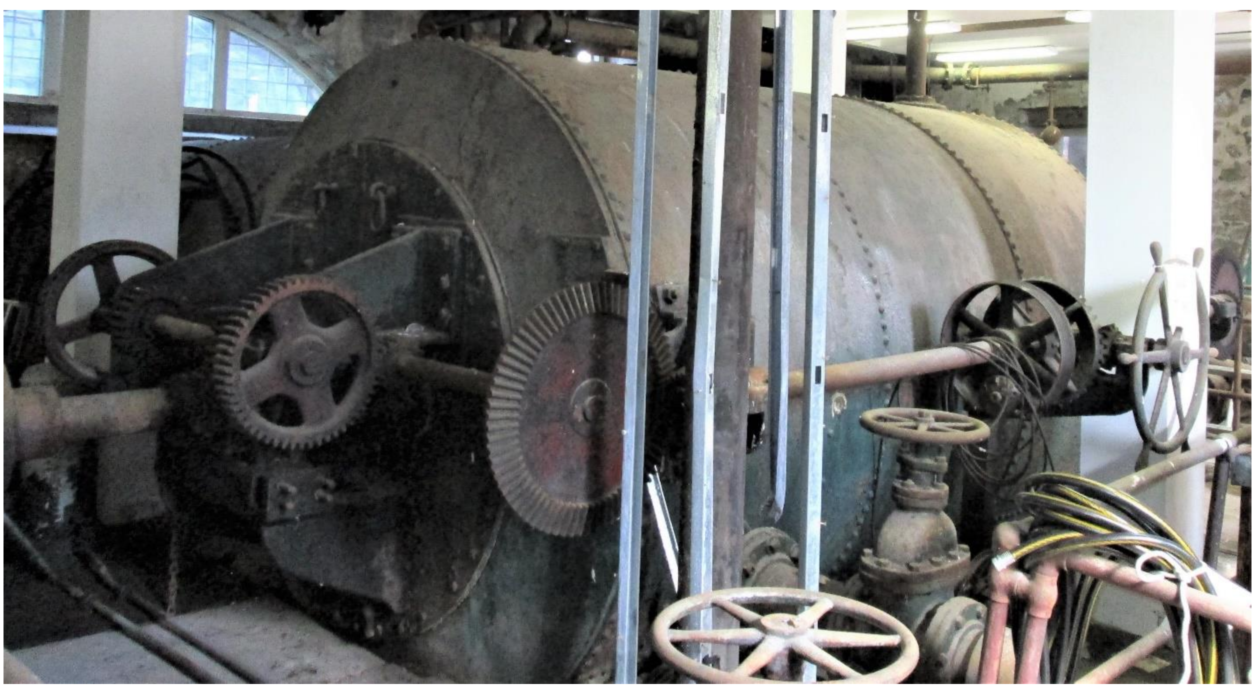
Help Needed to Confirm Identity of This Artifact

Robert W. Timmerman

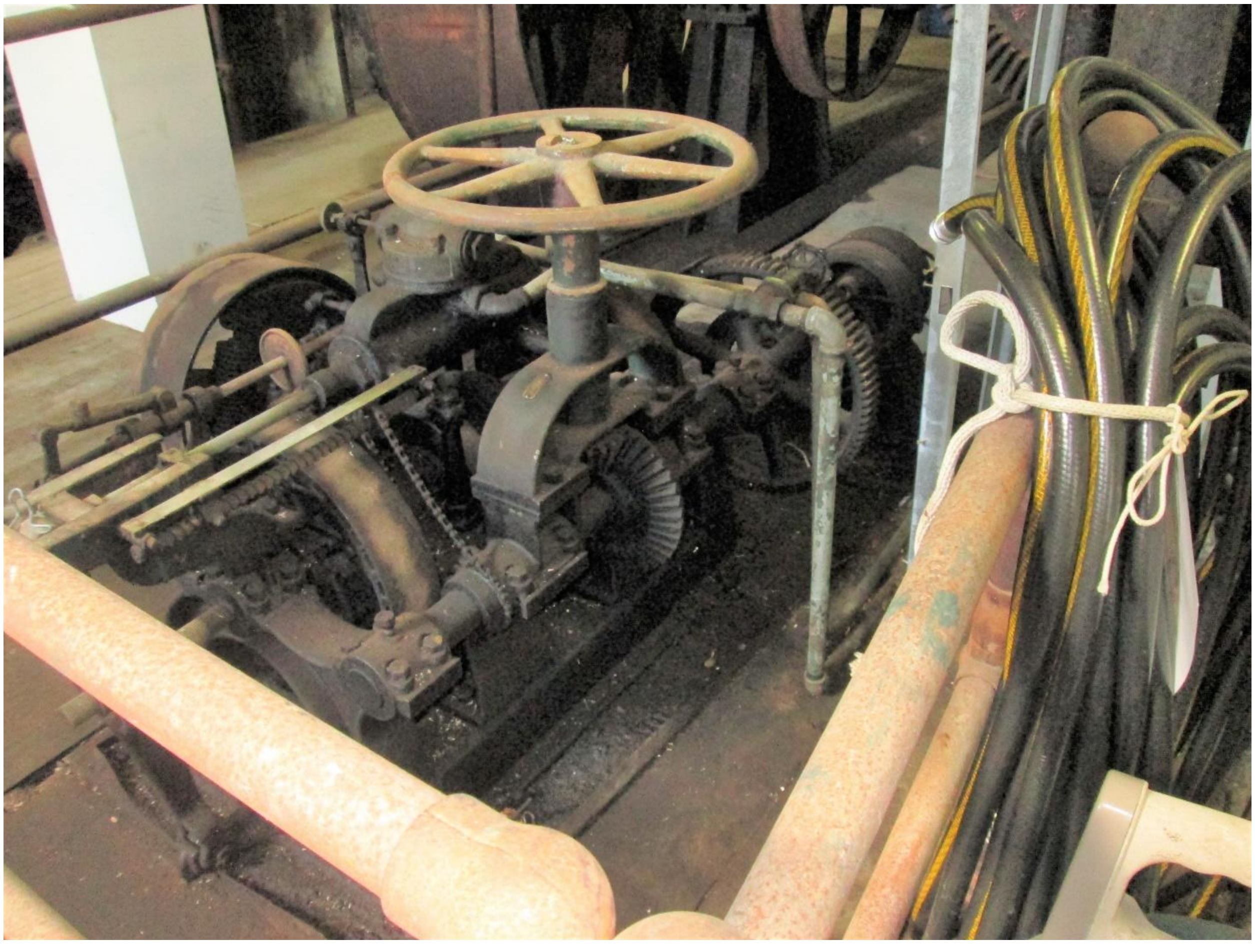
David Bryant, a resident of the Mother Brook Condominiums, located in the Old Stone Mill, built on the fourth privilege on the Mother Brook in Dedham, MA, brought the existence of this water turbine to my attention. I, Mr. Bryant, and his friend, Jack Hoell, would like to obtain more information. The turbine appears to have powered the mill through a belt drive. The mill powerhouse is preserved by deed and also contains an early steam turbogenerator.

Following are some photos taken by the author.

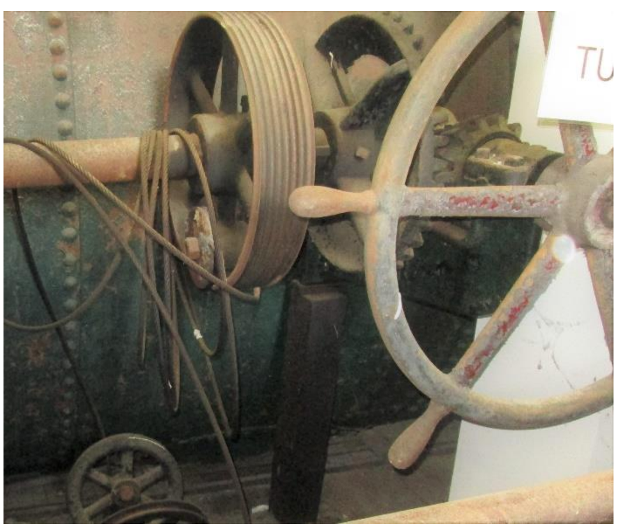
Overall view of the turbine. Water enters from the right and splits to drive what appear to be two turbines at the left. We think the water exits below the turbine. In the foreground is a battered flat belt pulley.



View of turbine from the other side. We believe the water leaves in the bottom of the turbine and that the gears control the wicket gates.



The governor. The wheel at the top is probably for speed regulation. The nameplate is barely visible on the yoke that holds the control wheel shaft. The wire rope drum can be seen at the upper right.



Left: Closeup of the control shaft, showing the drum that connects the turbine control shaft to the governor via cables and the cable sheaves on the floor.

The governor design is unusual as the governor is connected to the wicket gates of the turbine by wire ropes running around a drum, rather than a shaft. While this is a less rigid connection than a shaft, and it gives some freedom in locating the governor.

The nameplate on the governor says:

Improved Governor
Holyoke Machine Co.
Worcester, Massachusetts

Some internet research (not a primary source, merely an aid to research) says that Holyoke Machine Co, Holyoke, Massachusetts, made the "Hercules" Turbines and appears to have had a foundry in Worcester. We cannot find any nameplate on the turbine, but we are still looking. Does anybody have any information on this turbine, such as hp rating? Any help would be appreciated. Contact me at email address on pg. 1.

The Button Factory, Portsmouth, N.H.

Rick Ashton

In the spring of 2021, my daughter brought me to a restaurant in Portsmouth, N.H. The food was great, by the way, but what really caught my attention was an old factory building in the back of the parking lot. The door at the end of the building was open so in I went. It turns out the building is now a studio for artists. I was told the building was once a button factory that produced buttons for women's shoes around the turn of the twentieth century. I also learned they have an open house every December. I made a note of that and on the first weekend in December, my friends and I were there. This is what I learned that day:

The story of Morley. (Circa 1946) [Ed. note: the following appears to be a quoted text, the source of which is not clear]

"Evolution is not a force but a process: not a cause but a law." Viscount John Morley

About the time that the late Viscount Morley wrote on evolution in an essay concerning compromise, another Morley in Portsmouth, N.H., was starting an enterprise which in a little over 50 years of evolution has become the Morley Company, famous for buttons.

From a small maker of machines for the swing of buttons on shoes, the evolution since 1890 took the firm to the forefront in the production of fiber and molded plastic buttons for apparel. This evolution, constantly going on, is bringing newer horizons to this progressive manufacturer.

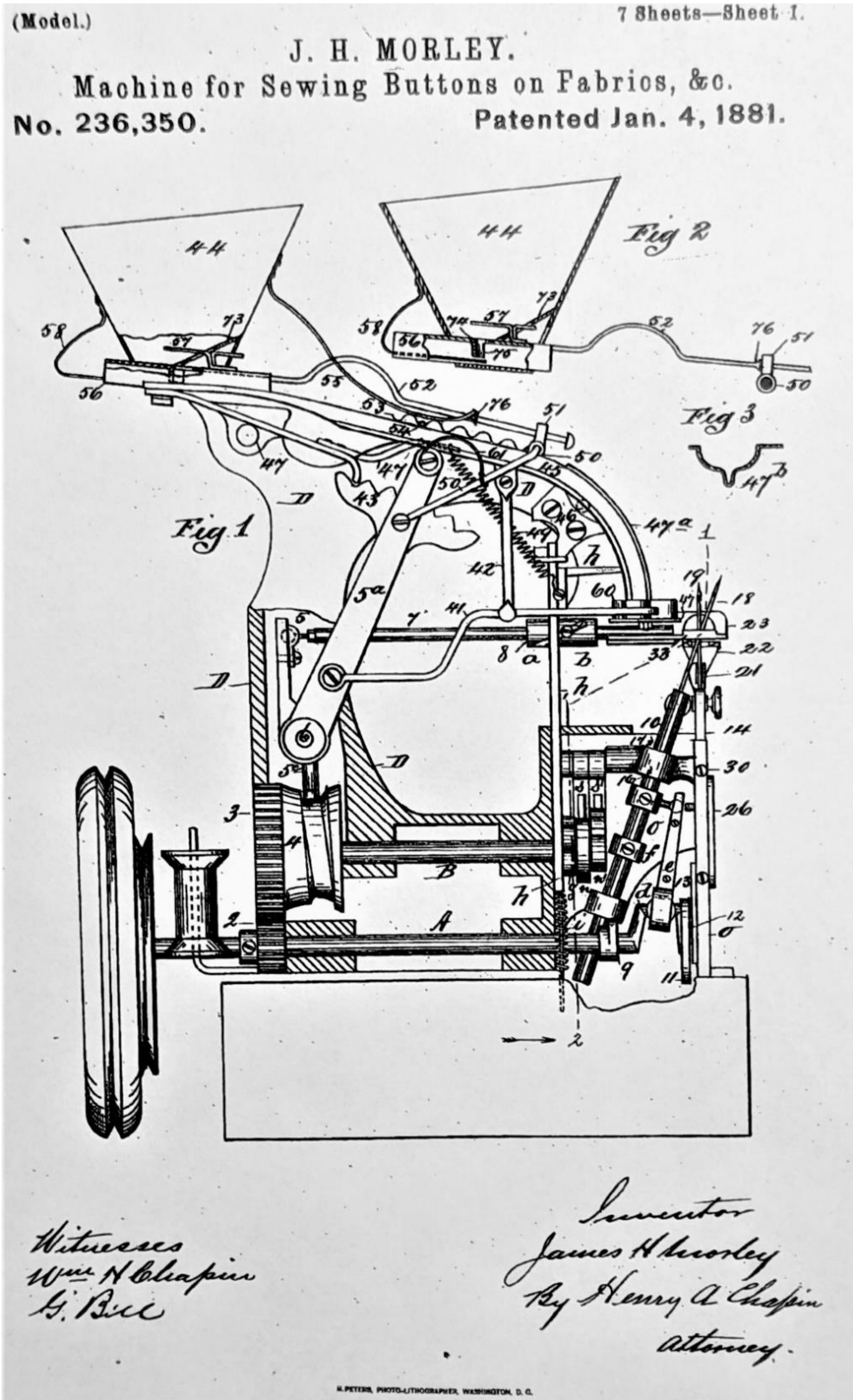
Actually, the idea that started the company on its way in 1890 occurred 10 years before when James Morley invented a shoe button sewing machine. There was need for such a machine in those days; button shoes were in fashion. After tinkering around for a decade trying to obtain buttons that would fit both shoes and his machine, Morley became convinced that to operate his automatic feeding unit successfully it was imperative to have buttons of uniform size and shape.

James Morley

Thus, when the business was organized as the Morley Button Sewing Machine Company by Morley, Charles A. Sinclair and Walter E. Bennet, who later became superintendent, not only did the firm make the machine but also fiber machine buttons. Operations began on the ground floor of a three-story building, and for a short time a button manufacturing factory in a small, shingled building in Beverly, Mass. also was conducted.

Before long, buttons were a more important part of the Morley business than the machines and the production of machines was abandoned. The growing company expanded its operations from fiber shoe buttons to fiber-headed upholstery nails and buttons. Fiber-headed nails for electric wiring then were added.

In 1895, the company needed to expand and moved from Beverly to the present location at the "cricket field" in Portsmouth. Within four months the original three-story building was erected, and the business was so successful that Morley became the largest manufacturer of shoe buttons in the world.

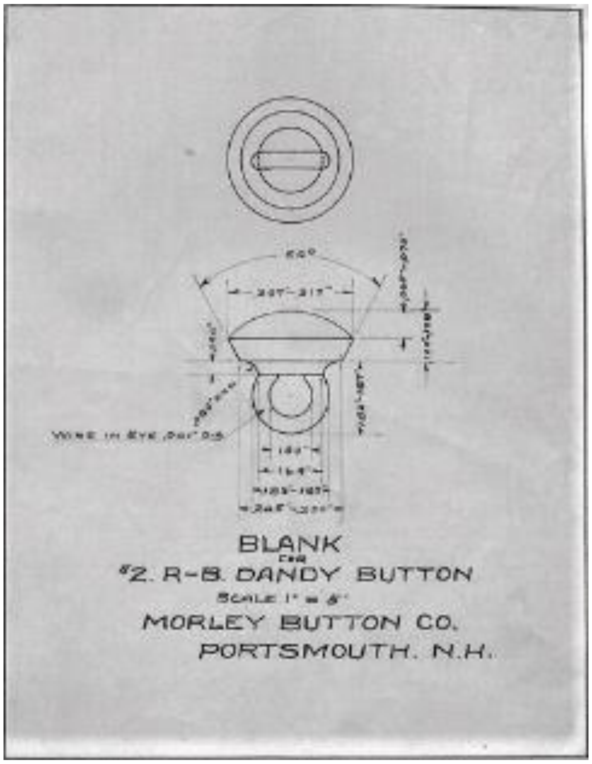


The machine that started it all, the shoe button sewing machine.

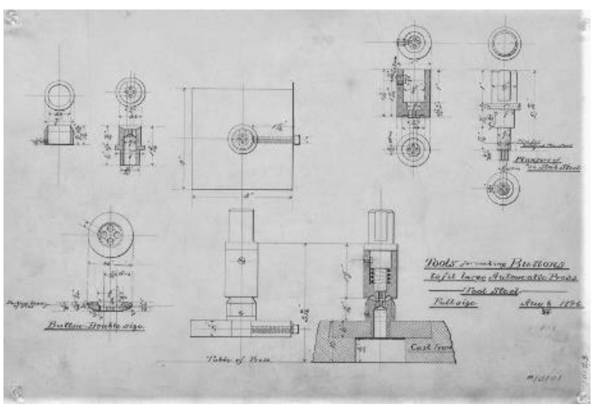
In 1899 Morley combined with five other companies making shoe buttons. These factories were then closed, giving Morley a monopoly. Frank Jones, (of brewing fame) became president of Morley in this period and erected a power generating plant (at the rear of Gallagher's place) which also served his brewery and his hotels, the Rockingham and the Wentworth.

At the turn of the century, Morley developed fiber buttons for the clothing trade. Gradually these gained top position in the firms' distribution.

The United States Investor Journal of November 1899, in a response to a question about the company's financial stability, offered these facts: "Morley Button Company. The above company was organized October 17, 1890 with an authorized capital of $250,000, divided into 2,500 shares of a par value of $100. The company is an offshoot of the Morley Button Sewing Machine company. The capital of the Morley Button Manufacturing company was furnished from the profits of the Morley Button Sewing Machine company, and stock of the Morley Button Manufacturing company was given in lieu of dividends. This company has never paid any dividends and we have heard of no offerings or sales of the stock. The company manufactures about 20 varieties of buttons and thumbnails, and is said to doing fair business. The enterprise is not bonded and the company is quite a close corporation. The concern, we are informed, pays its bills promptly and is enlarging its business, and its future is considered to be a promising one."

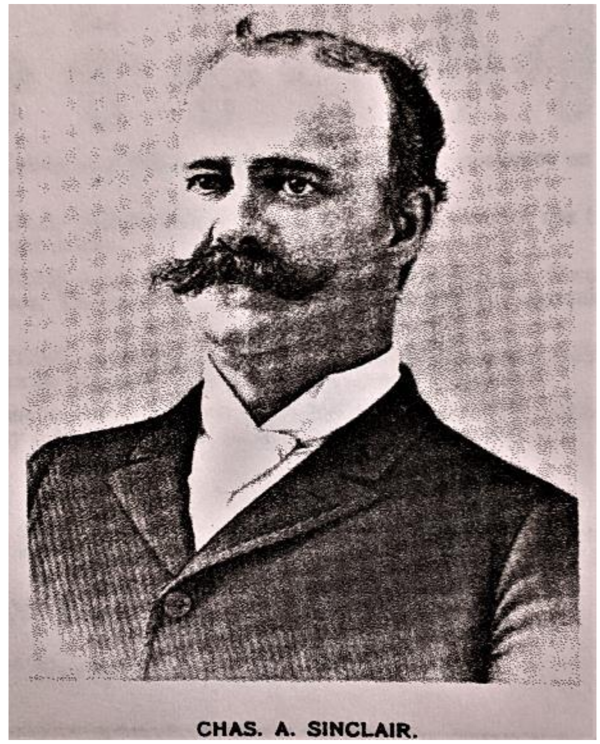


Shoe Button Blank



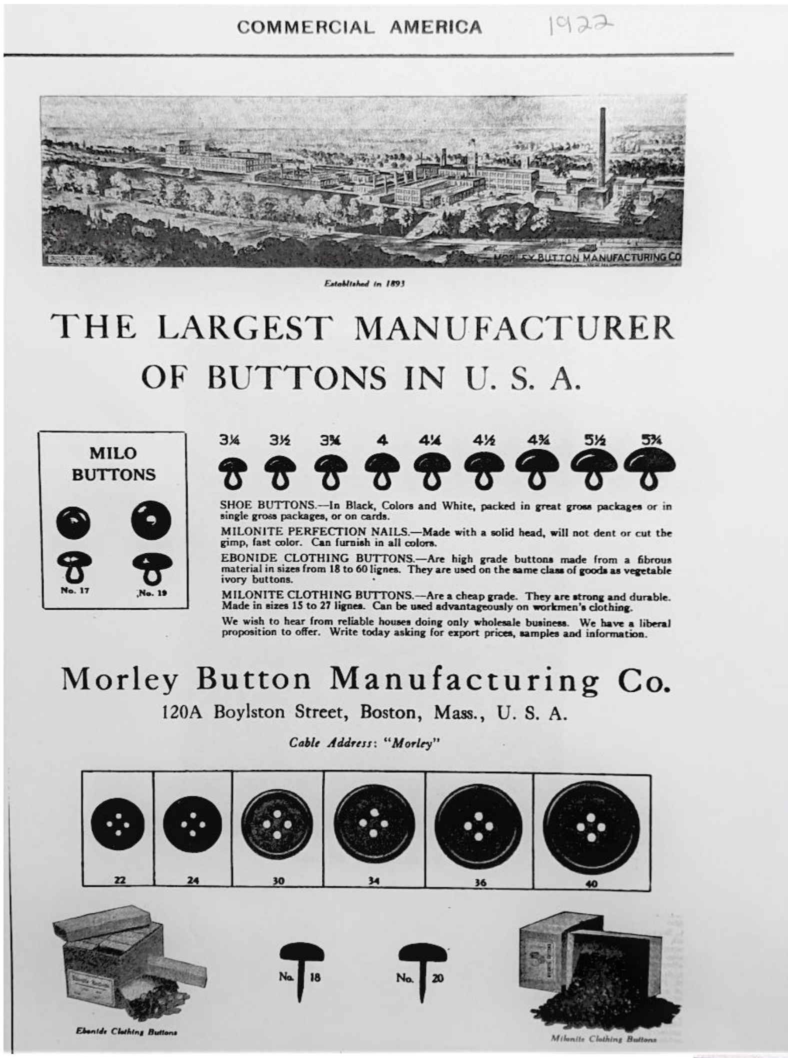
Tools used in press to make buttons

Wider and wider grew its activities. Between 1910 and 1920 Morley was making shoe buttons and upholstered nails, clothing buttons, cloth and metal tab laundry tags, elastic machines and clinch buttons. Its business grew to a point where it had to fabricate its own fiber board.



Charles Sinclair, the largest owner of the Morley Button Company

Walter E. Bennett, who joined the firm in 1891, and by 1895 was in charge of the entire plant



A 1922 trade catalog advertisement

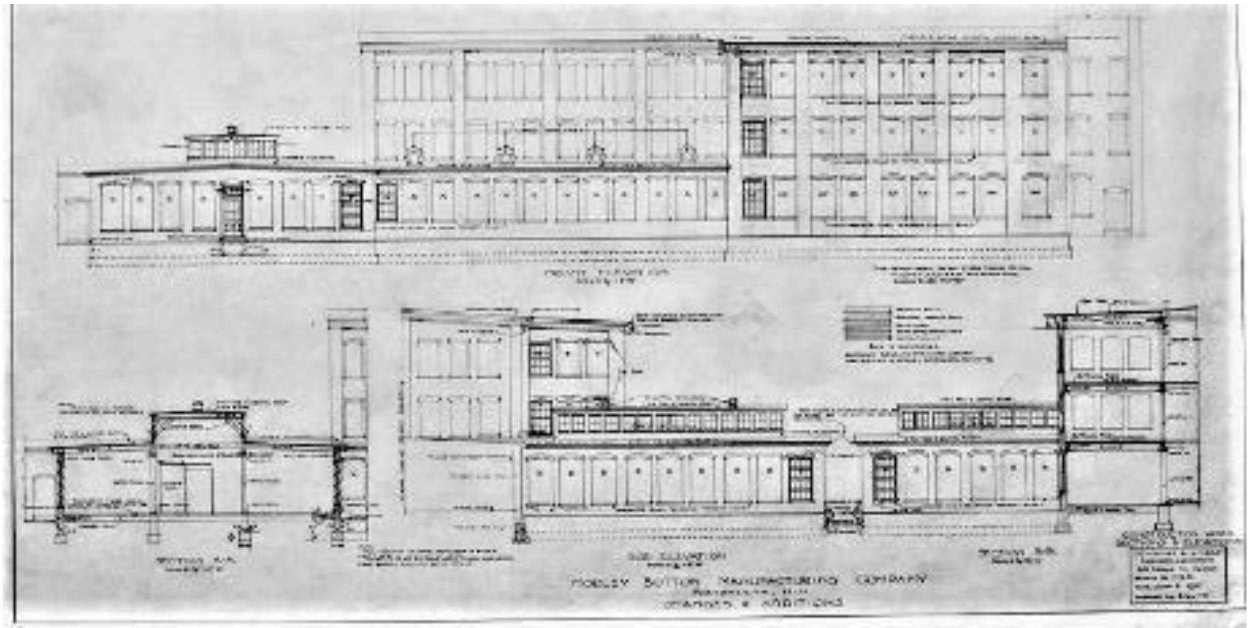
World War I saw the end of shoe buttons as a factor in footwear fashion and shoe buttons dropped to an insignificant portion of the company's activities. Thus, within a generation, Morley's operations had undergone almost a complete change. It is interesting to note, however, that shoe and gaiter buttons have continued to be manufactured since the first years of operation.

But, as the demand for shoe buttons declined, the other items grew more popular. Another oven room was added to manufacture ebonide buttons for apparel. Still later, a button for tufting mattresses was developed. So successful was this type of button that the company became the largest producer of buttons for the mattress industry. Other products included golf tees, collar buttons, ring travelers, fiber shoe soles and a wide variety of other fiber products.

The firm was the second to develop dry process stereotype mats for newspapers. Its Trutone mats for newspapers and Trumold mats for syndicates have attained national prominence. When plastics first made their appearance commercially the Morley company started to produce compression molded plastic clothing buttons. More recently various novelty packaged button items were introduced.

This constant expansion obviously required more extensive manufacturing facilities. Soon after the enterprise began to function, the second and third floors of the initial plant were added and the entire building was occupied. This was not sufficient. A number of one-story additions had to be erected. Then wings were constructed. Whereas one oven for the making of buttons was used by Morley in the early days, a single wing opened in 1910 had 56 ovens. A fiber mill was constructed to make fiber board. The company also built its own power plant.

Location of the plant from an 1877 map



Plans for one addition to the plant

A photograph of the plant, date unknown

In a 1922 U.S. Senate hearing on the Tariff Act of 1921 (page 4065), interesting details on the Morley Button Mfg. Company were reported by M.B. Whittemore.

1) Morley Co. wanted a 45% tariff on imported buttons from the proposed 38%.

2) Morley manufacturers cost per button was over .42 cents per great gross (1728 pcs). Importers' cost was estimated at .25 cents per great gross.

3) Morley manufactures buttons entirely of papier-mâché and fiber products, which are the cheapest grade of buttons used on cloth and shoes.

4) Morley's percentage of labor cost? 30% Materials, 20% overhead.

10,000 great gross of buttons produced in an 8 hour shift.

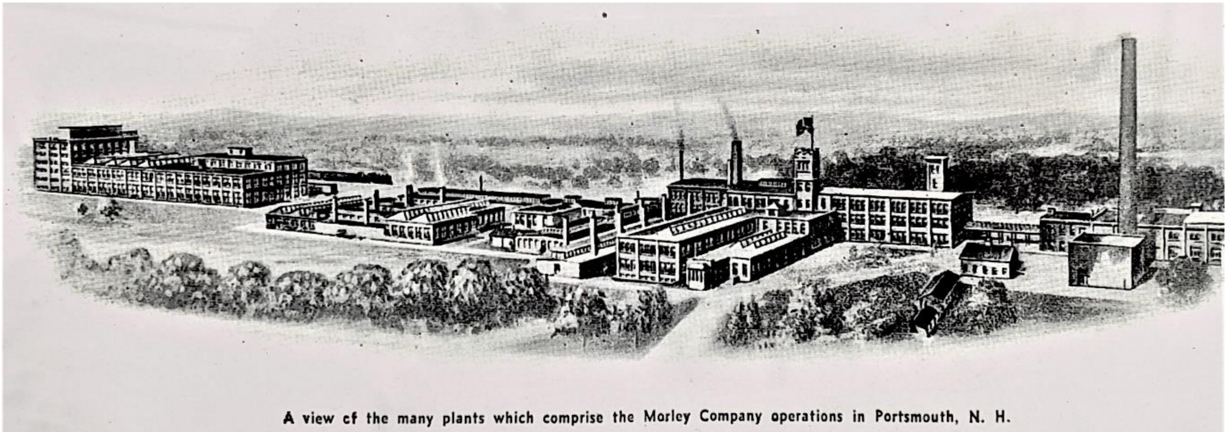
On a peak day, the value of the output is $5,000 a day.

600 to 700 people are working on an 8-hour shift

A normal factory payroll runs between $10,000 to $12,000 for 47½ working hours.

For a long time, the executive offices were located in Boston, but in 1930 were transferred to Portsmouth so that all activities centered in one place.

In 1923 A Pageant of Portsmouth was put on to honor the Tercentenary of the first Portsmouth settlement in 1623. Morley Button Manufacturing donated all the buttons used on the costumes.



Artist's view of the factory complex, no date

During World War II, the company had converted much of its civilian production to war activities. It had been making gas mask face forms and decontamination bags for the army chemical warfare service, fiber and molded plastic buttons for uniforms, tufting buttons for the maritime commission and medical corps, and fiber dimout-shades used by industry and utilities. In addition to fiber and molded plastic buttons for war workers garments, fiber board for lunch boxes and stereotype mats for the newspaper industry were also produced. Recently the company has been working with four consulting firms, two on factory methods and two on industrial chemical research to examine the possibilities of post war products. Buttons, as in 1890, will continue to be an important part of the Morley picture.

[Ed. note: this appears to be the end of the quoted history]

In 1947 parts of the factory were sold to the city of Portsmouth and the N.H. Technical Institute was established. There were no real structural changes to the site after 1957. The site housed a furniture warehouse and other small industries. Industrial use of the property ceased by the end of the 20th century. In late 1999 some of the buildings were converted into condominiums.

The building was purchased in 1986 by Jim Buttrick (a SIA member) and Peter Bowers. They focused on encouraging the use of the building by artists and craftspeople. The Button Factory became more visible to the community with the addition of the annual Open Studios. This event is now been going on for 34 years.

In a future article we'll visit the Sash & Solder Company, a tenant in the Button Factory, which specializes in historic restoration of stained-glass windows.

A big thank you to Jim Buttrick for the use of photographs and the bulk of the Morley story.

Editor's Notes: How to Prepare Articles and Images for Submission to the NEC Newsletter

Robert W. Timmerman

We seem to be getting a few more submissions, and I have already received proposals for articles for the next issue of the newsletter. The more people give us, the more we can print.

I think it is well that we have two articles on preservation or documentation of sites in the newsletter: one on the Elizabeth Mine (there is a detailed article on the mine contained in the author's website, which is referenced in the article), and one on tide mills, which are of interest to me, an energy engineer. The tides are renewable, and unlike wind and solar, are predictable.

One of the proposals for the next newsletter is also a preservation/documentation project. It was also refreshing to hear the presentation at the Northern New England Chapter meeting in March about stabilization and possible (let us hope probable) preservation of the gasholder in Concord.

Now we have to talk about some grubby details about how to submit material to the newsletter. This newsletter, like so many others, is formatted using Microsoft Word. Word is not a typesetting program, so it cannot replicate the printed page, but with some work it can come close. Your Editor, with some help, is trying to get it close to a printed look. We are refining it more with each issue.

We have had a lot of trouble with submissions that do not work, so as we have some extra space this issue, I would like to use it discussing what will and will not work. Many of you know this; what I write is for the benefit of those that may not be experienced with newsletter publishing.

Word can only accept certain inputs. For text, it can only accept another Word document. It CANNOT ACCEPT a PDF. Period. The PDF format "was developed to share documents, including text formats and inline images, among computer users of disparate platforms, who may not have access to mutually compatible application software." [From the original statement of purpose]. PDF does not depend upon application software; it is essentially a way to package a document so that just about any computer can read it. This means that once the document is "packed for shipment as a PDF" as it were, it cannot readily be unpacked. A PDF cannot be incorporated into a document created by an application program such as Word.

Moral: Send anything you want printed as text in the form of a Word file.

Graphics and photos are more complicated, a LOT more complicated. The no PDF rule applies here too. The only thing Word can accept is the .JPEG or .JPG format. Nothing else works. Sending photos or scans as PDFs just will not work, Word cannot accept it. Your camera puts out documents in the .JPEG or .JPG format. Send those photos in without converting to PDFs. Reportedly there are programs that can convert a PDF back to a .JPEG, but something is lost in the conversion. Photos start as .JPEG and should stay as .JPEG.

Scanners give the user two options to store the scan, as a PDF, or as a .JPEG. Use the .JPEG setting.

Besides being compatible with Word, a .JPEG file has an advantage over a PDF—you can crop and change brightness and contrast. If there is a lot of extra material around the photo, I can crop that out when I edit. Likewise, if the photo is too dark, a common problem with photos taken in the field, there usually is information in the shadows, and standard photo editing software allows lightening up the photo. I use it a lot.

Photos and scans of drawings are especially problematic. As someone who has made engineering drawings, I can tell you that they are meant to be read full size. They are drawn on large sheets to depict something large, like a building. A typical moderate size is 24" x 36", (a lot of sheets are even larger) with a border 1" in from the end. This leaves a maximum drawing area of 22" x 34", but nothing goes up to the border, so the working area is about 20" x 32". The drawing is landscape orientation, and the sheets in the newsletter are portrait orientation. It is asking too much to ask a reader to turn the page 90 degrees, so the maximum usable width is 6½ inches (8½" minus a 1" margin on each side). The reduction from a 32" maximum width is 4.9 to 1, let's be generous and say 4 to one, as the numbers work out. Drawings are not made for that much reduction. For many years, large engineering firms have photographically reduced drawing by 50% for office use. They have had to institute standard ways of drafting and standard sizes of lettering to make the half sizes work., and even at that they are a bit hard to read. A 4 to 1 reduction is reducing the total area by 16 to one, which packs a lot of detail into a small space.

Consider also that most of the lettering on a drawing is 1/8" high, except for titles. Reducing 4:1 makes it 1/32" high, which is pretty hard to read, especially when it has gone through a printer and maybe offset printing after that.

My suggestion is to copy the drawing in pieces, so the overall reduction is not too great.

A comment on photos: I compress them to 150 ppi to keep the overall size of the newsletter within reason. If someone wants a copy of an original photo that has not been compressed, drop me an email, and I will send a copy of the original photo by return email.