Society for Industrial Archeology · New England Chapters

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Contents

Newsletter Editor

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Website

SIA New England Chapters: http://nec-sia.org

SNEC Annual Meeting

Saturday, December 3, 2022
10:00 a.m. to 10:45 a.m.

SNEC will hold an annual meeting via Zoom on December 3, 2022, 10:00 a.m. to 10:45 a.m. A Zoom link will be sent out a few days before the meeting. You will be able to attend using a cell phone through WiFi or dial-in, or using a laptop, desktop, or iPad type device with WiFi and speakers and microphone (camera not necessary if you don't have one).

The purpose of the meeting is to discuss management of the chapter; the annual conference next year, which SNEC will host; and ideas for tours or programs.

If you don't think you can attend and would like to propose a tour or some sort of project, or have an idea for helping the chapter, please contact Betsey Dyer, member of the SNEC Management Committee, bdyer@wheatonma.edu.

Robert Gordon Wins SIA Vogel Prize for 2022

Long time SIA and SNEC member Robert Gordon, Emeritus Professor, Yale University, who has published extensively on iron and the iron manufacturing industry, was awarded SIA's Vogel Prize for his article, "Building Sewall's Bridge: Colonial American Structural Engineering," *IA: the Journal of the Society for Industrial Archeology* 42:1 (2016): 5-18. The prize, according to the SIA website, is to recognize "the author of the best article to appear in the society's journal IA within the past three years." Congratulations to Robert!

SAVE THE DATE!

Saturday, April 22, 2023

Spring New England Industrial Archeology Conference

Lawrence Heritage State Park
Lawrence, MA

Yes, winter is about to begin, but it's not too soon to be thinking about spring and the 2023 New England Industrial Archeology Conference!

SNEC will be hosting the conference next year. The meeting will be at the Visitor Center of Lawrence Heritage State Park in Lawrence, MA, on Saturday, April 22, 2023. More details of the program will be coming nearer to the date.

In the meantime, please be thinking about presentations for the conference. You can present your own research, and you can contact someone you'd like to make a presentation and get that person interested. New England IA topics are the focus, of course, but interesting talks regarding IA sites outside of New England are also welcome.

A call for proposals for presentations will go out next year. If you have questions or ideas for the meeting, please contact Betsey Dyer, Conference Organizer, bdyer@wheatonma.edu.

NNEC SPRING TOUR REPORT

Saturday, June 4, 2022, Wakefield, NH

Rick Coughlin

The 2022 Northern New England Chapter Spring Tour began when 20 of us met at Turntable Park in the village of Sanbornville in Wakefield, New Hampshire. The town of Wakefield consists of several villages including Sanbornville and Union.

At Turntable Park we viewed the 19th century, 60 ft. long railroad turntable with granite block circular walls that has not been used for many decades. Member Dennis Howe provided several pages and photos regarding an Archeological Survey of the site in 2019.

Turntable Park. (No attribution)

Adjacent to the park is the 1871 J.W. Garvin Building that served various purposes including the first railroad station at this location. We visited the Alvah T. Ramsdell designed 1892 Romanesque Town Hall listed in the National Register of Historic Places. In the first-floor hallway was a collection of old photos of Sanbornville. On the second floor we viewed the Opera House still used for theatrical and musical performances.

We drove a few miles to see the Newichawannock Canal, an 1,800 ft. long, 16 ft. deep and 13 ft. wide unmortared stone canal and the unmortared stone arch bridge over the canal, both built in 1868. The canal and bridge are listed in the National Register of Historic Places. The canal water is the boundary between New Hampshire and Maine.

This canal supplied water from Great East Lake to Horn Pond and to the Great Falls Manufacturing Company mills in Somersworth, NH, 25 miles downstream. Water continues to flow through the canal to Horn Pond. Some of the canal walls are visible under the water at Great East Lake, as the canal extends far into the lake to provide water for the canal when the lake level was low. The bridge crossing the canal was recently improved by installing a new bridge that is built several inches above the old stone arch bridge so that it is not damaged.

Newichawannock Canal. (No attribution)

Stone Arch Bridge. (No attribution)

Next we drove past the Wakefield Village Historic District, which includes the 1837 Old

Wakefield Town Hall, the 1861 Wakefield Public Library and the 1858 Little Red School House. Past the Little Red Schoolhouse, we stopped to see what is said to be the oldest Town Pound in New Hampshire, built in 1774 of piled stones.

After a nice outdoor lunch at the Tumbledown Café in the village of Sanbornville, we went to the village of Union, NH, to visit the Heritage Park Railroad Museum. Here, thanks to the efforts of Wakefield Heritage Commission member Phil Twombly, we visited the restored 1912 Union train station museum filled with train-related artifacts. On the grounds were an old B&M Railroad wood water tower, a 1902 Russell railroad snowplow, a 1950's era railroad caboose and the 1850 Joseph Smith Wentworth cobbler shop, recently moved to the site.

In the old freight house was an interesting HO scale model B&M Railroad depicting in great detail the rail service in the villages of Wakefield circa 1909, with scale model buildings, rail stations, factories, houses, etc.

We crossed the street to visit the circa 1848 Union Blacksmith Shop to hear its history. The blacksmith shop is operated for special events and can produce various metal items.

We also visited the early 20th century Lyle Drew Mill that for many years manufactured wood products such as children's toys. The Lyle Drew Mill is gradually being restored with donated old belt-driven machinery utilizing the line shafts, pulley and leather belts to power the machinery. Originally the Lyle Drew Mill had a water-powered turbine that generated electricity, which was sold. Electricity generated by the turbine was fed to an electric motor that drove the belt driven line shafts in the building to power machinery. An old electric motor was run so we could see the belt driven machinery in operation. Waterpower is no longer used at the mill building.

These buildings are typically not open to the public until July, but the Wakefield Heritage Commission kindly opened all these building to us and provided 8-10 volunteer guides to show us around and provide information on the buildings, railroad history, the model railroad, blacksmith shop and the mill building.

Russel snowplow. (No attribution)

Phil Twombley speaking at the Union Train Station Museum. (No attribution)

Model railroad layout of Wakefield, N.H., circa 1909. (No attribution)

Union Blacksmith Shop. (No attribution)

Lyle Drew Mill building. (No attribution)

NNEC PRESIDENT'S REPORT

David Dunning

There was no annual meeting this fall as the fall tour got rained out. Some did attend for the morning, see separate report [in the next edition].

Where should we start planning for the next spring tour? Send your ideas to dummark@tds.net.

NNEC TREASURER'S REPORT

Rick Coughlin

Bank balance on Sept. 30, 2022: $3,323. Bank balance on Sept. 30, 2021: $4,351.

Thus the bank balance has decreased $1,028 in the past year.

2022 annual paid membership as on Sept. 30, 2022, is 28. Life members estimated at 30.

As can be seen there was a huge drop in the bank balance in the past year. This was due primarily to several factors. There was a larger expense for the winter conference site rental and we did not have as many attendees as hoped due to a snowstorm that day.

Since Covid appeared in 2020, paid membership has been lower. The three years prior to 2020 we averaged 39 paid memberships per year. In the three years since we have averaged 26 paid memberships per year.

Now that we have returned to having the winter conferences and the spring and fall tours, annual membership may increase.

As we are no longer mailing printed flyers for the spring and fall tours, annual expenses should be reduced.

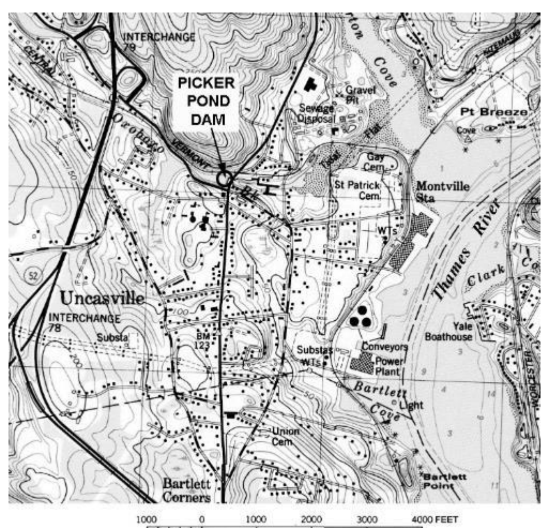
PICKER POND DAM ON OXOBOXO BROOK

Michael S. Raber, Raber Associates

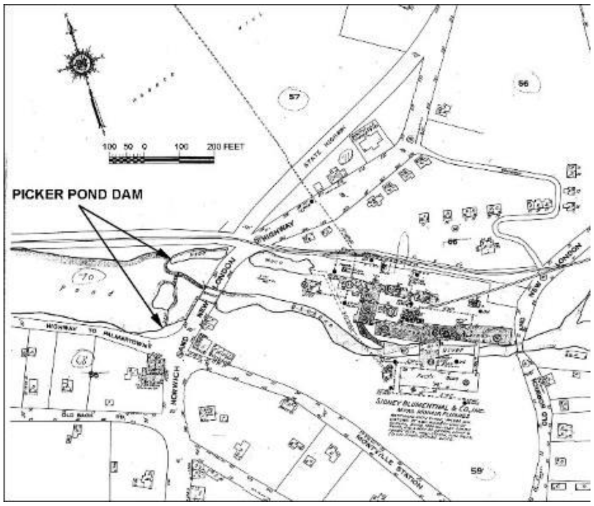
There has been a widespread effort to remove non-operating, often poorly-maintained, dams in New England, to restore river environments and fish passage. In many cases, these environmental improvements remove significant historic resources, often when a dam is a potential flood hazard or a poor candidate for fish passage via a ladder. In a somewhat less typical recent Connecticut case, partial removal of a mill dam in a National Register district left most of the dam intact and required little archaeological monitoring, but led to documentation of an unusual example of vernacular engineering. In Montville, CT, the Picker Pond Dam was a high risk impoundment a short distance upstream of a mill complex proposed for residential redevelopment by Dakota Partners, Inc. The dam and mill complex are contributing resources to the Uncasville Mill Historic District. As part of a Connecticut Department of Energy and Environmental Protection project permit, the Connecticut State Historic Preservation Office requested state-level photographic and historical documentation of the existing dam and any features exposed during partial demolition.

Dam Location and Removal Project Objectives

The valley of Oxoboxo Brook, tributary to the Thames River, is the dominant topographic feature in Montville. Almost 90% of the approximately 12-square-mile watershed flows through the town, with the uppermost portions extending into Salem, CT. The brook drops 350 feet in Montville over a course of about 6 miles below Oxoboxo Pond, in a valley which is generally steep and narrow, with sediment of late-glacial ice-dammed ponds overlying glacial till. The valley is prone to rapid shedding of rainfall and was subject to flooding, which damaged some of the approximately 13 saw, grist, oil, paper, dye, and textile mill sites developed from the mid-17th to mid-20th centuries. What is now known as Picker Pond at the Uncasville Mill complex was the second privilege upstream of the Thames River, a short distance upstream of State Route 32 and the mill complex.



Picker Pond Dam Location on Uncasville, Conn. 7.5-minute U.S.G.S. Quadrangle.



Picker Pond Dam and Sidney Blumenthal & Co. complex c1924. Sanborn Map Co., 1924/1945

Picker Pond Dam project objectives included eliminating the risk of dam failure, by removing the principal spillway to drain the pond, and restoring fish passage upstream for American shad, blueback herring, alewife, American eel, and possibly Atlantic salmon. The stream channel above, through, and below the dam was modified so as to not exceed a 7% slope, to allow for fish navigation.

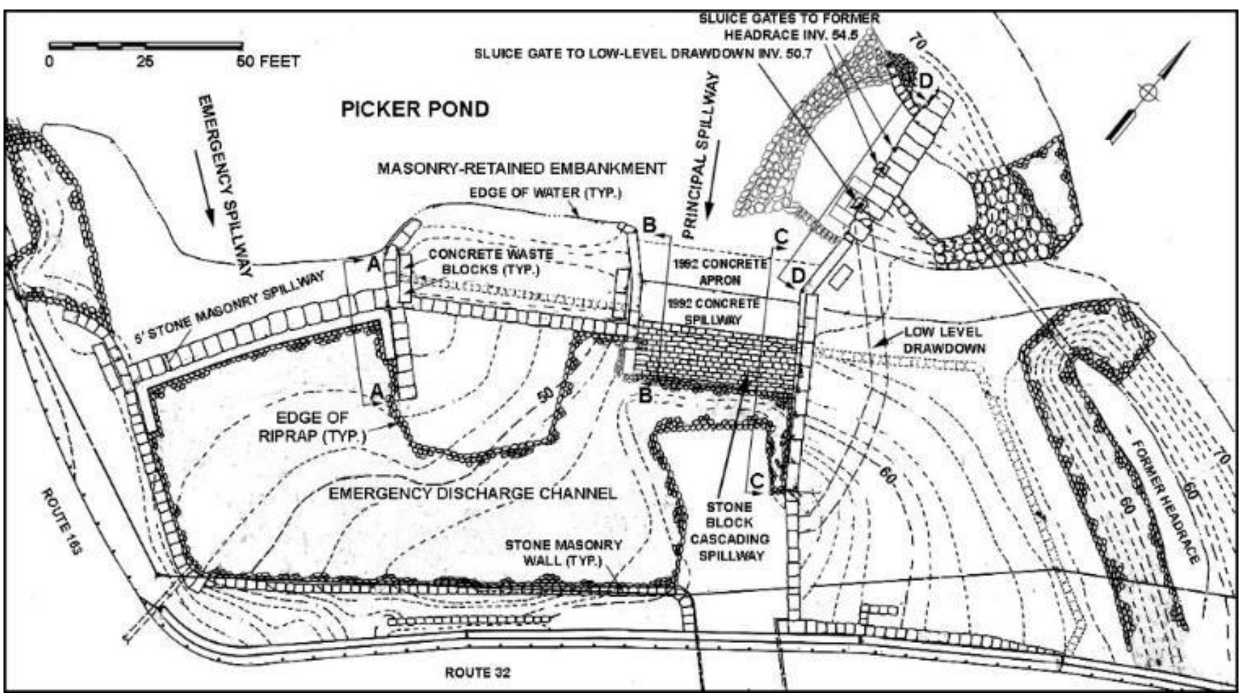
Dam History and Design

The earliest mill sites on Oxoboxo Brook were a c1653 sawmill at the lowest privilege near the mouth of the brook and the c1670 sawmill at the Oxoboxo Pond impoundment, which controlled flow to the sites downstream. Both were established after the 1646 settlement of New London by English settlers under John Winthrop, Jr., who negotiated with the Native American Mohegans to make Oxoboxo Brook the northern boundary of the town. Beginning in 1658, the Mohegan sachem Uncas granted land rights north of the brook to English settlers, who began settlement in present Montville in 1670. New London annexed the land from Oxoboxo Brook north to Norwich, including part of Salem, in 1703 as a grant from the Connecticut General Court. Present Montville was established as the North Parish of New London in 1772 and as an independent town in 1786.

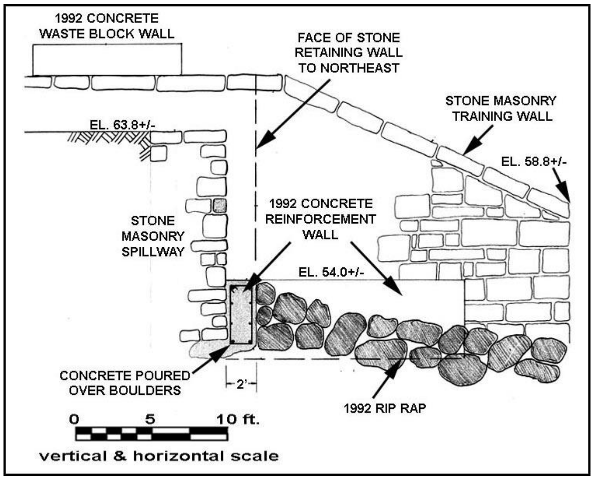
Waterpower use below Picker Pond began with an undocumented 1794 gristmill built by Levi Lester. Peter Richards (1778-1863) and his son, Henry A. Richards (1801-1855), purchased the mill, water rights, and 47 acres of adjoining land in 1822 and 1823, and built a cotton mill with a few dwellings, which were the beginnings of later Uncasville. The Richards mill survives within the Uncasville Mill Historic District. The Richards operation failed, and the property was purchased in 1829 by brothers Charles A. Lewis (1809-1853) and George R. Lewis (1804-1883), who at about the same time acquired the Oxoboxo Pond reservoir and privilege near the head of the brook. They now controlled flow along the entire brook and raised the reservoir dam several feet in part to power a second cotton mill at the reservoir privilege. This mill was abandoned c1840. In 1848, the Lewises incorporated the Uncasville Manufacturing Company and raised the Oxoboxo Pond dam another 8 feet in 1849, increasing the reservoir to approximately 160 acres for additional storage while regulating flow to accommodate the rights of downstream mill owners.

Uncasville Manufacturing Company expanded the mill complex at Uncasville several times by c1860-1895. Picker Pond Dam history is not well documented, and the structure as it existed in 2020 may have included some earlier components. The mill complex was north of Oxoboxo Brook, with the location and terrain indicating waterpower was always delivered from a headrace north of the mill buildings, running from the north side of the original and later impoundments. Land records and historical maps suggest the dam first built c1823 was rebuilt c1868-1873 for anticipated mill expansion, as a larger, longer, higher earth and masonry gravity structure with two spillways, and a wall at the north end with intakes for the mill raceway and for a probable low-level drawdown. Pond size increased dramatically, with the impoundment raised at least 5 feet, and the head reported in 1880 from the pond to the brook below the plant was 40 feet, exceeding all but one of the mill dams upstream. The Picker Pond Dam was one of three privileges on Oxoboxo Brook with falls of 40 or more feet by c1880, by which time it impounded the largest pond on the brook. Much of the dam completed by 1873 remained in 2020, with modifications noted below. The southern of the two spillways was an emergency overflow, slightly higher than the northern spillway which controlled normal flow to the mill complex, and was built to address an additional concern about Oxoboxo Brook flooding. A flood in August 1877 breached most of the mill dams on the brook, but the reconstructed one at Picker Pond evidently survived.

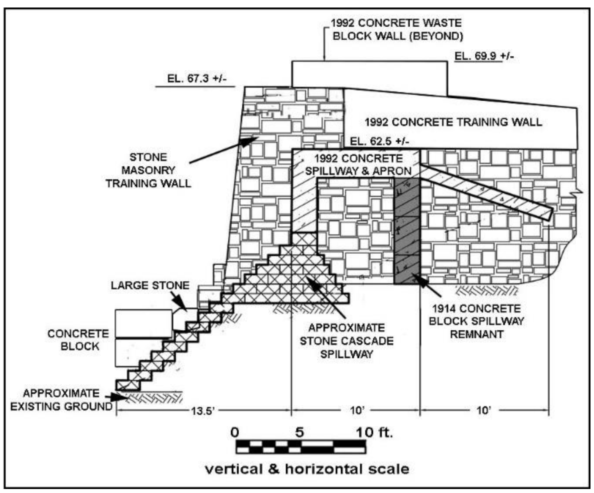
Part of the principal, northern spillway was rebuilt in 1914 with concrete. There is very limited documentation of this work, but maps showing the pond, as well as the need to accommodate upstream mill rights, suggest the spillway remained at the same elevation as built c1868-1873. Spillway reconstruction in 1914, and possible construction of a low-level drawdown, likely enhanced dam stability just prior to the last phase of mill complex expansion by the Uncasville Manufacturing Company. Although direct-drive waterpower had been insufficient to operate all the mill machinery by 1880, even with the increased pond size and head created by the c1868-1873 dam, the pond supplied boilers, steam engines and turbines which allowed for plant expansion. There are insufficient data to reconstruct changing power requirements or waterpower supply in any detail. The mill in 1870 operated with water wheels generating 75 horsepower, but just prior to the first steam-engine installation in 1880 it was reported that in dry months the wheels could only operate at about two-thirds of capacity. Undocumented electric power use, probably for lighting as well as mechanical drive, began c1892. By 1919 the mill had five boilers and five turbines After almost a century of operation, Uncasville Manufacturing Company succumbed to changing market trends and sold the property to Sidney Blumenthal & Company in 1923. That firm, established c1854 in Shelton, Connecticut, produced textiles, including silk and rayon, and at its height operated five factories. At Uncasville, the output was predominately piled fabrics and mohair plush, produced in plant facilities as completed by WW I.



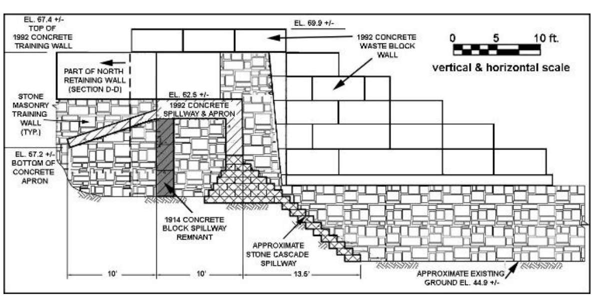
Picker Pond Dam plan after 1992 modifications. 2-foot contour intervals, NGVD 29 vertical datum. (Towne Engineering, Inc. 1992) [Editor's note: capital letters are directions of sections cut through the dam; sections on following pages]



Section A-A. Picker Pond Dam Emergency Spillway to North. (Towne Engineering, Inc. 1992)



Section B-B. Picker Pond Dam Principal Spillway to South. (BSC Group 2017)

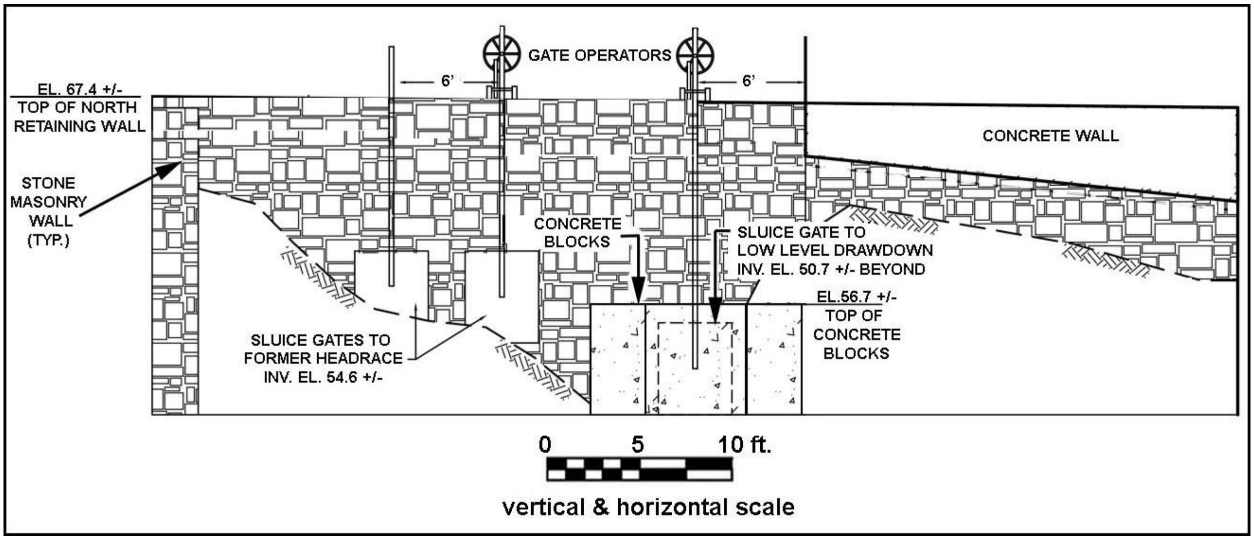


Section C-C. Picker Pond Dam Principal Spillway to North. (BSC Group 2017)

There is limited documentation on any changes in power arrangements, but the headrace remained open throughout the period of Blumenthal operation, suggesting that water was still used to feed boilers and power turbines. Textile operations ended in 1964 when the plant was sold to the Thomas G. Faria Corporation, a manufacturer of marine and automotive instruments established in 1956. The headrace was largely filled in soon after, suggesting that most or all power was provided by the regional electric grid. The Faria company operated at this site until 2017, with no new building construction.

Although evidently not needed for manufacturing after 1964, the Picker Pond Dam remained an essential component of Oxoboxo Brook flood and sediment control for which the Thomas G. Faria Corporation was responsible. State Route 32 crosses the brook less than 100 feet downstream of the dam, as a stone-masonry-retained causeway with a road elevation approximately 4 feet above the c1873 spillway elevation and a 20-foot-wide channel for the brook. For undocumented reasons, the Faria company made no plans to remove or lower the principal spillway with sufficient upstream channel modification to reduce potential flood impacts. Instead, the company attempted to stabilize the structure in 1992. The dam continued to deteriorate and may only have remained functional by conveying most or all of the brook flow through a low-level drawdown noted below. Another set of repairs authorized in 2012 was not completed, and after 2017 ownership changes, plans were begun in 2019 to remove the principal spillway and create a stable riverine corridor.

The Picker Pond Dam is approximately 250 feet long in four sections which are 10-28 feet wide, and up to 26 feet high. The former pond had a surface area of approximately 8.5 acres at the principal spillway elevation of 62.5 feet NGVD 29. From the south end of the dam north of State Route 163, the 70-foot-long, 13.5-foot-high emergency spillway has a 5-foot-wide vertical face of mortared rubble masonry fronting approximately 20 feet of earth fill, and 17-foot-high mortared-rubble training walls.



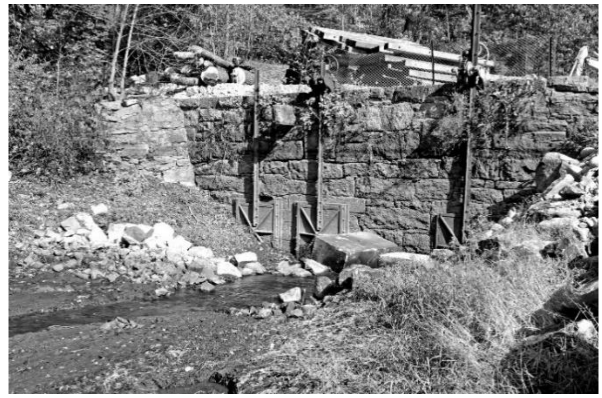
Section D-D. Picker Pond Dam gate wall to east. (BSC Group 2017)

The spillway has an upper elevation of approximately 63.8 feet. The north training wall extends 24 feet downstream of the spillway face with a sloped profile and granite capstones, and meets the face of the embankment between the two spillways. The south training wall extends over 50 feet downstream of the spillway face along an emergency discharge channel, meeting a lower rubble masonry wall which forms the east side of the discharge channel 10-15 feet from the State Route 32 masonry bridge abutment. Dam repairs in 1992 included a concrete reinforcement wall along the base of the emergency spillway face and adjacent sections of training walls. At this time, concrete waste blocks were placed above the abutments of both spillways, providing uniform elevations of approximately 70 feet for enhanced abutment protection against high water The embankment between the spillways is approximately 58 feet long, with a 3.5-foot-wide vertical face of coursed, mortared cut stone up to 19 feet high with an upper elevation of approximately 67.3 feet. The spillway training walls at either end of the embankment retain the embankment fill extending over 20 feet upstream.

The discharge channel downstream of the embankment has been modified several times with riprap and fill, and was approximately 30 feet wide along the roadway alignment in this area after work done in 1992 The 40-foot-long principal spillway was approximately 18 feet high, with two main components: an upper 10-foot-wide flat weir with a 6-foot-high vertical downstream face, and a stepped, approximately 12-foot-high cascade of stone blocks which extended over 13 feet downstream of the vertical face. The vertical upstream face of the spillway was approximately 11 feet high. Upper spillway components likely consisted of mortared stone masonry outer horizontal and vertical surfaces retaining earthen/rubble fill when first installed c1868-1873. The upper spillway masonry was rebuilt in concrete in 1914 and 1992, with a 10-foot-wide angled upstream apron built to protect the spillway at least during the 1992 project. Buried masonry walls in abutments, identified during the 1992 repairs, suggest the 1823 dam had a south abutment and spillway at approximately the same locations reconstructed c1868-1873, although the length of the earlier spillway is not known. The downstream left abutment face of the c1868-1873 spillway was a rubble masonry wall approximately 16 feet in horizontal and vertical dimensions, with a slightly-sloped downstream face matching the extreme northern end of the face of the embankment between the two spillways. From the bottom of the downstream left masonry abutment face, an approximately 8-foot-high rubble masonry channel wall runs over 60 feet to the base of the Route 32 bridge abutment, probably to resist potential floodwater discharge as noted above. The downstream left abutment was replaced as needed with concrete waste block in 1992, at which time similar blocks were used to raise the elevations of the abutment and approximately linear 30 feet of the channel wall.

The 1823 headrace entrance and gates appear to have been rebuilt and moved for the higher c1868-1873 construction. An approximately 60-foot-long wall extends north of the principal spillway downstream left abutment wall to a modified streambank. The wall is up to 17 feet high but has been partly obscured by riprap. The uppermost south end was rebuilt with concrete for over 20 feet, likely during the 1992 work. As noted above, the largely-coursed stone masonry in the wall resembles that seen at the low-level drawdown outlet in the stream channel wall, and may post-date the work completed c1873 if the wall was rebuilt for the drawdown structure. Two 4-by-5-foot cast-iron gates, with present or former hand-powered rack-and-pinion operators, controlled flow into the large-filled headrace. There is a remnant rubble masonry headrace wall running east from the wall with the gate controls. South of the headrace intake gates, a third gate of identical size and design controls flow to a low-level drawdown and may be the only gate still functioning. Three concrete blocks installed in 1992 enclose the drawdown gate for enhanced protection from sediment. The largely-undocumented drawdown structure, possibly installed in 1914, is a buried 4-foot-wide, approximately 100-foot-long channel dropping over 8.5 feet behind the principal spillway's downstream left abutment, with the upstream portion a 4-foot-high stone culvert and the lower portion a 4-foot-diameter metal pipe which exits the channel wall as noted above.

2020 view northwest of principal spillway, and low-level drawdown outlet (lower right). (Michael Raber)



2020 view northeast of masonry wall with headrace intake gates (center) and low level drawdown intake gate (right center). (Michael Raber)

Dam Significance

Picker Pond Dam is a contributing component of the Uncasville Mill Historic District, which includes all the Uncasville Manufacturing Company mill buildings supplied with water from the pond. Despite removal of the principal dam spillway and the pond as a water feature in 2020-2021, the remaining dam components and remnants of the headrace continue to provide visual context for the mill's water supply through most of its history.

The dam is an earth-filled, masonry-retained gravity structure with two straight broad-crested overflow spillways. There are vertical faces on the emergency spillway, the abutment section between the two spillways, the upper part of the principal spillway as discussed below, and the downstream left abutment with control structures for the headrace and the low-level drawdown. The choice of a vertical-faced gravity design for these components, rather than some variant of timber-crib construction which remained common for large projects at this time, probably reflects three factors:

- probable compact till and fine glacial lake sediment which allowed for creation of an extremely stable base with limited excavation;
- the financial strength of the Uncasville Manufacturing Company, which could pay for

substantial initial construction to minimize future maintenance issues;

- the sufficient maturity of dam engineering to allow the unknown designer to design a relatively large earth-filled masonry structure with confidence.

The vertical masonry faces used less material than a stepped face, and resemble contemporary Connecticut dams for which engineering calculations were made to assure the embankments could withstand water pressure at the anticipated impoundment height. Such calculations, first made by French engineers in the 1850s, were extremely complex until simplified in 1881 by English [Editor's Note: Rankine was Scottish] engineer W.J.M. Rankine, and it seems more probable that this dam was built by an experienced local mason with limited formal engineering, using masonry to retain earth fill as seen at hundreds of mill dams in the region.

Much of the masonry is uncoursed and mortared, like many contemporary mill dams, but the embankment between the spillways, the wall containing the gate control structures, and part of the channel wall downstream of the principal spillway around the low-level drawdown outlet are less typical. They are faced with largely-coursed cut granite or gneiss blocks. These and other features appear to reflect enhanced construction to address potential flood/high water issues, to an extent seen in few Connecticut mill dams. Floodwater was a threat not only to the impoundment, but to the mill complex via the headrace, and to several generations of bridge/elevated roadway along what is now State Route 32 over Oxoboxo Brook approximately 80 feet downstream of the principal spillway.

The largest flood control measure in the c1868-1873 dam is the emergency spillway, nearly twice the length of the principal spillway and 1.3 feet higher. The emergency spillway was a significant expansion to the south of the 1823 impoundment and included a large masonry-and-riprap-sided discharge channel which could flow floodwater into Oxoboxo Brook just upstream of the road crossing which was protected by the rubble-masonry discharge channel wall. There are few examples of emergency spillways at contemporary Connecticut mill dams. One is at the 1872 dam at North Grosvenordale Pond built to power one of the region's largest cotton factories. The emergency discharge channel affected the design of the principal spillway and its discharge into the brook. From a point approximately 10 feet below the spillway crest, the spillway's high north training wall continued as a lower, armored channel wall of rubble and cut-stone masonry to the Route 32 stream crossing. The channel wall protected the north stream bank, and the dam and bridge abutments, against erosion from high-water flow in the emergency discharge channel. The width of the channel and the short distance from the spillway crest to the road precluded some options for downstream protection of the spillway. Overflow weirs must resist potential undercutting of the spillway by falling water or partial vacuum conditions created between falling water and the spillway face, as well as upward pressure on the upstream face. Typical downstream measures to address downstream undercutting in other contemporary dams could include timber or masonry downstream aprons, construction of low dams downstream to create stilling basins cushions of water, and curtain walls of sheet piling or masonry against the upstream face. Such measures allowed for vertical or slightly sloped downstream spillway faces. Stepped spillway faces to deter undercutting required more material and appear to have been less frequently deployed at contemporary mill dams. At Picker Pond Dam, the upper third of the principal spillway downstream face was vertical, but the remainder was a steep cascade of mortared blocks which ended just upstream of the emergency spillway discharge channel. This vernacular response to constrained site design conditions probably required regular maintenance to deter erosion of the cascade, which deteriorated quickly after maintenance ended c2017. A somewhat similar stepped-faced spillway survives at a former sawmill site on Slater Hill Road in Killingly, Connecticut.

The emergency spillway discharge channel and the siting of the principal spillway and mill headrace also appear to have affected design of the low-level drawdown structure serving the c1868-1873 dam. Low-level drawdowns are typically built adjacent to, or as part of, dam spillways. There is no sign of a drawdown in the dam embankment southeast of the principal spillway, although it is possible an earlier drawdown for the 1823 dam could be buried in that embankment. The discharge channel may have inhibited construction of a low-level drawdown conduit for the later dam in this area. A buried stone wall in the northmost dam abutment area suggests the c1823 headrace entrance was at a different location than the extant north retaining wall with gates. The largely coursed masonry of large cut blocks in this wall appears very similar to that built at the outlet of the low-level drawdown, just downstream of uncoursed rubble masonry in the channel wall noted above. These masonry differences suggest the low-level drawdown outlet, and the wall built at the intakes to the outlet and the headrace, post-date the c1868-1873 dam construction and were perhaps part of undocumented work in 1914 which included reconstruction of the upper part of the principal spillway. The three cast-iron sluice gates controlling flow to the headrace and the low-level drawdown are of identical size, with surviving, reconstructed, or former rack-and-pinion gate operator stems which remained common into the 1940s.

[Editor' s Note: Mr. Raber's article is accompanied by two pages of references, which are omitted in the interest of brevity. The Editor will make those available to interested readers.]

16 NEW HISTORICAL SIGNS IN WALPOLE MARK MILL PRIVILEGES

Betsey Dexter Dyer
Walpole Historical Society and SNEC

Walpole has historic mill privileges all along the Neponset River from South Walpole, through downtown, and into East Walpole. There are also privileges on two main tributaries, Spring Brook and Mill Brook. A privilege is a legally granted right to use water in a river; the Walpole privileges were granted in the 18th and 19th centuries.

The Walpole Historical Commission and Walpole Historical Society collaborated to write short histories of each privilege or other historic river site, for a total of sixteen signs. Walpole's Department of Public Works installed the signs. Funds were from donations in memory of Roger Turner Jr. (1932-2021) who loved Walpole's rivers and ponds.

<u>I submitted this article to the SNEC newsletter for three purposes:</u>

1. To encourage SNEC members to consider such projects for their own towns. To that end, I am providing some details about the logistics that might be encouraging.

2. To follow through with some recent discussions of Betsey Dyer, Sara Wermiel, Ron Klodenski, Robert Timmerman and Leonard Henkin: We would like to encourage members to let us know about obscure, mostly undocumented, unpreserved, hard-to-find industrial sites in their towns and to find ways to encourage others to find and appreciate the sites. A series of historical signs in a town could accomplish that and could even comprise a do-it-yourself field trip for SNEC members.

3. To provide SNEC members with all the information for a do-it-yourself field trip: A list and location of each of sixteen historic mill privileges in Walpole, Mass., follows. Each site has a lengthy informative sign describing how the privilege was used. In a very few cases there are extant standing structures, and those are described below.

<u>Logistics for this Sign Project that could apply to other sign projects:</u>

First of all, we were pleasantly surprised to find that 12 X 15-inch aluminum signs of thickness 0.063 inches with baked on enamel paint cost about $50 each. That was at Signarama, a franchise with a branch near us. Probably other sign shops have a similar price. Signarama took the 8.5 X 11 in. PDFs of our sign wording and formatted them to fit the signs and showed us proofs. Because our project was funded by the Walpole Historical Society, we could use a tax-exemption number.

Of course, a lot of the important work was researching each site and getting the correct information written up and thoroughly proofread and fact-checked. Members of both the Walpole Historical Society and the Historical Commission were enthusiastic about doing that.

Other enthusiastic participants were Walpole's Town Administrator and the Select Board. We needed permission from both to put signs on town property, which most of these sites were.

Historical signage is good publicity for a town. They welcomed the project.

The building inspector assured us that historical signage of this size does not require a permit. That might be true for other towns too.

The one private property owner, Hollingsworth & Vose, an extant paper company in East Walpole, was delighted to have an historic sign for their property.

The town administrator delegated the Department of Public Works to install the signs. Some were on new posts, some attached to fences and bridges. We went around town to study each site and come up with a clear description for the DPW of where each sign should go.

As for funding we suggest:

- Your Historical Society
- Your Historical Commission
- Your Trails Committee
- The Massachusetts Arts Council, which distributes funding through town boards
- Business owners who might value a history of their business displayed on a sign
- Your public library
- Your chamber of commerce or other town group involved with town improvements

Field Trip to View Sixteen Historic Mill Privileges of Walpole, Massachusetts

Start in South Walpole where the Neponset River enters town and proceed sign by sign to East Walpole. Or, if you are just driving through and see a new sign (white font on a green background), it's probably at a mill privilege; consider stopping to read about it. In most cases the sign will be at the place where the river crosses under or close to the road except when there is no safe sidewalk or stopping place. Five signs are on Walpole trails.

Diverse products were made at most of the privileges and so this is not an attempt to list all those. The signs are informative on that topic. Most of the 16 privilege sites have no remaining structures. The five that do, are described below and those are primarily 20th century structures.

"The Ellbridge Smith Privilege" circa 1814
Washington Street Extension in South Walpole. The Washington Street Extension is the former route of the Boston to Providence Turnpike.

"Clarke's Privilege" circa 1720
Summer Street (next to the South Walpole Post Office) in South Walpole.

"Rucaduc Privilege"' circa 1812
Neponset Street in South Walpole just past 50 Neponset Street. This was the site of the Walpole Emery Mill and later Bird Machine. Following an EPA clean up, it has now become a solar farm.

"Upper Blackburn Privilege" circa 1742
White Bridge in the Walpole Town Forest (parking at 221 South Street)

"Lower Blackburn Privilege" circa 1787
On a short path off the Rail Trail to the old hydroelectric dam, accessed either from parking at 221 South Street or from behind the Council on Aging at 60 South Street. This site provides a great view of a large waterfall and the remains of a hydroelectric plant that powered the Massachusetts Chemical Company.

"Union Factory Privilege" circa 1812
At the Council on Aging parking lot at 60 South Street. A series of industries at this site included the Massachusetts Chemical Company and Multibestos in the 20th century. The last of the mill buildings was torn down in the 21st Century, the site was cleaned of asbestos and other materials by the EPA and now is the location of the Council on Aging and Police Station.

"Lewis Privilege" circa 1812
75 West Street. In the 19th Century the mill at this site was Lewis Cotton Batting Mill. That business was revived in the 20th Century to become Kendall Mills. Many of the nearby mill buildings have been repurposed as condominiums and businesses.

"Bradford Lewis Paper Mill"
Elm Street (facing into the large MBTA parking lot). Paper and cotton products from waste paper and waste cotton were made here. It is also the site of the first telephone exchange and first electric lighting in Walpole.

"Morey's Privilege" at Turner's Pond circa 1840
Mill Pond Road, site of E.F. Lewis's wool scouring mill and ice houses. In the 1890s Lewis left Walpole and established his business in Lawrence, Mass.

“Stetson’s Privilege” circa 1754
At the little triangular park at the base of Rural Cemetery, corner of Pemberton and North. (This is not quite at the river but the river can be seen from that place.)

“Clark’s Privilege”
Across from 290 Stone Street. For decades a sawmill operated here. The Spring Brook Ice Company cut ice from the pond until about 1940. Along the wooded trail of the parking lot may be viewed a low concrete foundation for an ice house and an ice cart scale.

“Diamond Privilege”
Old Diamond Street.

“Plimpton Upper Privilege”
Plimpton Street at the entrance to the trail at Dog Rock. There is parking for only 2-3 cars. Dog Rock is a small boulder painted to look like the face of a dog.

“Plimpton Lower Privilege”
Walk a short distance along the trail at Dog Rock to a second sign. In the 20th century, George Arthur Plimpton revived the old mill site and built a hydroelectric plant. The remains may be seen across the pond and accessed more closely by walking further along the trail.

“Bird Upper Privilege”
At the trailhead to Endean Trail on Bird Drive/Mansion Drive in East Walpole. Bird and Son operated a huge paper mill there for decades. Most of the buildings are gone but one at 153 Washington Street has been repurposed for businesses including a retail pie shop.

“Hollingsworth & Vose Privilege”
At Hollingsworth & Vose, an extant paper mill at 112 Washington Street in East Walpole. The company produces specialty papers for industries.

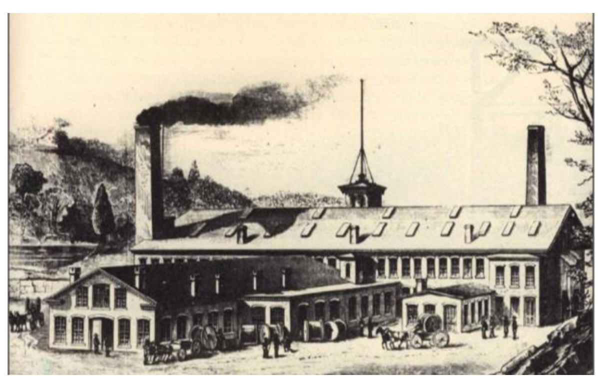
KERITE COMPANY
49 DAY STREET, SEYMOUR, CT

Amber Courselle, WSP USA Inc.

This brief history of the internationally important Kerite Company, early manufacturers of the insulated telegraph cable and other wire and cable products, was prepared as a partial mitigation for the recent demolition of the Kerite factory’s circa-1884 dam and restoration of the Bladen’s River stream. The firm’s rubber-insulated copper wires represent the amalgamation of two important Naugatuck Valley industries. The company began operating at the Seymour site in 1854 and continues in operation today.

A paper mill operated at the property as early as 1850. Austin Goodyear Day purchased the property for his rubber processing business in 1854. The original mill building burned in 1864 and was soon replaced by a three-story red brick factory.

1856 map of Seymour, CT, showing plant.


The 1870 factory with the dam on the left. (Rudd)

The existing dwelling on the property, Day's residence, was built circa 1884 (Rudd 1966). One remaining corner of the original mill building bears a datestone inscribed "A. G. Day 1884," which likely represents the year the factory was again enlarged, and the existing dam and powerhouse were built (Sanborn Map Company [Sanborn] 1884).

The dynamo and pump house, no longer extant, first appear on the 1895 Sanborn Fire Insurance map between the boiler house and the headrace embankment, south of the factory. In 1900 this building was labeled "Wheel Room" and "Dynamo" (Sanborn 1900). Minor additions and alterations to the factory and the outbuildings took place between 1900 and 1911 (Sanborn 1906, 1911). Several more, small additions were erected in the 1920s and 1930s, and approximately seven factory blocks were built on the east side of the complex in the 1940s, 1950s, and 1960s. In 1946 and 1960, two red brick office blocks, still extant, were constructed on the west side of the original factory building. The original pump house and factory building were demolished in a major building campaign in the late 1990s, and the main building was replaced by a building sided with corrugated metal that sits on a concrete foundation. A corner of the original brick factory building with the 1884 datestone has been retained west of the dam. Three similar metal-sided additions were also constructed at that time west of the main block.

At the time of its removal, the Kerite Dam was oriented generally northeast to southwest across the Bladens River, with the impoundment pond located to the east. The dam consisted of a coursed cut stone masonry face 23' high with a spillway 101.5' wide capped with reinforced concrete. The original timber spillway cap was replaced with concrete circa 1992. The dam rested on bedrock but was not anchored. The face of the dam had been leaking water between the stones for some time, indicating required rehabilitation, but the dam itself was intact.

The open headrace had a natural rubble bottom with a poured concrete retaining wall on the south side and a rubble masonry retaining wall on the north side adjacent to the factory buildings. A brick archway was located at the base of the north retaining wall, within the water channel. A small hatchway, which did not appear operable, was located in the concrete pad near the former location of the wheel and pump house. These may lead to a former underground equipment area, but this area was not disturbed during the dam removal and was reportedly inundated along with the basement areas of the factory in a 1955 flood.

Corner of building with 1884 datestone. (No attribution)


Leaking dam c 2020. (No attribution)


Looking at the dam with the plant in the background c. 2020. (No attribution)

A concrete pad separated the north wall of the race channel from the circa 1890 brick powerhouse. A rubble masonry embankment retaining wall approximately 12' tall extended north-northeast of the dam. A stairway at the north side of the retaining wall led to the impoundment/retention pond. A large metal pipe, possibly the remnant of a former penstock, also pierced this retaining wall. The area south of the concrete retaining wall once housed a large oil tank; the small building adjacent to the tank contained the oil pumping controls.

Kerite Company History

Charles Goodyear, a hardware merchant of Naugatuck, Connecticut, invented the rubber hardening process that he called "vulcanizing," which he patented in 1844. By 1850 Naugatuck had become the center of the growing rubber industry, and by the time Goodyear died in 1860, local rubber companies employed 60,000 people (Rudd 1966).

In 1850 the A.G. Day Caoutchouc Company was started in New Haven by Austin Goodyear Day, a cousin and former employee of Charles Goodyear. Day's company focused on cleaning rubber imported mainly from South America, India, and the East Indies as ballast in clipper ships and selling it to nearby mills. Day was granted a patent for his cleaning process in 1853, allowing him to "process a variety of rubbers and improve their quality."

In 1854 Day purchased a former paper mill property in Seymour and moved his rubber business into the mill. By 1859 the mill was processing 500,000 pounds of rubber annually (Rudd 1966). Besides preparing crude rubber, the company also manufactured hard-rubber durable goods, including pen holders, pencils, handles, and bridle bits. Austin Day's brothers, Henry P. and Edmund, led this business, which eventually moved to its own separate factory in Seymour in the early 1900s (Rudd 1966).

A.G. Day continued experimenting with rubber and vulcanization to improve rubber for more uses. Through these experiments in the 1860s, Day invented a compound he called "kerite." The ingredients and process of formulation of kerite remain a company secret. In 1856 Alva Goodrich DeWolfe, a manufacturer of rubber-making machinery, joined A.G. Day's company as chief assistant and plant superintendent. Although he made many improvements to the rubber cleaning machinery, DeWolfe's invention of a rubber extruder or insulating machine in the 1860s made possible the development of cable insulated with a compound of rubber and kerite (Rudd 1966). Theodore Rudd, the mid-twentieth-century chairman of the Kerite Company, noted, "In fact, the entire insulated wire and cable industry is indebted to DeWolfe since all modern extrusion machines depend on the basic principles he developed" (Rudd 1966).

By 1868 at least 200 Kerite cable installations had been made in the United States, Canada, Panama, and Egypt. These Kerite-insulated wires were essential for the early telegraph industry. Day's Kerite cables were soon being sold to multiple customers for submarine and other applications. In 1870 Kerite cable was used for a telegraph wire at the weather station of Mount Washington, New Hampshire. In the 1880s hundreds of miles of Kerite telegraph cable were run along the New York City elevated railroad system.

Telegraph systems were crucial in the westward expansion of the country after the Civil War, and Kerite was a major cable supplier. Kerite cables were also used in large fire alarm systems: first in Ottawa in 1874, then Chicago in 1877. These two applications led directly to Kerite's entry into the extremely important railroad business for use in its new automatic signaling system equipment. The Pennsylvania Railroad was using Kerite wire by 1880, and eventually they were used throughout the Pennsylvania's tunnels, station and rail yard complex from the west side of the Hudson River, into Manhattan, under the East River and into Queens, New York. In 1892 the New York Central Railroad used Kerite wire for the 300-mile overhead block signal system stretch between Albany and Buffalo. Kerite also supplied hundreds of miles of cable for the New York subway system in 1908 (Rudd 1966).

Austin G. Day died in 1889, and the firm passed to his widow, who ran it with help from her brother, W.R. Brixey, who became the sole owner when Mrs. Day died in 1892 (Rudd 1966). Brixey, operating under the name W.R. Brixey Kerite Telegraph Cable Works, greatly expanded both the plant's size and output, primarily focusing on the manufacture of submarine, aerial, and underground electric cables. Among the firm's customers were the Western Union Telegraph Company, Postal Telegraph Company, New York Telephone Company, and the United States Government.

As electricity became more ubiquitous, power transmission cable became another important line of business for Kerite. In 1898 the Coney Island & Brooklyn Railroad Company placed a large order for transmission cable to be used under the Gowanus Canal in Brooklyn (Rudd 1966). In 1908 a Kerite telegraph and signal cable was laid during construction of the Panama Canal, "joining for the first time the Atlantic and Pacific lines and thus covering all of South America" (Rudd 1966).

In 1908, the firm was reorganized and incorporated as the Kerite Insulated Wire and Cable Company. W.R. Brixey died in 1911, and the company passed to his son, R.D. Brixey. He moved the company's main offices to New York City and opened a sales office in Chicago, while retaining the plant in Seymour. He also developed additional sales teams to manage the railroad and utility sectors, canceling the company's smaller contracts to focus on those two sectors.

As other offices focused on sales, the plant in Seymour continued to produce finished products. In 1918 an engineering office was opened at the Seymour facility, which was "responsible for the design of Kerite cables to meet the requirements for new applications." It also oversaw quality control programs and conducted research and testing for new applications, as over 90 percent of their products were made to order (Rudd 1966).

R.D. Brixey also greatly expanded the size of the Seymour facility, with nearby buildings purchased and new ones constructed, all while the 1864 plant remained in constant use. Kerite engineers designed new machinery to refine those used since the mid-nineteenth century.

Upon Brixey's death in 1943, Chester Harris, a long-time manager and assistant to Brixey, was elected president of the company. Simultaneously, the company was engaged in several unique World War II contracts, including supplying cable for the Manhattan Project and for submarine air conditioners. At the end of the war, the trustees of the Brixey estate sold the company to the Lee Higginson Corporation, an investment firm, which took the company public.

Pent-up demand following the war, as well as the new company structure, helped both the Seymour facility and its work force to expand. Between 1946 and 1966, the engineering department was expanded fivefold to solve increasingly complex technical problems. Rudd explained the decision to remain at the Seymour location was based on the local talent pool as cablemaking is a specialized skill which generations of local residents possessed (1966).

Kerite Company continued expanding its offerings with the 1958 introduction of Permashield, a non-conducting stress control coating. The company introduced cable for the nuclear power industry in 1965. Soon, Kerite cable was installed in over 65 nuclear plants, more than half the country's total (Kerite 2021).

Kerite was sold to the Hubbell Company, an electrical equipment manufacturer, in 1969. The plant continued to expand as needed for 30 years before being sold to Marmon Group in 1999. Around that time the factory was enlarged again, and the 1864-1884 building and pump house were demolished. Kerite today is the only U.S. manufacturer of armored submarine cable, and continues to provide cables for high-voltage underground applications (Kerite 2021).

Facing East to office building, July 2020. (no attribution)

References and Bibliography

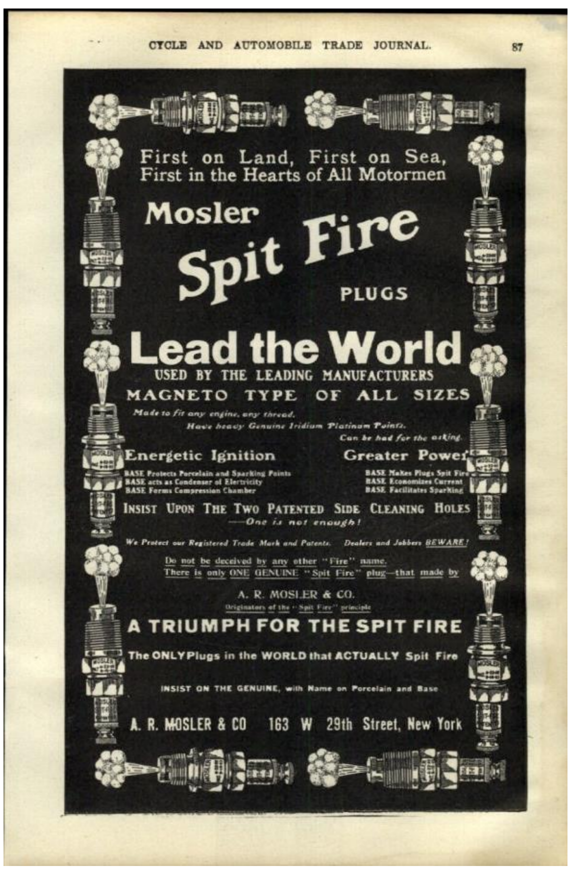
H & C.T. Smith, Philadelphia, 1856, Library of Congress, A Map of New Haven County, CT, https://www.loc.gov/resource/g3783n.la000065a/?sp=1&r=0.262,0.651,0.09,0.058,0.

Karmazinas, Lucas, 2015, Mill Record Seymour: The Kerite Company, Seymour, CT, https://connecticutmills.org/find/details/the-kerite-co.

Kerite, 2021, History and Values. Kerite Company, Seymour, CT, http://fieldcalc.kerite.com/historyvalues.php.

Rudd, Theodore O., 1966, *A Century of Cablemaking: The Kerite Company 1854-1966*.

Newcomen Society in North America, New York.
Sanborn Map Company, 1884, Library of Congress, Sanborn Fire Insurance Map from Seymour, New Haven County, Connecticut, https://www.loc.gov/item/sanborn01173_001.
Sanborn Map Company, 1895, Library of Congress, Sanborn Fire Insurance Map from Seymour, New Haven County, CT, https://www.loc.gov/item/sanborn01173_003.
Sanborn Map Company, 1900, Library of Congress, Sanborn Fire Insurance Map from Seymour, New Haven County, CT, https://www.loc.gov/item/sanborn01173_004.
Sanborn Map Company, 1906, Library of Congress, Sanborn Fire Insurance Map from Seymour, New Haven County, CT, https://www.loc.gov/item/sanborn01173_005.
Sanborn Map Company, 1911, Library of Congress, Sanborn Fire Insurance Map from Seymour, New Haven County, CT, https://www.loc.gov/item/sanborn01173_006.



Advertisement, 1909.

THE MOSLER SPARK PLUG COMPANY

Rick Ashton

Can you recall the last time you were in a conversation about spark plugs? Perhaps, if you are restoring an old car or performing maintenance on your own car. For myself and others, a spark plug is something we take for granted. No one has ever asked me, "Rick, what are your thoughts on the Mosler Spit Fire plug?" The what? Mosler Spitfire? I'm familiar with the name Champion but I know little about the company. I had no idea Champion has been in the spark plug business since 1905.

Well, what about the Mosler company? While looking through vintage automobile trade journals, I came across visually striking advertisements for a spark plug company with quotes like: "The greatest spark plug the sun e'er shone on" and "the only plugs in the world that actually spit fire." And wait, isn't that a volcano in the background? I really enjoyed the somewhat whimsical attitude of their advertisements. I had to learn more. Here is what I found out.

Before the advent of spark plugs many engines were started by "hot tube ignition" in which a metal tube was heated by a blow torch. This wasn't the most efficient method as the tube wasn't always hot enough to set off the charge or it became too hot and melted. Car batteries were also used to create ignition, but the process seriously depleted the battery and occasionally started fires.

Enter the sparkplug. The inventor of the first spark plug is generally acknowledged to be Etienne Lenoir, who in 1860 used a spark plug in his gas engine, the first internal combustion engine. Some sources credit Edmond Berger, who is said to have created a plug in 1839 but didn't receive a patent. In 1898 Nikola Tesla patented a spark plug for his ignition timing system. Gottlob Honold introduced the first high voltage spark plug in 1902 while working for Robert Bosch, his employer. The patent was issued in Bosch's name (GB 26907). This led to the development of the spark ignition engine. A.R. Mosler patented his Spitfire plug in 1902. Albert Champion incorporated his company in Boston in 1905 and began producing porcelain spark plugs.

The Accessory and Garage Journal of 1913 documents the story of the Mosler Spark Plug Company. "Mr. Mosler's rise to a prominent position in the automobile Industry is remarkable.

In 1900 he experienced, as did other makers of horizontal motors, plug troubles due to the lubricant fouling the gaps. In 1902, to prevent the oil from short-circuiting the points, he designed and patented the Spitfire closed end porcelain spark plug with slots in the base to obtain a self-scavenging (basically self cleaning) effect. The first 1000 plugs were turned out in a lathe and fitted with imported porcelains. So successful were the plugs in overcoming ignition troubles and in economy of current, that they attracted attention from users of internal combustion motors, who were experiencing difficulty in obtaining efficient ignition. Demand soon exceeded the supply, leading Mr. Mosler to produce an additional 2000, which also found ready customers. Some idea of the expansion of the business may be obtained by Mr. Mosler's statement that in 1904 he marketed "20,000 spark plugs, the following year 100,000 and in 1907 500,000."

In 1908, an article in Gas Engine Magazine stated: "The rapid growth of the business of A. R. Mosler and increased demand for Spitfire spark plugs is well demonstrated in the increase in their plant, both in additional space and machinery. By a widespread and well-developed system of publicity, Mr. Mosler has made his copyright trademark, "Spitfire" and "Shooting the flame" known throughout the world wherever ignition devices are required. Today he has one of the largest and best plants in the country with an output of 5,000 plugs daily. Mr. Mosler has not devoted himself solely to spark plugs, as is shown by the well-known success of his Mosler distributor for synchronous spark timing and his double lever for spark and gas control."

But the factory couldn't keep up with demand and a 1913 Accessory and Garage article stated "Today (1913), the output of the factory in Mt. Vernon, New York, which was erected two years ago to meet the requirements of an increasing demand, runs into the millions annually. A number of different plugs are produced, including in addition to the Spitfire, The Mosler, Vesuvious, Triumph, and Mosler junior, etc. All types are based on long study and careful experimentation of the cylinders for which they are designed. The Mosler sparkplug has been adopted by a large number of leading car manufacturers after severe breakdown tests. Until recently the factory was operated night and day to fulfill 1913 contracts. Although produced in enormous quantities, quality is never sacrificed. Not only are plugs made for pleasure and commercial cars, but for motor cycles and marine engines; in fact, for every type of explosive motor utilizing the jump spark system of ignition. For the past 3 years the engineers of the factory have compiled annually a booklet listing all makes of cars and motorcycles, showing the plug best adapted to each motor."

An ad placed in the 1915 Literary Digest reads: "The Spitfire means swift, complete combustion-literally spits fire. Warranted to outlast the engine, gas tight; proof against soot, oil, and water. Standard equipment on such cars as the Pierce-Arrow; ideal for Packard, Peerless, etc."

The Mosler M-1 spark plugs were tested by the US Government Air Service in 1921 and the results published in the Air Service Information Circular (vol 3, # 273, October 1,1921). "The Engineering division standard spark plug test is divided into four principal parts:

1) Dynamometer tests on a Liberty single cylinder engine
2) Torque stand test on a Hispano-Suiza 300 HP engine
3) Preliminary flight test in Liberty 12 cylinder engine consisting of a series of climbs and guides
4) One hundred hour endurance flight test in two standard service engines

The plugs passed the preliminary tests satisfactorily. There were some failures which were determined to be caused by the condition of the engine. Most of the Mosler failures occurred late during the tests and since the service they received was so unusual, the percentage of failures should be ignored in order to obtain a true estimate of the merits of the plugs. The performance on test is considered excellent in view of the severity of the test. The plug is recommended for service in aviation engines."

Hard times hit the company after WW1. A receiver was appointed in 1920 and a 1922 article in American Garage and Auto Dealer recorded the outcome: "The firm of A. R. Mosler, New York City, which has been in receivers' hands for a period of about 20 months, was taken over by a new organization headed by a number of prominent Eastern financiers, on May 25, 1922. Hereafter the business will be operated under the title of the Mosler Metal Products Corp. To a complete line of spark plugs the company has always made, there will be added a number of automobile accessory lines and a full line of radio material. Every assurance is extended to the trade whose business A. R. Mosley & Company have enjoyed for the past 25 years, that the highest standard policy and merchandising will be maintained."

The "new" company cut back the amount of spark plugs offered to 6. Mosler's run as the "spark plug king" was over as companies like Champion, Bosch, Bethlehem, Rajah, and many other companies were also producing spark plugs.

EDITOR'S NOTES

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.

Now we have to talk about some grubby details about how to submit material to the Newsletter. This Newsletter, like so many others, is written in 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 spend some of that discussing what will and will not work. Many of you know this, this is for the benefit of those that may not be experienced with desktop 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. There is one article in this Newsletter that came with a lot of nice scans of old photos, which were all sent as PDFs. I have to disappoint the author, and run the text without the pictures, because Word cannot accept PDFs. 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 as 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, for a living, 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 a bit much to ask a reader to turn the page 90 degrees, so the maximum usable width is 6 ½ inches (8 ½" 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.

Mr. Raber used this to good effect in his article on Picker Pond Dam. He used a number of drawings of small pieces of the dam. A civil engineer would likely draw the entire dam on one large sheet, to a reasonable scale that makes all parts of the dam legible. Not having a large sheet, Mr. Raber used a number of small sheets

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.

Please send your graphics files as a separate file from your Word document. If the graphics are embedded in the Word document, it is a lot of trouble to pull it out. It is OK to put the graphics in the Word document, as long as they are also in a separate file. Having them in the Word document tells me where the author would like the graphics, although frequently the graphics may have to relocated from the ideal spot, to make room for a bigger view of the graphics.

To save space, I have sometimes deleted a long set of references at the end of an article. This might be insulting to people who have gone to a lot of trouble to do a lot of research. As with photographs, any truncated references are available from the editor, upon request.

Drafting Conventions Used by Michael Raber

Michael Raber's article on the Picker Pond Dam used some drafting conventions that are standard with engineers and architects, but may not be familiar to specialists in history. Mr. Raber used what are known among engineers and architects as "sections". In a plan view of a structure, or piece of machinery, the drafter marks lines which indicate vertical planes which cut the horizontal view of the drawing. These planes cut the three-dimensional drawing (of which the plan view is simply a view looking down on the three-dimensional object). Where the so-called cutting planes cut the three-dimensional object, there is a picture of the cross section of the object. For the Picker Pond Dam, there were four section views, cutting the dam in four places. The section views show how the dam looks in the vertical plane in each of these four places.

Usually, the sections are designated with letters at each end of the cutting plane, and referred to by the letters, such as "Section A-A."

Architects use sections to show how walls are constructed. Mechanical engineers use them to show details or machinery, or piping.

While the actual drafting is done by computerized systems these days, the representation will still be on two-dimensional pieces of paper, until virtual reality becomes widespread.