Society for Industrial Archeology · New England Chapters

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See New England Chapters of the Society for Industrial Archeology on the Web at http://nec-sia.org to obtain more information and membership details.

SNEC-SIA President's Report

Greetings from the "Biggest Little City," Reno, Nevada! Over a year ago I reported to you that 2017 would be my last year as president of the SNEC-SIA. During the annual business meeting last year, Jeff Howry and Bill Gerber agreed to serve as co-program coordinators, with Sara Wermiel staying on as treasurer and Leonard Henkin as secretary. However, since nobody came forward last fall to fill the role of chapter president, I agreed to stay on as president "pro tem" for 2018. From a distance, it is possible for me to continue to periodically update the joint New England Chapters' website, and send out the periodic e-mail news blasts via mailchimp.com. I regret that I can no longer attend events in person. With this, I seriously need to stress that this really WILL be my last year as president. I need to move on. We need someone who can take on a more active role for 2019. With the help of a capable support staff, the job of each chapter officer really isn't that difficult. While the current chapter bylaws (available on the website) give a very general idea of the intended duties of each chapter officer, they don't give specifics. Therefore, I have created the following list to summarize what is involved in running the chapter, based on my experience over the past several years. As you can see, the list is fairly short. I really hope to encourage you to offer your service this fall. The future of this chapter depends on it!

Operational Overview for the Southern New England Chapter – Society for Industrial Archeology

Basic Chapter Requirements (per SIA bylaws):

- The chapter shall hold at least two events per year; at least one must include a business meeting.
- The chapter president shall send a report to SIA HQ each January summarizing the chapter's prior-year activities and also a summary of finances.
- All Chapter officers shall also be members of the SIA (national). Note: SIA Dues paid by SNEC-SIA upon request.

Other Chapter Activities:

- New England IA Conference (odd-years)
- Newsletter (Spring and Fall) – edited by David Starbuck, printed & distributed by Dennis Howe (both NNEC)

President's Duties:

1. Prepare Annual Report for SIA (January)
2. Prepare President's Report for Newsletter (2x per year) (Mar-April and Sept-Oct)
3. Communicate / assist other officers in operation of chapter (Year-round – as needed)

Treasurer's Duties:

4. Maintain current "Official List" of members (Year-round – as needed)
5. Receive member dues / deposit checks (Mostly December-January, as needed throughout the year)
6. Send reimbursement expense checks (as needed)
7. Prepare year-end financial report (December or January)

Secretary's Duties:

8. Mail newsletters (2 times per year) (May-June and Nov-Dec)
9. Record meeting minutes at Fall Meeting (Fall)

Program Coordinator's Duties:

10. Organize min. 2 tours per year (Typically Spring and Fall)
11. Prepare tour flyers
12. Prepare tour handouts (optional) – printing costs paid by Treasurer
13. Prepare tour summaries for newsletter (delegate as needed)

Non-specified Duties (not necessarily done by a chapter officer):

14. Conference Coordinator (odd years, typically 1st Saturday in March)
15. Website (updates as needed – typically before and after events)
16. E-Mail Blasts (monthly, or as needed)

Other Tasks (unspecified):

17. Prepare set of labels for newsletter mailings – send to Secretary (2x per year)
18. Upload PDF version of newsletter (from Dennis Howe) to website – send E-mail Blast to members
19. Marketing / distribute Flyers / etc.
20. Maintenance of chapter records. Note: Archives currently with Secretary;
    President maintains a digital archive

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SNEC-SIA Treasurer's Report for 2017

In 2017, SNEC had 142 members, seven fewer than in 2016. At the start of the year, the balance in SNEC's account was $9,995.73. Income during the year amounted to $2,909.11, half of which ($1,470) was from member dues and donations, including dues from two new life members. The balance was registration fees from the well-attended 2017 NEC IA conference that SNEC hosted, and a small amount of interest from CDs.

Expenses totaled $1,923.58. Expense items, from largest to least, were for the 2017 NEC IA conference (room rental, lunch catering); the cost of publishing two newsletters; mailing newsletters, and printing announcements and mailing to members; SIA dues for officers; and treasurer's expenses.

The balance in the treasury at the end of the year was $10,981.26, an increase of $985.53. SNEC's funds are in a bank account and short term (year or less) CDs.

Sara E. Wermiel, Treasurer

NNEC-SIA President's Report

2017 was a very good year. The chapter was fortunate to have two very interesting tours available. Some new people have joined the chapter and almost everyone paid their dues. If you haven't paid yet for 2018, please send dues to Treasurer Rick Coughlin right away.

Treasurer's Report
Winter Conference: 52 people attended. We received $420 for registration:
Less $200 to PSU for hall rental.
Less $100 to Dennis Howe for printing and mailing conference flyers.
Less $49.50 to David Dunning for coffee, juice, donuts, etc.
This results in a total conference profit of $70.50 to the NNEC-SIA.

We currently have about $4,560 in the bank. So far this year 31 have paid annual dues.

Our roster lists 80 members, but many have been inactive (haven't paid annual dues) for several years. If I had to estimate, out of the 49 members that haven't paid this year, I'd say almost half of them have been inactive for several years.

The upcoming Spring Tour is described below in a separate article. The Fall Tour will be in upstate New York, exploring the Champlain Canals. This year is the bicentennial of the New York State canal system. The tour will be hosted by The Feeder Canal Alliance.

David Dunning
NNEC President

NNEC-SIA Spring 2018 Tour Plan

The spring tour will occur in June this year. That's because the Ely Copper Mine site is delayed by bureaucratic superfund cleanup planning. We will get there before it starts, though. The mine site is in Vershire, Vermont. That's about a half-hour northwest of White River Junction. The tour will be from 10:00 AM to noon, but plan to arrive by 09:30 AM. Lunch will be at Eaton's Sugar House, just off the I-89 Bethel Exit. They have an interesting museum and gift shop. After lunch, we will tour Green Mountain Feeds in Bethel. Grains come in to there by trucks and trains and they are mixed to farmers' specifications for their livestock.

The final tour will be of G.W. Plastics, also in Bethel. They make plastic parts, by the injection molding process, for other manufacturers. Tour details will be sent when the date is set.

David Dunning
NNEC President

Green Mountain Feeds, Bethel, VT, manufacturer of certified organic livestock feeds, is a process tour site planned for the NNEC 2018 Spring Tour in June.

GW Plastics, Bethel, VT, a producer of complex injection-molded thermoplastic, is a second process tour site planned for the June NNEC 2018 Spring Tour.

NNEC-SIA Fall 2017 Tour Report

This excursion included another process tour. Those present agreed that it was good to incorporate a modern factory in each tour and they didn't mind that it could (usually) only occur on a workday. On Friday, October 13th, about 25 people from both chapters met at Watts Water Technologies, Inc. in Franklin, NH. Watts makes fluid control valves in their 500-employee complex. Their valves range in size from the little ones in our home furnaces and hot water heaters to giant valves in underground utilities and refineries. The enclosed photographs show some of their casting and a view of a shop setting. During lunch at Watts, we asked questions about what we saw and learned more.

After lunch we explored Franklin Falls Dam. It is the largest flood control dam in New Hampshire. Franklin Falls is a dry dam, meaning that the river flows right through it without any backup. When a flood occurs, they close the massive gates to regulate the flow. This dam was built by the Army Corps of Engineers, and it was completed in 1943. The Corps operates this and several other dams in the Merrimack basin and closely coordinates their flow and backup. This dam helps protect cities and towns along the Merrimack River from Concord and Manchester, NH, to Lowell, Lawrence and Haverhill, MA. We went right into the gatehouse, where we looked down about 80 feet to see the water restricting gates at the bottom. A huge overhead crane is used to open and close the gates; it has a backup power unit to operate the crane if the central power goes down. The park ranger explained everything for us and had a diverse collection of old photos out for us to explore. They included pictures of the two towns that had to be relocated to accommodate the backup reservoir.

Then to the (much smaller!) Newfound Hydro Project in Bristol. This 1.5 MW generating station is owned by Eagle Creek Renewable Energy. Over many years it has had several owners. It started out just supplying Bristol. Most interesting to us was the great drop in this little river and the many mills that used to surround the falls there. The Newfound River is only 3.2 miles long, but it drops 327 feet, supplying power to many mills (back then). The river flows out of Newfound Lake and into the Pemigewasset River, which becomes the Merrimack when the Winnipesauke River joins it in Franklin. Unfortunately, all of the mills are gone now but some of these pictures show remnants and foundations.

Upstream, at the visitor park, the head of the Bristol Historical Society showed us pictures and maps and explained a lot about the old mills that used to be there. A little further upstream, we stopped at the upper dam site where the first power generation was.

The final stop (as the crowd dwindled) was Earth Inc., a private collection of restored old construction and farm equipment. Dick Hallberg, an old Yankee, politely and humbly answered our many questions as we hungrily drilled him for interesting details. See the photos.

David Dunning
NNEC President

A manufacturing floor at Watts Water Technologies, Inc. complex in Franklin, NH, a site visited during the NNEC 2017 Fall Tour.

Control valve castings awaiting finishing work seen during Fall 2017 NNEC process tour of Watts Water Technologies, Inc. in Franklin, NH.

The Gate House of the Franklin Falls Dam, New Hampshire's largest flood control dam, was visited during the Fall 2017 NNEC tour.

An antique elevator, part of the collection of restored old construction and farm equipment seen at Earth, Inc., Bristol, NH, during the Fall 2017 NNEC tour.

SNEC and NNEC Fall 2017 Tour and SNEC Annual Meeting

December 2, 2017 found a group of SIA members gathered to explore the historic Bolton, Massachusetts, limestone quarries and lime kiln along with the reconstructed Moses Wilder Blacksmith shop, also in Bolton. The outing was followed by the annual meeting of the Southern New England Chapter. The tour drew attendees from throughout New England, including members from Maine and Vermont.

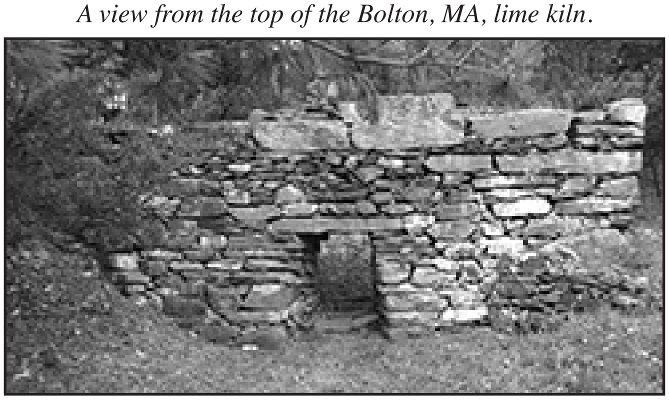
Our tour guide was Bob Roemer, who provided his invaluable expertise as well as familiarity with the history of the Bolton site. Bob (who is an engineer by training) and his wife Alice settled in Bolton in the mid-1970's on land adjacent to the site of the quarries and lime kiln. In 2004-05 they reconstructed the Moses Wilder Blacksmith Shop in its original location on their property adjacent to their house, the original shop having been relocated to Old Sturbridge Village in 1957.

The use of lime as a component of building materials such as mortar and plaster dates back thousands of years and is documented as a construction material used by the Romans and Egyptians. Limestone, a sedimentary rock, forms the basis of quicklime when stones are fired in a kiln. In 1736-1738 limestone was discovered in Bolton by the Whitcomb family on their farm. The Bolton Historical Commission records note in their Design Assessment that the quarry operation at Whitcomb is "said to be the first true industry in Bolton, is also believed to be the second lime-quarrying operation in New England." Quarrying in this Bolton location took place for more than 100 years. In his article dated July 28, 2017, Bob Roemer provides the following description of the process: "*The product produced by the kiln was 'quicklime,' a very caustic substance, which had to be hydrated (slacked) with water to be used. The water source to slake the lime was ...taken from a dedicated stone-lined well slightly to the southwest of the kiln door. Prior to the slaking process, the lime was stored and sold from a lime house, the foundation of which is still evident... .*"

The tour route, through what is now the 453-acre Rattlesnake Core Conservation Area, part of Bolton Conservation Trust lands, brought us past the two quarry sites: the older Hildreth Quarry and the larger Whitcomb Quarry. Use of the Whitcomb Quarry was started in the early 1800s and discontinued during the mid-1800s when it was flooded from a water source below the excavation. In addition, the tour stopped to see the remnants of a water-powered mill foundation and the reconstructed lime kiln. The lime kiln, reconstructed in the mid-1970s based upon historic documentation, is a stone structure about 30' in diameter that would have been top fed with lime stones. It has a lower level opening used to provide fire-pit access. The interior wall of the lime kiln is glazed over from repeated firings providing a seal on the walls of the kiln. Lime kilns such as this would have been

Bob Roemer demonstrates the forge during the SNEC and NNEC Fall 2017 Tour in the Moses Wilder Blacksmith Shop, which he and his wife Alice restored in 2004-05.

A view from the top of the Bolton, MA, lime kiln.



Front view of the Bolton, MA, lime kiln with its rectangular opening for removal of the quicklime product.

fueled by wood with the firing process converting limestone to lime powder over the course of three to four days.

As an extra bonus, Bob toured the group through the currently operational Blacksmith Shop he reconstructed on the site of the original shop. True to the design of the original shop, the forge is fired through twin bellows. To the delight of the group, Bob fired up the forge giving an impromptu demonstration and showing how quickly it heated to working temperature.

After the tour, the annual SNEC meeting was held in a barn that had been moved to the homestead from Connecticut to replace a barn that had burned in the 1940s. The group had a wonderful lunch in the upper story of the barn surrounded by mementos from Bob and Alice's travels overseas. The annual meeting concluded with confirmation of officers to serve next year and a reminder of the 31st New England Annual Conference to be held in Plymouth, New Hampshire, on March 3, 2018.

The Southern and Northern New England chapters are grateful for the time and energy Bob, Alice, and the officers put into organizing the educational and successful tour. In addition, SIA extends its gratitude to Bob Roemer for preserving important historical evidence of the lime industry in New England and reconstructing a working blacksmith shop, preserving what was a lost piece of the Bolton community.

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31st Annual Winter Conference

The winter conference took place on Saturday, March 3rd, 2018 at a new location on the campus of Plymouth State University. This year the conference was held at the Heritage Commons Room in the lower level of Samuel Read Hall. Everyone loved the new location and we had a large turnout of over 50 attendees. The following is a short description of the presentations at the conference.

Bob Frishman who owns a clock and watch repair business showed us many views of the large factories in New England which once produced watches and clocks. These factories used the "American system" of interchangeable parts and sophisticated machine tools to create these precision timepieces. Also, interior views of the factory workshops were shown and Bob brought a few clocks to show us.

Richard Candee gave a presentation on the life of J.H. Rollins Caughey (1851-1925) who drew atlas images and advertising cuts for many decades. During the 1880's he made an itinerant living in New England, with much of his work being in Portsmouth and nearby towns.

Pat Malone described has extensive research with Robert Gordon of the Back Bay mill dams of Boston. It's remarkable to see what Boston looked like a couple of centuries ago with its system of dams, sluices, basins, dikes, raceways and mills all designed to run on tidal power. No surface traces of this massive industrial project remain today.

Matt Kierstead talked about his work with the Elizabeth copper mine which ran off and on for almost 150 years (1809-1958) in Vermont. This mine is a Superfund site which required HAER documentation, archeological investigation, and will have interpretive panels for the public. Extensive clean-up work has been done at this site to lessen the contamination due to mining of both surface and groundwater runoff.

David Starbuck has recently returned from a trip to Egypt and encouraged all of us to visit there. The number of tourists is low right now, so this is a great time to go. It's possible to go into the pyramids and tombs that previously were off limits due to massive crowds. The pyramids were made with quarried stones and that's the relationship to industrial archeology.

Warren Huse finished off the afternoon with a presentation about the Laconia Car Company in Laconia, N.H. which existed from 1848 to 1928. The company produced thousands of railroad cars, both freight and passenger, and later on trolley cars for 80 years. There were many pictures of the factories in Laconia and the cars which came from them. A few of the trolley cars can be today seen at the Trolley Museum in Maine.

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CTDOT ARCHEOLOGICAL INVESTIGATIONS AT THE JACKSON STREET "DOG'S NEST" SITE

The Connecticut Department of Transportation recently completed archeological investigations at the site of a forgotten residential neighborhood between the Pan Am railyards and the Naugatuck River south of the I-84/Route 8 "Mixmaster" in the City of Waterbury. While this area today appears as a set of desolate and non-descript abandoned industrial pads tucked away in a difficult to access corner of the City, from the middle of the 19th to the early 20th century it was a vibrant neighborhood of first and second generation Irish and Italian immigrants. Closed in between Waterbury's coal-fired gasification plant, the New York and New England Railroad, and the Brown & Brothers Brass Rolling Mill, and with the industrial waste water coursing directly through their backyards in what was called the Manhan Canal, Jackson Street was not exactly prime real estate.

The Jackson Street community had a reputation for alcoholism and violence recognized as far away as Bridgeport, where the Bridgeport Herald in 1898 referred to it disparagingly as the "Dog's Nest" and called it "one of the worst [neighborhoods] to be found anywhere". Nevertheless, census records and other documents inform us that these people contributed to the 19th century growth and prosperity of Waterbury and the State of Connecticut as a whole by working at the local brass mills and as laborers at various other factories in the City. They became citizens, and in many cases landlords, proprietors and entrepreneurs in their own right, sometimes working out of their own homes. Within their community they often maintained the language of their country of origin, retaining and passing on key elements of their homeland lifeways that were eventually incorporated into what we consider to be "American" culture today.

Exposed house foundation at former number 23 Jackson Street, Waterbury. Photograph by Jason Nargiz.

Excavation on interior of foundation at former 23 Jackson Street. Photograph by Jason Nargiz.

Despite marginalization, ill-treatment and bigotry, and being left to live in unhealthy and even dangerous conditions, they survived and passed on their legacy. When the railroad and gas works expanded further into the neighborhood after 1904, however, the inhabitants of the Jackson Street "Dog's Nest" were increasingly driven out. By 1917 insurance maps show no homes remaining in this area. The residents presumably dispersed into the burgeoning suburbs and many may well have descendants residing in various parts of the City to this day.

Through the CTDOT archeological efforts, carried out by NV5 cultural resource consultants under the Section 106 Federal mandate to identify and evaluate impacts to historic properties, investigators aimed to learn even more about how Waterbury's 19th century immigrants survived in the face of adversity. Excavations revealed no fewer than eight building foundations still intact beneath an area that will soon become a temporary freeway bypass during renovations to the Route 8/I-84 interchange. The building foundations were constructed of varying quality, as expected, but all had cellars. The homes were of substantial size and probably contained multiple families. Several had running water and septic drainage systems. Artifactual remains so far have revealed the presence of horses for transportation, widespread use of medicinals, indications of tobacco and alcohol use, work boots and industrial implements, and occasional luxuries such as molded glass. Ceramic holy water fonts also attest to the neighborhood's Catholic heritage. Somewhat to the disappointment of the investigators, only one vertical shaft feature was discovered, possibly representing a 'dry well' placed for drainage purposes.

Though the area has now been backfilled in preparation for the upcoming construction, NV5 filmed a short documentary summarizing excavations at the site that should become available on the internet for public viewing in the near future.

Leonard Bianchi and Jean Howson
NV5-Connecticut, LLC

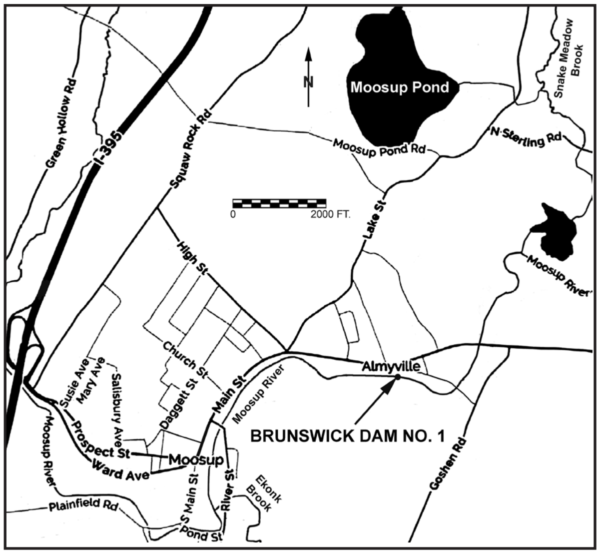
BRUNSWICK DAM NO. 1 ON THE MOOSUP RIVER

Readers of this newsletter are aware of 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. Archeological monitoring and documentary research at a recent Connecticut example contributed new information on timber cribwork construction. The project was completed for American Rivers, with assistance from the U.S. Department of Agriculture and the Connecticut Department of Energy and Environmental Protection (DEEP), and with permits required by the U.S. Army Corp of Engineers and DEEP. Based on assessment studies or other information, the Connecticut State Historic Preservation Office concluded the dam appeared eligible for the National Register of Historic Places, and initiated steps leading to documentation studies at each site.

Dam Location and Removal Project Objectives

The Moosup River is an approximately 24-mile-long tributary of the Quinebaug River with an 89-square-mile drainage area, with headwaters at Clark Pond in Foster, Rhode Island and a westerly course through Foster and Coventry, Rhode Island, and Sterling and Plainfield, Connecticut. Most of the river in Plainfield flows through deposits of till, glacial sand and gravel, or post-glacial alluvium overlying glacial sand and gravel. Where the post-glacial river flowed through or over till, there are steeper riverside slopes and associated drops in the river profile. In the Almyville section of Plainfield, the Brunswick Dam No. 1 site has a sand, gravel, and cobble riverbed, steep till deposits on the north bank, and a broader, lower floodplain of glacial ice-dammed pond sediment on the south bank flanked by steeper slopes 60-200 feet from the present river channel (Figures 1, 4).

Prior to construction of numerous mill dams beginning in the 18th century, the Moosup River hosted significant Atlantic salmon runs, and today supports a highly diverse group of fish species and is a regionally-important cold-water fish community. Migratory species include American eels, native sea lamprey, American Shad, and river herring, although their populations have been limited by dams on the Quinebaug and Moosup Rivers. Brunswick Dam No. 1 is



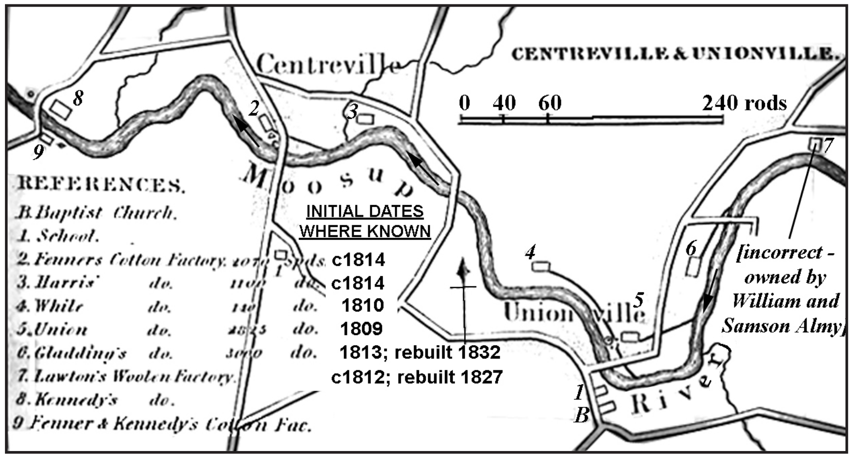


Figure 1 (Left). *Brunswick Dam No. 1 Location in Plainfield, Ct.*
Figure 2 (Above). *Moosup River Textile Mills c1833.*

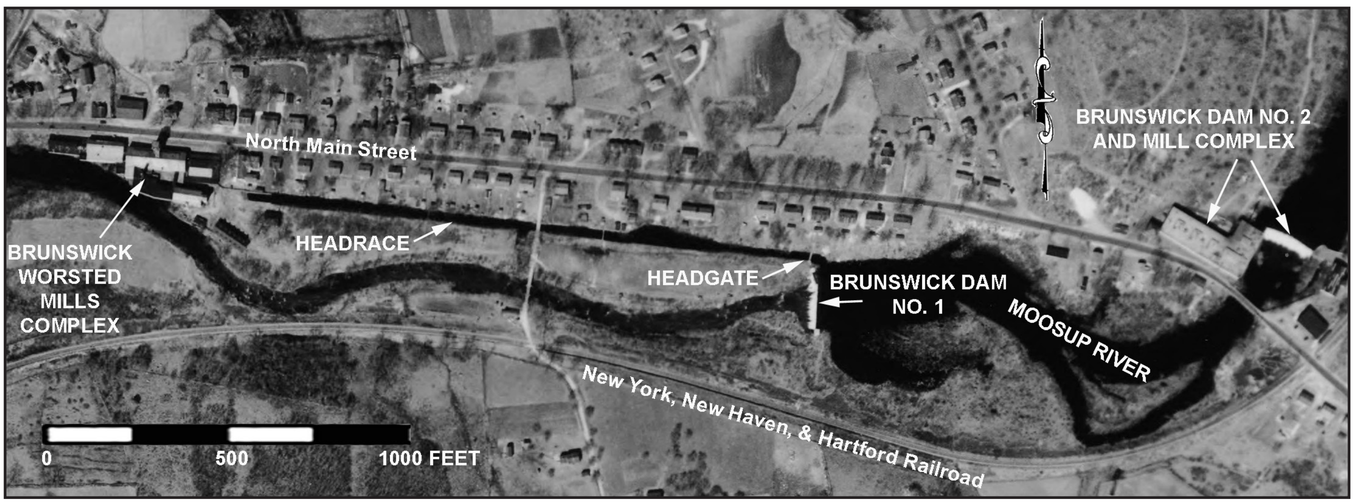


Figure 3. *1935 Brunswick Dams, Head Race, and Mill Complexes in Almyville.*

in the most upstream village section of the river, with only one impoundment further upstream in Plainfield. Resident populations of brook, brown and rainbow trout contribute to a short section of the river downstream that is designated a Trout Management Area for catch and release. Beginning in 2013, American Rivers and its partners began collaborating on the removal of Moosup River dams to improve fish habitat and passage conditions on the river and its tributaries, and to restore floodplain and channel conditions. The most downstream, partially-breached dam at Hale Factory Pond was removed in 2014, and remnants of the toppled Griswold Rubber Dam a short distance downstream of Brunswick Dam No. 1 were removed in 2015. These removals allow for natural flows and distribution of sediment and nutrients, creating a variety of deep pools and natural riffles throughout the drainage.

Dam Design, History, and Documentation Results

In 2017, Brunswick Dam No. 1 was a 125-foot-long overflow wier with a 10.5-foot-wide, 3-foot-high timber cribwork spillway, which recesses in the south abutment suggest was originally 5 feet high below flashboards approximately 1.8 feet high. Perpendicular arrays of 9- and 12-inch-diameter logs formed open cells approximately 4 feet square, with the larger logs arrayed in 15-to-20-foot lengths to form longitudinal members with varied joints including butt ends, tenons, and scarfed ends. Most transverse and longitudinal logs were generally joined together with 0.75-inch-diameter iron spikes. The lowermost transverse rows extended approximately 3 feet downstream of the spillway face to support an apron, which was probably covered with planks. The north abutment, not removed, is a 45-foot-long, approximately 9-foot-wide and 7-foot-high concrete structure, upstream of which some spillway logs extended into the riverbank. The south abutment built against the steep floodplain slope was approximately 80 feet long, 40-60 feet wide, and 12-16 feet high. As exposed during partial demolition, it consisted primarily of sand and gravel fill, with very large rubble fill in a protruding section adjacent to the spillway. The downstream side was originally retained by a 50-foot-long face of mixed-size unmortared rubble, which probably continued around the north face and probably had a return to the south to retain the very large rubble adjacent to the spillway. In the late 19th or early 20th century, reinforced-concrete walls were poured around the south abutment rubble faces, 2 feet thick on the east and west sides and 1.5 feet thick on the north

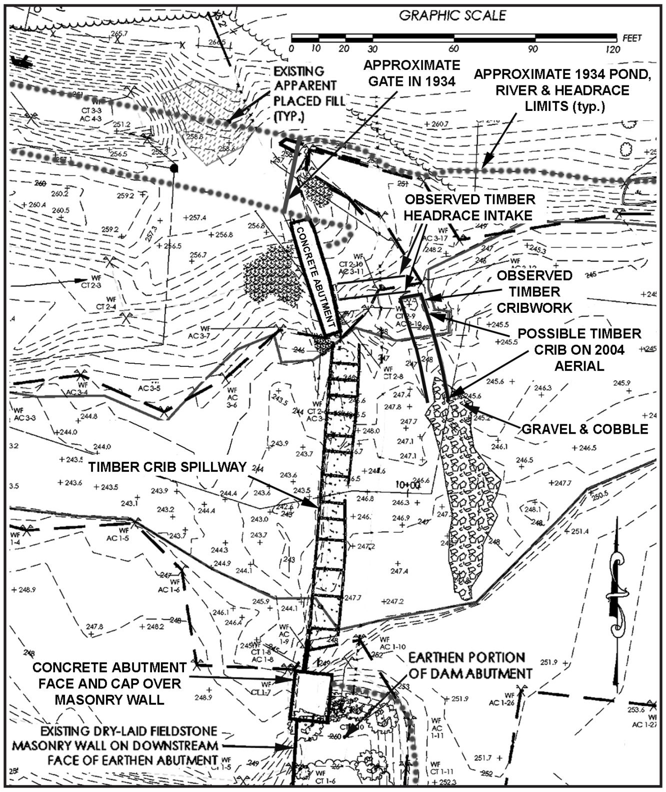


Figure 4. *2017 Plan of Dam and Pre-1827 Head Race and Cribwork.*

side, with a cap covering all three walls (Figures 4-6).

Most of the Quinebaug River became an important political boundary in the colonial period. Euroamerican settlement in Plainfield began in the early 1690s, on both sides of the Quinebaug in an area including present Plainfield and Canterbury. The area was recognized as an independent town in 1699, and divided by the Quinebaug, into the two towns in 1703. For over a century thereafter, Plainfield was an agricultural community supported by a number of saw, grist, and fulling mills, most of which were on the Moosup River or its tributaries, Snake Meadow Brook and Ekonk Brook. During the approximate century preceding textile manufacture in Plainfield, six saw, grist, or fulling mills operated at three or four natural drops on the Moosup, with four additional saw mills on Snake Meadow and Ekonk brooks. None of these mills were at the location of Brunswick Dam No. 1. Development of a privilege at this dam, where the river has a long gradual slope, required considerable headrace construction not attempted prior to larger industrial ventures.

In the early 19th century, the town was greatly affected by the growth of textile manufacturing, most of it on the Moosup River. Cotton and wool production, including home- or cottage-based operations, expanded rapidly during the War of 1812. Between approximately 1809 and 1814, at least six water-powered cotton or woolen mills opened on the Moosup River, some at earlier sawmill or gristmill privileges. Here and elsewhere in eastern Connecticut, there was significant involvement of capital and technology from Rhode Island, where the first American cotton factory opened in 1793. Unionville grew around the first textile mills on the river, cotton factories opened in 1809 and 1810 by the Plainfield Union Manufacturing Company [later known as the Union Manufacturing Company]. Downstream, Central Village or Centreville emerged from the c. 1814 establishment of two cotton mills by the Central Manufacturing Company. Just upstream of Unionville, the Moosup Manufacturing Company's 1813 cotton mill burned in 1815, and the site was not revived until the 1830s by Joseph Gladding (Figure 2).

The sixth textile mill on the Moosup River c. 1809-14 was the smallest and probably most difficult to develop, at a site not previously used for water power, and later associated with Brunswick Dam No. 1. Henry Dow, Sr. (1766-1825), a Plainfield resident who was one of the original partners of the Plainfield Union Manufacturing Company, acquired several acres upstream of the Moosup Manufacturing Company site in 1812, on which a very small carding mill was built by 1816 on the north bank of the river. There is very limited documentation on location or design of the mill and its dam. A small wooden race intake and a fragmentary cribwork dam structure documented during removal of Brunswick Dam No. 1, but not structurally associated with the latter dam, may represent the impoundment for the Dow carding mill. Located on the north side of the river, at a location without a short natural drop in river profile, the 8-foot-wide cribwork structure suggests a possible wing dam not intended for development of a millpond. Constructing a dam across the river here, at a point where higher riverbanks suitable for abutments are approximately 180 feet apart, may have been too large a project for builders of the small Dow carding mill. An 1817 deed refers to a ditch associated with the carding mill, likely leading some distance from the dam serving the mill. Development of sufficient head to run a mill here required construction of a ditch or flume along the less flood-prone north river bank. The 4.75-foot-wide wooden headrace intake, of vertical 10-by-1.5-inch boards nailed to 6-by-10-inch milled or hand-cut timbers, was documented in 2017 south of the larger, probably longer headrace used in association with Brunswick Dam No. 1. These features again suggest a different original waterpower design at this privilege, most likely with the shortest race needed to generate sufficient head for the small carding mill (Figures 4, 8).

Many of the small textile firms begun before or during the war did not survive the terrible depression in the industry that followed soon after the end of the conflict. Some of the most determined and capable mill owners got back on their feet in the 1820s with help from protective tariffs and technological improvements. Other textile operations, including several on the Moosup River, were sold during or shortly after the depression to new owners who succeeded and later expanded. Dow sold his carding mill property in 1818 to Darius P. Lawton (b. 1788) of Newport, Rhode Island, who with his brother George W. Lawton (b. 1792) appears to have operated the mill as first built for several years. Perhaps responding to improved market conditions, the Lawtons leased the Central Manufacturing Company operations c. 1820, and

Darius Lawton purchased an additional dam site in 1821, probably upstream at the site of an 18th-century sawmill and gristmill privilege. Enhanced pondage at this location would have served all the mill properties downstream which the Lawtons were managing.

The Lawton brothers did not succeed in their multiple ventures, and sold out in 1824. After several transactions in 1824 and 1826, the assets including the former Dow woolen mill, two mill privileges including the probable Dow dam, two houses, and 40 acres of land were held by Rhode Island Quaker William Almy (1761-1836). Almy was a very experienced textile manufacturer, who with his father-in-law Moses Brown had worked with Samuel Slater to establish the first successful American cotton factory in 1793. Almy made his nephew Samson Almy (1795-1876) a partner with one third of the former Dow-Lawton assets, and by 1827 they upgraded the mill privilege and completed a new, larger woolen mill along with perhaps eight tenement houses on North Main Street in Moosup. The mill, equipped with new machinery, was reported to be one of the largest in Connecticut at the time. To supply the new mill with sufficient waterpower, the Almys purchased additional land and flowage rights, replaced the earlier dam with a spillway across the entire river to impound a millpond of several acres, and excavated a headrace approximately 1700 feet long on the north bank to create a fall or head later reported as being 21 feet. Although there is no documentation of original dam or headrace design, the fact that the Almy mill site and/or headrace appear the same on a 1934 aerial photograph and on maps published in 1833 and 1869 strongly suggests that the headrace was the one built in 1826-27. These data indicate most of the present Brunswick Dam No. 1 was the impoundment completed at this time. The headgates for the race, the original north dam abutment -- probably of timber and stone -- and the original spillway height are not documented. The impoundment submerged the probable wing dam and wooden race intake used for the first generation of woolen mill operation. Anaerobic immersion of these features into the very late 20th or early 21st centuries likely accounts for their survival (Figures 3, 8).

Samson Almy inherited his uncle's local properties in 1836. Plainfield textile manufacturing was stimulated by completion of the Norwich & Worcester Railroad across the lower Moosup River in 1839-40, and by the 1854 completion of the Hartford, Providence, & Fishkill Railroad which ran along the south bank of the river opposite the Almy complex (eventually absorbed by the New York, New Haven & Hartford Railroad). Almy expanded the complex to include cotton as well as woolen production by the late 1840s. Published sources conflict on whether he converted the woolen mill to cotton production and then built a second mill for woolens, or added a second mill for cotton, but by 1850 nearly 150 people worked in the mills and the nearby area was known as the village of Almyville (Figure 3).

By 1850 if not earlier, Samson Almy was confronted by waterpower supply issues which affected most or all of the Moosup River textile manufacturers. Data on average streamflow conditions appear limited, but the river has a wide range of high- and low-flow conditions, and millpond or reservoir storage to supplement river flow became critical as textile mills expanded. By c. 1880, most or all of the mills supplemented waterpower with steam engines. There is insufficient data on Moosup River millponds, reservoirs, and mill equipment to reconstruct mill power operations accurately. However, comparison of estimated power require-

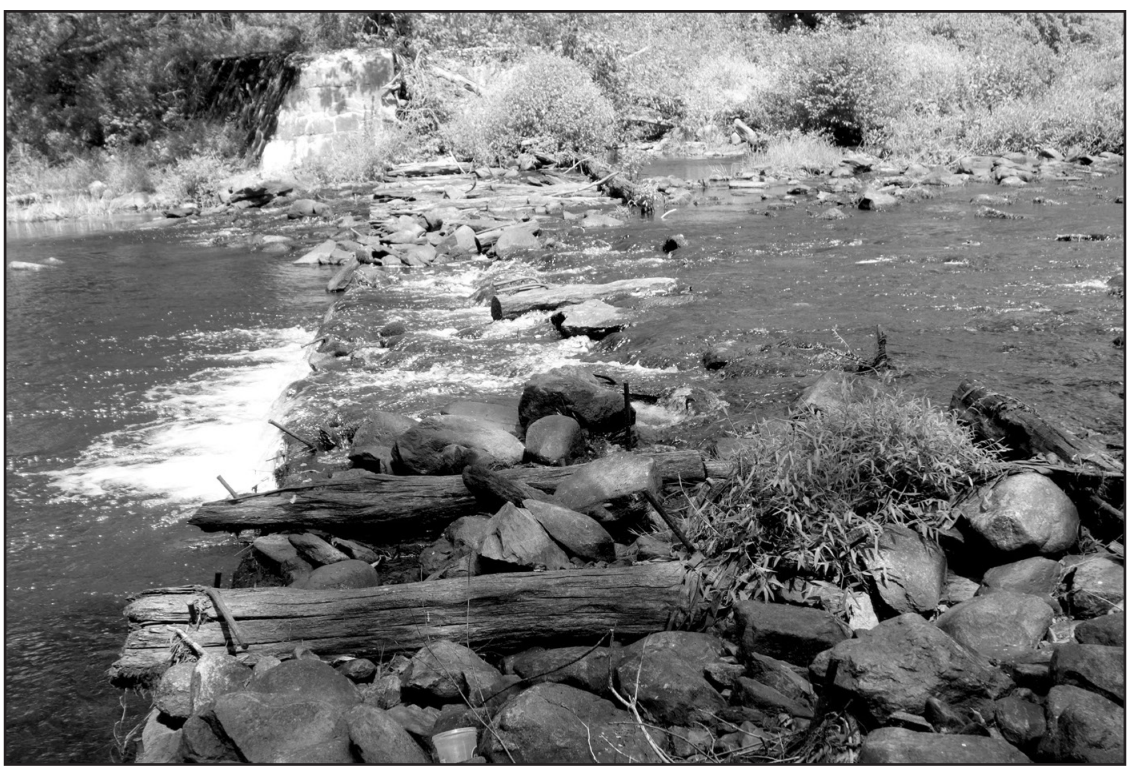


Figure 5. *2017 View North of Northern Two Thirds of Spillway and North Abutment; Spillway had Lost Approximately 2 Feet in Height.*

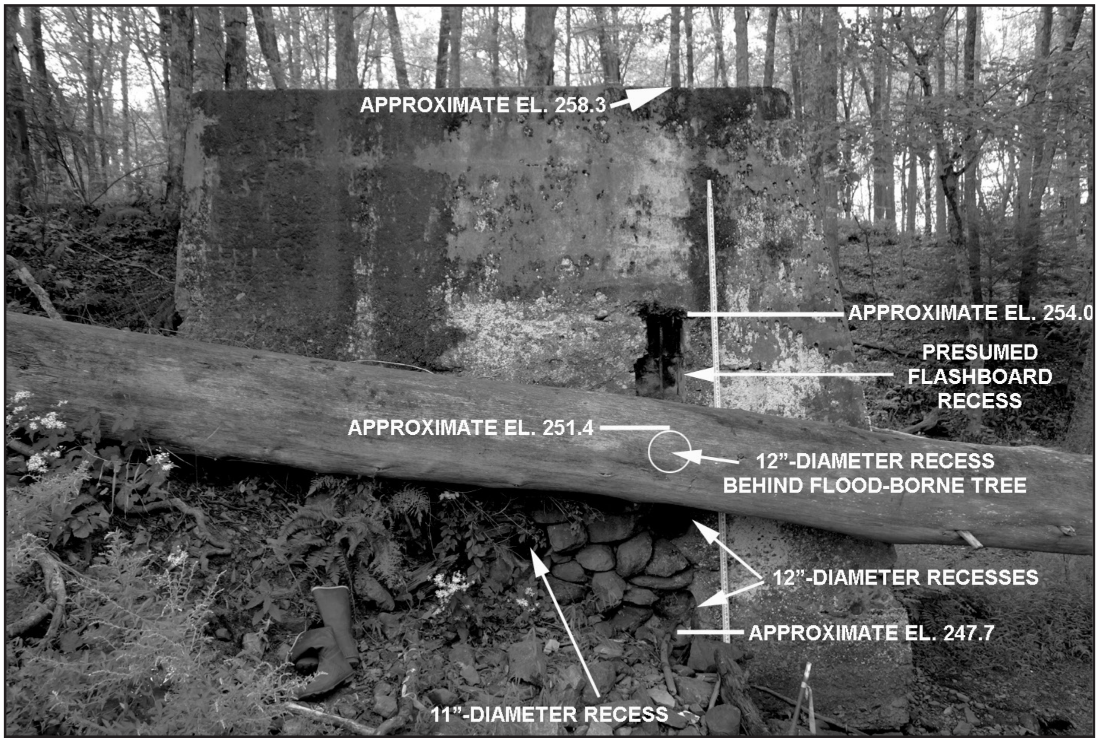


Figure 6. *View South of South Abutment North Face, With Annotations Showing Log and Flashboard Recesses, and Approximate Elevations in Feet NAVD 88.*

ments at the Almyville mills in 1870 and 1880 with recent calculations of average seasonal river flows at the dam indicate severe potential waterpower shortages for Samson Almy and his successors in all seasons other than early spring. Potential shortages were actually greater than calculated, due to power lost to friction in the long, open, rubble-walled headrace and in the mills' power transmission systems.

River flow, and storage available at the 1827 Almy millpond and at what was probably the small gristmill or sawmill dam a short distance upstream, was likely insufficient to provide all-season power to Samson Almy's two mills. In 1851, he purchased the property and water rights of the Union Manufacturing Company. The Union mills were well downstream of Almyville, but they had associated rights to Moosup Pond above Snake River Brook. The pond was the largest natural reservoir on the Moosup River, with a surface area of over 500 acres and a small dam at the outlet. Although located upriver of Almyville, the pond could not be drawn down at times needed for the Almy mills under other ownership, as suggested by a lack of any recorded arrangements otherwise in title data. It is not unlikely that the 1851 purchase was made primarily to control the pond. Samson Almy leased Union Manufacturing Company operations to others, but probably increased Moosup Pond storage in the late 1860s after buying more land near the pond outlet (Figures 1-2).

Samson Almy's woolen mill burned in 1875, and he went bankrupt shortly before his death in 1876. In the late 1870s, several overlapping groups of investors from Rhode Island purchased his assets. David L. Aldrich (1822-1889) and Edwin Milner (1842-1914) acquired the Almyville complex, the dam upstream of Brunswick Dam No. 1, and Moosup Pond, while Aldrich and Sanford G. Gray (1833-1885) purchased the Union Manufacturing Company mills with flowage rights from Moosup Pond. Aldrich and Milner built a large woolen mill and other structures to replace the plant burned in 1875, and immediately introduced steam engines to supplement waterpower in the greatly enlarged complex where cassimere fabric was produced. They also upgraded the privilege just upstream significantly, building an 18-foot-high curved gravity dam with a stepped face of stone blocks. The new dam, now known as Brunswick Dam No. 2, created a pond of approximately 100 acres. After Aldrich's death in 1889, Milner and his son John took over the properties as the Milner Company and built another woolen mill at the stone dam in 1891. The new Glens Falls Worsted Mill and the Almyville complex employed approximately 350 people, many of whom lived in expanded tenement housing.

The Milner operations suffered during the Panic of 1893, and after some periods of full employment, the company sold both mill complexes and associated water rights to the large American Woolen Company in 1899. Running the mills at both dams as the Moosup Mills, American Woolen converted the Glens Falls Mill to a woolen weaving and finishing plant, with yarn supplied by the complex at Almyville. Moosup Mills was sold to Brunswick Worsted Mills in 1933, which continued to make woolen products into the 1970s. The two dams took their present names from the Brunswick tenure. Since the 1970s, the properties associated with the two complexes and their dams have been divided. The Almyville mill complex remains largely intact and is used for a number of small businesses, but the Brunswick Dam No. 1 spillway deteriorated significantly by the early 21st century. The former Glens Falls Mills burned in 2000, and Brunswick Dam No. 2

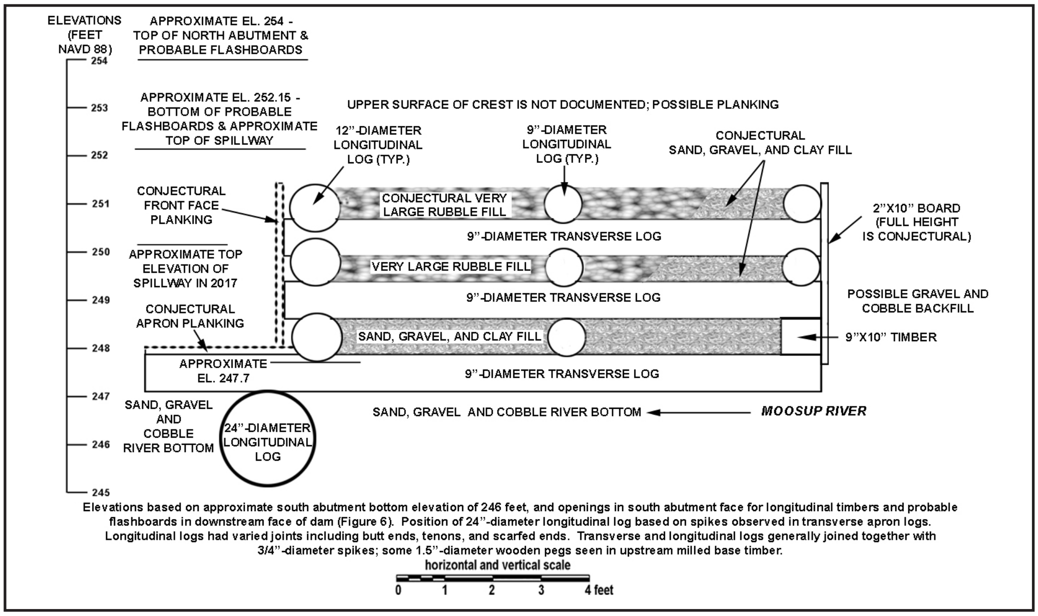


Figure 7. *Schematic Observed and Conjectured North-Facing Spillway Cross Section.*

has been proposed for hydropower development.

After the period of Samson Almy ownership, undocumented dam modifications included the concrete reconstruction of the abutments to enhance spillway protection, and the possible introduction of flashboards. The Moosup River is prone to floods, two of which in the 1880s threatened one or both of the Aldrich and Milner mill dams. A particularly severe freshet in 1886 washed out most or all of the bridges in Moosup and Almyville, and moved a stone cap most likely at Brunswick Dam No. 2.

Demolition in 2017 included removal of the spillway for its full height to the extent possible, and removal of the north end of the south abutment. Documentation included pre-demolition inspection and selective measurement, and observation during demolition. The latter activities were inhibited by the structure's long length, lack of a low-level outlet, and dense, coarse fill. These conditions precluded de-watering, and many spillway components could only be observed after their removal by an excavator. Although it was not possible to observe all removed components in situ, elevations of intact and some vanished features could be closely estimated based on an approximate elevations of recesses in the south abutment face for longitudinal timbers and probable flashboards in the downstream face of dam. No connections between the abutment and the spillway were visible, and none were documented during spillway removal since the abutment was not disturbed. Excavation of the spillway and the south abutment revealed some additional data (Figures 4, 7):

• The downstream spillway face was supported on one longitudinal row of 2-foot-diameter logs in a trench excavated into the riverbed, with the position of this footing estimated by the location of spikes in the apron area which appeared too large to have been used for planking. There were no other longitudinal supports for the lowermost transverse rows, which rested directly on the sand, gravel, and cobble riverbed. There was little apparent backfill immediately behind the spillway.

• The upstream longitudinal timber, milled or cut into a 9-by-10-inch section, was penetrated by spikes typical of the other spillway components as well as some 1.5-inch-diameter wooden pegs. The orientation of the spikes suggest they were used to attach the timber to the lowermost transverse logs, with the pegs perhaps used to set the next set of transverse logs atop the timber. The bottom of a row of 2-by-10-inch boards remained along the upstream face of the timber, and may have been used to face the entire upstream side of the spillway.

• Observed fill at the spillway bottom included clay, gravel, and cobbles below much coarser material including very large rubble.

• The south abutment concrete had a coarse aggregate of river cobbles, and was reinforced by 0.75- and .38-inch-diameter steel bars, some of them threaded, and with .88-inch-wide flat steel stock penetrated with .14-inch-diameter holes through which small bolts tied the flat stock to some of the round bars. The north abutment was not removed or damaged during the 2017 spillway removal, and the aggregate and any reinforcement was not documented.

Concrete in both abutments was most likely a Portland cement concrete intended for submerged conditions. Portland cement, developed in England beginning in the mid-18th century and patented there in 1824, was imported to the United States from England and Germany by the mid-19th century. It was first manufactured in the United States c. 1871-75. By the late 19th century, Portland cement concrete aggregate was commonly crushed stone rather than cobbles, suggesting at least the south abutment dated to the period of Aldrich and Milner ownership. Concrete reinforcement

Figure 8. *View South of Timber Head Race Intake (Center) and Cribwork Spllway (Left Background) Probably Associated with c1816 Impoundment for Carding Mill.*

systems were introduced in France by the late 1860s and patented in the United States beginning in 1878, but were highly variable in American structures through the 1920s. Use of scrap steel bars and cables, ranging in size up to street railway T-rail, was common in American dam concrete work during this period. It is possible some abutment reconstruction, which included recesses in the south abutment to hold the original upper three longitudinal log courses on the downstream spillway face, dates to the period of American Woolen Company ownership.

Significance of Documentation Findings

Although detailed documentation of all the Moosup River dams, water rights, and textile mills in Plainfield has not been assembled, the Moosup River mills operating c. 1809-1970 were a significant cluster of waterpowered industry in eastern Connecticut, and led to the development of at least four riverside villages in the town. Of all the privileges, it appears that the one associated with Brunswick Dam No. 1 required the most extensive construction to produce as much or more head, including one of the longest headraces in Connecticut. The apparent water supply problems at the Almyville mill complex were typical of most or all of the Plainfield mills on this river.

The timber-crib spillway at Brunswick Dam No. 1 was a common form of American dam construction from the 17th to early 20th centuries, usually built with abutments of similar material, or otherwise tied to river banks. The date(s) of Brunswick Dam No. 1 including the abutments indicate that, like many contemporary mill dams in the northeastern United States, this one was built by dam owners without professional engineering design. Overflow wiers 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. With open-cell cribwork typically built with logs, related problems include creating stable bases for the foundation members, and precluding erosion of fill material in the log cells which were typically less than 10 feet square. Although cribwork could be adapted to most river bottoms, tying the bottom-most logs to rock or creating trenches for them in softer riverbed materials appears to have been preferable to working in sand and gravel bottoms. Gravel and cobble fill was often preferred to finer materials to reduce fill erosion, but clay was sometimes used to provide more weight and water-tightness to the crib framing. On smaller streams with relatively low-head privileges, cribwork with triangular cross-sections may have been common, sometimes with timber aprons to resist undercutting. On larger streams, especially in sand and gravel bottoms, common designs included a vertical downstream face and a timber apron created by longer transverse bottom log courses than seen in the timber cells. Aprons, and sometimes downstream faces, were covered with planks. On longer spillways such as that at Brunswick Dam No. 1, cross sections for dam crests and upstream faces varied considerably. Crests typically ranged from 10-15 feet in width. Examples included sloped crests extending at the same angle to the riverbed, using smaller-diameter logs to create the angle. Many cribwork dam examples had vertical or nearly vertical upstream faces, with planking on the crest and sometimes on the upstream face, and extensive sloped coarse fill extending upstream. The backfill was sometimes capped with stone. To reduce costs, use of fitted timbers was typically minimized. Perpendicular log fittings were probably rarely notched, but instead flattened as needed. Some examples built prior to the early 19th century had only timber peg fasteners, but on larger structures iron spikes and pins were evidently used by at least the late 18th century.

Monitoring indicated at least four unusual features of spillway construction, relative to typical conditions summarized above:

• Both faces of the spillway were vertical, but there was little apparent upstream backfill.

• The cribwork cells forming the approximately 11.5-foot-wide spillway had three rows of longitudinal timbers, but the lowermost transverse logs which include the apron were only supported by one longitudinal row of 2-foot-diameter logs at the downstream face, joined end to end and excavated into the riverbed. The upstream components of the lowermost transverse logs rested directly on the sand, gravel, and cobble riverbed. Typically, longitudinal foundation logs supported the full width of lowermost transverse members in cribwork construction.

• Fill at the bottom of the spillway consisted of clay mixed with sand and gravel, below observed fill of very large rubble. There is no clay anywhere in the riverbed near this dam, and it is likely such material had to be hauled to the site from some distance.

• The lowermost upstream longitudinal foundation row consisted of large milled or hand-cut timbers, to which planks were attached which probably covered the full height of the upstream spillway face.

The extremely coarse substrate in the river may explain these variations from more common designs, as riverbed materials here increased costs of excavating foundation trenches, and were perhaps too erodible to serve as either fill or cohesive spillway backing. The addition of clay to spillway fill, and the vertical planking on the upstream face, may represent attempts to create a watertight structure. Although fill material observed above the lowest longitudinal course of logs consisted of very large rubble, it is possible that an undocumented vertical column of fine material including clay was deposited along the entire upstream interior of the cribwork (Figure 7).

The spillway design and extremely large south abutment of Brunswick Dam No. 1 made it an unusual application of a once-common method of vernacular dam construction, including examples of concrete reinforcement with probable scrap metal as seen elsewhere c. 1880-1930. The dam site was also significant for the survival of timber and stone components of a previous dam and headrace, probably used c. 1816-27, which remained intact under the millpond of the dam completed in 1827. The earlier components remain in place after removal of the spillway and part of the south abutment.

Principal References

Barrows, H. K.
1943 *Water Power Engineering*. 3rd edition. New York: McGraw-Hill Book Company, Inc.

Bayles, Richard M.
1889 *History of Windham County, Connecticut*. New York: W.W. Preston & Co.

Bickford, Christopher
1999 *Plainfield Transformed: Three Centuries of Life in a Connecticut Town*. Plainfield: Plainfield Historical Society.

Fairchild Aerial Survey
1934 Aerial survey of the State of Connecticut. Record Group 89, Records of the Department of Transportation. Connecticut State Archives. Available on World Wide Web at http://www.cslib.org/aerials/

Leslie, Robert W., comp.
1907 *Concrete Factories*. New York: Brucec & Banning.

Lester, William, Jr.
1833 Map of New London and Windham Counties in Connecticut.... New Haven: Daggett and Ely.

McKee, Harley J.
1973 *Introduction to Early American Masonry: Stone, Brick, Mortar, and Plaster*. National Trust for Historic Preservation and Columbia University.

Porter, Dwight
1885 The Region Tributary to Long Island Sound, in U.S. Bureau of the Census, Tenth Census of the United States, *Report on the Water Power of the United States, Part 1*. Washington: Government Printing Office.

Raber, Michael S.
2018 Historical and Archaeological Documentation, Brunswick Dam No. 1, State Dam 10109, Moosup River, Plainfield, Connecticut. Prepared for Princeton Hydro, LLC., South Glastonbury, CT: Raber Associates.

Wegmann, Edward
1918 *The Design and Construction of Dams*. 6th ed. New York: John Wiley and Sons.

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Documentation of a 19th-Century Connecticut Dam

Like other New England states, Connecticut is currently experiencing a loss of historic mill dams in order to promote the restoration of fish habitats. The Springborn Dam, in the Scitico section of Enfield, Connecticut, was recently removed by the Connecticut Department of Energy and Environmental Protection, assisted by funding from the U.S. Fish and Wildlife Service. As mitigation for the loss of the historic dam, the Connecticut State Historic Preservation Office requested state-level documentation of the dam and the adjacent mill complex.

The Springborn Dam was 15' high and spanned 76 feet between bedrock outcroppings on either side of the Scantic River. The dam was constructed of large cut stone blocks (the stone appears to be similar to the exposed bedrock nearby) laid in cement mortar. The stone blocks were arranged in regular courses, about 16" in height, with the length of the blocks varying but typically 2' to 3' long. The dam was slightly arched in shape, with the convex side facing upstream. The name of the dam reflects a long-time occupant of the adjacent industrial buildings, Springborn Laboratories.

The first definitive documentary evidence for the dam is the survey of waterpower that was undertaken as part of the 1880 federal census (Trowbridge 1885: 253), which described it as follows: "Privilege at Scitico, occupied by Spencer & Charter's 4-run grist-mill. The dam is of horseshoe shape, and is a fine cement-masonry structure, about 80 feet long, 20 feet wide at the base, and nearly as wide at the top. A fall of 12 feet is in use."

However, according to local historian John M. DeBell, the dam and gristmill considerably predated Samuel Spencer & Co., having been built in 1840 by the Enfield Shakers (DeBell 1977: 172). DeBell, who owned the property in the 1940s, may have been privy to information passed down from earlier owners of the dam, so his dating of the structure should be seriously considered. Industrial archeology studies of Shaker villages, notably Starbuck (2004), have documented extensive and complex water-power systems, and Shaker gristmills typically were large operations with multiple runs of stones (Nicoletta 1995: 103-104). A substantial stone dam like this would not be out of the question for the Shakers, who are known to have shared stone-working and engineering expertise among their various communities.

A deed from 1847, in which the Shakers conveyed the next property downstream to the Enfield Manufacturing Company, a producer of stockinets, reserved to themselves the right to install additional water wheels at the gristmill, suggesting that the Shakers were contemplating major improvements to the site. Was the Springborn Dam built as part of those improvements? The horseshoe shape and use of cement would be early even for 1847, but gravity-arch dams are known to have been built in Ontario and Vermont in the 1830s, and the early 19th-century use of natural hydraulic cement for canal stonework is well documented.

Downstream face of dam, camera facing east. Visible in the background is the 1913 plate-girder bridge carrying the New Haven Railroad's "Armory Branch" over the river.

Downstream face of dam, camera facing northeast.

Detail of remnants of crib structure, camera facing northeast.

Detail of tailrace outlet in mill building, camera facing east.

Removal of dam in progress, showing temporary channel under construction, camera facing southeast (Ox Blue photograph, August 2017).

Brick manufacturing building adjacent to the dam, built in the late 1880s for the Gordon Brothers shoddy mill.

In 1864, the Shakers conveyed the property to another Enfield miller, who then sold it two years later to Samuel, Leroy, and Wells Spencer (the Shakers helped finance the Spencers' acquisition of the property). According to statistics reported in the 1870 federal census of manufacturing, the Spencer gristmill was large for its day, with four runs of stone, 4 employees, and a capacity of 400 bushels a day. The overall capitalization, which probably also included the sawmill, was $16,000. About half the gristmill's production of flour and feed was for market, rather than custom grinding for local farmers. One intriguing detail reported by the census (both for 1870 and 1880) was that the mills were powered by five water wheels; were there separate wheels for each run of stones and the circular saw in the sawmill?

The Spencer milling operation lasted until 1885, the last three years under the ownership of one of their investors, Sylvester Charter, at which point the property was sold to three brothers, David, Andrew and George Gordon. The Gordon brothers, who operated the property as a shoddy mill for the rest of the 19th century and most of the first half of the 20th century, had a family tradition in textiles, their Scottish-immigrant father William Gordon having worked in the nearby Thompsonville mills as a carpet weaver and later as a foreman in the Enfield Manufacturing Company stockinet mill. The Gordons built the present two-story brick buildings on the site, installing rag pickers and carding machines and replacing the earlier five water wheels with two wheels. Textile-directory listings indicate that the Gordon shoddy mill was a modest enterprise that gradually expanded as time went on; from 2 pickers and 10 cards in 1888, the mill was expanded to 4 pickers and 24 cards in the 1890s. Around 1900, the mill also had equipment for carbonizing, a process by which mixed-content rags had the linen and cotton fibers removed by means of heat and chemical treatment, leaving just the wool; the processes and machinery used in shoddy production are described in detail in Kittredge (1906). The Gordon Brothers work force numbered 35 employees in the 1890s and around 45 for much of the early 20th-century. The mill does not seem to have been affected by the Great Depression; the highest level of employment, 75 workers, was recorded in 1939. Following World War II, the mill was sold and converted to an industrial-research laboratory serving the plastics industry.

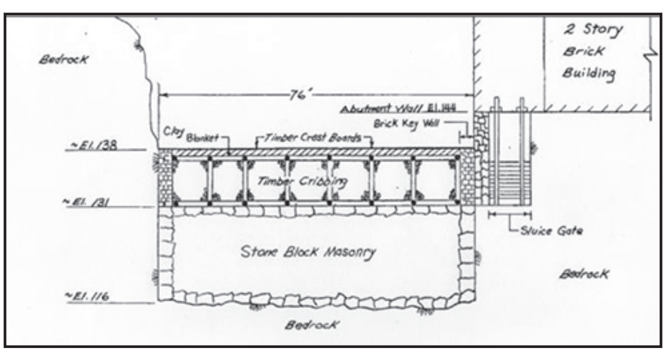
Shoddy—reprocessed wool fiber—is under-appreciated as a component of American textile production. In addition to providing batting for upholstery, mattress stuffing, and packing, shoddy mills produced carded fiber that could be spun into yarn and then woven into cloth. Reprocessed wool was particularly useful for blended cotton-wool fabrics in which the shorter length of the fibers was not much of a disadvantage. Reprocessed wool was definitely perceived as second-rate—hence the pejorative connotations of the word "shoddy" and the use of its opposite, "100% virgin wool," as an advertising slogan. Nevertheless, shoddy allowed the production of less expensive fabrics that were available to a wide market of people who were less able to afford fine woolens. It was estimated that in 1890, the production of shoddy in the United States was the equivalent of the wool from 29 million sheep, accounting for about 40% of all the raw wool used that year (U.S. Congress 1902: 12).

Advertisement for Gordon Brothers, from the 1910 edition of "Davison's Blue Book."

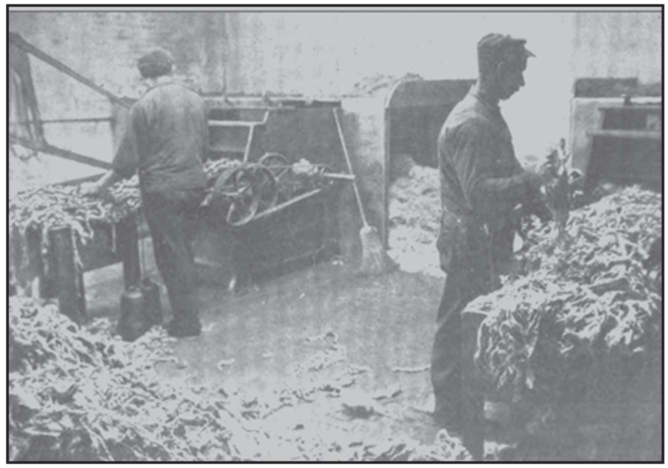
Shoddy mills were once ubiquitous throughout New England, particularly at smaller water-power sites. Shoddy production was well suited to small businesses because the basic processes of picking and carding could occur at virtually any scale. Advertising in national trade publications, Gordon Brothers marketed its products directly to textile mills, possibly including the many nearby woolen mills in Rockville and Stafford Springs, which could have made use of Gordon Brothers' output for their lower-end fabrics. An advertisement in Davison's Textile Blue Book for 1910 shows that Gordon Brothers not only sold shoddy but also served markets for intermediate products such as wool rags, wool waste, flocks (chopped wool waste), and wool extracts (the product of carbonizing).

The Springborn Dam was inspected in detail by the Army Corps of Engineers in November 1979. The inspection report, now almost 40 years old, preserves evidence of an important feature that had mostly disappeared by the time the present project began, a 7'-high timber crib structure that had been added to the original stone dam. The crib structure is believed to have been installed in the early 20th century, when the dam provided power for the Gordon Brothers shoddy mill, and repaired following damage during the Flood of 1955. The sluice gate that admitted water into the adjacent mill building was also no longer visible at the time of the state-level documentation. This series of inspection reports should always be consulted as part of the documentation for removal or rehabilitation projects involving historic dams.

The dam was photographed in April 2015 by Archaeological and Historical Services, Inc., with additional photographs taken in August 2017 as it was being dismantled.



Transverse section through the Springborn Dam as reported by the U.S. Corps of Engineers, 1980. The timber cribbing and sluice gate were no longer in place at the time of the state-level documentation (2017).



Interior of typical shoddy mill, showing workers feeding rag pickers (Kittredge 1906).

References

Davison Publishing Co.
1910 *Pocket Edition of "The Blue Book" Textile Directory.* New York, NY.

Kittredge, Henry G.
1906 "Shoddy, or the History of a Woolen Rag," *The Technology Quarterly and Proceedings of the Society of Arts* 19 (1906): 65-82.

Nicoletta, Julie
1995 *Architecture of the Shakers*. Woodstock, VT: Countryman Press.

Starbuck, David R.
2004 *Neither Plain Nor Simple: New Perspectives on the Canterbury Shakers*. Hanover NH: University Press of New England.

Trowbridge, W. P.
1885 *Reports on the Water-Power of the United States*. Washington, DC: Government Printing Office.

U.S. Census Office
1870 Census of Industry, manuscript schedules, microfilm, Connecticut State Library, Hartford, CT.

U.S. Army Corps of Engineers
1980 *Scitico Dam (CT 00529), Scantic River Basin, Scitico, Connecticut*. Phase I Inspection Report. Waltham, MA: Corps of Engineers, New England Division.

U.S. Congress
1902 "Shoddy vs. Pure Wool," hearing before the Ways and Means Committee, House of Representatives, 57th Congress, 1st Session, June 19, 1902. Washington, DC: Government Printing Office.

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