



Society for Industrial Archeology · New England Chapters

Volume 6 Number 1 1986

EDITORIAL

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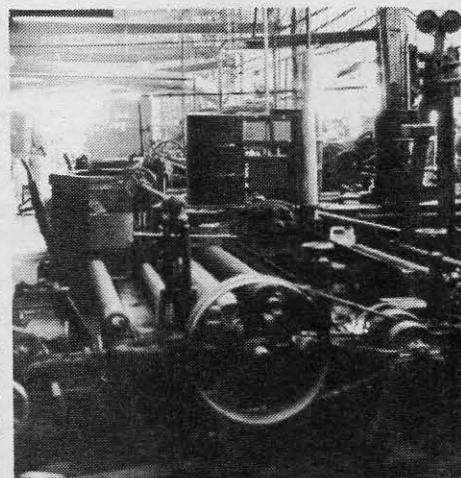
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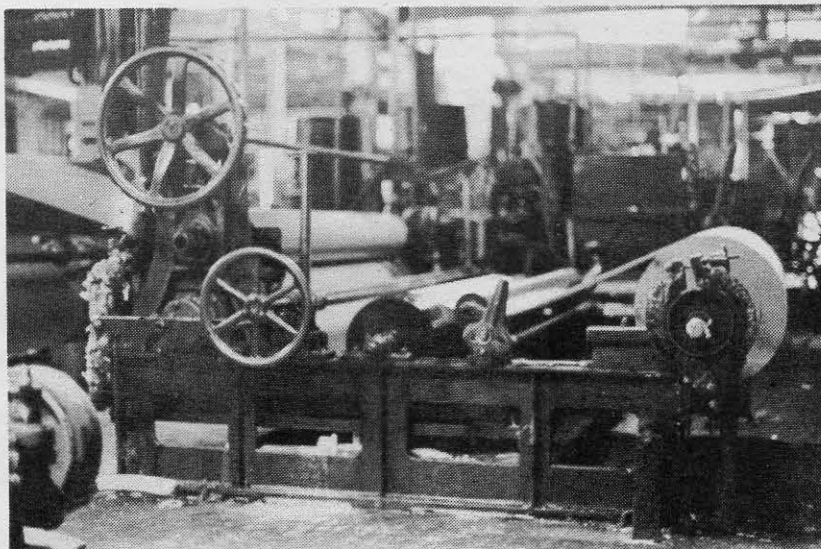
With this issue the Newsletter is now back on schedule, and hopefully it will continue to come out on schedule! To facilitate this process, please mark March 15 and September 15 on your calendar as the "due" dates for Newsletter copy. If I do not receive your writeups by those dates each year, then there is no guarantee that your news item will go into the spring or fall issue, respectively.

Also, you will notice that "Current Research" items are limited to just Massachusetts and Vermont. This Newsletter purports to represent SIA chapter members in six states! If you live or do research in one of those states not routinely reported on in this Newsletter, then please consider how to best transmit news items to me. Ideally, if one member in each state will volunteer to coordinate sending copy for that state to me, then this Newsletter will ultimately come to reflect the geographical and topical breadth of our membership.

David Starbuck
Rensselaer Polytechnic Institute



Paper-making machinery at the Robertson Paper Company, Bellows Falls Island, Vermont. The Island has been the site of intensive archeological study by U. Mass Archaeological Research Services. See Vermont Current Research, Page 5.



SNEC PRESIDENT'S REPORT

The Southern New England Chapter is looking forward to a joint Spring Meeting and Tour with their Northern SIA neighbors in Portsmouth, NH on Saturday, May 17th. Many thanks to Dennis Howe, Faith Harrington and Woody Openo for putting this meeting together.

The site for SNEC's Fall Meeting has yet to be chosen, although several suggestions have been put forward. There will be a meeting, however, at a decent interval after the National SIA Fall Tour.

SNEC will host the National SIA Fall Tour from October 3-5, 1986, based in Mystic, CT. The stalwart tour organizers are primarily Chapter members on the staffs of the Connecticut Historical Commission, the Rhode Island Department of Environmental Management, and Slater Mill Historic Site. The Tour's general theme will be 350 years of maritime New England history and will feature maritime sites in Connecticut, and both maritime and industrial sites in Rhode Island. Among these will be the just-opened Nautilus Museum in Groton, CT. The museum, dedicated to the history of the submarine, is also the permanent berth of the Nautilus, the first nuclear-powered submarine. We will be able to explore much of the Nautilus, which was built by the Electric Boat Company, including military hardware, the navigation room, and living quarters for 100 men. The Nautilus Museum was designed by, who else, but Cambridge Seven Associates, creative designers of museums all over the country.

In Rhode Island, the Fall Tour itinerary will include Beaver Tail Lighthouse and a drive-through of such textile villages as Peace Dale and White Rock. The complete flyer for the Fall Tour, with registration material, will be available in Cleveland in June at the Annual SIA Conference.

On a less cheerful note, membership has continued to be a critical issue for the Chapter. The roster of paid-up SNEC members had declined over time to a total of 75 by November 1985. In an effort to reawaken lapsed members and recruit new ones, the new SNEC brochure has been completed by Chuck Parrot, Peter Stott, and Jeff Howry, and is in production. If all goes well, it will be available at the Spring Meeting. Come and take lots away for distribution.

A promotional mailing of SNEC brochures to the memberships of IA- and preservation-related organizations is also planned. And in an effort to systemize membership renewal, and corral lost members, a renewal notice with a deadline will be sent out to members with the SNEC Fall Meeting notice each year. Members not renewing by December 31st will (after a stated grace period and perhaps a follow-up notice) be dropped (alas) from the chapter mailing list. The membership mailing list is currently being updated, and a willing word processor would be welcome. Suggestions for expanding SNEC membership will also be welcome at the Spring Meeting.

Anne Booth
Charlestown, MA

NNEC PRESIDENT'S REPORT

Since the Fall Meeting, the Northern New England Chapter's membership has been slowly increasing. An encouraging sign. But, not to beat an old subject to death, it is still important to stress that more members is a priority for the Chapter. Requests for Chapter assistance in recording and restoring industrial sites are piling up. Without adequate brainpower and body power that sufficient membership provides, we can not hope to address them all with any degree of intensity. We ask that everyone make the effort to sign up at least one new member during the year.

Secretary/Treasurer Vic Rolando reports that the bank account is in good shape, and that he has completed computerizing the Chapter membership and mailing list on his own PC. He informs me that he has the ability to sort the list for a number of purposes, including individual member's particular interests. He has included a "I am interested in" line on the latest dues billing. Please provide him with the information. It will help us contact members for projects that are best suited to them.

We thank Faith Harrington and Woody Openo for the very fine work they have done in setting up the Spring Meeting and Tour in Portsmouth, NH on May 17th. Early registrations indicate a good turn out. We're looking for volunteers to make Fall Meeting and Tour arrangements in the western end of the Chapter's three-state area. Anyone interested?

Thanks also are due to David Starbuck for the excellent work he has been doing as Newsletter Editor. It is no easy job to produce the quality, timely publication that it is.

Don't forget the SIA's 15th Annual Conference in Cleveland, June 12-15. You can be sure, like past Conferences, it is well worth the time to attend. The tours alone will provide you with sights you would never be able to see without attending. See you there!

Dennis Howe
Concord, NH

NE SIA MEMBERS SPREAD INDUSTRIAL ARCHEOLOGY ABROAD!

On March 13-14 of this year, SNEC-SIA members Patrick Malone and Matthew Roth attended a round table in Paris, France at the specific invitation of the Ministry of Culture. They were asked to talk about methods and objectives of preparing inventories of the industrial heritage, and this was an international gathering of individuals who had experience in inventory procedures. They discussed state-wide broad-based inventories and also small-scale inventories (e.g., of a particular city). They talked about HAER procedures, about work done in the U.S. and about the possibilities of computer technology and videodiscs. (Incidentally, they had a great time, and saw a lot of IA sites and technological museums in Paris, and enjoyed the food too!) Malone and Roth were invited as the only U.S. representatives to the conference and feel that their papers were very well received. Their papers will be published by the Ministry of Culture as part of a volume of proceedings of the meeting.

Last August (1985), Pat Malone also had a first-hand look at industrial sites in China when he was invited to give a series of lectures at the Northeast University of Technology in Shenyang, the People's Republic of China. Among the topics he lectured on were industrial archeology and the history of American technology. Among the spectacular IA sites he visited were the Great Wall of China, the Marco Polo Bridge, the Grand Canal, and the great steel mill in Anshon. As Pat notes, China has a wealth of IA — including a great deal

of early European technology — but this is now threatened by a rush toward modernization of industry. Consequently Pat is now trying to develop a cooperative program between American and Chinese industrial archeologists. On the same 2-week trip, Pat also spent a week in Kyoto, Japan studying the textile industry.

MEETINGS AND ANNOUNCEMENTS

NNEC/SNEC SPRING MEETING IN PORTSMOUTH, NH SATURDAY, MAY 17

The Northern New England Chapter of the SIA will host a combined meeting of the Northern and Southern Chapters of the Society for Industrial Archeology. Held in Portsmouth, New Hampshire, the day's events will include an afternoon industrial-sites boat tour of Portsmouth Harbor.

Schedule

9:00 - 10:00 am

Registration, coffee and donuts at the Strawberry Banke Orientation Center

10:00 - 11:00 am

Business Meetings of the Northern and Southern New England Chapters

11:30 am - 1:00 pm

Lunch on your own in Portsmouth

1:00 - 3:00 pm

Harbor tour aboard the MV Heritage, departing from the Oar House Dock, 65 Ceres Street, Portsmouth

Narrated by: Richard Candee

Boston University
Raymond Brighton
Author and Publisher
James Dolph
Navy Yard Historian
Walter Dunfey
Harbor Historian

3:00 - 5:00 pm

Auto tour to Cocheco Mills site in Dover, NH (option)

Led by: Woodard Openo

Auto tour to Atlantic Heights, Portsmouth (option)

Led by: Richard Candee

You must preregister for the boat tour. Space is limited to 49 persons. To preregister, you must send a check

for \$7.00 per person by May 10 (or earlier: if overbooked, the earliest registrants will be honored), payable to NNEC-SIA, to: Dennis Howe
c/o The Printed Word, Inc.
24 Pleasant Street
Concord, New Hampshire 03301

SOCIETY FOR THE PRESERVATION OF OLD MILLS

The SPOOM will hold its Spring Meeting in Bernardston, Massachusetts on May 17. They will be visiting the Bernardston Grain Mill, a 1903 hydro station, an 1880 machine shop, and a water-powered sawmill. For further information, contact Al Daloz, Hancock, New Hampshire 03449.

SIA ANNUAL MEETING

The Society for Industrial Archeology will hold its 14th Annual Conference and Tour in Cleveland, Ohio June 12 through 15. If any New England Chapters members have not received the announcement and preregistration material in the mail and desire more information, contact either SNEC President Anne Booth or NNEC President Dennis Howe.

SIA FALL TOUR

The SIA Fall Tour will be hosted by the Southern New England Chapter on October 3-5, 1986. For more information see SNEC President's Report elsewhere in this issue.

THE AMERICAN PRECISION MUSEUM

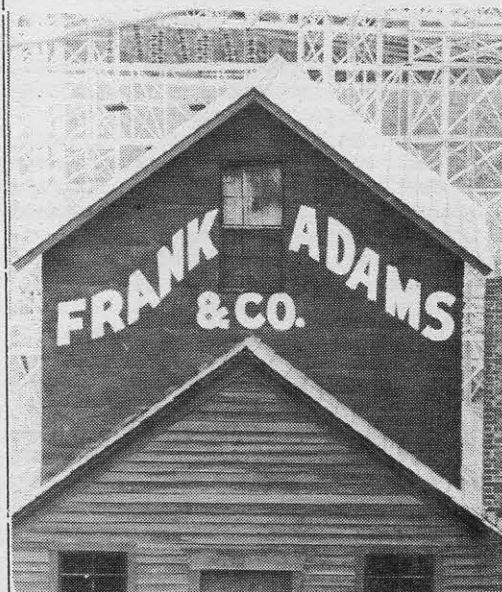
The American Precision Museum's open season will commence on May 24 and will continue to November 1. At that time, the Museum becomes quite cold and has to close for the season. The Museum office remains open at another location. We have plans developed for many improvements, including heat for the front wing of the building housing offices, library, and some exhibit space. We presently have over \$23,000.00 toward this undertaking and will have another \$11,000.00 as soon as we are able to match it. We hope this match may be achieved this year so that work can commence when we close for the season.

Collections of both historic objects related to the history of tools and machinery and of related library materials continue to grow. Our quarterly, Tools & Technology, is finding wider acceptance by libraries of universities and historical societies. General membership also continues to grow.

Our hours are 9-5 on weekdays and 10-4 weekends and holidays. The Museum is located in Windsor, Vermont.

1986 LOWELL CONFERENCE ON INDUSTRIAL HISTORY

The theme of the 1986 Lowell Conference on Industrial History is "Politics and Industrialization". The meeting will be held in Lowell, Massachusetts on October 30 - November 1, 1986. Sponsors of this event include the University of Lowell, the Lowell Historic Preservation Commission, Lowell National Historical Park, the Museum of American Textile History, and Boston University. Inquiries should be directed to Lowell Conference on Industrial History, Lowell National Historical Park, 169 Merrimack St., Lowell, MA 01852; (617) 459-1025.



Ca. 1831 Adams Grist Mill, the present site of the Bellows Falls (VT) Historical Society, has received a preservation grant for protection and repair. See Page 7.

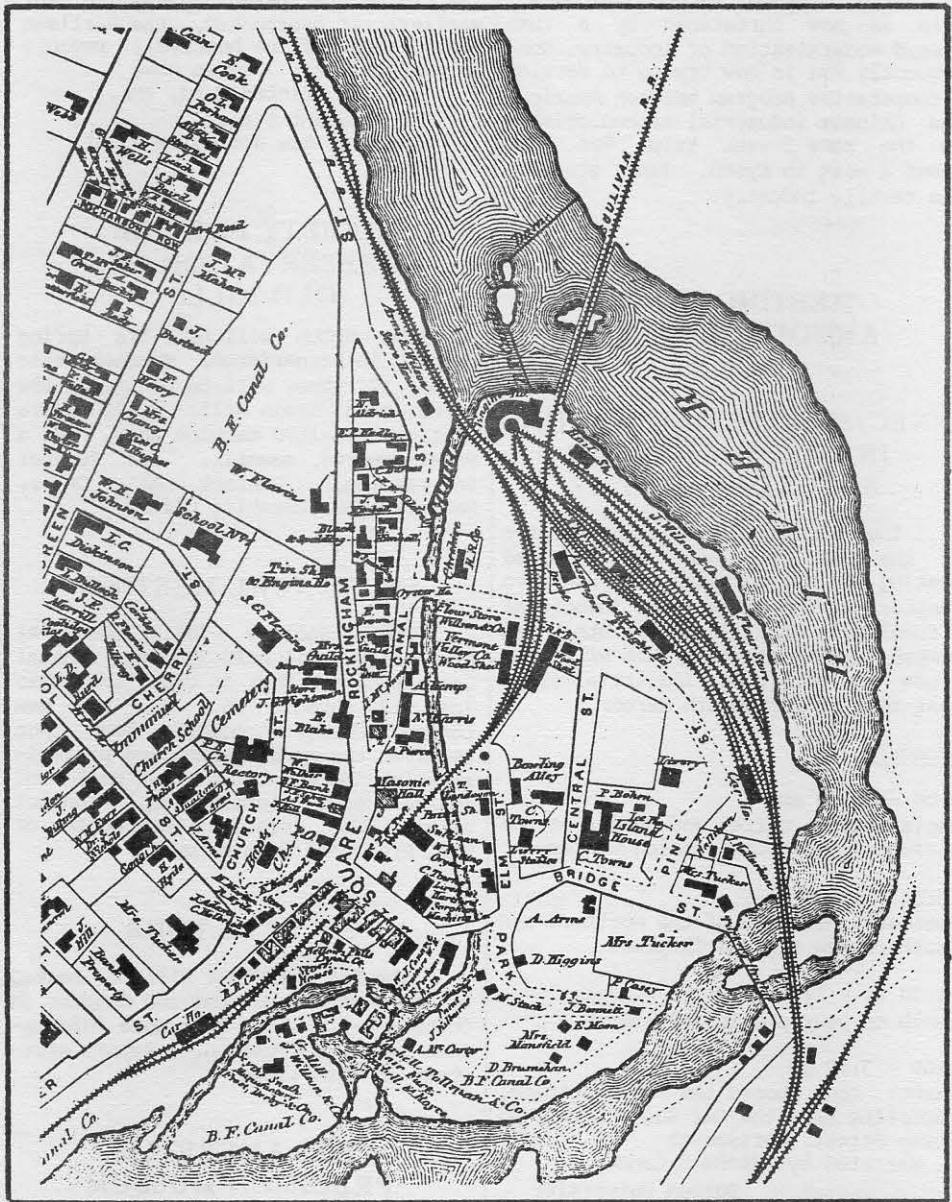
CURRENT RESEARCH

Massachusetts

BOOTT MILL IN LOWELL

As part of the first year of a five-year cooperative agreement between the North Atlantic Region of the National Park Service and the Center for Archaeological Studies at Boston University, preliminary excavations were conducted on the site of two of the Boott Mill's boarding houses in Lowell, Massachusetts. The excavations are part of a larger, interdisciplinary study of the Boott Mill operation and the lives of the Boott Mill workers. The project is being supervised by Mary C. Beaudry (Boston University), Ricardo J. Elia (Boston University) and Stephen A. Mrozowski (NPS). Fieldwork was supervised by Donald Jones (Boston University). Documentary research is focusing on a variety of topics including a study of Lowell's utility system by Edward Bell, a graduate assistant at B.U. Kathleen Bond (Boston University) is conducting an oral history project as part of the study. Gregory Clancey, a graduate student in the American Studies Program at B.U., is examining the architectural development of the Boott Mills, Boott Mill Boarding Houses and Boott Mill Agents House under the supervision of Richard Candee (Boston University). Gerald Kelso (NPS) and Mrozowski will be conducting an analysis of pollen and plant macrofossils. Karl J. Reinhard of Texas A & M University will be responsible for the analysis of parasite ova.

Excavations at the boarding houses exposed a rich and well-preserved archeological record only a few inches below the surface of a parking lot. Remains of a well were discovered, along with several elements of the boarding house's drainage system. Several foundation walls and yard areas were also uncovered during the excavation. Documentary research carried out to date has provided information relating to the operation of the boarding houses in rich detail. Boarding house keepers, for example, were responsible for furniture and linen as well as the purchase and preparation of most of the food. Documentary research has also uncovered some records of purchases made



Plan of Bellows Falls, VT, ca. 1869 (Beers 1869). See Page 5.

by the individual keepers from local grocers. We have also discovered that keepers often kept livestock in the boarding house yards. Augmenting this documentary research will be a series of interdisciplinary analyses that will focus on the use of yard space and the overall quality of life for the mill workers. Pollen and macrofossil analysis will attempt to answer questions concerning the diet of the mill workers including the use of wild plants. This work will also try to identify specific plant communities that would have been fostered by the

evolving urban/industrial landscape. Analysis of parasite ova should provide some idea of the health status of the workers. Through interdisciplinary research we hope to understand the processes that contributed to the evolution of the urban/industrial landscape of Lowell and that shaped the daily lives of the Boott Mill workers. Many of these workers were women, and therefore it may also be possible to delve into the question of gender and how it can be studied archeologically.

EXCAVATION FROM THE GROUND UP

Old Sturbridge Village is in the third year of an archeological and documentary investigation of the early 19th century agricultural and crafts neighborhoods known as "Four Corners" in Barre, Massachusetts. Numerous mills, shops and agricultural service crafts facilities as well as farmsteads have been identified, cleared and mapped. Utilizing property records, old maps and a full complement of public and personal documents in tandem with on-site survey and excavation, the history of this rural neighborhood, which flourished for a couple of generations before being eclipsed by developments in surrounding industrial and town centers, is being pieced together and serially depicted. Central to the study is the life and work of farmer-blacksmith Emerson Bixby whose house still stands, scarcely altered since the early 19th century, and whose shop and other functional features remain as well-preserved archeological sub-sites. John Worrell has been directing the project, with David Simmons directing the archeology and Myron Stachiw the documentary and architectural research. Some fifteen standing domestic structures in the vicinity dating from the late 18th to the beginning of the 19th century are also currently being systematically analyzed to determine techniques and sequences of fabrication, stylistic appointments and alterations and other characteristics. A recording system is being devised to allow integration of the architectural and archeological data. The final act in this research is the initial one in the establishment of a new exhibit at Old Sturbridge Village. As the house of Emerson Bixby and his family is partially dismantled for relocation and restoration in the museum, the archeological teams will merge the recording of the "excavation" both above and in the ground. This is intended to contribute to the collaborative understanding by archeologists, architectural historians and social historians that all components of a site, structural and otherwise, are an integrated functional unit.

John Worrell
Old Sturbridge Village

UPPER QUINEBAUG RIVER WATERSHED

Old Sturbridge Village is undertaking a comprehensive survey of historic low technology water power exploitation in the upper Quinebaug River watershed in Massachusetts. This research is part of a larger project, "Traditional and Transformational: Rural Economic Life in Central New England, 1790-1850", partially funded by the National Endowment for the Humanities. Myron Stachiw and John Worrell are heading the research which is utilizing primary source documents, data from government agencies, and physical inspection and mapping of sites. The objective is to delineate the development of water power sites along the Quinebaug headwaters from earliest settlement (generally around the second quarter of the 18th century) through the period of industrial development in the first half of the 19th century. The focus is on those traditional water power-assisted crafts that formed a necessary component of the agricultural service network; how they changed over time; and what effect the emergent textile industry had on water privileges, technological skills, and the economic fabric of the neighborhoods served by the proto-industrial mills.

John Worrell
Old Sturbridge Village

OSV FIELD SCHOOL

The eighth annual Old Sturbridge Village Field School in Historical Archaeology will be conducted from June 23 to August 8 at Old Sturbridge Village and at the home and workplace of Emerson Bixby, an early-19th-century blacksmith and farmer of Barre, Massachusetts.

Following a week of intensive orientation to the historical and material culture of early-19th-century rural New England, students will spend six weeks learning the methods and techniques of field archeology, working at the Bixby site. The Field School will involve students in excavation, survey, measured drawing, conservation and other field, lab and recording activities. Lectures, workshops, and informal seminars will complement the work in field and lab.

This is the third season of a three-year project to develop new

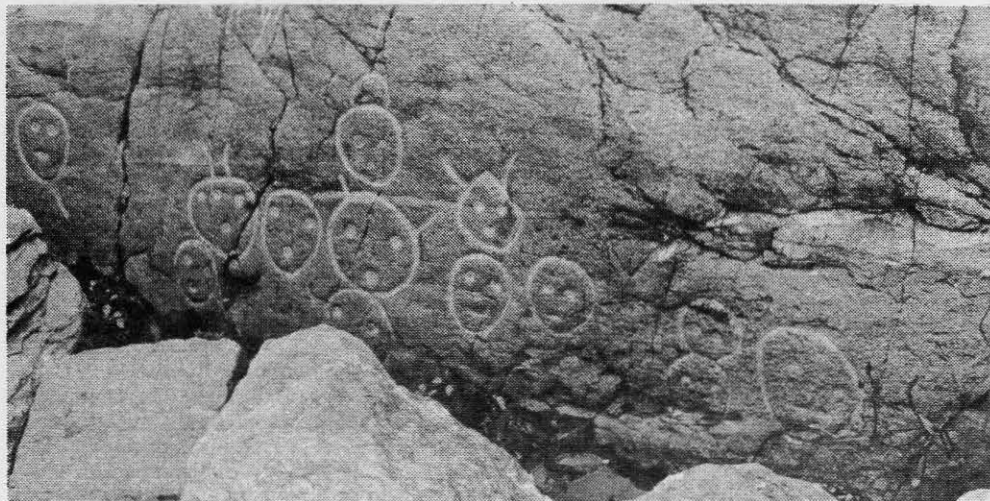
historical information for exhibits and interpretation at Old Sturbridge Village. The focus of the 1986 fieldwork will be selected areas near the house, several outbuilding sites on the homelot, and the remains of Bixby's nearby blacksmith shop.

The Field School is designed as the equivalent of two full courses at either the graduate or undergraduate level. Eight semester hours of credit are available through Clark University in Worcester, Mass. for an additional fee of \$100. The basic program fee of \$500 covers all materials and fees and includes complimentary admission to Old Sturbridge Village during the program. Housing at Clark during the Field School is also available for an additional fee. Participation is limited to 20 students. Applications will be processed as received. For further information and application forms, please contact: David Simmons, Archaeology Field School, Old Sturbridge Village, Sturbridge, Mass. 01566. Telephone (617) 347-3362.

Vermont

BELLOWS FALLS ISLAND

Bellows Falls Island, Rockingham, Vermont, noted for its prehistoric petroglyphs carved in bedrock on the banks of the Connecticut River, has recently been the site of an intensive archeological research study conducted by the University of Massachusetts Archaeological Research Services. This research study focused on the interior portions of the Island, excluding all areas and structures that are presently listed on the National Register of Historic Places. The Island was evaluated for its architectural, historic and prehistoric significance, and its eligibility for inclusion in the National Register. The evaluation included all standing structures, historic features, and a subsurface evaluation to determine the potential existence of prehistoric sites on the Island, and to assess their integrity. Excavation of 26 shovel test pits and two backhoe trenches at the site of the c. 1850 hotel called the "Island House" revealed extensive historical deposits that date from the late eighteenth century to the present, and a prehistoric workshop or habitation site. Field observations proved that there are numerous areas that have not been extensively disturbed historically.



Bellows Falls prehistoric petroglyphs.

The Island's historical significance derives from its physical location and available natural resources. Indian and colonial settlement patterns focused on the area's fishing and transportation networks. The Island was the first site of a bridge across the Connecticut River, and the first canal in the country which defined the project area as an Island. Turnpikes along the Connecticut River Valley and railroads through Bellows Falls Island combined to establish Bellows Falls as a center for tourism and industrialization in the nineteenth century. Such dramatic land use changes have created, as well as disturbed, prehistoric and historic archeological sites. They have also played a major role in the architectural development of the Island with erection of structures such as the Island House Hotel, the railroad station complex including a roundhouse, coal storage sheds and bridges, paper mills, commercial and small-scale industrial/craft facilities such as an organ factory and rendering plant, the Vermont Farm Machinery Company, and a host of other industrial buildings.

These buildings demonstrate architectural solutions to complex problems. The railroad owned much of the land on the Island, and leases required the tenants to move their buildings upon thirty days written notice. Secondly, the high fire rate always presented a danger, exasperated no doubt by steam trains constantly belching sparks and cinders. A third constraint is the physical location of

tracks that force buildings into novel shapes. Elevated on piers, buildings were designed to be either broken down or moved whole. The second solution lies in timbering with a lack of complex joinery. Large timbers and plates along with the plank floors decrease the likelihood of destructive fires. These techniques were adapted from the industrial architecture associated with the mill complexes on the Island.

Background research, field observations and excavations determined that Bellows Falls Island possesses significant archeological sites and historic structures which are eligible for inclusion in the National Register of Historic Places. These cultural resources reflect the transformation of the Island from a site for prehistoric fishing camps and burials, to an historic tourist center, to a site of heavy industry and manufacturing, and finally to the present use as a commercial center. This series of transitions marks several of the themes of New England's development throughout this period, and reflects Bellows Falls' historic importance in southern Vermont.

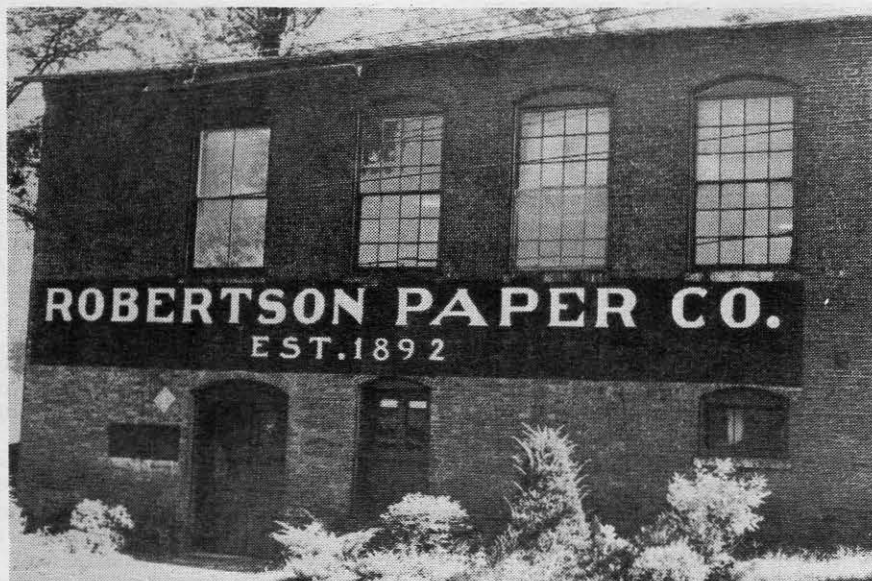
Ellen-Rose Savulis
U. of Massachusetts-Amherst

THE ISLAND INSTITUTE

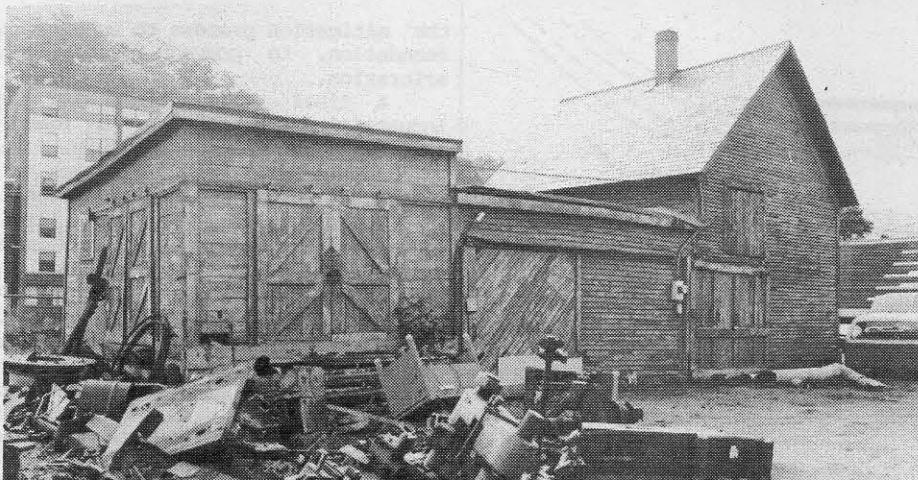
The Island Institute for Industrial Archeology and Historical Research is organizing in Bellows Falls, VT as a 501 non-profit. Tentative plans include sponsorship of a tour next year of some interesting southern Vermont sites relating to papermaking and power production.

For information on this year's field trips and activities, write to the Island Institute, Box 142, Bellows Falls, VT 05101.

Dorothy Nadeau



Robertson Paper Company building at Bellows Falls.



Ca. 1900 rendering plant at Bellows Falls (facing west).

PRESERVATION GRANT FOR THE ADAMS GRIST MILL

The Adams Grist Mill in Bellows Falls, VT recently received some badly-needed funds for protection and repair of the 155-year-old structure. The Vermont Division of Historic Preservation contributed \$2,500 toward exterior painting and relettering of the mill, and the New England Power Company pledged a generous \$8,000 grant for general repairs, roofing, rewiring and lighting improvements, and a fire detection system. Rewiring to meet fire codes, while maintaining the historic character of the interior of the mill, presented a few problems for the local historical society which leases the mill for its museum. But a compromise allowed the old post-and-tube system to remain in place as part of the exhibit of the mill itself, while the newer wiring was installed.

The mill started operation in the fall of 1831 as a mill for the processing of corn. Up to 10,000 bushels were ground in a day. Over the decades, the stone mill changed hands many times, and continued in general operation until the early 1960s. The Bellows Falls Historical Society organized in 1965 and took over the responsibility of care of the mill. Most of the Society's museum articles, including a large collection of farming tools manufactured in Vermont, are presently on display there. The mill is open from Memorial Day through Labor Day.

Dorothy Nadeau

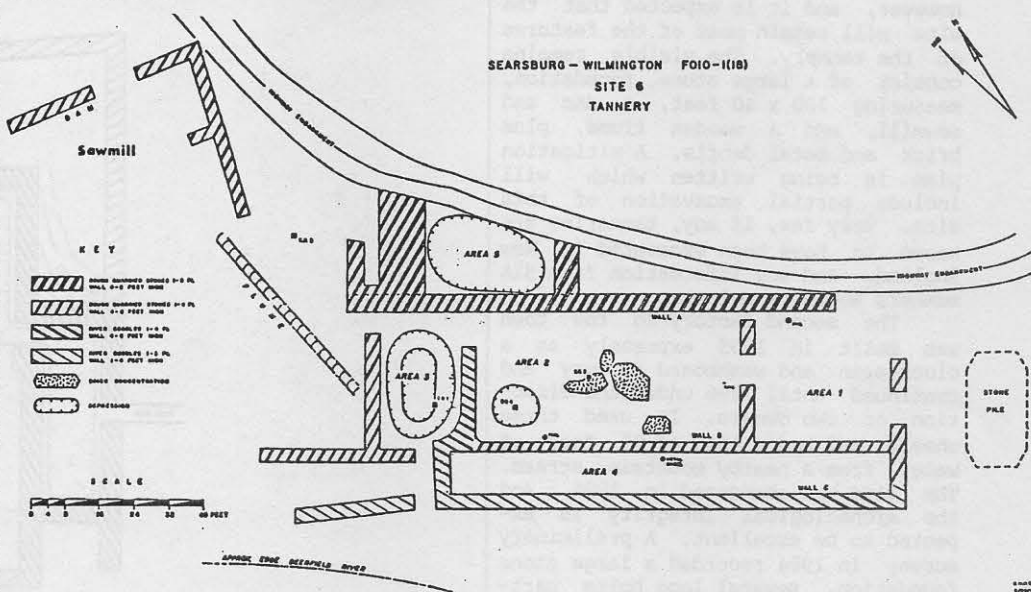
CONSULTING ARCHEOLOGY PROGRAM UNIVERSITY OF VERMONT

The Consulting Archeology Program (CAP) at the University of Vermont (UVM), under the direction of Peter Thomas, has completed over 75 archeological surveys in the state of Vermont since its inception in 1978. Most of the surveys have located prehistoric sites, but, as more roads are widened, and more development in both rural and urban areas is contemplated, more and more historic and industrial

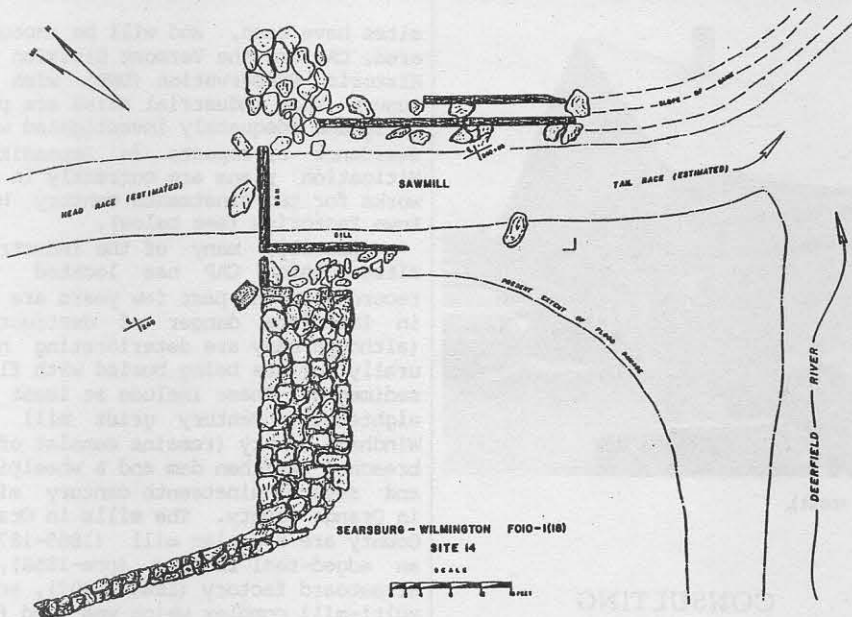
sites have been, and will be encountered. CAP and the Vermont Division for Historic Preservation (DHP) wish to insure that industrial sites are properly and adequately investigated when avoidance of impacts is impossible. Mitigation plans are currently in the works for two nineteenth century hill town factories (see below).

Luckily, many of the industrial sites which CAP has located and recorded in the past few years are not in immediate danger of destruction (although many are deteriorating naturally, or are being buried with flood sediments). These include at least one eighteenth century grist mill in Windham County (remains consist of a breached earthen dam and a wheelpit), and several nineteenth century mills in Orange County. The mills in Orange County are a woolen mill (1865-1875), an edged-tool factory (pre-1858), a strawboard factory (1848-1880?), and a multi-mill complex which was used from 1775-1918. A stone wheelpit at this last locale may be related to an eighteenth century sawmill. This mill complex may be investigated further if a proposed hydroelectric facility is pursued.

At least three industrial sites encountered in the last two years will be affected by proposed highway construction. Two of these, a tannery and a clothespin and washboard factory, are nineteenth century mills at Searsburg, an upland town in southern Vermont.



Plan of above-ground features of Ca. 1842 Tannery at Searsburg, VT. The CAP at the University of Vermont seeks information on NE tanneries from SIA members.



Remains of possible eighteenth century sawmill at Searsburg, VT. Site could be endangered by proposed hydroelectric facility.

The Tannery was in operation from 1842-1866 and was the first industry of this small town. It produced sole leather which was sold to other companies specializing in shoe production. For many years it was the largest factory in town. It burned twice in its lifetime; the second time, it was reconstructed as a chair factory. The chair factory only lasted a year, however, and it is expected that the site will retain most of the features of the tannery. The visible remains consist of a large stone foundation, measuring 100 x 40 feet, a dam and sawmill, and a wooden flume, plus brick and metal debris. A mitigation plan is being written which will include partial excavation of this site. Very few, if any, tanneries are known to have been excavated in New England, and any information from SIA members would be welcome.

The second factory in the town was built in 1855 expressly as a clothespin and washboard factory and continued until 1896 under the direction of two owners. It used three wheels and had a head of 85 feet of water from a nearby mountain stream. The site was abandoned in 1896, and the archeological integrity is expected to be excellent. A preliminary survey in 1984 recorded a large stone foundation, several long bolts partially buried in the wheelpits (suggesting that some machinery may still be present, buried beneath the leaves

and rubble), and a twentieth century dump associated with an adjacent house. This site will not be directly affected by proposed highway construction, but there is some concern that vibration from heavy equipment could harm the already unstable foundation. Steps will be taken during

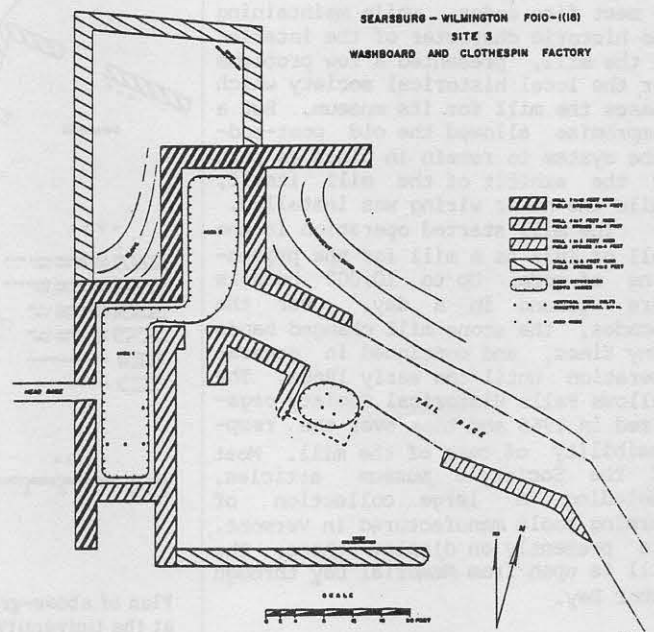
the mitigation process to support the foundation, to prevent further deterioration.

A final project involving an industrial site concerns a foundry (forge?) in East Middlebury. Vic Rolando, an SIA member, will act as a consultant to CAP during this project.

To date, there has been little industrial archeology done in Vermont aside from background studies and preliminary mapping of surface remains. It is clear that there is much to learn from such abandoned eighteenth and nineteenth century sites. CAP welcomes inquiries from interested parties. If any SIA member wishes to know more about the sites we have encountered, or would be interested in acting as a consultant during testing, research, or formulation of mitigation plans for industrial sites, please contact Peter Thomas at the Consulting Archaeology Program, Williams Hall, University of Vermont, Burlington, VT 05405-0168 (802) 656-2947.

Marie Lynn Bourassa
University of Vermont

Above-ground remains of Ca. 1855 factory built to manufacture washboards and clothespins.



Article

GRANITE QUARRYING IN NEW HAMPSHIRE

(Editor's Note: This article is considerably longer than those which ordinarily appear in this Newsletter. This is not intended to be precedent-setting; rather, it simply means that the article is one that could not easily be condensed. Also, this account is somewhat more "popularized" than the norm for this Newsletter. Please let me know whether you would prefer "popular" or more technical articles in future issues.)

While hiking in the deep woods of a southern New Hampshire town on a summer day some fifty years ago, a young boy stopped and climbed a boulder to rest. Looking all around he could see no sign that man had been there before. The pine, beech and birch trees arched high overhead, the ground was rough and a bit swampy, and it was at least a mile to the nearest roadway.

Then he noticed a groove in one edge of the rock on which he sat. It was about the size and length of his forefinger. As he looked further it became apparent that this was not nature's work for there along the edge, equally spaced, were two more such grooves. Now he could see that a large block had been removed from the boulder and was nowhere to be seen. It was incomprehensible to him that someone might have exerted the skill and labor required to separate such a piece and remove it from this site.

This was not a unique experience then, and it is not now. Many hikers, hunters, bird-watchers or cross-country skiers continue to wonder at these evidences of forgotten industry deep in the woods or even in the backyard or next to a busy highway. Wherever there are found granite boulders and outcroppings, then chances are there will be found marks of splitting, drilling or chiselling and, in many instances, all done in a time before recollection.

Unlike a tree stump which can rot away and disappear in a lifetime, these "stone carvings" remain to be examined hundreds and perhaps thousands of years later.

Although there is considerable knowledge about stone quarries that have operated in the Northeast, and some of which continue to operate in New Hampshire and Vermont, references

to smaller operations appear to be scarce.

There were thousands of slabs of granite placed to support old homes, barns and meeting houses long before such quarries came into being. Produced also were millstones, grave-stones, doorsteps, wharfing, fence posts, watering troughs and hitching posts. Done before the age of power machinery, or perhaps later but without access to it, the skill and volume of labor required to produce these things is almost beyond imagination.

Histories of the erection of Colonial and Revolutionary period buildings generally began with the description of the collection of the framing timbers, then go right into the setting of the sills onto the stone foundation. A great deal of information has been given concerning the work from then on. But those great stones, some weighing many tons, carefully cut, squared and fitted, are just "there".

Local libraries, the New Hampshire State Library and town histories revealed some information, as did a number of interviews with older citizens, some of whom had direct experience, and others with passed-down knowledge on the subject of cutting, moving and fitting heavy stones. There are still many untapped sources of information which are to be pursued. Meanwhile, here are some of my findings.

EARLY UTILIZATION OF STONE

The first demand for quarried granite in New England may have been for gravestones. Early settlers, beginning about 1630, however, used stone for underpinnings of buildings, for doorsteps, wharves, wells and walls.

Glaciers had deposited stones on the surface of the land in the Northeast in all shapes and sizes, and they could be broken up by the use of fire and striking with other stones or with a cannon ball. There were some quarried stones brought from Europe as ballast in sailing vessels, then most likely used for breakwaters or wharfing.

The actual hewing of local stone was first introduced by German immi-



The author inspects a boulder containing lead-in steel pins with cables running through the steel pins' eyes. The purpose is unknown.

grants about 1725 to 1750. A man named Waldo was a leader in this craft, and when he later moved to Maine to work his craft, a town, Waldoborough, was named after him. Use of a hand drill, hammer and wedges to split rock is first credited to a man named Tarbox, from Danvers, Massachusetts, and it revolutionized the industry. Production increased markedly with the new technique after 1803 when he began to teach others how to make and use the tools.

According to Arthur W. Brayley in History of Granite Quarrying in New England, it was shortly thereafter when stone was first used to construct a building in the greater Boston area and, about the same time when quarrying first was undertaken in Quincy and Braintree.

CELLARS AND MILLSTONES

In early Colonial New England it was not considered necessary to set a house over a cellar, but stones for foundations were put down into the ground just far enough to prevent frost heaving. Later on when cellars were built under the whole or, in many cases, only part of the house to provide winter storage for turnips and the like, cellar walls were laid up of boulders which may have been split to give one flat side.

Many stones used at the base of such a wall were as large as a pair of cattle could haul to the site on an oak drag, according to the Dodges in Puritan Paths (Newport Press, Inc. 1963) The men were skilled in the work so that they laid in place surprisingly large boulders.



Drillings, 3/4" by 3", in a granite slab.

Around and about early farm buildings one would often see stone used for gate posts or for stone fences. They are sometimes mistaken for monuments or old hitching posts, and they are deeply implanted in the ground.

There are countless millstones scattered about the countryside, sunk in the ground or side by side to make a wall for decorating an innyard or garden, and people wonder where so many could have come from.

From Eric Sloane's America, we learned that stones for grinding grain, usually driven by water power from a dammed-up brook, were "dressed" with chiselled grooves. The stones turned one upon another, crushing the grain and pushing it outward to spill off the edges and into bags or baskets. The grooves were called "furrows", and the plain surface between them was called the "land". Some hex signs and quilt designs were inspired by millstone designs.

LOCAL TALES AND HISTORIES

Hannah August was born in 1836. She was, in later life, known to all as "Aunt Gustie" and she lived in the Dearborn Hill section of Conway, NH. In the far side of her field was a huge boulder. A Mr. Potter tried to buy it from her to quarry it, offering her fifty dollars, but she declined. She enjoyed references to it as "Aunt Gustie's Big Rock".

However, Mr. Potter did buy another boulder nearby at the foot of Dearborn Hill on the "Low Road". An 1884 deed from a Merrifield reserved the boulder for Mr. Potter, and he later "quarried it", using blasting powder to make the initial split.

The Potter twins, Vilreueus and Pheuneus, quarried two large blocks of granite and proceeded to create their own sarcophagi. They began by splitting a slab from one side of each block to be set aside for covers. Along with their monuments, tall and capped with vases and veils, it was many years before they were done; then they were set into a lot to await the twins' demise.

OLD TIMER'S RECOLLECTIONS

"In 1934, I (C.C. Wilber, Keene, NH) visited Center Conway and called on the Littlefields to see a spectacular view of the mountains. I found Mr. Littlefield drilling a granite ledge behind the barn. He was using a 15-inch grinding chisel, a 3/4-inch stock like an arrow head and a 3-pound

hammer with an 11-inch handle.

"He also had a 3/16 by 6-inch rod, spooned at the end, and some 'feathers' and wedges. Once he got a line of wedges into his holes he'd pound them consecutively, 'tuning' them in order to perceive the pressure they were exerting on the stone." ("The Forgotten Art of Building a Stone Wall" by Curtis Fields, Yankee Magazine, 1971).

"One day (in the summer of 1939) Dr. C.E. Jenkins, of East Westmoreland, N. H. called at our house with a sample of rock, which he said was taken from the farm of the late Marshall Barrett, in Sullivan.

"It bore a curious impression, which was much weathered, about 1 x 1-1/2 inches in length and breadth, and from an eighth to a quarter of an inch deep. This marking was duplicated several times in the ledge where the sample came from.

"We had never seen anything like it, and brought the piece into the Square where we showed it to a number of people, but no one could tell how the mark was made.

"Finally it was shown to a gentleman from Fitzwilliam who was a stone-cutter. He immediately recognized it as the mark made by an iron chisel. He said that the chisel was used to cut holes in a line in the rock, after which iron wedges would be used to split off the stone. Some used hard wood wedges and, in case the rock did not split off, by leaving the wedges tightly driven in, the rains and snow would make the wood swell and the rock would then split.

"He also said that this method went out of the picture 75 or 80 years



Drilled, feathered, wedged and abandoned granite boulder.

ago (about 1860-1870) and that an inspection of the foundations of houses in the area would probably show the other half of the chisel mark where the pieces taken from the ledge were used." (From an article by Clifford C. Wilber in The Oldtimer, No. 30, April 22, 1941.)

TROUGHS AND COBBLES

Horse troughs were put along most city streets in the nineteenth century. They were installed in Manchester in 1855. Being quite durable and not easily moved about there are many to be found beside roadways and in town squares even today, some of which use fine red or gray granite.

Cobblestoning was the principal method of paving city streets until 1880 when "Macadamizing" was introduced. This was a process of making a base of gravel or the crushed waste from granite quarrying, then spreading thick oil over it. Nashua was so paved in 1879, Concord in 1881, and Keene in 1894. Cobblestone sidewalks, originating about 1703, began to be replaced by concrete about the same time. It wasn't until about 1925 that concrete became more feasible for use in foundations of buildings.

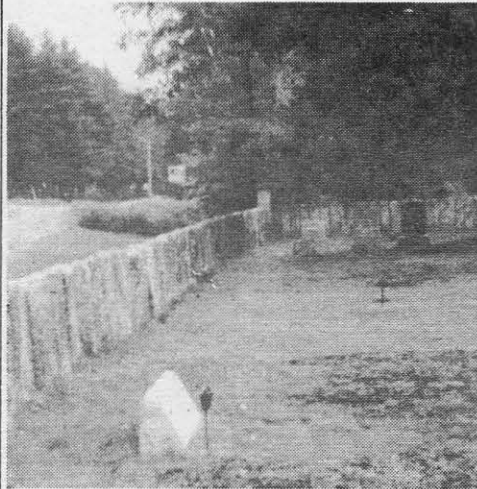
The paving block business was really an adjunct to the granite business, since they were made of waste stones. A few smaller quarries, however, were devoted to the production of cobblestones. One was located in Maine.

From Brayley's History of Granite Quarrying in New England we learn that two million such blocks were made in the year 1889. They were generally three or four inches wide by eight to twelve inches long and about six inches thick. Large ones were preferred by eastern cities and smaller ones were generally shipped south. Stonecutters were paid two to three cents for blocks which later sold for five to ten cents each.

TOOLS AND TECHNIQUES

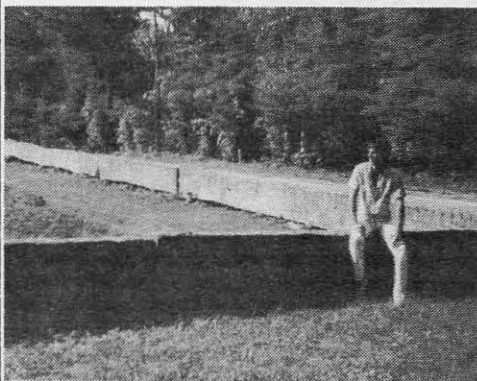
Maurice Lovejoy, of Conway, recalled when there were as many as nine quarries of various sizes in the Conway, Madison and Albany area from which granite was being removed. He worked at the Redstone operation and developed a familiarity with the techniques and skills of drilling and cutting stone. Mr. Lovejoy displayed some of the hammers, hand-held drills and several types of wedges.

The drills are simply sharpened bars of iron, ranging from only a few



(Above) Cemetery fence in Chatham, NH made of granite posts, approximately six feet long, sunk two feet into ground.

(Below) Cemetery fence made of 20-foot slabs of granite.



inches long to four and five feet long, some with octagonal shape.

Forging of the drills required a special skill, he explained. One had to get just the right hardness to the metal and the correct angles to the point. If too hard it will break, if too soft it will bend. The forger looks for just the right color of the metal as it is heated up to yellow, then he watches the color change toward the tip while it is being hammered into shape.

The larger drills were held by one man while as many as four others, working rhythmically in sequence, swung the hammers. The holder would turn the point as they worked and occasionally might stop to remove the stone dust from the hole, either by blowing in a tube or by reaching in with a metal "spoon" forged from a small rod.

Rarely were holes made more than four inches deep, and if there was intent to use dynamite, then a drill of larger diameter would be used to provide for the stick, or a part-stick. Normally, however, black powder was used in blasting rock due to its slower burning quality. Dynamite gave too quick a blast impulse and would shatter the rock rather than shearing it off as wanted.

The quarry rock has three particular characteristics important to stonecutters: "rift", "grain", and "hard-way". The rift is the relatively smooth surface left when a stone fractures, as along the flow lines when a pasty liquid is poured.

The grain, as in wood, is the direction in which the stone will crack. The hard-way is the rough, cross-grain end.

Out in the yard he pointed out some large blocks of granite which he had hauled to the site for the foundation of his modern home and for the retaining walls there on the bank of the Saco River. Pointing out an indentation on the side of some of them, he explained their purpose. A hollow is chiselled into opposite sides right at the balance point of the heavier pieces, providing a gripping place for the ring and dog-hook apparatus used in lifting.

GRANITE STATE GRANITE THE BIGGER QUARRIES

The first mention of industrial quarrying in New Hampshire was at Pelham where stone was cut up from "loose boulders" and not from ledge. Sixteen locks of the Middlesex Canal

were made of hewn granite from the general area centered at Chelmsford, Massachusetts. The canal was then used for transporting granite into Boston for construction of buildings and also loaded onto ships for coastal and harbor installations according to Brayley.

There is a twenty-five by thirty-five square mile area of a special type of granite underlying and surfacing particularly in the Redstone area of New Hampshire.

There is Redstone-red and Redstone-green. Both have been quarried from there in bands separated by only about eight hundred feet. This granite has a composition of 63% feldspar, 31% quartz and 6% mica. Some of the quartz is jet black, some clear, some smoky or milky. There are crystals ten inches in diameter of microcline with color from red-brown to pink (Joseph Lincoln Gillson, New Hampshire Mineralogist, Vol. 12, No. 8, 1895).

In a discussion with Osborn E. Stone, of Derry, NH, concerning the quality of stone at Mystery Hill, in North Salem, he described a quarry in that area which had a gneiss granite (coarse and slatey, made up of quartz, feldspar and mica). The earliest drilling there was done with a three-cornered hand-held drill and hammer. Later came the rotaries, initially driven by donkey engines using steam power. The large slabs were loaded and hauled by use of a large wheeled frame. This would be rolled over the slab, and then a jack and sling apparatus would give it clearance above the roadway.

Rattlesnake Hill

Concord, NH, with its Rattlesnake Hill bedrock, according to Squires' History of New Hampshire, had long been a center for quarrying and cutting of granite. Evidence that it might continue as we approach the 21st century was found in an April 1984 announcement that the John Swenson Granite Company had purchased the Rock of Ages Corporation of Vermont, "a quarrier ten times its size" (Business New Hampshire, April 1984).

Seventy percent of the Concord granite was described as going into curbing and twenty-five percent into building blocks.

Graystone for the New Hampshire Historical Society building, the Post Office and the U.S. Courthouse in Concord came from Concord quarries

during early years as did the material for the Congressional Library in Washington, DC and the Hannah Dustin monument in Penacook.

Milford Quarries

Lovejoy and Kitteredge were only two of the several quarries operating in Milford over a period of one hundred years. In 1900, the granite there was described as "light to dark gray, or slightly bluish, some pinkish or buff and spangled with grains of feldspar and mica, and highly polishable." Thirty columns at the U.S. Treasury Building in Washington, DC came from Lovejoy's in 1908, each weighing some ninety tons and costing \$23,000 per column.

The railroad's coming in 1850 was the key factor in commercial development of quarrying in Milford. Scots from Aberdeenshire were hired as craftsmen; Italians did much of the cutting, and skilled carvers came from Northern Italy. There were English paving stone cutters and Finnish laborers. Average pay in 1907 was twenty-five cents an hour. Quarries closed in winter. One famous production from Milford is a carving of a crucifixion now at St. Barnabas Episcopal Church in Troy, NY, standing fourteen feet high and carved by Frank Comelli in 1947 (Winifred A. Wright, The Granite Town, NHSL 974.26, and NHSL 553.52 W366).

Keene

An August 1847 publication tells of the building of the Cheshire Railroad in the Keene area by Irish laborers who cut "fifty miles through ledges near the summit in Surry. The rock cutting, one of the greatest works of its kind in New England was let out to (several contractors) and the section involved continual work for three years. A large part was done by hand drilling, although three steam drills were in operation by March, 1847." (Clifford C. Wilber, The Oldtimer, 1941).

Swansey quarry opened to build the St. James Episcopal Church in Keene in 1863. The granite was described as "peculiar and different".

A more recent Keene journal claims that this granite also appears north of that quarry on the Ellis Farm and again at Leverett's quarry on Beaver Brook, all lining up north and south.

Conway

In the early part of this century as many as nine quarries were operating in the Albany, Madison, Conway area. The Boston & Maine Railroad had its own source there for bridge building material (still called "B&M ledge" today).

A geologist's report describes an area of twenty-five to thirty-five square miles underlying Conway and surfacing particularly in the Redstone area and spectacularly at Rattlesnake Mountain.

Louis Dondero operates a gem and mineral shop located next to the Eastern Slopes Inn in North Conway. When asked if he might provide a sample of Redstone granite from his shop, he proceeded to do just that, by going down to the cellar and knocking a piece of his foundation with a rock hammer.

The late Harry Mason remembered starting work at Redstone in 1915 and that much of the production in the early days was for bridges and foundations. About three hundred men had worked there, but it was down to under two hundred when the quarry closed during World War II. Many Italian workers were employed there as well as Norwegians and Spaniards. They were described as mobile craftsmen, moving from quarry to quarry around Northern New England.

In Claremont, a diamond drill channeling machine for quarrying was developed by Albert Ball with James Upham. They formed the Sullivan Machine Company in 1873 to handle it. Used in the Transvaal Mines in the late 1800s it also became revolutionary to the mining of coal.

The hundreds of quarries in Quincy and the Rockport area of Massachusetts and in the Barre, Vermont area would require much more space to describe. There are some fine publications dealing with many of them, such as Barre Life, published by the Barre Granite Association in 1982, and Hammers On Stone - The History of Cape Ann Granite by Barbara H. Erkkila. The Province of Quebec boasts many active granite quarries, and its "Association Des Producteurs" offers fine descriptive literature.

CONCLUSION

There were many answers found to questions of sources and final resting places of quarried granite throughout the northern New England area. However, there are still few clues concerning the hundreds of small quarries whose remains are scattered in the woodlands.

The one thought that comes through clearly from the forgoing is this, however: There were thousands of artisans, craftsmen and stone laborers attracted to the area by available work in the large quarries over a period which may have peaked early in the twentieth century. It is quite logical to assume that at a given time there were a great number "between Jobs" or perhaps requiring extra work, doing "moonlighting" jobs wherever there was a good stone and someone willing to pay a few cents to cut it up for them.

There was a broad distribution of the knowledge of stone cutting among the general population from the base of craftsmen employed in the big quarries. There were good blacksmiths in many towns and would have learned to turn out quality tools to fill the demand.

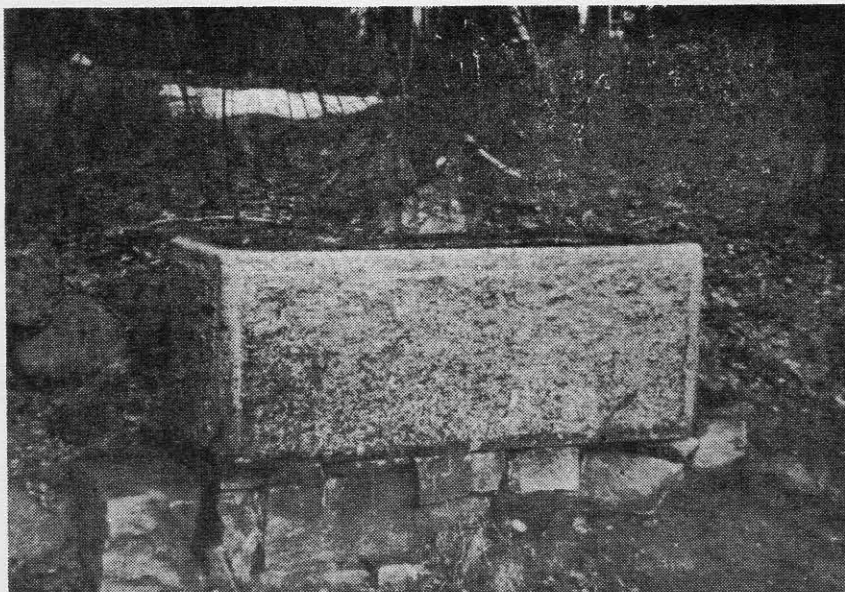
Under those considerations, then, perhaps it is not surprising to find stones were high on the list of resources to be harvested just as were the forests.

We have adapted today to the easy availability of energy and machines to do work for us. But forgetting that for a moment, perhaps we can identify with the farmer who, with the time between harvest and replanting, would expend hundreds of work hours drilling, breaking up and moving stones with his ox team into place for the new barn foundation.

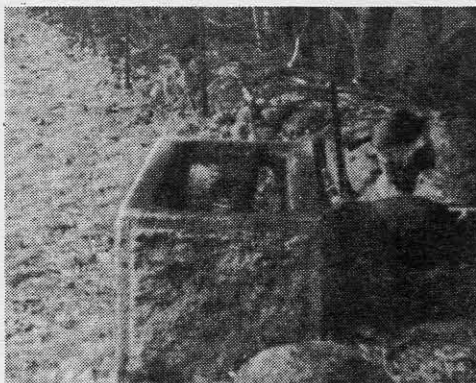
Ed McKenzie
Conway, NH

HELP WANTED

NNEC-SIA member Al Daloz writes: "I recently 'discovered' a chap, John Sanborn, Route 2, Pittsfield, NH 03263, who runs a dairy farm, but it still has the basics of blacksmith shop, and a grist mill, with two stones, run by water power, and a sawmill run by water power with the capability of cutting forty-foot logs! The saw mill is still in use. He has a total possibility of forty feet of head. He hopes to restore the whole group with the possibility of opening it to the public. BUT, he needs help, both in the location of equipment or parts, and also some direction on how to go about it...IT IS A MOST UNIQUE situation and is worth some attention."



Granite watering trough in Chocorua, NH.



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