VERMONT ARCHAEOLOGICAL SOCIETY NEWSLETTER

Number 69 April 1992

The Vermont Archaeological Society and The Rutland Historical Society present

"Archeology in the National Forest"

Saturday, May 9, 1992
at
The Fox Room of the Rutland Free Library
10 Court Street, Rutland, Vermont
[One block west of South Main Street (Route 7) between West and Center Streets]

9:00 Sign-in, coffee/tea and donuts, and socialize

9:30 Welcome by *Victor Rolando*, VAS President, and *Eleanor Elwert*, Rutland Historical Society President

Opening statements by:
Richard Ackerman, Staff Officer for Resources, G.M.N.F.
Giovanna Peebles, State Archeologist, D.H.P.

10:15 "Area Analysis and its Role in Planning on the Green Mountain National Forest" by *Shelley Hight*, Archeologist, G.M.N.F.

11:00 "The Pittsford Ironworks: A Progress Report" by *Allen Hitchcock*, Retired Mechanical Engineer

11:45 Lunch on your own

1:00 "Historic Preservation at the Nickwackett Firehouse" by *Eleanor Elwert*, President, Rutland Historical Society

1:45 "Update of the Prehistoric Quarry at Wallingford" by *David Lacy*, Forest Archeologist, G.M.N.F.

2:30 "Industrial Archeology in the Green Mountain National Forest" by *Victor Rolando*, VAS President; Research Associate for D.H.P. and G.M.N.F.

3:00 Closing remarks, announcements, tour of exhibits at Nickwackett Firehouse, Headquarters of The Rutland Historical Society

The Lake Morey Shipwreck: Has the *Aunt Sally* Survived?

by David Skinas
Vermont Division for Historic Preservation

Inventor Samuel Morey was reputed to have developed the first working steamboat. Sam Morey was born in Hebron, Connecticut, in 1762, and his family moved to Orford, New Hampshire, in 1766. Morey later moved to Fairlee, Vermont, in 1832. Morey's first patent in 1793 was for a steam-powered roasting pit. In 1795 he received a patent, signed by Washington, for a steam engine "For propelling boats for all other purposes affected by horses and men." Morey experimented with an internal combustion engine and is said to have tested these boats on the Connecticut River and on Fairlee Lake (Lake Morey). In 1797 Morey formed a relationship with a wealthy financier, Chancellor Livingston, and his assistant, Robert Fulton, to develop a faster steamboat. After several attempts Morey successfully located the paddle wheel on the side of the vessel. The steamship company that Morey hoped to form with Livingston never developed. Morey returned home dejected. As history records, Robert Fulton received credit for developing the first steam-powered boat, the *Clermont*, and was also awarded a patent for the sidewheel paddle while Morey remained in obscurity.

In 1826 Morey received a patent for the first internal combustion engine and built the *Aunt Sally*. Local legend has it that Morey's prototype steam boat was scuttled on Fairlee Lake out of disgust and remorse for his failure to achieve the recognition he justly deserved. The speculated date of this sinking is said to have occurred between 1832, when Morey moved to Vermont, and the year of his death in 1843. The question of whether Morey sunk the *Aunt Sally* or another of his experimental crafts on Fairlee Lake was investigated by the Antiquarian Society of New Hampshire in 1874. This group used grappling anchors and ropes to intensively search the bottom of the lake for evidence of Morey's boat. No watercraft was found. Side-scan sonar surveys were conducted in the late 1970s and early 1980s but without success.

In August of 1991 Frank Harris Jr., a local driver and former resident of Fairlee, discovered a wooden

vessel in 20 feet of water while diving in Lake Morey. He contacted the Division in September to notify the state of his find. On November 18, 1991 Art Cohn, director of the Lake Champlain Maritime Museum, and I met with Frank Harris and dive partner Randy Miller to investigate and video-document the wreck thought to be the hulk of the *Aunt Sally*. The vessel measures approximately 20 feet long by 8 feet wide. The wreck is a flat-bottomed boat with both ends severely damaged or missing. No diagnostic features were identified to place the wreck in a time period contemporaneous with the alleged sinking of the *Aunt Sally*, but there was also no evidence to suggest that the vessel was of a late 19th or 20th century vintage. It was concluded that the Lake Morey shipwreck has research potential which warrants further study.

The Division and a group of 8-10 volunteer divers from the Fairlee area, headed by Frank Harris and Randy Miller, will conduct a non-intrusive, Phase I Reconnaissance survey of the wreck later this spring. The goals of this project are to determine the origin, function and period of use of this watercraft. A Lake Morey Advisory Committee has been established to conduct archival research and assist with the project. The underwater survey is wholly a volunteer effort with limited funds provided by the Division. These funds, if needed, will go towards the radiocarbon dating of two wood samples from the wreck to date the vessel.

Any VAS members who have information about Samuel Morey or are interested in participating in the project should contact me at (802) 828-3226.

A Forest Community Environmental Model for Native American Settlement and Procurement Sites

by Douglas Frink, Charity Baker and Keith Knoblock
Archaeology Consulting Team, Inc.

Analyses of Native American archaeological sites conducted by the Archaeology Consulting Team have revealed a strong correlation between site locations and seasonally abundant food resources. Although this study is still in progress, the general findings provide a context for explaining locational choices and site functions of Native American archaeological sites identified throughout the State of Vermont.

The fundamental assumption of this study is Zipf's "principle of least effort" (Zipf 1949), asserting that people tend to optimize resource procurement activities by locating themselves on the landscape in those places which minimize the effort required to obtain essential resources. If Native Americans optimized their resource procurement activities by locating themselves in, or adjacent to, specific ecological environments, the selection of site location would have depended on the seasonally abundant food resource in the particular area.

Written ethnographic accounts of Abenaki settlement and procurement traditions are limited, although a few do exist. A 1749 account portrays a group of Abenaki people, probably from Missisquois, in the Lake Champlain area:

> We often saw Indians in bark boats, close to shore, which was, however, not inhabited, for the Indians came here only to catch sturgeons, wherewith this lake abounds, and which we often saw leaping up into the air. These Indians lead a very singular life. At one time of the year they live on the small store of corn, beans, and melons, which they have planted; during another period, or about this time, their food is fish, without bread or any other meat; and another season they eat nothing but game, such as stags, roes, beavers, etc., which they shoot in the woods and rivers. (Calloway 1991)

This excerpt, from the writings of a Swedish traveler named Peter Kalm, indicates that the Abenaki at this time observed a scheduled seasonal settlement pattern. This practice would result in the formation of a variety of archaeological sites during the course of a year for each group of people.

Certain specific ecological environments in Chittenden County are conspicuous in their seasonal high biomass and would afford Native Americans with a wide range and/or large quantity of exploitable resources. These ecological environments include:

(1) The falls and rapids along the Lamoille and Winooski Rivers. Pike, fresh water salmon, bass, sturgeon and eel, migrating to upstream spawning grounds during mid-to-late spring, were available in large quantities.

(2) The Bottomland Hardwood forests bordering the Lamoille, Winooski, Browns, and Huntington Rivers, and Lewis Creek. Fish, small mammals and reptiles, greens, grains, tubers and small fruits were plentiful and easy to procure during mid-to-late summer months.

(3) The Pitch Pine - Oak forests located on the sandy glacial outwash deltas of the Lamoille and Winooski Rivers. Nuts, seeds and fruits were abundant during the late summer and early autumn months. This rich botanical resource would attract and concentrate deer, bear, turkey and various smaller mammals and birds.

(4) The Fresh Water Marshes located in the deltas and lower reaches of the Lamoille and

Winooski Rivers, the numerous shallow bays of Lake Champlain, the shallow fringes of Colchester and Sherburne Ponds, and various no-longer-extant ponds and marshes indicated by muck and peat soils. Migratory fowl, quality-fur bearing mammals, tubers and small fruits were plentiful during mid-to-late autumn.

(5) Potential winter deer yards found throughout the county. These are located by the specific soil series conducive to supporting a forest environment required by deer during the colder mid-winter months. The increased density of deer in known locations during the winter months provide a dependable resource at a time of year when other resources were scarce.

The locational data for known Native American archaeological sites in Chittenden County strongly supports this hypothesized settlement and procurement pattern. To date, a total of 355 Native American sites have been identified and recorded in the Vermont Archaeological Site Inventory (VAI) for Chittenden County. Of these, 187 have one or more temporally defined cultural components represented. Counting each recognized cultural component as an independent occupation results in a sample population of 536 Native American occupations. Over three-quarters (76.5%) of these occupations are located in, or adjacent to (within 500 feet), one of the five ecological environments defined above. Table 1 shows the correlation between Native American occupations and the specific ecological environments. The low values for the Falls and Rapids and Bottomland Hardwoods environments may reflect the lack of studies, the relatively limited acreage when compared to the other environments, and the probability that the dynamics of the adjacent rivers have destroyed or buried sites in these areas.

TABLE 1
Native American Site Components
by Ecological Environment
for Chittenden Country, Vermont

Ecological Environment	Count	% Components
Falls and Rapids	16	3.0 %
Bottomland Hardwoods	37	6.9 %
Pitch Pine - Oak	99	18.5 %
Fresh Water Marshes	131	24.4 %
Winter Deer Yards	127	23.7 %
Undetermined	126	23.5 %
Total	536	100.0 %

Native American sites with undetermined environment specific resources likely represent occupations during those seasons not covered by the defined ecological environments: late winter-early spring, early summer, and early winter. The vast majority (79.4 %) of the "undetermined environment specific resource" sites are located within the Northern Hardwoods - White Pine forest community. Table 2 shows the Native American site (undetermined resource) component distribution by forest community. The variability in distribution may partially reflect the relative sizes of these forest communities and the uneven distribution of archaeological studies in the county. However, these factors do not account for the extreme preponderance of site components associated with this forest community.

TABLE 2
Native American Site (undetermined resource)
Components by Forest Community
for Chittenden County, Vermont

Forest Community	Count	% Components
Northern Hardwoods		
- Hemlock	1	0.8 %
- Hemlock-White Pine	11	8.7 %
- White Pine	100	79.4 %
White Pine		
- Transitional Hardwoods	12	9.5 %
Northern White Cedar Bluffs	2	1.6 %
Total	126	100.0 %

The Northern Hardwoods - White Pine forest community has a high carrrying capacity from spring to autumn. Specific resources tend to be dispersed and are therefore difficult to predict. It is expected that Native American settlement and procurement strategies would reflect this dispersed pattern.

Viewing the archaeological site within the context of specific exploitable resources provides a hypothetical explanation for site function, seasonality, and the site's relationship to other sites of the same time period. This hypothesis can provide the basis for the research designs used during intensive site excavations and for anthropological syntheses concerning Native American culture.

References

Calloway, C. G., 1991, *Dawnland Encounters.* University Press of New England, Hanover.

Zipf, G., 1949, *Human Behavior and the Principle of Least Effort.* Cambridge, MA.

Archaeology, Public Outreach and the Chittenden County Circumferential Highway

by Jack H. Wilson, Jr.
Associate Director, Consulting Archaeology Program, UVM

The Consulting Archaeology Program (CAP) of the University of Vermont has been conducting archaeological investigations for the Chittenden County Circumferential Highway (CCCH) since the summer of 1984. This work has involved the study of over 50 miles of preferred and alternate highway corridors, including the 16 miles that comprise the final highway design, for the Vermont Agency of Transportation. Over 500 test pits have been excavated across the landscape between 1984 and 1992. A total of 89 prehistoric sites that date before A.D. 1609 and 8 historic Euro-American sites that postdate 1609 have been documented.

An integral part of the archaeology conducted over the past two years for the CCCH project has been the dissemination of information to the public through a number of different forums. The public we are talking about is comprised of two overlapping groups, one that can be called "public officials" and the other the "general public." In interacting with the pubic, it has proven to be especially effective, as will be seen, to target these two groups both as separate entities and as a single unit.

Public officials consist of people who are elected to and volunteer for positions with the various town and state government entities, ranging from selectboard members to zoning commissioners to state legislators, and the employees of these same town and state agencies. The latter category includes people employed by and associated with the Vermont Agency of Transportation, the regional environmental review boards, and the University of Vermont, to name a few examples. The general public includes all the people that qualify as public officials as well as the people who otherwise work and live in Vermont.

The Consulting Archaeology Program prepared a three pronged approach to public outreach. Initially, background presentations concerning the archaeology and why it was being done were given to the various town boards of the three main towns — Colchester, Essex, and Williston — impacted by the CCCH project, and to the public trustees of the CCCH project that were directing the work. Next, two open houses were held specifically for public officials that represent the towns and legislative delegation from Chittenden County. Both prehistoric and historic archaeological sites being excavated for the CCCH were

used as living workshops so people could actually see the various kinds of data recovery techniques employed in the field. An introduction to the living workshop briefly covered the federal and state regulations requiring that archaeology be done for the CCCH construction, and a general summary of the different kinds of artifacts recovered from the CCCH sites and other sites in Vermont.

In a similar fashion, an open house was also held for the general public. And contact was made with the general public through guided tours given to students from Chittenden County schools like Milton, Essex Junction, Williston, Camel's Hump, and Burlington's "On Top" program, and from schools as far away as Sheffield's Miller's Run School in the Northeast Kingdom. The set-up that followed for the general public presentations has been noted above. The emphasis was placed more on giving people (and students) a general idea about the different activities associated with archaeological fieldwork from shoveling to screening to troweling to recording spatial and contextual information. Groups were given guided tours of the site areas being excavated and were all provided an opportunity to participate in the work being done. Screening soil was an especially popular activity because it was quickly recognized that screening was the way you found artifacts. Before visiting the work areas, background information was provided the people in the form of brief lectures about the prehistoric and historic archaeology of Chittenden County and the CCCH project, the different kinds of artifacts recovered, and a preliminary assessment of the meaning of the sites and artifacts documented by the work. The focus here was less on why the work was being done, at least as regards the legal requirements, and more on the differing kinds of information being obtained, the possible meanings of the information, and how this information was obtained.

The third component of this outreach program is the presentation of the information recovered and its interpretation to the public. A preliminary assessment of the CCCH archaeology has been presented to the public at an open meeting of the Vermont Archaeological Society and at a publicized open forum on the Native Americans and early settlers of Essex, Vermont, as part of the Essex centennial celebration. The Essex centennial presentation was also videotaped for broadcast on the local cable television network. At least one more public presentation is expected to be made in the fall of 1992 at a public meeting where the results of the analysis and interpretation of the past two years of CCCH archaeological research will be discussed.

A basic part of the CCCH public outreach described above has been making use of the various public media, including radio, TV, and newspapers. The information about the various open houses was, of course, disseminated through the media. Reports about the CCCH archaeology in progress, why it was being done, and what was expected to be documented were also provided to the public through these media channels.

In summary, the outreach activities of the CCCH archaeological project conducted by the Consulting Archaeology Program incorporated a number of techniques that have traditionally been utilized to disseminate information to the public. Open houses, guided tours, observer participation, pubic presentations, media releases, and media coverage were all used to make the CCCH archaeology understandable and accessible to the public.

Before closing, mention must be made of those individuals who made the CCCH archaeological public outreach program a success. These include Ginny West, Pru Doherty, Gerri Kochan, Scott McLaughlin, Bob Sloma, Peter Thomas, Nora Sheehan, Chris Schlosser, Rob Florentin, and the members of the field crews who are too numerous to be named individually. Without the effects of these people, their dedication to archaeology as a profession, and their positive attitude toward public outreach, the benefits of these endeavors would have greatly suffered. Thanks to you all and to the people of Vermont.

Weybridge Historic Archaeology Project

Barbara Meyenberg and James Consler

As part of the Vermont Bicentennial Celebration 1991, the Weybridge Bicentennial Committee commissioned the two of us to aid residents in compiling historic site information. The theme of the Weybridge Historic Archaeology Project (W.H.A.P.) was: *"You are the history of Weybridge: you are making it by living here, creating it by documenting it, changing it for the future."*

The short range goal was to involve the community in historical archaeology during the town's Bicentennial year. Several presentations, meetings with residents, a teacher workshop and walking tours under the motto of "Archaeology without digging" served the purpose of raising awareness of historical archaeology and stimulating children and adults to document their own history. While the full potential of incorporating public participation in doing historical archaeology was not reached, walking tours led by long time town residents were greatly informative and activated community members to record their town's history.

The long range goal was to systematically compile a preliminary collection of historic site information into the *Weybridge Historic Archaeology Site File and Maps* for public use. All structures on the Middlebury 7.5' (1972) and Port Henry NY-Vt 15' (1945) quads were numbered, and locations from the Walling (1857) and Beers (1871) maps were related to them. A car/surface survey was then conducted in an attempt to confirm the Walling/Beers site locations.

The site file has a separate page for each of the 247 sites. For each site, information aiding in locating (e.g., types of vegetation, presence/absence of standing structures, etc.), suggesting the condition of its archaeology (e.g., remodeling of structures, bulldozing, etc.) and establishing a time line of site use [e.g., residents' name from Walling/Beers; Child (1882) occupational references] was recorded. This survey was not limited to cellar holes alone since there is only one difference between cellar hole and standing structure sites: the lack of a very visible and significant artifact, the building. In fact, the presence of this artifact aids in confirming a Walling/Beers site location and provides a wealth of information that can allow for proper understanding of the related archaeological materials. The site file does have two major omissions: early settler log house sites and structures standing only after 1871 (Beers) and before 1945/1972 (U.S.G.S. topo maps).

The site file was submitted to the Weybridge Bicentennial Committee under condition that the file and map be deposited with other town records at the town clerk's office vault, that photocopying will not be allowed in the interest of protecting historic sites, and a sign out sheet will insure appropriate use. Furthermore, the State Archaeologist has to be consulted for any use of the site file and map for planning purposes.

The public and archaeological community are encouraged to use it for the purpose of:

- education (e.g., to document one's own environment)
- tourism (e.g., biking, hiking, walking tour guides and to tie sites into existing tourist attractions)
- archaeological research (e.g., duplicating such broad systematic surveys for other towns will lead to recognition of the condition and types of historic sites in Vermont and allow for innumerable research projects).
- etc.

Above all, the real value of initiating and expanding a site file like this is the opportunity for the archaeologist to cooperate with the public in a mutually educational way.

For more information please contact:

Barbara Meyenberg / James Consler
RD 1 146 A
Shoreham, Vermont 05770

or consult:

Weybridge Historic Site File and Maps (1991) *and Final Report* Weybridge, Vermont Town Clerk's Office.

and *Detailed Final Report, Historical Archaeology of 18th/19th Century Addison County, Vermont.* 1987. by David Andrews. A systematic survey of Middlebury and Shoreham, available at the Sheldon Museum, Middlebury, Vermont.

Book Review

Building With Stone

by Charles McRaven, Pownal, Vt.

reviewed by Victor R. Rolando

Storey Communications, Inc., A Garden Way Publishing Book, 1989, 192 pp., Glossary, Index, $12.95.

This is a how-to-do-it type of book with a twist. In describing how to build stone walls, stone foundations, and stone dams, the book also hints at how early Vermonters might have built the stone walls, foundations, and dams that today still dot the countryside.

The book opens with an introduction to various stone types, weights, workabilities, and strengths. Tools for working stone and mortar are followed by techniques of drystone work (laying stone without mortar) and basics of stone walls, retaining walls, stone-lined wells, cellar foundations, and steps. Chapter five gets into mortaring, cautioning that mortar is mud, not glue. The stones in a wall must hold together without mortar to be successful. Foundations, reinforcing, and footings are covered.

The projects start with Chapter six: stone walls (patterns, the "right rock", capstones, corners, buttress braces), arches and chimneys, flagstones, a root cellar, stone arch bridge (even a stone-buttressed covered bridge), stone dam (with a warning to "keep it small"), waterwheel and turbine pits, well and spring houses, a stone house and barn (for the energetic), and a final chapter on stonework restoration.

The 8½- by 11-inch soft cover book is sufficiently illustrated, with 119 black-and-white photos and 132 line drawings. All illustrations are captioned and well

positioned with respect to the text, which is very readable and non-technical.

Stone bridges and barn foundations are definitely not projects for couch potatoes; the photos alone are daunting. I've always been fascinated by stone walls and always thought of building a massive drystone structure. But as the years pass, I prefer to read books on the subject and look at photos of other people hauling and lifting. Finding furnace and kiln ruins turns out to be enough exercise for me.

I found the book a valuable insight into what goes into the physical "how" and "why" of stone work, which helps me understand how all those stone furnace and kiln ruins might have been built. How was the furnace arch held up before its keystone was put into place? (By building a temporary wood brace to hold up the arch stones.) Why drystone over mortared walls? (To compensate for seasonal ground movement and sunlight warming; if not correctly reinforced with heavy footings, mortared walls will crack, while drystone walls will merely shift almost unnoticeably.)

A few errors were detected, such as a warning not to lay stone with an outward slope into a wall: "Each stone in a wall should be laid so that it stays in place by itself, whether it is to be mortared or not" (figure 4-9 caption). Yet, 24 pages later is a cross-section sketch of a drystone wall (figure 6-8) depicting just such a violation. And although the author is shown wearing heavy-duty gloves, he isn't wearing safety goggles when banging away with hammer and chisel.

As for acquiring the stone, the author recommends following house-wreaking crews (he calls it "recycling") or prospecting for stone that lies all around the countryside, but he cautions against stealing stone. I regret that he merely warns us to ask the property owner's permission before tearing down a rural stone wall; I wish he had outright discouraged robbing old stone walls or cellar holes (permission or no) for their stone.

For the weekend do-it-yourselfer, *Building With Stone* offers time-tested techniques for building or restoring stone walls. But his book could also be a valuable addition to an archaeologist's library, especially those of us who study stone walls, cellar holes, and stone chambers.

Green Mountain National Forest News

by David Lacy

As the field season is about to begin in earnest, we are once again inundated with Forest-sponsored projects. These range from timber sales and the creation of wildlife openings, to the reconstruction of hiking and snowmobile trails and bridges. In all, we can expect to participate in or review 50-75 projects each year.

The range of cultural resources with which we concern ourselves is broad – from early prehistory through the CCC-era buildings associated with the establishment of the National Forest in the 1930s. At the moment, we are addressing a number of specific site preservation concerns reflecting some of this breadth.

A section of historic Windham Turnpike, which ran from Bennington-to-Brattleboro starting in 1801 (following the Military Road established in 1791), is within one of our study/project areas. It has been used in recent years as a hiking and snowmobile trail, and for a significant stretch along high, flat terrain in the town of Readsboro, it retains its integrity (corduroy surface, road-side stone walls, etc.). Our efforts (thanks largely to Shelley Hight) will result in continued use of the road for recreation purposes but will formally specify the methods used for maintenance of the route so the historic "fabric" of this (somewhat unusual) archaeological site will be preserved.

Another road-related resource has been identifed in Leicester, where the 19th century wagon road leading to the historic Silver Lake Hotel (a popular religious retreat in the latter 19th century) still retains several modest hand-laid stone bridge abutments. These now support the narrow snowmobile plank bridges in use today and will be preserved (and possibly enhanced) as we do maintenance on these structures.

Across the mountains in Rochester, we anticipate purchasing a tract which has a largely unmodified mid-19th century dairy barn complex on it. Given the plight of the dairy industry in Vermont, and the economics of maintaining these old barns, they have become a true "endangered species". We are working with the Division for Historic Preservation to come up with a sensitive, workable plan to stabilize, rehabilitate and re-use the salvageable (and most historically significant) half of the complex as an integral part of our proposed new Rochester Ranger Station.

Finally (at least for this installment), we are returning to the lab to do more work and analysis on the materials recovered from the Homer Stone Quartzite Quarry (VT-RU-105). Dr. John Cross has assisted us in devising a coding tool/method which we can use to quickly process the large amount of debitage and "waste" materials collected at the site. Our initial sweep through the collection is designed to yield quantitative measures which will lend themselves to expressions of, for example, "average weight per flake of size X (or Y or Z)" in a given Unit. These kinds of expressions will help us identify patterns of activity

(i.e., an area where people were primarily bashing cobbles to get raw material, vs. the reduction of cores to blanks and and other nearly finished products) — so, for example, a test sample showed that (not all that surprisingly) lighter flakes in a category defined by the maximum width of an artifact were strongly associated with "thinning," while heavier flakes in the same category were strongly associated with initial bashing (shatter, chunks, etc.). While we have subjective ideas about the distribution of activities at the site, its size (1 kilometer × ca. 400m) and the density of materials (hundreds of thousands of pieces of debitage) requires us to get a more statistical handle on what is going on. Subsequent analyses will be pursued based on sampling within the "zones" of activity identified through this stage of analysis.

Fort Hill Artifacts Exhibit

by Audrey Porsche

Artifacts from the Fort Hill site (Hinsdale, N.H.), a Contact Period village on the Connecticut River, will be on exhibit this summer at Chimney Point State Historic Site. Based on Peter Thomas' dissertation, *In the Maelstrom of Change*, the exhibit focuses on the effects of the fur trade on Native American life.

Fort Hill was home to approximately 400 Squakheags (or Sokokis) from the fall of 1663 to the spring to 1664. During this time, they actively participated in the burgeoning French and English fur trade, and successfully thwarted a Mohawk attack on the village. In spite of the environmental and social stresses that resulted from these pursuits, the Squakheags continued their involvement in the fur trade not so much for access to European materials or technology as much as for the socio-political gains.

The exhibit opens June 10th and will run through the '92 season. For more information please contact: Chimney Point State Historic Site, RD 3, Box 3546, Vergennes, VT 05491, (802) 759-2412.

Limited Foundation Excavation of the Pittsford Iron Company Furnace, Vermont (VT-RU-57)

by Victor R. Rolando

Background

Having spent many years researching blast furnace ruins throughout the Northeast, the author has never ceased to marvel at the ingenuity that had to go into constructing such tall and heavy structures as 19th-century blast furnaces. No record has been found documenting the construction of the immense stone walls of these furnaces, a technique that was probably handed down orally from family to family. One has to marvel how exactly each large stone was placed one above the other and the spaces between carefully chinked with smaller stones. There was also the foundation that supported and stabilized this gigantic structure from tipping, not only from the shear weight of the furnace itself but also from the weight of the charcoal, limestone, and iron ore that filled the

operating furnace, the molten iron and slag in its hearth, the weight of charging ramps, furnace-top ovens and chimneys, and the building that sat atop the furnace to protect the stack from the weather. There must have been some careful ground preparation. What lay deep in the ground directly beneath these structures?

In his treatise on *The Manufacture of Iron* (1850), Frederick Overman devoted a paragraph to ground preparation prior to the construction of a blast furnace:

> A furnace should be located on a dry spot, free from springs and water of any kind, and not exposed to floods after heavy rains. The ground should be then excavated, until the bottom is sufficiently solid to bear the heavy weight of the stack. The foundation should be at least one foot larger in each direction than the base of the furnace; that is to say, if the furnace is thirty feet at the base, the foundation ought to be thirty-two feet square. Any kind of hard, large stones may be used to fill the excavation. No mortar should be used in the stone work. We should be careful to leave some channels through which rain or spring water, in case it should penetrate the foundation, may flow off. Such a drain should be carefully walled up and covered. The cavities or channels for the blast pipes are to be placed level with the ground; and the four pillars of the furnace then laid out (Overman 1850: 153-154).

Pittsford Furnace

A recording session was held on the grounds of the iron furnace owned by Allen Hitchcock at Pittsford, Vermont, by the members of the Northern New England Chapter - SIA, the Pittsford Historical Society, and the Vermont Archaeological Society the weekend of May 25-27, 1991. Permission was granted by Project Director David Starbuck to excavate a corner of the furnace to compare Overman's foundation recommendations with construction techniques at the Pittsford furnace. Although the first furnace at this site was built in 1791 by Israel Keith, the structure was rebuilt and enlarged by later owners and most likely completely razed when it was rebuilt to a 42-foot height and "modernized" in 1853. This was the last recorded modification, making the present structure contemporary with Overman's 1850 publication (Rolando 1991: 7-10).

The referenced 42-foot height included furnace-top ovens that pre-heated the blast. These ovens no longer exist atop the furnace ruin. The furnace now stands about 35 feet high with a 32-foot square base at a point 3 feet above the present ground level (measured December 18, 1983 by the author). Although sections of stone walls and earth around the furnace have collapsed against it, the stack continues to exert heavy pressure on the ground directly beneath the corner pillars.

The front furnace wall is oriented at approximately 45° east from magnetic north-south. Facing the front of the furnace (the front defined as that containing the large, red-brick-lined casting arch and facing on Furnace Brook), starting with the immediate left-hand corner and continuing clockwise around the stack, the corners were identified as the northwest, northeast, southeast, and southwest corners. The two corners on the rear side of the furnace (northeast and southeast) were buried beneath fill that covered the entire rear wall level to the rise behind the furnace. These corners were for all practical purposes inaccessible, leaving the front two corners (northwest and southwest) as the only two accessible for excavation. A low mound of firebrick, red brick, slag, and miscellaneous hardware lay adjacent to the southwest corner. Additionally, this corner was in the immediate vicinity of trees being cut and felled from the hillside next to the southeast wall, and also beneath that corner of the stack from which trees and brush being cut at the top of the stack were dropped to the ground. The remaining corner, the northwest corner, was therefore chosen for excavation.

Excavation

Assisted by Krista Jackson, excavation started on Sunday morning, May 26, first by taking photos of the ground and inspecting the surface. Using an arbitrary site datum as the overall site reference point, the northwest corner of the furnace (hereinafter referred to as "the corner") was located 37 feet at an angle 10° east of north from the datum. An azimuth was shot from the transit to a point near the corner of the wall to be used for vertical reference for the excavation. This corner reference point was located 28 inches above the ground at the base of the corner (height of the transit telescope was 60⅞ inches). The reference point was 1⅜ inches below the top of a 21½-inch-high by 46⅞-inch block. This block had a major piece of its northeast corner missing (later found in the excavation). The reference point was 24½ inches (inward) from the corner and coincided with a small crack in the block "A" into which a nail and a blue/white striped tape was inserted.

A rectangular area for excavation was laid out 38 inches perpendicular from the corner in a southwest direction by 60 inches parallel to the wall starting from the corner (at undisturbed ground level) in the southeast direction. The surface was inspected and cleared of pieces of charcoal, slag, glass, miscellaneous domestic trash, and pieces of firebrick and red brick. This debris continued through the first 8 inches of excavation. Excavation was done with trowels and an army trench shovel. At 4 inches into the excavation and sticking into the excavation from its northwest

wall, the missing corner chip of the reference corner block was found, measuring 6½ inches across the bottom and 10 inches across the top. It was estimated to weigh about 30 pounds. The chip (stone A1) fit perfectly into the corner and held without support, although for the safety of the diggers, it was removed and put aside.

Underneath stone A, two side-by-side blocks were exposed measuring 17 inches high (stone B) and 18 inches high (stone B2), and separated by a small vertical triangular stone (stone B1). The bottoms of these blocks were 40⅛ inches below the reference point (12⅛ inches below local ground level). Beneath was an approximately 15-inch-high block (stone C) that lay wholly under stones B, B1, and B2. The bottom of stone C was 57 inches below the reference point (29 inches below ground level). These measurements were approximate due to the blocks not being cut exactly flat. In addition, spaces between blocks varied between virtual contact inside the wall's surface to an inch or two of space containing flat, stone chinking.

While exposing the face of stone C, less glass, trash, slag, and brick were encountered, while more pieces of iron were found. Some of this iron appeared to have spilled while in a molten state, retaining a "puddle" look. Other pieces looked like sprues, that is, pieces of iron that had broken from castings upon removal from the mold. Also uncovered was an end of a 2¼ inch (outside diameter) threaded pipe, sticking into the excavation out of its southeast wall. The pipe was worked around, resulting in its sticking about 6 inches into the excavation and into the backs of the diggers. The pipe was measured 44 inches below reference (16 inches below local ground level).

Firebricks unearthed measured 4½ by 2½ by 9 inches and 4½ by 2¾ by 8½ inches. The latter was marked OSTRANDER & SONS NO 1 TROY N.Y., a common marking found at 19th-century blast furnace and lime kiln remains throughout Vermont. A beveled firebrick measured 9½ inches long by 2⅞ inches thick by 4½ inches at its wide end and 3¾ inches at its narrow end. Beveled firebricks were used for furnace lining. Two red bricks measured 3¼ by 1¼ by 6¾ inches and 3⅝ by 2⅛ by 7¾ inches.

At 61 inches below reference (33 inches below local ground level), the earth changed from black dirt to a yellow or light-brown clay material, possibly yellow ocher. This yellow clay continued for 9 inches, at which time sand was encountered. The associated exposed block in the wall measured approximately 16 inches high (stone D); its bottom was 74 inches below reference (46 inches below local ground level). Stone D was the lowest measurable block encountered. Underneath this block, at 77 inches below reference (49 inches below local ground level), were smaller, irregular-shaped blocks (stones E, E1), whose faces were not as smooth as the blocks above. The excavation now uncovered the tops of large, round boulders (stones F, F1) in the floor of the hole. The sand continued down into the small spaces that could be dug from around the boulders. There was no way to excavate any of these boulders without enlarging the area of the excavation or significantly disturbing the area directly beneath the furnace wall. At this time (3:00 p.m.) it was pouring rain, and the entire site was abandoned for drier quarters.

The excavation was revisited by the author the following Saturday morning, June 1, a bright, sunny, dry day. Nothing appeared changed in the excavation from when it was left six days earlier. Measurements and photos were taken. As the levels of stone block in the furnace wall were exposed by the excavation, the gently sloping corner angle of the furnace was seen to continue down to the foundation boulders, maintaining the stack's truncated and stable configuration. All horizontal levels of stone block were generally flat and in line with the wall; no outward bulging or stone block movement was detected.

Measurement of the bottom of the excavation, where tops of large boulders were uncovered, found that the area had reduced from its surface area of 38 by 60 inches to about 28 by 36 inches. This could reflect poor excavation control, but having encountered many pieces of large stones on the way down and not wanting to dislodge them and make the excavation area larger, it was decided to bypass them and, thereby, allow the excavation to become smaller with depth. The excavation did, however, keep flush with the furnace wall. After all measurements were made and before the hole was refilled, a plastic sheet was laid flat on the bottom of the excavation, both to mark the depth of the excavation for future reference and to preserve a waterproof cover over this exposed and disturbed section of the foundation.

Conclusions

It is assumed that the tops of the large, round boulders found at the bottom of the excavation were the start of the large stones that were used to provide the furnace foundation, as recommended by Overman. The bottom of the excavation was 28 inches wide and also indicated that the stone foundation agreed with Overman's building the foundation at least one foot larger than the base of the furnace. It was a surprise to find, however, that the furnace foundation started only 46 inches below the present ground level. The first 33 inches excavated revealed sufficient trash and debris to conclude that this was overburden and not there when the furnace was in operation. Realistically, therefore, the foundation started a mere 13 inches below original casting floor level, which closely coincides with the start of the layer of yellow clay. We presently have no idea of the depth of the foundation boulders, but it is expected

that they continue much deeper beneath the furnace walls, in the order of many feet. What lies below this? How far outward the foundation boulders extend beyond the lowest layer of blocks would also have been nice to know, as well as the many other unanswered questions that came to mind as we stared into the little excavation.

The function of the yellow clay might be to waterproof the foundation from surface rainwater and the sand to provide a porous run-off medium for that which gets through. Overman recommended that the furnace foundation remain dry, and the combination of the 9-inch-thick layer of yellow clay and 7-inch layer of sand below the clay might afford a degree of moisture drainage beneath a moisture barrier. A lateral continuation of this yellow clay was also encountered in another limited excavation by Megan Battey and Walter Ryan the same day, about 15 feet away, directly in front of the main arch, and into what was probably the front of the casting room floor (Ryan 1991: 12-13).

Overman's recommendations for surface preparation prior to the construction of the blast furnace were obviously followed to some degree here at the Pittsford iron furnace. Whether the furnace builders were using Overman's instructions or were even aware of Overman is unknown. What the common furnace construction practice was during the mid-19th-century is likewise unknown. Was Overman leading the technology or merely recording it?

References

Overman, Frederick, *The Manufacture of Iron.* Philadelphia, Henry C. Baird, 1850, pp. 153-154.

Rolando, Victor, "The Granger Furnace, Pittsford, Vermont". *Society for Industrial Archeology - New England Chapters Newsletter,* Vol. 11, No. 1, 1991, pp. 7-10.

Ryan, Walter, "A Brief Analysis of a Metal Sample From the Pittsford, Vermont, Iron Furnace". *Society for Industrial Archeology - New England Chapters Newsletter,* Vol. 11, No. 2, 1991, pp. 12-13.

Ethan Allen Homestead Seeking Help for Archaeological Dig

The Ethan Allen Homestead Trust in Burlington is looking for volunteers to help with its summer 1992 archaeological investigations. Participants will work with archaeologists, learning basic excavation and laboratory techniques. Volunteers will make discoveries about life at the Homestead since 1774.

Those interested may sign up for any of three 2-week sessions between June 15 and August 1. Volunteers must be at least 16 years old and be able to perform strenuous outside work.

For information about the dig and other Homestead programs, call (802) 865-4556.

New Editor of VAS Newsletter

by Victor R. Rolando

On the occasion of David Starbuck being appointed the new Editor of the *VAS Newsletter*, the VAS Board takes this opportunity to thank Pru Doherty, former Editor, for her efforts over the past number of years. Pru took on the Newsletter with issue 61, April 1989, and published eight issues in three years, no small feat considering how many times she had so little copy to work with.

Since 1982, when the Newsletter started printing the Editor's name at the top of the title page, the Editors have been:

Pru Doherty	Issues 39-51	(March '82 - March '85)
Scott Dillon	Issues 52-56	(February '86 - Spring '87)
Sharon Murray	Issues 57-59	(January '88 - Autumn '88)
Bill Murphy	Issue 60	(March '89)
Pru Doherty	Issues 61-68	(April '89 - January '92)

Nautical Archaeology on Lake Champlain Shipwrecks

by Art Cohn

Nautical Archaeology Field School, June 8-26. Burlington Harbor. Planned to complete the documentation of the horse-powered ferry and study a sailing canal boat. Credit through University of Vermont.

Advanced Nautical Archaeology Field School, July 7-17. Mt. Independence / Fort Ticonderoga. This study will focus on documentation of the Revolutionary War "Great Bridge" whose caissons span the lake in this historic region. Credit through University of Vermont. (This program depends on funding approval.)

For more information about either field school, contact:

Art Cohn, Director
Lake Champlain Maritime Museum
Basin Harbor, Vermont 05491
or call (802) 475-2317.

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