BULLETIN OF THE MASSACHUSETTS ARCHAEOLOGICAL SOCIETY

VOLUME 50 NUMBER 1 APRIL 1989

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The BULLETIN OF THE MASSACHUSETTS ARCHAEOLOGICAL SOCIETY is published semi-annually, with each volume beginning in April. Institutional subscriptions are $20; individual memberships in the Society are $10 and include a subscription to the Bulletin. Information on special rates for family members, seniors, students, etc., is available from the Membership Secretary. Order back issues of the Bulletin from the Museum Director, Massachusetts Archaeological Society, 42 Union Street, Attleboro MA 02703 (617-222-5470).

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37 Conant Road, Lincoln MA 01773 (617-259-9397 or 617-228-4381)
The articles in this issue of the Bulletin reflect the wide and wonderful variety of activities carried out in the name of archaeology. Charles Bartels describes the wet and dry screening equipment designed, built and operated by the Ekblaw Chapter when faced with a large salvage project and time constraints. Bill Moody illustrates the research values obtainable from a carefully controlled surface collecting method, followed by recording and publication of the results.

Jim Bradley undertakes a regional review of ossuaries, and his results place the Wellfleet ossuary on Cape Cod of about 950-1150 A.D. in the context of other ossuaries in coastal southeastern New England and New York at about the same time. Curt Hoffman provides data and discussion on the elusive Late Woodland village in the uplands of Massachusetts. His contribution was originally written for the 1987 NEAA Symposium, Where are the Woodland Villages?, of which a number of papers were published in Bulletin 49(2) 1988. Both Jim's and Curt's papers relate to that symposium and would have been in the last issue had there been space.

Charles Nelson contributes a radiocarbon date for a Middle Woodland dog burial, which provides hard data for a number of archaeological issues in New England. And, finally, Robin Maloney describes a model and procedures for contemporary museum studies of prehistoric New England pottery.

Radiocarbon Age Reports, especially for dates funded by the MAS, are a continuing project of the editor. Contributions (radiocarbon dating lab reports) would be welcome.

**RADIOCARBON AGE REPORTS (SEE BMAS 49:1)**

**Butler Site, Osterville, MAS #M46-E25; MHC #19-BN-511**
Sample: Wood charcoal, final feature sample 1, found below a clay-like "floor" feature in square W1GN, in a pit containing softshell clam shells, deer bone, flakes and potsherds. A small stem point was recovered near this pit at the same level in W1GN. Sample age: 905 ± 135 B.P. (GX-10229) in radiocarbon years before 1950 ± 1 sigma. Error is judged by analytical data alone. No δ 13C correction; 14C half-life: 5570 years; 95% NBS Oxalic Acid Standard (Marie Etoson, Cape Cod Chapter, Geochron Report 1984; MAS Matching Funds Application, 1984).

**Charlestown Meadows Site, Charlestown, MAS #M22-SW16; MHC #19-WR-268**
Sample: Charcoal from Feature #20, S28E19, a large "red earth feature", containing small stemmed and Vosburg points, a Neville point and a charcoal lens. Sample age: 9120 ± 285 B.P. (GX 10925) in radiocarbon years before 1950 ± 1 sigma. δ 13C = -25.80/00; C-13 corrected date; 14C half-life: 5570 years; 95% NBS Oxalic Acid Standard. "There is no apparent reason why this date should be so early" (Curtiss Hoffman, Ekblaw Chapter, Geochron Report 1985; MAS Matching Funds Application, 1984).
THE EKBLAW SCREENING SYSTEMS

Charles R. Bartels

The W. Elmer Ekblaw Chapter, Massachusetts Archaeological Society, conducted an archaeological salvage operation at the Charlestown Meadows site in Westboro, Massachusetts in the last quarter of 1986. The turf and plow zone were cleared from 1350 square meters of the site by a bulldozer. Then chapter members, using hoes and shovels, removed an average of 6 to 7 cm of soil to expose the undisturbed features. The soil was moved by garden cart and wheelbarrow to the edge of the site for dry screening. On the undisturbed surface, 122 features were located and mapped. The contents of each feature were bagged in double plastic bags and stored over the winter. In the next season the bag contents were wet-screened on 1 mm mesh, and the retained material dried and saved for laboratory processing. This report describes the dry and wet screening systems used.

INTRODUCTION

Excavation, on a seasonal basis, at the Charlestown Meadows site in Westboro had continued for ten seasons. Then, in 1986, the property was sold, with a proviso that the chapter would be permitted to conduct a salvage operation in the critical area on which a warehouse was to be built. Due to legal complications, permission to dig was not received until October, and was limited to a three-month period. Since the area had been farmed for over 50 years, provenience of artifacts in the plow zone was not expected to be very exact, so the turf and plow zone were cleared by bulldozer from 1350 square meters. Then chapter members, using hoes and shovels, removed 6 to 7 cm of soil to expose the undisturbed features. The soil was moved by garden cart and wheelbarrow to the edge of the site for dry screening (Warfield 1988).

The soil collected from the layer just above junction amounted to about 90 cubic meters. To screen this through 1/4 inch (6 mm) mesh hardware cloth on hand-held screens would have been impossible, given the constraints of time, personnel and weather under which the operation was carried out. A neighboring contractor kindly tried his loam screener, but the smallest screen available, 3/8 inch (1 cm) x 5/4 inch (3 cm), allowed a loss of lithics which the dig director deemed unacceptable. One member of the chapter, Al Pinard, designed and built a hand-powered, suspended screen. This was a considerable advance, and the unit was used regularly as the number of workers permitted.

THE EKBLAW DRY SCREENER

The pressure to complete the field work led another chapter member, Roy Usher, to design and build an engine-powered screener. To save time and money he used an old gas-powered garden tiller as the basic unit. A welded frame of angle iron extended from the front of the tiller to support the carriage, which held a wood screen, 50 x 75 cm with 1/4 inch (6 mm) mesh hardware cloth. The carriage rolled back and forth on roller-skate wheels bought at a bargain price at a flea market. The gasoline engine and gear-reduction box of the tiller were connected through a belt drive and crank-arm to power the movable carriage. A flip of an idler pulley arm disconnected the drive from
the carriage, and allowed a screen with its load of lithic material to be exchanged for an empty screen. Some details are shown in Figure 1.

The machine imitated the action of vigorous hand-screening with a rate of 20 to 40 cycles per minute, for which the five hp motor was more than adequate. The rate of screening varied with the quality of the soil. When the soil was very wet, or, as often happened, was partially frozen, screening was considerably slowed. With a soil that was judged good or even marginal for hand screening, the screener handled it as fast as one person could shovel it onto the screen and shovel away the sifted soil from beneath the unit.

Weather and ground conditions deteriorated and it became difficult to move carts about. Now another feature of the design became much appreciated. This screener is self-propelled when power is shifted to the broad, rubber-tired wheels. The screener was readily moved to the piles of soil to be screened and away from the accumulating screenings. The amount of shoveling and carting was greatly reduced.

Engine-powered and hand-powered screeners and their efficient use are described by Bird and Ford (1956), and by Bird (1968, 1980). Bird also discusses the importance of planning the screening and sorting to minimize the efforts and discomforts of the excavation team. At the Charlestown Meadows site, providing a sorting table, comfortable seating, and possibly a canvas shelter might have lessened the burden and attracted more participants.

An operation like this is a learning experience for all. Though the individual steps of excavation, recording and screening are much the same on large scale as on small, the large number of repeated actions required, and the necessary specialization of the participants places a much greater stress on organization and planning. The approach

Figure 1. The Ekblaw dry screener being operated by Roy and Marge Usher.
described is not the only way to meet a problem such as faced the Ekblaw chapter. It is presented here to encourage others to use the talent hidden in their own organizations, and to exploit their local conditions. Ekblaw Chapter would be glad to discuss details with those interested, and would appreciate receiving the suggestions of others.

THE EKBLAW WET SCREENER

About 830 bags of soil, averaging 20 kg each, were recovered from features in the Charlestown Meadows salvage excavation (Warfield 1988). The bags were piled in random fashion in the old DPW garage in Westboro, since the frantic pace of excavation and transportation had not allowed the orderly arrangement of the storage area, which would have been desirable. During the winter of 1986-87, while the bags in storage soaked in water from a leaky roof and froze in the unheated building, the next step was under consideration.

Guidelines.

Suggestions were solicited from many sources. Time was once more of the essence because of the threatened demolition of the storage building. Drying and screening of the amount of material in storage seemed possible only on a sampling basis, and significant random sampling would not have been possible.

Ranging tests of wet screening were carried out on a small scale in a home kitchen "lab". The test screen was actually a tuna fish can, its bottom replaced with a bit of aluminum window screen. This readily available material, with openings 1 mm x 1 mm, has been used widely since the early work of Struever (1968), French (1971) and Watson (1976). A 300 gm sample could be washed free of silt and sand in about two minutes. The lithic fraction and bone remained on the screen. Some carbonized organics floated, but never more than a small fraction of the total present unless the sample was first dried. With this information on hand, planning and preparation began.

The working group was aware of the possibilities of froth flotation (Jarman et al. 1972), and heavy-media separation (Struever 1968; Bodner and Rowllett 1980), but under the circumstances they were out of reach. Each of these approaches involved disposal problems which the team was not prepared to handle.

D. H. French (1971) stated his aims in using a wet screening unit:

"1) to retrieve (from excavated soil) macroscopic materials, whether artifactual or not, by means which are practical and economical and by methods which are simple, efficient (i.e. to high level or standard of recovery) and as free as possible from human bias.

2) to conduct this operation by mechanical methods and definable standards so that the recovery programme is, as far as possible, repeatable either on the same site or at any other site.

3) to combine in a single process the separation and recovery of floatable and non-floatable materials in clean, sortable fractions.

4) to have the possibility of bulk process whereby all dug earth, in whatever amount, is sieved."
One could not ask for better guidelines.

From our discussions among the working group, some basic decisions emerged:

1. Operations must extract the maximum information from the material processed. Realistically, the capabilities for microscopic examination of 800 samples were not likely to be available. Material retained on a one mm screen would include most debitage. The one mm screen would also retain samples of each of the carbonized forage resources such as Chenopodium or Amaranth, other seeds, as well as charred nut shells, charred wood and bone. By capturing and packaging particles that were retained by this mesh, it was hoped to gather the maximum information possible under the circumstances.

Uncharred organics were to be rejected as probably recent invaders (Minnis 1981; Largy 1984, 1985). The use of surfactants was rejected because of the possibility of recovering charcoal for dating from some samples (see Matson [1955] for caveat). Since water from processing would exit from the garage site across public land, it was important to be able to show that this effluent was the equivalent of rainwater. Surfactant foam did not seem acceptable.

2. The lab tests and estimates of operating cycles suggested that a screen area of about 1000 sq. cm would give processing times in an acceptable time range, 10 to 15 minutes per bag. The inside area of the base of a standard plastic milk carton crate is slightly larger (1090 sq. cm). Use of such inexpensive, available components would hold down costs and facilitate construction. The lattice-work sides of the crate and the mesh sides of the liner added to the available screening area and improved the flow of water through the basket contents.

3. The size of the screen unit dictated the size of the wash tank. Again, by good fortune, it was found that a heavy-duty, 120 liter trash barrel was about the correct size.

4. The equipment had to be such that it could also be handled by junior or senior citizens.

The Design.

Design evolved by expediency, trial and error. Three Ekblaw wet-screeners were assembled and used. The final design is described here, but those variants that might be useful in other circumstances are noted. Each screener consists of five parts: a screening basket, a wash tank with a bottom discharge and a side overflow, a wash tank stand with a mast and davit, a feed stand and a feed tray. These are shown in Figure 2.

The metal components are 3/4 inch (2 cm), standard iron pipe size. The wood components were cut from 1/2 inch (1.3 cm) plywood and other members from 2 x 4's (5 cm x 10 cm).

1. The screening basket is a half-height milk crate with a liner of standard aluminum window screening. The liner is best shaped by folding a 32 inch x 32 inch (80 cm x 80 cm) piece of screening over a form which fits inside the plastic crate with about 1/4 inch (6 mm) clearance. The corners of the screening are notched to allow the sides that project above the rim of the crate to be folded down to reinforce the edge. The extra screening below the crate rim is folded to stiffen the liner sides. These liners do wear and must be replaced, so on a large project it is well to invest the time and effort
Figure 2. Ekblaw Wet Screener, showing screening basket, wash tank, tank stand, feed table and feed tray, and how they were mounted and arranged.
to make a shaping form.

Fastening of the folds can be done with "pop" rivets, with duct tape, or by use of a strong, waterproof adhesive. Each is satisfactory, but the combination of rivets and a flexible adhesive seems to hold the folds best. A piece of larger mesh screen can be used as an underdrain between the bottom of the liner and the bottom of the crate.

2. The wash tank is a standard, 120 liter heavy-duty, plastic trash barrel, 71 cm high by 52 cm top inside diameter. Each wash tank had a bottom valve to discharge sludge. The first tank was fitted with a rubber cone (actually, a soil pipe roof boot), which could be stoppered with a liquid-filled two-liter soda bottle.

Since it happened that the sludge could be discharged directly to the ground instead of to a run-off flume, the next unit was equipped with a flat, gasketed plate to cover the discharge port in the bottom of the tank. This required a hold-down pole to hold the plate in place until the water level rose high enough to provide the requisite pressure. The third unit had a standard toilet flush valve for the bottom closure and the outlet pipe could be directed to an off-flume, but the smaller size of the available standard fittings limited the discharge rate.

As sand and silt accumulate in the wash tank the water level rises, so an overflow port is provided by installing a bulkhead fitting in the side of the tank, about 10 cm below the rim. In the unit with the toilet-tank valve, the integral overflow pipe, extended by a short length of hose, serves the same purpose.

3. & 4. The wash tank stands on a 60 cm x 60 cm plywood platform mounted on 30 cm legs. The wash tank valve discharges through a hole in the center of the platform. The feed stand is also 60 cm x 60 cm at a height of 106 cm. This feed stand is placed

Figure 3. Operation of the Ekblaw wet screener by C. Hoffman and C. Bartels.
next to the wash tank stand. One leg of the tank stand is extended to about 2 m to support a davit arm made of 3/4 inch (2 cm) pipe and fittings. The vertical arm of the davit is fastened to the upright with pipe hangers to permit the davit to swing in an arc. The mesh-lined screening basket is suspended from the davit by a tackle made of two small, double-sheave pulleys and light plastic rope. Below the lower pulley a rubber tie-down strap of the sort used on cartop carriers extends to the ends of a spreader bar. On either end of the spreader bar a snap hook engages cord loops on the sides of the basket.

5. The feed tray is just a piece of plywood with an edge-frame of 2x4's (5 cm x 10 cm). On one side an opening 8 inches (20 cm) wide, closed by a removable gate allowed the soil to be raked out using a hoe. The sides perpendicular to the feed gate are drilled to install rope loops. See Figure 3.

THE SCREENING SYSTEM IN OPERATION

Through the cooperation of the town and an adjacent property developer, Ms. Fran Riel, a water connection for a garden hose was provided. From this main line a series of plastic Y's and valves allowed fill and wash hose connections to each unit. At first the combination of branch connections, plastic valves and hose nozzles seemed like a plumber's nightmare. With experience, the system was quite workable. A very small increment of cost spent on good quality hoses was money well spent.

The scale of the operation required careful organization and record-keeping. Each plastic bag of soil was transferred from storage onto a feed tray. At the director's table the quadrant number and feature number were copied from the bags and recorded in the log. An ink-numbered paper placemat ("linen-like," high wet-strength) and two numbered paper lunch bags were placed in a beer flat, because single bags and placemats were found likely to break when wrapping wet samples. The loaded feed tray was moved to the screener on a hand truck which Roy Usher fabricated from a steel plate, a bent pipe handle and the wheels from the dry screener which was not in use at that time. When the handle was fully raised, the front lip of the plate touched the ground, which simplified the transfer of the bags or feed tray. Alternatively, the feed trays were moved about on an antique "little red wagon". The feed tray could have been hoisted to the feed table by using the davit and tackle. In practice, it was lifted to the feed table by one neo-Neanderthal, two senior citizens, or four preteens.

The feed tray was extended from the feed table over the wash tank so soil could be pulled into the basket with a short hoe. The tackle held the basket at optimum level, about half-submerged. Vertical shaking of the basket on its elastic support required little effort. Sometimes large lumps were broken up by the operator's hands. Vertical positioning of the basket by the hoisting tackle, and maintenance of the water level by the overflow insured that no floating material washed over the side of the basket.

After screening and rinsing, the mesh liner was drained briefly. The operators checked for artifacts, which were bagged separately. These operators may be new recruits, with no previous exposure to sorting of artifacts and debitage from screened gravel. Remember, "Muzzle not the oxen that trample out the corn" (Deut. xxv: 4). To allow the beginner to make a preliminary search of the retained material and find an artifact or flake ties that person to archaeology for a lifetime. The gravel, with its debitage and retained organics, was dumped onto the numbered paper towel and placed in the numbered paper bags. These were set aside in units of five in paper grocery sacks.
for removal to the laboratory. In the paper packaging, most samples dried in a day or less.

On average, four bags of soil could be screened in one tank before the accumulated sand and silt had to be emptied. When the valve port was opened by pulling a rope attached to the stopper or plate there was a moment of hesitation and then a spectacular gush of mud. The remaining mud was hosed out of the tank, the valve port closed, and the tank refilled. This took about ten minutes. Since, at one point, it appeared that there might be a restriction on water use, an estimate was made of the amount required: about 80 liters in the wash tank, and another 80 liters in hosing out the silt and cleaning the equipment, or 2 liters of water/kg of sample.

The particular circumstances allowed the discharge of the silt-laden water in a thin sheet across a broad, paved surface - ideal for settling the silt. The silt contained enough clay so the dried mud crusted slightly, minimizing dusting on drying. Had it been necessary to use another processing site where silt might be damaging to the environment if it flowed into a pond or stream or sewer, plans had been made to contain it in a settling basin or with hay bales or geotextile barriers.

The water, as used here, is simply a dispersion and transport vehicle for the sand and silt. It may be possible to devise a simple and inexpensive method for removing the silt from the bottom of the tank without emptying the tank, but it just didn't come to mind. Suggestions would be appreciated.

SUMMARY

In a work day, limited by travel time to about six hours, the three units could process about 66 bags. This allowed an hour for set-up and take-down, and a half-hour for lunch. Two operators worked at each screener and one person recorded and packaged for all three units.

The rate of processing was: 73 kg or 46 liters/hr/unit, and 55 kg or 35 liters/hr/worker.

The actual expenditure for construction materials and supplies for the three wet screening units amounted to less than $300.

REFERENCES CITED

Bird, Junius, and Ford, James

Bird, Junius

Bodner, Connie Cox, and Ralph M. Rowlett
French, David H.  

Jarman, H. N., A. J. Legge and J. A. Charles  

Largy, Tonya  

Matson, Fredrick  

Struver, Stuart  

Warfield, Ruth  

Watson, Patty Jo  
POTENTIAL RESEARCH VALUE IN SURFACE COLLECTING

William E. Moody

For many avocational archaeologists and probably more than a few professionals, their interest in prehistory was very likely first sparked by discovering a projectile point or some other stone implement lying exposed on the surface of a plowed field, on an eroded hillside or along the bank of a creek they explored as a youngster. In my personal collection, I still have the first "arrowhead" I found when I was twelve years old. That projectile point came from my grandfather's homestead along the Alafia River near Tampa Bay on the west coast of Florida. But for the serious amateur, if surface collecting is to go beyond a pleasant hobby, there are methods for approaching the activity that can make it much more rewarding personally and also add something of potential significance to the archaeological research in a community.

This report is intended to share some ideas that have proved helpful in drawing conclusions about particular sites as well as in making some interesting comparisons between sites in a local region.

EQUIPMENT

The materials and supplies needed are basic:

1) A good topographic map for accurately locating and recording the areas you will be hunting.

2) A compass for orienting yourself on the site.

3) Clipboard and graph paper for sketching the site, entering locations of artifact recoveries, and making field notes.

4) A camera for making a photographic record of the site.

5) A small canvas satchel, or something similar, that can be hung from a belt or tied around the waist, for holding recoveries.

6) A supply of small zip-lock plastic bags and cotton balls or tissue. To protect your recoveries from incidental "bag wear," each item should be individually wrapped and placed in a plastic bag before going into the larger canvas satchel.

7) A marking pen, such as an extra fine point marker, for waterproof writing on non-porous surfaces. You can write an acquisition number and pertinent information directly on the plastic bag as recoveries are made. Later when the artifact has been cleaned, a catalogue number can be transferred to the specimen.

8) Sunglasses and hat. Walking a field in the late afternoon while facing west can make it extremely difficult to see, even when one is looking at the ground!

9) A walking stick with a pointed end. A sawed-off broom handle sharpened at one end is fine. This is a great help in turning over rocks or moving small debris aside without having to bend over constantly.
Figure 1. Author's method of thoroughly surveying the surface area of a disturbed or plowed field. When completed, the field has been crisscrossed along the edges of one-meter squares. Artifact recoveries can be plotted on graph paper according to square numbers, as in B-2, D-3, E-2, G-3, H-1, and so on.

METHODS

In surface hunting, some sort of baseline is important to provide a basic point of reference. Normally, you can readily pick out a couple of landmarks, a tree, boulder, telephone pole, road sign, etc., or the boundary of the field, to determine your baseline, and with a compass it is easy to keep on track as you cover an area by foot.

When starting out across a field, I begin by walking at a ninety-degree angle from the base line (Figure 1). I proceed slowly, looking at the ground ahead and also just slightly from side to side. I'll stop every few steps and squat down to get a better look at the surface of the soil, because, through experience I've found that the closer I am to the ground, the more artifacts are recovered. After crossing the field, I move over approximately one meter and then proceed back across the field in the same manner until reaching the original base line. This procedure continues until the whole area has been covered, at which point I start again, this time walking parallel to the base line. In this
manner the entire field will have been crisscrossed along the lines of a one-meter square grid. Here, too, experience has shown that no matter how carefully an area is surveyed in one direction, looking over the field at right angles to the original route will reveal many more artifacts.

The next point in discussing methods is the one that I consider to be perhaps of most significance. It is simply this: pick up and save for future study every bit of archaeological evidence during a surface hunt. This is probably the most neglected aspect of surface collecting by amateurs in New England, many of whom choose to pick up only the most highly valued artifacts, i.e., the perfect projectile points. Others collect chiefly artifacts made of white quartz, simply because this material is easier to see than felsite and other dark material on the surface of a plowed or disturbed field. What is then left behind at a site may actually be the preponderance of material that could truly give the surface collection some effective research potential. If such a narrowly defined collection were ever to be donated to a museum or presented to professional archaeologists for study, the perfect specimens and white quartz artifacts might be interesting to look at, but the collection would display an obvious collecting bias (Sterud et al. 1978).

Not enough surface collections, for example, include flake scrapers or flake knives, rudimentary bifaces, or implements like shaft abraders, notchers, hammerstones, and so on. The average collection of a hobbyist would thus not reveal anything like a representative tool kit for the site. And without any debitage present, such a collection would provide little evidence of whether diversified forms of tool utilization, tool-making, or tool repairs were significant prehistoric activities at the location, nor would the collection indicate what range of local or exotic lithic materials were being employed. Basically the collection would not illustrate much more than the fact that perfect projectile points were left at the site at some period in prehistory. A general time period might be determined by projectile point typology, but beyond that, not much else could be deduced. For all anyone might guess, perhaps the site was a location where early inhabitants threw their javelins or shot their arrows over a practice field!

Proper collecting demands that in addition to all perfect projectile points, all other tools and broken implements should be saved. Moreover, all debitage should be collected. And this of course requires that the amateur learn to recognize other tools and the chipping and flaking debris at least as well as he or she recognizes the projectile points.

SITE REPORTS

For each location where artifacts have been collected by surface hunting, it is extremely important to write a brief site report. One copy should stay with the collection and copies should be made available to the Massachusetts Archaeological Society (42 Union St., Attleboro 02703) and to the Massachusetts Historical Commission (80 Boylston St., Boston 02116).

A report can include specific information on the site's location, ownership of the property, and access. It can state potential for further research or actual excavation. It should include a sketch map and describe nearby watercourses and other geographic features of interest. It can mention soil conditions and surrounding vegetation. It should catalog, classify, and describe recoveries and draw possible conclusions about prehistoric activities. [A form for recording this data is available from the Massachusetts Archaeological Society or from the editor.]
To illustrate by example, in the fall of 1986 and spring of 1987, I had the opportunity to investigate two fields along the North River in southeastern Massachusetts (Figure 2, Sites A and B). The sites were both approximately the same size and configuration. They were both south-facing locations, situated on level land on the first terrace above the river. Each site had the advantage of a hill to the north, which would have served as protection from winter winds.

The two sites had both been recently disturbed for the same reason: installation of a residential septic system and leaching field. And the disturbed areas that were surface hunted at each location covered approximately 1/3 acre (1350 m$^2$) in size, although the boundaries of the actual prehistoric habitation sites were undoubtedly much larger. Upon investigating the sites, it also seemed clear that both locations had previously been used as agricultural land during historic times. And from talking to residents in the area, I was convinced that the two locations had been surface collected during the past century. Later, my research into earlier accounts describing archaeological studies in the North River valley proved my assumptions about larger site size, historic agricultural activity, and past surface collecting to be accurate (Howe 1948). However, despite intensive collecting in past decades and the agricultural disturbances over many years, some interesting recoveries were still possible.

At each site the soil was typical of the zonal, podzolic soils in this area of New England. Having in the past been plowed, however, the top horizons were thoroughly mixed and appeared as a dark layer of topsoil. This was followed by a thick layer of brown subsoil that gradually lightened in color from top to bottom. Deposits below the subsoil consisted of sand and then glacial till of pebbles and cobbles. This was evident at both locations from the excavations for the septic systems. Surrounding vegetation included some second growth woodland of mixed pine and hardwood.
Figure 3. Artifact assemblage from Site B: 1) projectile point, corner-removed #3, felsite; 2) projectile point, small stemmed, felsite; 3-8) projectile points, small stemmed, quartz; 9) projectile point, small triangular #5, quartz; 10-11) projectile points, small triangular #6, quartz; 12) flake scraper, quartz; 13-14) side scrapers, felsite; 15) chopper, sandstone; 16-20) bifaces, quartz; 21-23) basal sections of unidentified tools, quartz (Rivard 1976).

Figure 4. Artifact assemblage from Site A: 1-2) choppers, argillite; 3) biface, Saugus "jasper"; 4) projectile point, broken, marine chert; 5) projectile point preform, felsite; 6-9) flake scrapers, Saugus "jasper" (retouched), felsite (retouched), marine chert, Saugus "jasper"; 10) preform, Saugus "jasper"; 11-13) basal sections of unidentified tools, marine chert (11), felsite (12 & 13); 14) large triangular blade, felsite; 15) core, felsite (Rivard 1976).
It can readily be seen that in nearly all respects the two sites were closely similar: in orientation, geographic features, access to the same watercourse, soil composition, and vegetation. The primary difference between the sites is that Site A is 3 km closer to the ocean than Site B.

Both fields were carefully surface collected in the manner described earlier in this report, and with so many similarities in the two sites, it was somewhat surprising to discover how different was the make-up of lithic materials recovered at each location.

The artifact assemblage at Site B included (Figure 3): one corner-removed #3 projectile point (possible Bare Island or Merrimack) made of felsite; seven small stemmed points, one of felsite and six of quartz (four of which were broken); three small triangular points, all of quartz (one is type #5, possible Beekman; and two are type #6, one with a broken tip); one quartz flake scraper; two felsite side scrapers; one sandstone chopper; five quartz bifaces; three broken quartz bases from unidentifiable tools.

The debitage was considerable, including both large and small flakes and chips. By count, the total debitage amounted to 358 flakes and chips, weighing 1.84 kg. There were also five quartz cores. The materials were classified as follows: quartz, 350 chips, weighing 1.72 kg, which amounted to 93.5% of total by weight; felsite, 7 chips, weighing 90.7 gm, or 5% of total; quartzite, 1 chip, weighing 28.4 gm, or 1.5% of total. This high percentage of quartz debitage corresponded generally with the high percentage of quartz artifacts.

By contrast the lithic materials from Site A included only a very small amount of quartz. The artifact assemblage was as follows (Figure 4): two broken projectile points, one of marine chert and one of argillite (the argillite point, not shown in Fig. 4, was identical to Fig. 4, number 4 in shape, size, manufacturing technique, and was even broken at the same spot on the point); one projectile point preform of felsite; one large triangular felsite blade with broken tip; two argillite choppers, one of which is quite large; one biface of Saugus "jasper"; four flake scrapers (two with reworked edges and two that are blade-like); one preform, or worked blank, of Saugus "jasper"; three broken bases from unidentifiable tools, one of marine chert and two of felsite; one felsite core.

Here, too, the debitage was considerable. Again, by count, the total was 417 flakes and chips, weighing 1.05 kg. The materials were: quartz, 20 chips, weighing 51 gm, which was only 4.9% of total by weight; felsite, 211 chips, weighing 569.9 gm, or 54.5% of total (felsites were further subdivided into the following categories: purple porphyry, 101 chips, 241 gm, 23% of total debitage; black porphyry, 91 chips, 218.3 gm, 20.9%; other felsites, 19 chips, 110.6 gm, 10.6%; Saugus "jasper," 81 chips, weighing 141.7 gm, or 13.6% of total; marine chert, 46 chips, weighing 141.8 gm, or 13.5% of total; argillite, 26 chips, weighing 56.7 gm, or 5.4% of total; other, 33 chips, weighing 85 gm, or 8.1% of total. The lithic material of artifacts recovered at this location correspond to the argillite, felsite, chert, and jasper of the debitage, but there were no quartz artifacts.

CONCLUSION

From these two, very small, surface collections, one could quite fairly assume that at both locations there was a good amount of tool-making and tool-utilization occurring. Furthermore, considering the geography of the sites as well as the amount of debitage and the variety of tools collected from a small portion of a large landform at each location,
one could assume that the two sites would have been long term habitation sites, base camps, or villages. In an attempt to illustrate the potential usefulness of surface collections, I originally drew these conclusions independently of additional research into the archaeological literature on the area. Later research did, however, tend to support these early assumptions (Howe 1948; Hallaren 1988).

In drawing further conclusions, projectile point typology at Site B would indicate a probable Late Archaic habitation, although previous investigations in the area immediately adjoining this small section of the total site have revealed additional lithic evidence of settlement patterns extending back through Middle and Early Archaic cultures, even including a transitional Paleo component (Hallaren 1988). Also, from the adjoining area a reliable radiocarbon date of $4,800\pm 110$ years B.P. has been attributed to stemmed points of the Squibnocket and Merrimack varieties (Hallaren 1988). This date also compares favorably with the age range for Beckman triangles, such as the specimen recovered at Site B (Ritchie 1976). From the artifact assemblage and the debitage which was surface collected within the limited boundaries of this small section of the total site, it is clear that the original inhabitants at this location relied heavily on local quartz cobbles and pebbles as a primary resource in tool manufacture.

At Site A, however, the inhabitants were obviously using some materials brought to the site from other areas, either through trading or quarrying. If the two broken projectile points are possible large triangular (Levanna) points, as believed, this would normally define a Late Woodland occupation. Also, the Henry F. Howe collection, recovered from this same vicinity in the 1940's and reported in the Bulletin of the Massachusetts Archaeological Society (Howe 1948), clearly showed large triangular points to be the distinctive style. Further research in the literature and in the field could help to locate possible sources of the lithic materials used at Site B.

Although surface collecting has often been considered as providing only a modest amount of new archaeological information, in recent years professional archaeologists have been looking more seriously at the data provided by surface collecting and by careful analysis of plow zone disturbances (Redman and Watson 1970; Roper 1976; Sterud et al. 1978; Hoffman 1982). It has become clear that significant conclusions can often be drawn about site density and subsurface patterns of features from the surface distribution of artifacts. Further conclusions may also be reached concerning diversified uses of space by prehistoric inhabitants, and certainly a surface collection could offer a base for studying various processes associated with the manufacture of lithic implements. As the major study by Redman and Watson clearly illustrated, "Systematic surface collection can also be used in regional surveys, without excavation, to provide comparative data about the chronological placement and functional nature of various sites" (Redman and Watson 1970). All of this is important when considering questions of proper cultural resource management (Hoffman 1982).

So, regardless of how modest a surface collection may be, it nonetheless has the potential for contributing knowledge well beyond the enjoyment of a pleasant hobby. And occasionally, when carefully planned and diligently carried through to its conclusion, a surface hunt can produce something extremely valuable.

In one of Louis Brennan's popular books on archaeology, he observed, "To hunt an archaeologically productive field on a sunny March day after a rain when the surface is bare or newly plowed is one of the pleasantest avocations. To pick up an artifact or other evidence of occupation by Amerinds lying in plain sight is a good deed; it saves the piece from breakage, from being possessed by the uncaring, or from being covered over and lost again. But to pick it up is also a responsible act; the item should not be merely
pocketed and then stored in an empty coffee jar. What turns surface hunting...into archaeology is record-keeping" (Brennan 1973). And, one might add, what turns surface hunting into even better archaeology is a willingness to share that record-keeping with the archaeological community.

It is hoped that this report and the examples given offer insight into some of the potential research value of surface collecting and how amateurs can support the work of professionals. Even though today it may seem that opportunities for surface collecting are dwindling because of continued expansion of commercial and residential development, interesting recoveries still remain to be made. And from time to time, a surface collection can throw new light on aboriginal activities in New England, or at least provide additional confirmation of previous conclusions. Furthermore, there is always the possibility that one's efforts might raise some new questions or stir discussion, and every site surveyed and recorded will ultimately add to the general understanding of habitation patterns in prehistoric times.

REFERENCES USED

Brennan, Louis A.

Hallaren, William D.
1988 Prehistoric Indicators from Southeastern Massachusetts, 10,500-8,000 Years B.P. Scituate Historical Society, Scituate MA.

Hoffman, Curtiss

Howe, Henry F.

Redman, Charles L. and Patty Jo Watson

Ritchie, William A.

Rivard, J. J. (editor)

Roper, Donna

Sterud, Eugene, Frank McManamon and Matthew Rose
Although common elsewhere in northeastern North America, the ossuary form of burial, in which the disarticulated remains of several individuals are interred together, is extremely rare in New England. The first documented occurrence in Massachusetts was discovered in 1979 on Cape Cod (Bradley, McManamon, Mahlstedt, and Magennis 1982). The Indian Neck Ossuary (19-BN-387) was a difficult site to interpret since no other comparable examples were known. With the discovery of a second ossuary, the Grove Field Ossuary, on the Cape, and additional occurrences in nearby coastal New York, it begins to be possible to place these unusual sites in the context of southern New England's prehistory.

DESCRIPTION

Four sources provide information on the Grove Field Ossuary. Two are contemporary newspaper accounts. The Sandwich Observer of August 1, 1911 noted the following under the headline, "Mystery":

A big mystery was unearthed by F. F. Bumpus on Saturday while engaged in digging a cess pool near his residence when a short distance from the top of the ground he came upon a pile of human bones. He unearthed 14 skulls of different sizes, and stopped digging. The bodies appear to have been buried in a long, shallow trench, three feet down being the depth, but as yet it is not known how long it will prove to be. Representatives from the Peabody Museum, Harvard University, visited the place Monday, to determine if possible whether the bones are those of Indians, white people, or some other race of beings. There have as yet not been found any of the cooking utensils, or war implements of the Indians as was customary with them to place with their dead. There are various theories that a trading vessel may have come up the river and the Indians massacred them; that an epidemic may have carried off scores, etc. Which is correct will probably never be known. There have been many visitors to view the mysterious thing which has been unearthed.

Another version of Mr. Bumpus' discovery was reported by the Yarmouth Register on August 19th with a heading, "Digs up Bones of Fifteen Indians":

The prosaic and ordinarily monotonous work of cesspool digging led to the uncovering at Bourne recently of fifteen human skeletons on the premises of Frederick Bumpus. At a depth of three feet below the surface Bumpus was shocked when his shovel brought to light a human skull. More digging disclosed more skulls, until enough to stock a museum had been exhumed. The position of the bodies indicated that they had been buried in haste, as there was no effort whatever, apparently, to place them in rows. The region about Bourne abounds in Indian relics, and it is believed that the bones uncovered by Bumpus are the remains of some aboriginal dwellers of Cape Cod....
The opening of the Cape Cod canal in 1914 was celebrated with a number of local festivals and events. One of those which took place, The Pageant of Cape Cod, produced a souvenir program with several pages of contemporary photographs (The Pageant of Cape Cod 1914). Among these was a photo captioned, "Exhuming Indian Graves at Bourne," which, out of respect for human burials, has not been reproduced here. While it cannot be proven that these are the remains found by Mr. Bumpus, the notoriety of his discovery (not to mention the sheer quantity of bone shown in the photograph) argues that this is the case.

The final source which provides information on this ossuary is Betsy Keene's History of Bourne published in 1937. While reiterating some details, this account also added new ones:

In 1911-12, while digging a hole in his garden, the late Frederick F. Bumpus of Bourne unearthed a heap of different sized Indian bones, the smaller size predominating. The skulls had all been crushed and all the bones bore unmistakable signs of having been burned; some very greatly charred, others merely blackened. Mr. Bumpus notified the state department in Boston and officials were sent down to investigate. Their opinion was that there had been a camp of Praying Indians at this place; and that they had been massacred by an enemy tribe two hundred years or more ago. Mr. Bumpus was ordered to rebury the bones immediately. It is not known how many bones were contained in the heap; for after the few that had been dug up were returned to the pile, all were as ordered covered with four feet of earth (Keene 1937:210).

According to the 1908 Directory of Bourne, Falmouth, and Sandwich, Frederic Bumpus was a grocer and provisioner who lived in Bourndale. His property was located on the south side of the Monument River just west of the bridge in an area known as the 'Grove Field.' Construction of the Cape Cod Canal in 1913-14 completely altered this area and appears to have destroyed the site.

DISCUSSION

Despite their folksy quality, these accounts contain enough information to confirm the identification of the Grove Field site as an ossuary. Four lines of evidence, and comparison with the Indian Neck Ossuary, support this.

1. The site was a mass interment containing many individuals, not a series of single burials. According to the various accounts, at least fifteen individuals were represented. Since the entire feature was not excavated, this was only a sample of the overall burial population. The Indian Neck Ossuary presented a similar situation. A minimum of fifty-six individuals were recovered (McManamon, Bradley, and Magennis 1986:20); this appears to represent approximately 80% of the original burial population.

2. The remains were apparently disarticulated. Although no precise description survives, the use of terms such as a 'pile' or 'heap of different sized' bones certainly indicates that these were not the usual flexed or extended burials. The descriptions also suggest that the feature contained bones from individuals of different ages. Speculations that the burials had been done in haste or that the site was the result of an epidemic or massacre are frequent lay interpretations of an ossuary. The Indian Neck Ossuary could easily have been characterized in a similar manner. In fact, the upper level of the
feature is described as 'a mounded, semi-chaotic pile' of human remains. It was not until
the feature was excavated that some evidence of internal organization, such as location of
cranial and the presence of post-cranial bundles, became evident (McManamon et al.
1986:8-11).

3. There was evidence that many of the remains had been cremated. While it is
uncertain whether all or only a portion of the remains had been burned, it is clear that
cremation was a component of the mortuary activities which produced the Grove Field
site. This was also the case for the Indian Neck Ossuary where the upper level of
unburned bone was underlain by highly compacted mass of calcined bone. It should also
be noted that several of the bones in the lowest portion of the unburned level were
charred on the ventral surface (McManamon 1986:11-14).

4. No mortuary offerings were present. While the manner in which the Grove Field
site was discovered and excavated could have easily resulted in missing material
accompaniments, there is no evidence that any were present. In fact, it was the absence
of artifacts that was noted in contemporary accounts. The Indian Neck Ossuary also
lacked associated artifacts; the one possible exception was a single, large triangular,
felsite point located at the edge of the feature. Whether this was a deliberate inclusion
or had intruded from an overlying refuse midden is unclear.

CONCLUSIONS

Despite limited information, the Grove Field site clearly fits a pattern, one which
includes not only the Indian Neck Ossuary, but a series of similar sites which have been
reported in coastal New York. These include: the Conklin site in Aqueboque, Long Island
(Ritchie 1969:268), the Archery Range site located in the Bronx (Kaeser 1970), Tottenville
(Burial Ridge) on Staten Island (Skinner 1909:11), and Bowman's Brook, also on Staten
Island (Skinner 1909:51). Unfortunately, good documentation is not available for each of
these sites. Nonetheless, all appear to share the traits diagnostic of an ossuary - the
disarticulated remains of several individuals interred communally. Specific characteristics
of these sites are summarized in Table 1.

These sites also cluster in two additional ways; all are located in close proximity to
the coast (10 km or less), and those that can be placed chronologically date from the
beginning of the Late Woodland period. The Indian Neck Ossuary, the only site which has
been radiocarbon dated (McManamon, Bradley, and Magennis 1986:18-19), has three dates
with overlapping sigmas between A.D. 935 and 1140 (see Note 1). Based on stratigraphic
position and ceramic style, the Conklin site is identified with the Sebonic Phase of the
Windsor Tradition while the Archery Range site is identified with the Bowman's Brook
Phase of the East River Tradition; thus both sites are roughly contemporary with the
Cape Cod ossuary. Unfortunately, the information available on the Tottenville and
Bowman's Brook mortuary components is too vague to date reliably.

Elsewhere in eastern North America, the occurrence of ossuary burials is strongly
correlated with sedentary, 'tribalized' people (McManamon, Bradley and Magennis
1986:23-25). As a result, the presence of ossuaries in southern New England and coastal
New York requires us to rethink some of our assumptions about the nature of social
organization at the beginning of the Late Woodland period. It may be that group
identity was stronger and more locally defined than has been suggested traditionally. It
also seems likely that group identity may have been expressed more clearly in mortuary
terms than in either settlement or material culture patterning.
Figure 1. Location of Known and Probable Ossuaries in Southern New England and Coastal New York: 1, Indian Neck; 2, Grove Field; 3, Conklin; 4, Archery Range; 5, Bowman's Brook; 6, Tottenville.

Table 1: A Comparison of Known and Probable Ossuaries in Southern New England and Coastal New York.

<table>
<thead>
<tr>
<th>Site:</th>
<th>Minimum Number of Individuals:</th>
<th>Remains Disarticulated?</th>
<th>Cremated?</th>
<th>Mortuary Offerings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grove Field</td>
<td>15</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Indian Neck</td>
<td>56</td>
<td>yes</td>
<td>yes</td>
<td>one projectile point</td>
</tr>
<tr>
<td>Conklin</td>
<td>13</td>
<td>yes?</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Archery Range</td>
<td>21</td>
<td>yes</td>
<td>no</td>
<td>a miniature pot and unmodified canine</td>
</tr>
<tr>
<td>Tottenville</td>
<td>20?</td>
<td>yes</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bowman's Brook</td>
<td>6?</td>
<td>yes</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Acknowledgements. I would like to thank Steve Cole for bringing the Pageant of Cape Cod Program, with its remarkable photograph, to my attention and starting me on the trail of the Grove Field site. Special thanks also to Richard Weckler of Yarmouth for his help in tracking down the newspaper articles as well as the details on Mr. Bumpus, and to Leonard Loparto for drafting the map in Figure 2.

Note 1. Two arithmetic errors occur in the reporting of C-14 dates for the Indian Neck Ossuary; these errors occur both in the text on p. 18 and in Figure 21 (McManamon, Bradley, and Magennis 1986). For sample I-13,476, a date of 1260±130 BP was obtained, which converts to a date of A.D. 690±130, not 860±130. For sample GX-777-M (GX-7779), a date of 785±230 BP was obtained, which converts to a date of A.D. 1165±230, not 1155±230.

REFERENCES CITED.

Bradley, J., F. McManamon, T. Mahlstedt, and A. Magennis

Foss, A. E. and Company, compiler
1908 Resident and Business Directory of Bourne, Falmouth and Sandwich, Massachusetts. A.E. Foss and Co., Hopkinton MA.

Kaeser, E. J.

Keene, B. D.
1937 History of Bourne from 1622-1937. Charles W. Swift, Yarmouthport MA.

McManamon, F. P., J. W. Bradley, and A. L. Magennis
1986 The Indian Neck Ossuary, Chapters in the Archaeology of Cape Cod, V. Cultural Resources Management Study No. 17. National Park Service, Boston.

Ritchie, W. A.

Skinner, A.

The Pageant of Cape Cod, Inc.
1914 Program and Souvenir of the Cape. Blanchard Printing Co., Boston, MA.
FIGURE AND GROUND:
THE LATE WOODLAND VILLAGE PROBLEM AS SEEN FROM THE UPLANDS

Curtiss Hoffman

Abstract. Recent excavations conducted by members of the W. Elmer Ekblaw Chapter of
the Massachusetts Archaeological Society working under the author's direction in
Westborough, Massachusetts, have revealed the presence of three Late Woodland sites:
Cedar Swamp-3, Cedar Swamp-4, and Haskell I. Although analysis of organic materials
from Cedar Swamp-3 and -4 is not yet complete, and the sample size from Haskell I is
very small, it is possible to draw conclusions regarding the function, subsistence base, and
position of these sites within regional exchange networks. By so doing, it will be possible
to contribute to the understanding of settlement patterns throughout southern New
England during the Late Woodland. The village sites which have occupied so much of
the attention of researchers will be seen against a background of pervasive cultural
conservatism, in which large population concentrations and dependence upon horticulture
were absent. Recognizing the presence of nucleated villages against this background is a
type of figure-ground relationship (Hofstadter 1980:64-74), and is essential if we are to
understand fully the dynamics of cultural change during the Late Woodland phase.

Cedar Swamp-3 Site.

Cedar Swamp-3 occupies the top of a glacial kame in the center of the swamp. Quartz,
quartzite, and Milford granite are obtainable in the glacial drift at the site. The
Late Woodland component is intermixed with dated Transitional Archaic and Early
Woodland components; it is best defined in two features, #6 and #12, which contained
substantial quantities of bone, charred botanical remains, artifacts, and debitage (N = 1253
flakes in 6 square meters excavated). A radiocarbon sample from Feature #6 returned a
date of 970 +/- 70 B.P. (Beta-15195). The faunal assemblage includes five species of turtle
(Rhodin 1986), white-tailed deer, cottontail, raccoon, muskrat, beaver, black racer, garter
snake, along with unidentified fish, reptile, and mammal bones (Bellantoni and Dorr 1986).
Flora so far identified include hazelnut and acorn, as well as oak and chestnut wood
(Largy, 1988); all are available on site today. The debitage associated with these Late
Woodland features includes a slightly higher percentage of non-local lithics than in earlier
components (0.17%, as compared to 0.03% for the rest of the site), including finishing
flakes of Pennsylvania jasper (Hoffman 1985; Warfield 1986; Luedtke 1987). Substantial
quantities (>1200 fragments) of fired clay fragments were found in Feature #12; these are
unlikely to be pottery, but may represent daub used in shelter construction which was
accidentally subjected to fire. The faunal analyses concluded that the site was very
probably occupied during several seasons of the year, if not year-round; yet there is
absolutely no evidence of either horticulture or storage of large quantities of vegetable
foods. The size of the Late Woodland component is difficult to estimate, but may very
well have been only 800 meters square.

Cedar Swamp-4 Site.

An even better example of a Late Woodland component is found at Cedar Swamp-4
(Hoffman 1987a). This site is just 150 meters southwest of Cedar Swamp-3, and occupies
a small, conical knoll adjacent to Cedar Swamp Pond, the source of the Sudbury River.
The Late Woodland component is dated to 390+/-80 B.P. (Beta-19921). This date derives from a hearth feature at the top of the knoll, in direct association with a quartz Madison point. The cultural material extends down to the edge of the modern water table. The material from the fringes and slopes is almost exclusively quartz and quartzite; a date of 1090+/-110 B.P. (Beta-19922) was derived from this area. The unplowed topsoil and some of the features on the crest of the knoll, an area only 500 square meters in extent, contain a higher density and variety of cultural material than the rest of the site. This includes debitage (N = 2059 flakes in 4 square meters), artifacts, floral and faunal remains, including Levanna and Madison points, shell-tempered pottery, and a suite of lithics including New York and Pennsylvania cherts, Braintree hornfels, Sally Rock felsite and Sudbury mylonite, all of which are limited to this area. Organic preservation in this portion of the site was very good, compared to Cedar Swamp-3. The assemblage includes cottontail, raccoon, beaver, woodchuck, possibly deer, dog, vertebrae of fish of the Clupeidae (herring) family, a possible sturgeon plate, bird (possibly mallard), snake, and fresh-water mussel shell (Ballantoni and Dirrigl 1988). Seven of the eight turtle species resident in New England were present, including red-belly turtle, identified for the first time at the headwaters of a river system (Rhodin 1988). Also within this component were three small fragments of steatite, which are very unusual in Westborough, despite its proximity to known steatite sources in Grafton and Millbury.

The presence of the non-local lithics is deceptive; the actual amount of non-local material at Cedar Swamp-4 is very small. Local materials constitute 93.5% of the lithics by weight; all of these can be recovered from the drift at the site or from Cedar Swamp-3. Only 0.07% by weight are from outside the region. Barber (1982) has argued that mass is the appropriate measure of inter- and intra-regional trade, rather than number of items, since it alone provides an index of the effort involved in transporting exotic materials into a site. The percentage of exotics in the Late Woodland components at Cedar Swamp-3 and -4 is slightly in excess of that found in earlier components in Westborough, but it is miniscule compared to percentages at contemporary coastal and floodplain sites (Feder 1984).

The use of steatite in the Late Woodland has been related by Johnson and Malstedt (1985:35) to the manufacture of soapstone pipes. The three fragments at the site might indicate trade for tobacco with either the coast or the Connecticut Valley, but the tobacco could have been grown in small quantities locally also. Otherwise, the economy of the occupants appears to be oriented exclusively toward swamp resources. The overwhelming character of the adaptation at both Cedar Swamp sites appears to have been local, non-horticultural, multi-seasonal, and self-sufficient, involved very little in regional exchange.

Haskell I Site.

The only other documented Late Woodland site in Westborough is an unexcavated "village" on the north shore of Chauncy Lake reported by Lawrence Gahan in 1940. His surface collection contained a number of Levanna points as well as net sinkers--further indication of a reliance on local resources such as fish. During the summer of 1987, a small-scale reconnaissance survey was conducted between the eastern shore of Chauncy Lake and the adjacent lowland of Orchard Swamp. A small (about 25 meters diameter), very thin (N = 10 flakes in 1.5 square meters) lithic scatter was recovered; associated with this were a pestle, a pounding stone, and a flake knife of Connecticut Valley indurated shale, along with another small fragment of steatite. Except for the last two, all items are of local lithics. This scatter, designated as the Haskell I site (Hoffman 1987b), is interpreted as deriving from a small isolated homestead, possibly of the Late
Woodland period. The age attribution is partly based upon tool recoveries and partly upon the correlation of the site with the location of a wigwam described in the 1659 account of the original surveyors of Westborough:

"On the East, a little swamp near an Indian wigwam, a plain running to a great pond, and from thence to the Assabeth River; and this line is circular on the north side, the south line running circular to the south side of a piece of meadow called Jacob's meadow, and so to continue till it reach to the said Assabeth River" (Shurtleff 1854 IV:405).

The presence of the grinding tools and the steatite fragment (again perhaps from pipe manufacture?) suggests the possibility that small-scale horticultural activity may have been part of the livelihood of the residents. All of the debitage is of local origin, although the indurated shale artifact may again suggest acquisition from the Connecticut Valley. The absence of horticultural tools from the surface collection at the much larger Chauncy Lake site may indicate that while some individual families may have dispersed during the summer/fall to relatively flat locations to supplement their hunting and gathering by growing a little corn (and tobacco?), a seasonal pattern of in-gathering to harvest wild lakeside resources was the dominant form. Indeed, the very name of the Contact Indian tribe of this area, Nipmuck, means "People of the Fresh Water Lakes." In Westborough it is now possible to trace the existence of this lacustrine adaptative pattern from at least the 6th millennium B.P. continuously through to the Late Woodland (Hoffman 1988).

Comparison With Other Small Late Woodland Sites.

Lest one think that this pattern was limited to the upland margins of Eastern Worcester County, I will cite some recent evidence from the Norfolk-Plymouth uplands. The Stepping Stones Condominium site is located adjacent to a small wetland about Trout Brook, a headwater tributary of the Cochato River in Holbrook. The cultural material is very limited in horizontal extent, being essentially a debitage scatter (N = 491 flakes in 4.25 square meters) from a tool-making episode about four square meters in area. Charcoal from the midst of the scatter gave a date of 400+1/150 B.P. (Beta-16517). All of the tools and 78% of the debitage by weight are of Blue Hills felsite. A high concentration of this material is characteristic of Cochato sites (Cote 1958), and it has always been assumed that it was traded up the river from the well-known quarries to the north. At Stepping Stones, however, we found large quantities of cobbles of felsite and other materials found in the debitage assemblage in the glacial drift. No materials used for tool-making were derived from outside the Boston basin. North-to-south glacial transport, rather than participation in a regional economy, could account for nearly all the lithics at the site (Hoffman 1986).

This pattern is also true of the Hanson Tree Farm site, excavated by Bill Hallaren (1988). This site is located on Poor Meadow Brook, near the watershed between the North and Taunton River systems. It has a date of 600+1/-70 B.P. (Beta-15189). The only exotic is a gunflint of European flint. One might also cite Luedtke's Calf Island site, at which 81.9% of the debitage by weight could be matched to materials present as cobbles on the beach (Luedtke 1980). The Late Woodland component at this site has a date of 410+1/-110 B.P. (GX-3652). While Luedtke characterizes the site as a specialized fall procurement and processing station, a very wide range of activities seem to have taken place there during the Late Woodland. As at most of the other sites described in this report, there was no evidence of horticulture.
Conclusions.

The pattern that emerges from these sites supports the model (III) of McManamon, Bradley and Magennis (1986) most strongly. It is characterized by the persistence of a dispersed settlement pattern, essentially non-horticultural, self-sufficient, and involving relatively little social complexity among small groups of people (households?) for extended periods of time. While this certainly does not preclude the existence of large nucleated settlements in the region, I would suggest that the evidence from the uplands requires us to look upon the entire pattern of Late Woodland settlement in southern New England as stable, complex and diversified. What permanent or semi-permanent horticultural villages there may have been have to be viewed within a context of strong cultural conservatism. When looked at in this way, locating the villages becomes a sort of a figure-ground problem. By the time of European contact, the new pattern of horticultural villages had not made sufficient headway to displace the old pattern in the uplands. Given the absence of draft animals and metal ground-breaking equipment, it is unlikely that horticulture could ever have completely supplanted hunting and gathering for Native American groups living in the uplands, had the English not succumbed to the irresistible temptation to appropriate their lands.

REFERENCES CITED.

Barber, Russell

Ballantoni, Nicholas and Brenda A. Dorr

Ballantoni, Nicholas and John Dirrigl

Cote, Wesley

Feder, Kenneth

Hallaren, William
1988 Prehistoric Indicators from Southeastern Massachusetts: 10,500 to 8,000 B.P. Scituate Historical Society, Scituate, MA.

Hoffman, Curtiss

1986 Stepping Stones Condominium Archaeological Survey, Holbrook, Massachusetts. On file at M.H.C.

1987b Supplemental Report, Reconnaissance Survey, Haskell Street Sewer Extension, Westborough, Massachusetts. On file at M.H.C.


Hofstadter, Douglas R.

Johnson, Eric and Thomas Mahlstedt
1985 *Historic and Archaeological Resources of Central Massachusetts*. Massachusetts Historical Commission, Boston, MA.

Largy, Tonya

Luedtke, Barbara


McManamon, Francis, James Bradley and Ann Magennis

Rhodin, Anders


Shurtleff, Nathaniel B.

Warfield, Ruth
RADIOCARBON AGE OF THE DOG BURIAL FROM SQUANTUM, MASSACHUSETTS

Charles M. Nelson

In 1970, test excavations at 19-NF-81 (Dincauze No. BST-S-24) unearthed the complete skeleton of an Eskimo dog from a shallow pit beneath a midden that was assigned to the Middle or Late Woodland period on the basis of ceramics (Dincauze 1974:53; Braun 1974:589; Harvard Peabody Museum accession number 971-33). The pit containing the burial intruded through a midden lens, which was highly decomposed and trampled, into yellow subsoil (Dincauze 1973; MHC File Notes). The dog remains were covered with the overlying shell midden and there was no evidence of an intrusive pit from the soil overlying this midden. However, the skeleton was in a remarkable state of preservation, complete and including costal cartilage. For this reason, the association between the skeleton and the archaeological occurrence has always been treated with caution.

During archaeological field schools conducted by the University of Massachusetts (Boston) at Squantum and on Long Island, local residents volunteered the information that the area around Squaw Rock, including the immediate vicinity of the dog burial, had been used to bury pet dogs and cats for many decades. This fact prompted a re-examination of the burial. The unusual physiology of the dog and the preservation of proteins with the skeleton were of potential importance both culturally and biologically if the burial were of pre-contact age. However, the limited size of the test excavation and the difficulty of detecting intrusive pits within shell middens suggested the association would never be regarded without suspicion unless the dog remains were dated directly. For this reason, a sample of rib bones (Harvard University, Museum of Comparative Zoology catalog number 52973) was submitted to Geochron Laboratories for collagen dating. The collagen was converted to gelatin and produced a C-13 corrected date of 1710 +/- 70 BP (GX-13732; $\delta^{13}C = -13.1$ o/oo; $^{14}C$ half-life = 5570 years; reference year 1950). This date confirms the stratigraphic relationships and archaeological association noted by Dincauze and Braun, and should lay to rest any doubts about the context of the burial.

The author wishes to acknowledge the Museum of Comparative Zoology at Harvard for providing the sample of bone for dating.

REFERENCES CITED

Braun, D. P.

Dincauze, D. F.
CERAMICS OF THE GUIDA SITE AND WALTER S. RODIMON COLLECTIONS:
ANOTHER PIECE OF THE PUZZLE

Robin E. Maloney

The ceramics of the Guida site, Westfield MA, are re-examined, along with the ceramics from the Walter S. Rodimon collection at the Science Museum, Springfield, in an effort to better understand the pottery of the prehistoric peoples of New England. The paper that follows outlines the history of pottery analysis in New England as well as a research plan which emphasizes the importance of paste characteristics over surface treatments in the development of a New England-based pottery typology.

Not all archaeological collections are found in or on the ground. As time goes by, more and more artifacts can be found on the collection storage shelves and in the exhibit cases of the world's museums. In truth, the excavation and/or collection of archaeological remains is only a small part of the field of archaeology. Once an artifact has been removed from the ground, it must be conserved and properly cared for as well as made accessible to researchers if the discipline of archaeology is to be productive. The Science Museum in Springfield, Massachusetts has done just that with respect to the archaeological remains from the Guida site and the Walter S. Rodimon collections. Not only have these two collections been acquired and conserved by the museum but they are available to researchers like myself who wish to study various aspects of mankind's past. In my case, the pottery of prehistoric and Early Contact Period Indians of western Massachusetts is to be analyzed.

THE COLLECTIONS

Before discussing the pottery of the Guida site and Rodimon collections as well as pre-Contact pottery in general, let me first describe the two collections.

The Guida site is located on a floodplain of the Connecticut River east of Westfield, Massachusetts (Figure 1). The site was discovered in 1937 when, "during the removal of loam. . .two burials of adult Indians were found. With them was a fragment of a pottery jar, several arrowpoints and a celt" (Brooks 1946:6). Since then the area has been the focus of several excavations as well as amateur collecting. In 1952, a team consisting of D. Byers, I. Rouse, F. Johnson, W. Young, and K. Starr, excavated the site. By using a series of test pits and trenches they hoped to establish the natural, undisturbed stratigraphy of the Guida site. Their purpose in doing this was to show evidence of relations between the aboriginal populations of the Connecticut and Hudson River valleys (Byers and Rouse 1960:5-12). Recovered artifacts included potsherds, faunal remains (river clam, deer), chipped stone objects (flakes, drills, projectile points), and burned granite and river pebbles (some of which was used for pottery temper) (Byers and Rouse 1960:11).

The results of the 1952 excavation were disappointing in light of the large number of artifacts collected by the Guida family (and eventually acquired by the Springfield Science Museum). As of 1960, Byers and Rouse (1960:12) concluded that although the site was extensive it was shallowly deposited and widely dispersed.

William Young returned to the site in 1964. His excavations uncovered fire pits, a hard-packed floor and two burials. The fire pits contained "pottery, two Levanna-like
points, deer bone, a butternut, a hammerstone and a plummet." (These artifacts are also now part of the anthropology collections at the Springfield Science Museum.) In short, Young's work in the mid-1960's confirmed Byers and Rouse's theory that Guida was an extensive and noteworthy site (Young 1969:50-52).

Like the bulk of the artifacts from the Guida site, the Walter S. Rodimon collection is the product of surface collecting and not systematic excavations. The result of over 65 years of work, the collection includes more than 5000 artifacts. Approximately 14% of these are pottery sherds and vessels. The entire collection comes from 71 collecting loci situated throughout the 41 kilometers between South Hadley at the south and Gill at the north of the dashed oval in Figure 1. Thanks to his job as a railroad employee, Rodimon was able to travel extensively and frequently throughout the Pioneer Valley (western Massachusetts' section of the Connecticut River Valley). This enabled him to gain important geological and archaeological information as is made evident in the cataloging system and series of maps that accompany the artifacts and greatly enhance their usefulness as a research tool (Johnson 1985:1-2).
THE IMPORTANCE OF POTTERY

Just as archaeologists often organize objects and artifacts into typologies, they have organized time into man-made periods. The transition about 9,000 years ago between the Paleo-Indian and Early Archaic periods is distinguished by human adaptation to a warmer, drier climate; the replacement of a tundra environment with a boreal forest and the mass extinction of many of North America’s megafauna (Parker 1987:5-9). The Late Woodland Period is equally easy to distinguish from the Contact Period of the sixteenth century, not as a set of responses to changes in the natural environment, but to cultural ones.

The invasion of Europeans represented a relatively rapid, major change in the ‘rules of the game’ for the people of the Northeast. The resulting clash of cultures is an obvious diagnostic factor in demarcating a time period (Feder 1984:101).

The "obvious diagnostic factor" which distinguishes the Terminal Archaic from the Early Woodland is not as dramatic as wide-scale environmental changes or clashing cultures. It is, in fact, the adoption of pottery about three millenia ago. That pottery is part of the Woodland Period tool kit is unfortunately about the only aspect of prehistoric pottery upon which archaeologists agree. Differences of opinion and the resulting confusion stem from the fact that the "adequate description, typological classification and functional analysis of New England prehistoric pottery is lacking" (Kenyon 1979:81). D. Dincauze shares Kenyon’s opinion when she notes that:

Ceramic analysis and description as now practiced in the region are more art than science. Terminology is understandized to the extent that two analysts, selecting differently among sets of synonyms, could conceivably describe the same sherd in terms so different as to leave no obvious grounds for comparison (Dincauze: 1975:5).

Rather than developing a typology of their own, New England archaeologists have relied heavily on two systems designed for the prehistoric pottery of New York state, namely those of Ritchie and MacNeish (1949:98-99), and Smith (1950:188-189). While the former emphasizes rim form, decoration techniques and design, Smith’s system uses paste (the mixture of clay and temper) as the primary criteria and surface finish, decoration and rim form as secondary criteria to differentiate the various pottery types. The emphasis of one criteria over others contributes to the unclassification of sherds without that particular attribute. "Consequently, the loss of data in a small sample of undecorated body sherds [can] be outstanding" (Kenyon 1979:82).

In general, researchers in the past have over-emphasized decoration technique and style over the physical properties of clay and temper of the pottery sherds and vessels they’ve recovered. In an effort to resolve the problems and inadequacies of pottery analysis, and to understand the adoption, manufacture and use of pottery amongst New England’s prehistoric peoples, New England archaeologists are beginning to change their approach and methodology.

RESEARCH PLAN

My reasons for analyzing the pottery remains of the Guida site and Rodimon collections are three-fold:
1) To see how the pottery from the two collections compare.
2) To see how the pottery from these two collections compares to that from other regions in New England.
3) To see how the pottery from these two collections (as representatives of New England Algonquian prehistoric pottery) compares with that of the Iroquoian peoples in New York and northern Vermont.

Like Dr. Kenyon in her analysis of the Smith site pottery (Manchester, NH), I have decided to let the sherds of the Guida site and Rodimon collections ‘speak for themselves’ rather than pigeon-holing them into pre-existing pottery types. Following the lead of Kenyon, Lavin (1980:3-41) and Dincauze (1975:5-17), my criteria of classification include the physical properties of the paste as well as the artistic surface treatment and morphology of the sherd and/or vessel. For those readers unfamiliar with Lavin’s (1980) work at the Ben Hollister site (Glastonbury CT), my criteria are as follows:

- Temper: fine, medium (1-3mm), and large (3+mm) particle size; grit, shell and/or mica; sparse, average (1/4 to 1/3 temper to clay ratio) and above average (more than a 1/3 temper to clay ratio)
- Thickness: 0 through 12mm as well as N/A (not applicable) when part of the sherd is worn away.
- Texture: (as viewed from the side or in cross-section) compact, granular, sandy, coarse, medium, fine, flaky and pocked.
- Color: (with respect to exterior and interior surfaces as well as the core, alone or combinations of the following) buff, brown, black, grey and red.
- Surface Treatment: incised, dentate stamped, wiped, smooth, cord-wrapped paddle impressions, shell edge impressions, fabric impressions, punctates, notching, rocker stamping, brushed, wrinkled, channeled, bumpy, undecorated.
- Orientation of lines: horizontal, vertical, oblique.
- Vessel part: collar, neck, body, rim.
- Rim morphology: straight-sided, castellation, everted, inverted; concave, horizontal, rounded, beveled, oblique in or out rim surface.
- Miscellaneous: vertical ridges on collars, evidence of coiling.

My reasons for this approach are as follows:

1) To make the classification criteria as objective as possible; to remove the number and impact of subjective observations.
2) To allow replication by other and future researchers.
3) To avoid regional and temporal biases from outside New England.
4) To provide a method of study with which pottery from different regions can be compared.

As a research source I used all the Guida site sherds currently in the anthropology collections at the Springfield Science Museum. With respect to the Rodimon collection, I used all available pottery from the collecting loci H-2, H-8, H-X (Bark Wigwams, Northampton); E-12 (Hatfield); and I-15 (Deerfield). I have chosen only these five loci from the 71 available to me because collectively they represent 56% of all the pottery in the Rodimon collection. Geographically, they represent three different areas in the Connecticut River drainage basin. Furthermore, the sherds from these loci are varied in paste characteristics as well as surface treatment. In short, I believe the sherds I’ve chosen to study are a good representative sample of all the pottery remains in the Rodimon collection.

I refer the reader to Figure 1 for the location of the five Rodimon collecting loci to be analyzed. The loci in Northampton and Hatfield are located on the floodplains of the
Connecticut River with the latter loci approximately seven kilometers upriver from the Bark Wigwams' loci. Collectively they were dated (using the recovered lithic assemblages) to the 7,000 years from the Middle Archaic to the Contact Period, with the largest concentration of projectile points coming from the Late Woodland and Contact Periods. Unfortunately, all five loci have been disturbed by flooding, erosion, farming and construction (Johnson 1984:35-39, 73, 83).

The relation of the dates of the pottery from each loci to their respective lithic-based dates has not yet been fully addressed. With respect to the physical properties of the pottery, not all sherds with a fine, compact paste, which one could assume, based on technological evolution, to be younger than coarse paste, are thin and delicately made. Furthermore, sherd thickness is not always an indication of age but may also be an expression of the vessel's use. In short, there are still a number of important issues to be considered.

I have analysed approximately 600 sherds from the collections. By organizing the visually overwhelming data of hundreds of potsherds by means of a chart, the following patterns have become evident:

1) Grit is the most common temper used in the pottery from both collections, especially medium-sized (1-3mm) grit.

2) Most of the sherds from both collections have an average amount of temper (1/4-1/3 temper to clay ratio).

3) Most of the paste of the sherds from both collections is compact, with sandy/granular or flaky also being common.

4) While the thickness of the sherds varies widely at Guida, a surprisingly large number of those from the Rodimon collection are 6mm. This can be explained as:
   a) a result of the function of the vessel
   b) a result of the potters' and/or society's standards
   c) a temporally narrow representation of either or both of the above
   d) collector's bias.

5) Color of the fired sherds varies widely with combinations of buff, brown, black, grey, and red. The only constant in this respect for both collections is the predominance of grey as the core color.

6) Most of the sherds from both collections (but by no means all) have a smooth and wiped interior. Exterior surface treatments include incised lines, shell edge impressions, and cord-wrapped paddle impressions. Notching, punctuates, channeling, stamping, and brushing are less prevalent.

In the course of my work I've determined that the physical properties of the paste are the most important criteria upon which to distinguish pottery types. Color, thickness and surface treatment all vary within one vessel and in many cases on a shingle sherd. My approach is similar to Smith's in that we both emphasize the importance of paste attributes. We differ, however, in that he uses rim form as a secondary criteria and (to this point) I don't. I prefer to gather as much data as possible from each sherd. I believe that emphasizing just one part or aspect of a vessel greatly increases your chances of missing important data from the lower parts of a pot thereby skewing your results. Even an undecorated body sherd can be used to develop a pottery typology.

FUTURE PLANS

I'd like to learn more about the local geology in order to further identify the various grits used to temper prehistoric pottery. I also plan to experiment with local
clays, prehistoric firing techniques and surface treatment techniques to analyze and understand the sherds I'm studying. Lastly, I'd like to examine prehistoric Iroquoian pottery and see how it compares with that of the Guida site and Rodimon collections. Although much has been made of the Iroquoian influence on western Massachusetts Algonquian pottery, I am looking forward to testing this.

SUMMARY

The acquisition and conservation of the Guida site and Walter S. Rodimon collections by the Science Museum in Springfield, Massachusetts has made possible my efforts toward a better typology system and understanding of prehistoric and Early Contact Period pottery from western Massachusetts. Thirty years of research have taken archaeologists from the classification systems of Ritchie/MacNeish and Smith to the less subjective, raw material-oriented typologies that are currently in development. The next thirty years may find this approach to have been too optimistic and the "physical attributes. . .too variable or ideosyncratic to represent culturally-dictated attributes" (Kenyon 1979:81). At the very least, however, archaeologists working in New England will have an objective, descriptive system with which to analyze pottery. In the meantime, the Guida site pottery, now in conjunction with that from the Rodimon collection, is once again playing an active role in the better understanding of New England's first settlers. Hopefully, Byers and Rouse's lament (1960:36) for the need for a New England-based pottery system will also soon be an artifact of the past.

Acknowledgements: Let me first thank John Pretola of the Springfield Science Museum for not only giving me the idea for this paper but for offering advice and/or constructive criticism when needed. My mother and sister are also deserving of many heartfelt thanks for their support and interest throughout my research.

REFERENCES CITED

Brooks, Edward

Byers, D. and I. Rouse

Dincauze, Dena

Feder, Kenneth

Holland, Josiah
1855 History of Western Massachusetts, 2 volumes. Springfield, Massachusetts.

Johnson, Eric
Kenyon, Victoria B.

Lavin, Lucianne

Parker, Johnson

Ritchie, W. and R. MacNeish

Smith, Carlyle

Young, William

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NOTES TO CONTRIBUTORS

The Editor solicits for publication original contributions related to the archaeology of Massachusetts. Authors of articles submitted to the Bulletin of the Massachusetts Archaeological Society are requested to follow the style guide for American Antiquity (48:429-442 [1983]). Manuscripts should be sent to the Editor for evaluation and comment.

Manuscripts, typed as originals with two copies, should have margins of 3 centimeters (5/4 inch) on all edges. Corrasable paper should NOT be used. Typing should be on one side of paper only with at least double spacing. Proper heading and bibliographic material must be included.

Authors with MAC and IBM-PC compatibles are encouraged to mail floppy disks containing their files or send them electronically in ASCII to the editor. Tables should be submitted camera-ready.

Bibliographic references should be listed alphabetically by author and presented as follows:

Gookin, Daniel
1970 Historical Collections of the Indians of New England (1674),

Several references by the same author should be listed chronologically by year. Reference citations in the text should include the author's name, date of publication, and the page or figure number, all enclosed in parentheses, as follows: (Bowman and Zeoli 1973:27) or (Ritchie 1965: Fig. 12).

All illustrations, called figures, should be submitted as originals. Each figure should fit within the space available on a Bulletin page, which is 17 cm by 23 cm (6 & 1/2 x 9 inches), allowing for margins. Full, half or quarter page figures should be planned carefully. Space must be allowed for captions.

Figures must be referred to in the text and are to be numbered in their order of reference, with their number placed lightly on the margins of their reverse sides. Every item in each figure and each person should be identified. All lettering must be clear and legible and have high contrast; dry transfer letters available at any stationery store are fine. No pencil drawings are acceptable. Photos must be glossy prints with high contrast. Scales with dimensions should be included with all figures for which they are appropriate. Captions, not a part of the illustrations, should be typed on a separate sheet in order and numbered to correspond to the figures.

Dimensions and distances should be given in metric units or in metric units and English units. If feet and inches are used, they are to be spelled out.