

The Bulletin

Number 33 March 1965

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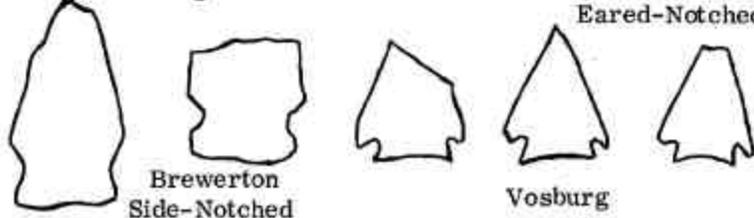
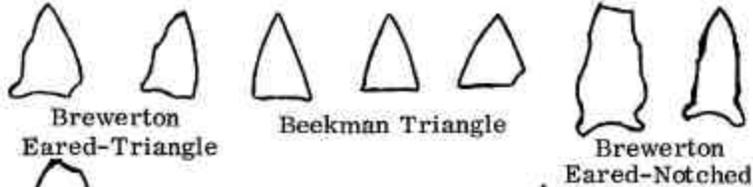


THE BULLETIN

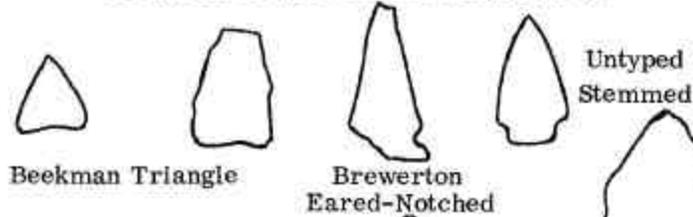
MARCH 1965

NUMBER 33

SYLVAN LAKE ROCK SHELTER ARTIFACTS



STRATUM II (LOWER LEVEL) POINTS



STRATUM III PROJECTILE POINTS

scale in inches
0 1 2

THE SYLVAN LAKE ROCK SHELTER (Clo 2) AND ITS CONTRIBUTION
TO KNOWLEDGE OF THE ARCHAIC STAGE IN EASTERN NEW YORK:
A BRIEF REPORT

Robert E. Funk

Van Epps-Hartley Chapter

LOCATION, DESCRIPTION, HISTORY

In May and June, 1964, excavations were carried out by a New York State Museum expedition under the writer's direction at one of the most important stratified sites in eastern New York. The Sylvan Lake Rock Shelter, actually a small cave, is located about one-half mile northwest of Sylvan Lake, in Dutchess County, New York. Permission to excavate was generously granted by the owner, Mr. Gerald Thew of Arthursburg. Mr. Hans Stefensen, whose property line cuts across the front of the cave, also consented to the excavations and allowed the field personnel to park their cars on his land.

At the outset, I wish to acknowledge my debt to various members of the Mid-Hudson, Auringer-Seelye, and Van Epps-Hartley chapters, N. Y. S. A. A., without whose sustained

(Cont. on next page)

1965 ANNUAL MEETING at
State University of New York at Buffalo
Buffalo, New York

April 23 - 25

The Frederick M. Houghton Chapter is the host Chapter, and the meetings will be held at Norton Union, State University of New York at Buffalo. The local committee has made special arrangements at the Lord Amherst Hotel, conveniently located right off the Thruway and 2 miles from the University. The room rates are as follows: \$11.00 for single occupancy, \$12.00 for two persons, \$16.00 for four persons.

The preliminary schedule is as follows:

Friday, April 23

8:00 p. m. Executive
Committee
Meeting

Saturday, April 24

9:00 Registration
(Fee \$1. 50)
10:00 Business Meeting
12:30 Luncheon (\$1.45)
1:30 General Session
(Papers to be announced)
Tour (To be announced)
7:00 Dinner Faculty Club \$2.60
Speaker to be announced

Sunday, April 25

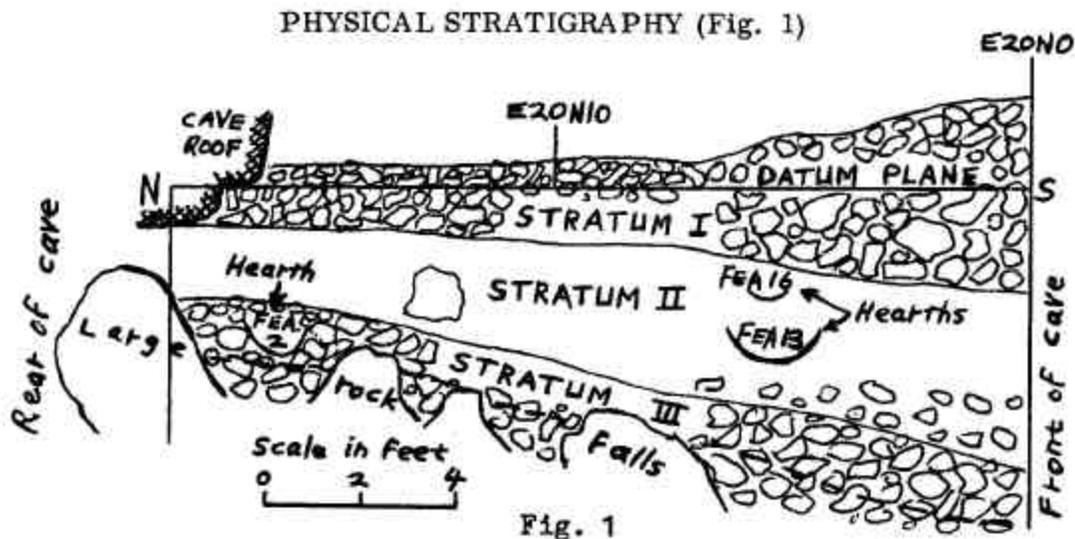
9:00 a. m. Short Field Trip

There will be exhibits of local materials courtesy of Houghton Chapter, and space will be provided for other exhibits upon request. Address requests to Faith Moll, University of Buffalo, Buffalo, New York 14014.

labors and unflagging enthusiasm, the job could not have been done. Special thanks are due to Mrs. Margaret Bowman, Malcolm Kinney, Earl DeWitt, and Alvin Wanzer, Mid-Hudson Chapter; Paul and Thomas Weinman, Auringer-Seelye Chapter; and R. Arthur Johnson, Van Epps-Hartley Chapter. Valuable assistance was also given by Dale Fraleigh, John Bowman, Thomas Turck, and K. B. Robinson, Mid-Hudson Chapter, and John Wolcott, Van Epps-Hartley Chapter. Miss Cynthia Weber, graduate student in anthropology at Harvard University, also contributed several days of hard work on the site.

The rock shelter, or cave (it has characteristics of both), is a gaping cavity in the face of a solitary limestone cliff at the head of a small valley overlooking Sylvan Lake. At the mouth, which opens directly south, the cave is 27 feet wide. It has a maximum depth of 15 feet, and the ceiling before excavation averaged 5 feet high. Just outside the portal is a steep talus slope, which descends into a large sinkhole in the valley floor.

The interior features give clues to the origin of the cave as a water-leached subterranean chamber, now exposed in the cliff face. At both ends, toward the rear of the cave, are nearly vertical narrow chimneys, which open on the surface of the hill above and behind the site.



Sylvan Lake Rock Shelter
Profile A (simplified)

Before excavation, the level interior floor of the cave was covered by several inches of minor rockfalls, probably of post-colonial origin. Just below this surficial rubble was stratum I, the first relic-bearing zone. Ten inches thick, this stratum was composed of mixed rubble, brown dirt, and Indian refuse.

Stratum II was a compact, tan sediment, at least partly water-deposited, varying from 20 to 40 inches thick. Some of the silt may have washed in through the chimneys. Relatively little rubble was found in it; I surmise that the prehistoric Indian hunters kept the floor clean of rockfalls, for the sake of comfort. There were considerable quantities of Indian refuse.

Stratum III, the lowermost relic-bearing zone, was made up of intermixed rubble and gray earth, and averaged ten inches thick. It contained small amounts of refuse. It overlay open rubble among big rocks which formed the culturally sterile basement of the site. This heavy rubble zone, of undetermined depth, probably represents rockfalls which occurred at the close of the last glaciation. The first human occupation was on the rather uneven surface of this talus zone.

X-ray diffraction analyses of soil samples from the three strata were run by Mr. Roger Borst, Curator of Geology, New York State Museum and Science Service. In every case the main constituent was calcite, with minor amounts of quartz, a composition identical with that of a sample from the cave roof.

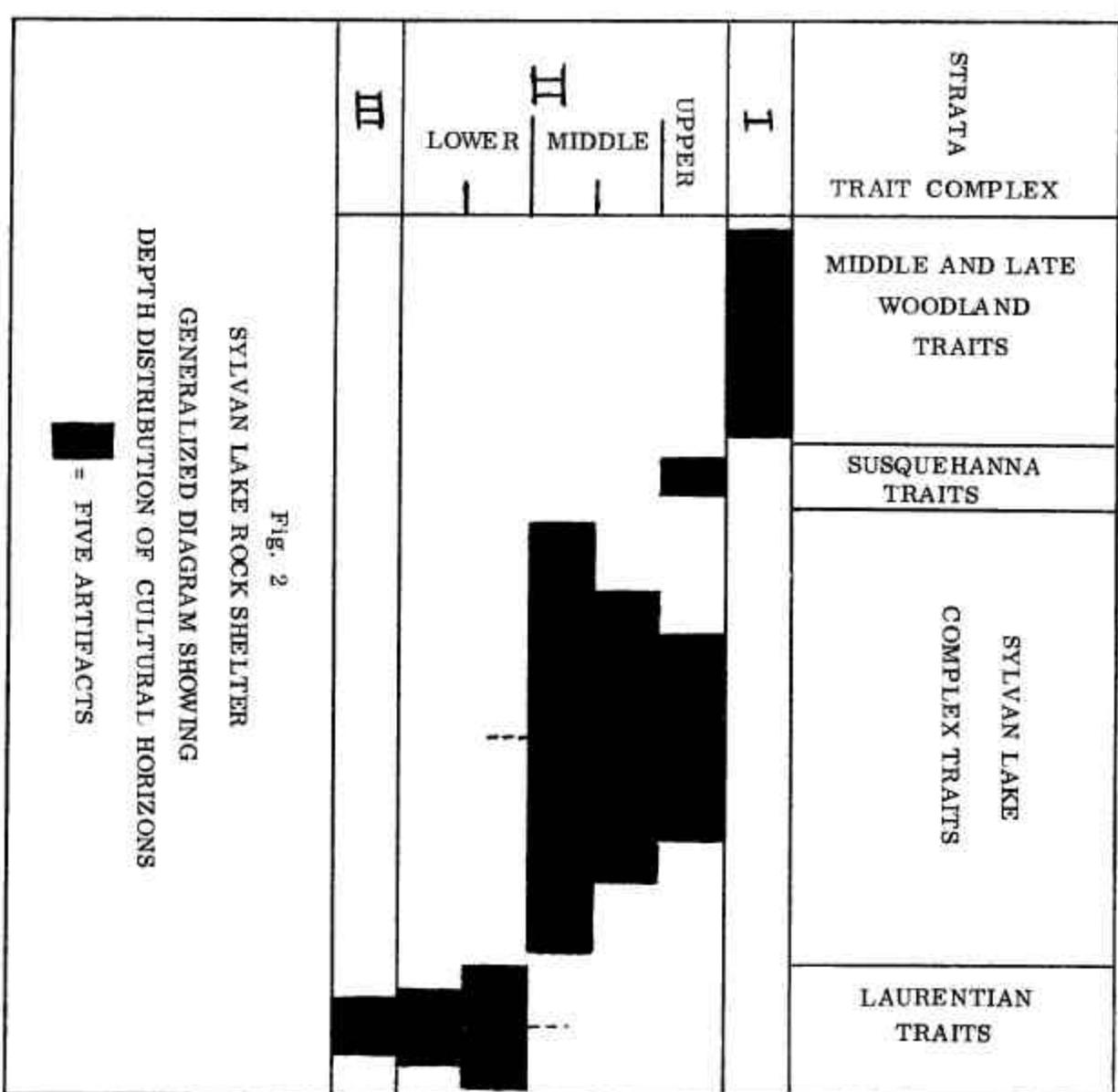


Fig. 2

CULTURAL STRATIGRAPHY

The culture sequence in the cave (see Fig. 2) corresponds in part with that described for eastern New York by Ritchie in a previous publication (Ritchie, 1958) and in his forthcoming new synthesis (Ritchie, n. d.). Projectile point types used herein are based on the "Typology" (Ritchie, 1961).

The artifactual contents of stratum I, in no apparent stratigraphic order, included sherds of a Jack's Reef Corded pot (Ritchie and MacNeish, 1949, p. 106) and a Jack's Reef Pentagonal point, of Middle Woodland origin; and Late Woodland items, comprising Cayadutta Incised rim sherds (MacNeish, 1952), fragments of two bone mat needles, a perforated bear canine tooth, and the head of a bone pin. Objects of indeterminate cultural affiliation were ovate knives, end scrapers, drills, and antler tine flaking tools. No Early Woodland material was found.

The upper levels of stratum II produced a few artifacts of the Transitional stage-four Orient Fishtail points, and one large-stemmed blade similar to a specimen found by Ritchie in association with Orient Fishtail points in stratum 2 at Lotus Point near Catskill (Ritchie, 1958, plate 11, fig. 42). These artifacts were in the same levels as six Bare Island points, 13 Lamoka-like points, one stemmed point intermediate in form between the foregoing types, one Levanna point, seven small, thick-side-notched points, and a point conforming to the type Brewerton Side-notched. In the same context were two flake knives, one antler flaker, and two possible end scrapers based on quartz spalls. Just below the level of the deepest Fishtail was a Perkiomen point with reworked base. In this zone most stemmed points were fashioned from quartz; all Fishtails and Perkiomen point are of Normanskill flint, probably derived from local outcrops.

Attributed to middle levels of the stratum are: 51 Bare Island points; 36 Lamoka-like points; ten "intermediate stemmed" points; 14 untyped small, thick side-notched points; three small Brewerton Side-notched points; three fishtail-like points; and a handful of untyped stemmed, narrow side-notched and indeterminate points. More than half of the points are made of quartz; most of the others are of flint. Associated artifacts comprised four notched bannerstones, four possible end scrapers on quartz spalls, five ovate knives, one expanded-base drill, one scraper-knife, one antler tine flaker, a crude ovate chopper, and three pebble hammerstones.

In bottom levels of the stratum occurred three large, heavy Brewerton Side-notched points; two Brewerton Eared-notched points; four Brewerton Eared Triangles; six Vosburg points; three small, thick side-notched points; nine straight or convex-sided untyped triangular points; and one untyped isosceles triangular point. Most of these points are of flint. No atlatl weights were associated. A large triangular knife, an ovate knife, one pebble hammerstone, and two antler flakers were recovered from the same levels. A deep pocket of the stratum yielded an asymmetric slate knife and a small broad-bladed stemmed point.

Thirteen basin-shaped hearths were recorded in stratum II. Charcoal samples were collectable from several hearths. One sample has been sent to the Yale Radiocarbon Laboratory for radiocarbon age determination; it should date the middle-level occupation.

Stratum III contained few artifacts. They included: two Brewerton Side-notched

points; two Brewerton Eared-notched points; two untyped triangular points with convex edges; and four untyped stemmed points. Two of the untyped stemmed points were small, thick, straight-stemmed, and broad. The other two were the deepest artifacts on the site. One, at 61 inches, was fairly large with tip and base missing. The other point, found at 65 inches, had an expanded stem with convex base. The tip was missing. All but one of the points in this zone are flint. Five pebble hammerstones and a grooved hammerstone were also found.

Two charcoal-rich basin-shaped hearths were found in stratum III. A charcoal sample from one feature is undergoing radiocarbon analysis at the Yale Radiocarbon Laboratory, and should indicate the temporal placement of the stratum III occupation.

PALYNOLOGY

Pollen samples collected from all levels in two profiles have received expert analysis by Mr. Donald Lewis, Botanist at the State Museum.

Results were disappointing, due to an extreme scarcity of pollen in all levels. Profile A was located well inside the cave, and was nearly sterile of pollen. Profile B was at the cave mouth. In samples from this profile a few grains of *Artemisia* (wormwood) were found by Lewis in all levels of stratum II and in stratum III. At the base of stratum II was the sole occurrence of either *Chenopodium* (goosefoot) or amaranth. The pollen of these plants are, to all intents and purposes, indistinguishable. In his report Lewis states, "*Artemisia* is frequently taken as an indicator of an open, park-tundra habitat, but in association with other pollen having a boreal or arctic distribution. It would seem likely that these grains occur as they do (*Artemisia* exclusively in some layers and the concentration of *Chenopods* at 2-4) by the flowering plants being brought into the cave by man or animal or the pollen grains being brought in insect or animal excrement. . .

"The paucity of pollen in all strata would indicate that the cave is situated so as to prevent deposition of airborne pollen."

It is thus impossible, on the basis of such meager data, to draw conclusions as to the climatic and floristic associations of the various culture zones at Sylvan Lake.

INTERPRETATIONS

The lower-level occupations at the site are clearly referable to the Laurentian tradition of the Middle Archaic in New York State. The traits in lower levels of stratum II appear to be affiliated with the Vosburg complex (Ritchie, 1944, pp. 257-259; 1958; n. d.). There are many correspondences with the assemblage from stratum III at South Cruger Island (Ritchie, 1958, pp. 71-82). In conjunction with similar components at the Weinman site on Lake George (Funk, Weinman, and Weinman, n. d.) and the Barren Island site near Ravenna (Funk and Johnson, n. d.) the Sylvan Lake Rock Shelter has provided important new data on the Vosburg culture.

Although the sample of projectile points in stratum III is small, the absence of Vosburg and Brewerton Eared Triangle points poses an interesting question. If we regard the lowermost assemblage of stratum II as a manifestation of the Vosburg complex, is the Laurentian of stratum III an as yet undefined pre-Vosburg expression?

The Weinman site and Fish Club Cave near Ravena (Funk and Johnson, 1964a) have produced artifacts of the Vergennes phase of Laurentian in context below Vosburg levels. This situation was anticipated by William A. Ritchie (n. d.).

It would seem entirely possible that the Laurentian component of stratum III at Sylvan Lake corresponds in temporal and cultural position to the Vergennes phase farther north. Logically, one could postulate such an early Laurentian substratum as ancestral to the other known phases of the tradition, which have been radiocarbon dated in New York and New England between 2000 and 2500 B. C. (ibid.).

The straight-or convex-sided, usually stubby triangular points of the lower horizons are equivalents of specimens recovered on other Hudson Valley Vosburg stations and on Brewerton phase sites of central New York (Ritchie, 1940). They have not previously been named. They have received the type name "Beekman Triangle", after the township in which lies Sylvan Lake. For full type description see Funk, n. d.

The Laurentian inhabitants of stratum III, as evidenced by refuse bone, hunted and ate a greater variety of animals than did the hunters of any succeeding horizon. The species include Virginia deer (52 per cent of the total), elk, raccoon, turkey, fox, woodchuck, beaver, muskrat, opossum, rabbit, dog or wolf, passenger pigeon, grouse, duck or goose, turtle, fresh water clam, and unidentified fish. Some occupation of the site in warm months is indicated by the presence of clam, fish, passenger pigeon, and duck or goose. Several species—muskrat, opossum, pigeon, duck or goose, painted turtle—disappeared from this list in the Vosburg zone of stratum II, where deer rose to 85 per cent of the total. In post-Vosburg horizons, eight species never reappeared. A hypothesis may be proposed to account for the differences. Possibly, the original Laurentian inhabitants were the first people to enter the region, finding the fauna in their natural state of distribution. At first, all available foods were collected, but certain populations of small animals became severely depleted through intensive exploitation. Deer eventually prevailed heavily over all other species in the hunters' diet.

The complex in middle levels of stratum II appears to have some relationship to the Bare Island complex of Pennsylvania, first described by Kinsey (1959). However, there are a number of differences. Shared by the Sylvan Lake assemblage and Kinsey's suggested trait list are Bare Island points, corner-notched points, expanded-base drills, bannerstones (though drilled at Bare Island, notched at Sylvan Lake), choppers, and hammerstones. Present at Bare Island, absent at Sylvan Lake, were Poplar Island points, steatite vessels, slate crescents, axes ("very tentative"), plummets ("very tentative"), milling stones, mullers, pestles, whetstones, and chipped disks. Small thick side-notched points and fishtail-like points, not on Kinsey's list, were found at both sites. Present at Sylvan Lake, but not at Bare Island, were Lamoka-like points, ovate knives, antler flakers, possible quartz spall end scrapers, and "intermediate stemmed" points. There is some evidence for mixture of multiple occupations on Bare Island.

I am indebted to Dr. Edgar M. Reilly, Curator of Zoology, New York State Museum and Science Service, for his assistance in identification of the various species represented in the refuse.

The Sylvan Lake congeries, on the other hand, has much in common with components on other Hudson Valley sites, including the Dennis site near Albany (Funk and Johnson, 1964b), the Weinman site, the Samsonville Rock Shelter near Kingston (Funk, n. d.), the Lotus Point site (Ritchie, 1958, pp. 25-34), the Quarry Glen Rock Shelter near Suffern (Funk, n. d.), and several other stations. Together, these components evince a widespread Hudson Valley manifestation, featuring Bare Island points, Lamoka-like points, small thick side-notched points, "intermediate stemmed" points, fishtail-like points, narrow expanded-stem points, notched bannerstones, pestles, pebble hammerstones, netsinkers, drills, ovate knives, thick ovate blades, choppers, and other tools. This complex, wherever it occurs in stratified contexts, follows Vosburg horizons and precedes the Broad Point and Transitional cultures.

I am calling it the "Sylvan Lake complex". It comprises at least one newly isolated point type, designated as "Sylvan Side-notched", to be described in future publication (Funk, n. d.). These are small, thick side-notched points, generally of sloppy execution but falling within a given size and shape range.

The Sylvan Lake Rock Shelter has so far provided the only definite evidence on the subsistence pattern of the culture. The Sylvan Lake people relied mostly on deer (92 percent of refuse bones), but also consumed elk, woodchuck, raccoon, fox, rabbit, dog or wolf, grouse, turkey, mussel, and turtle. The riverbank locations of some components, e. g. the Dennis site, and rare finds of netsinkers, suggest that fishing was important in warm seasons of the year. Residence was probably shifted to rock shelters and other hunting camps in the fall. Pestles found on some stations indicate that wild plant foods were collected.

The origins of the culture are obscure. It has few, if any, links with the preceding Laurentian phases, despite the rare occurrence of small-sized points resembling the Brewerton Side-notched type. Ulus, plummets, gouges, and other Laurentian diagnostics are absent. End scrapers of the simple unifacial form have not been found. Ornaments are also lacking.

Its nearest relationships, aside from the Bare Island complex, are with narrow point complexes reported for Massachusetts, including a component on a recently investigated stratified site at Martha's Vineyard, found above Laurentian levels (Ritchie, n. d.).

In upper levels of stratum II at Sylvan Lake, there is evidence for intrusion of traits usually attributed to the Susquehanna Soapstone tradition (Witthoft, 1953; Ritchie, 1959). Steatite was not found. There is every indication that the local Sylvan Lake complex traditions in point styles continued until deposition of the stratum ceased. The cave was probably inhabited in fall and winter, its occupants moving to fishing camps along Fishkill Creek and the Hudson River in spring and summer. Thus in the period represented by the upper levels of stratum II there may have been alternate occupations by hunting parties or bands of Sylvan Lake people and Susquehanna groups, the latter newly arrived in the Hudson Valley. The Susquehanna people are generally supposed to have remained close to major waterways, and this is borne out by the extreme rarity of broad points (Snook Kill and Perkiomen types) in back country locations throughout the Hudson Valley. Occupation of the cave ceased before Early Woodland

times; apparently a full Transitional stage of culture-what the writer calls "Hudson Orient"-never dominated at the site. The next occupation was in Middle Woodland times.

This interdigitation of Susquehanna traits and narrow-stemmed point complexes has been recorded at sites in New England (Ritchie, n. d.), Staten Island (Ibid.) and at the Parham Ridge site near Croton (Brennan, 1962, .p. 145). The horizons involved are considered by the writer to have existed entirely on a Late Archaic time level. The data at these stations and at Sylvan Lake evince complex interrelationships of Late Archaic traditions, manifesting in different ways at different sites.

The stratum II, upper level inhabitants at Sylvan Lake, like their immediate predecessors, hunted the deer to the near exclusion of other creatures.

The appearance of fishtail-like points in most components of the Sylvan Lake complex should be noted. Such points are morphologically distinct as a series from classic Orient Fishtails, although they intergrade with the type (see for example illustrated specimens in Ritchie, 1959, many of which are semistemmed like the fishtail-like points). It seems likely that during the Late Archaic the Orient Fishtail type was gradually emerging from the standard straight-stemmed pattern of the Sylvan Lake complex. The Orient culture of Long Island featured a few stemmed and side-notched points (Ritchie, n. d.), and there is evidence for its development from a horizon related to the Sylvan Lake complex (Funk, n. d.). Thus it seems reasonable to consider the notion that the Fishtail form evolved from the narrow point tradition, rather than from the broad points of the Susquehanna Soapstone cultures.

Dr. William A. Ritchie has suggested that data from certain Hudson Valley sites indicate that a horizon of Lamoka-like points underlay the Vosburg, and that Vosburg components reveal partial assimilation of this undefined narrow point complex, related in some way to the Lamoka culture of central New York (Ritchie, 1958; n. d.). Evidence that Lamoka culture preceded the Brewerton phase of Laurentian has also been adduced (Ritchie, 1932; 1936; 1944, pp. 292-310; 1945; n. d.).

However, analysis of data gathered in the writer's 1961-1964 Hudson Valley surveys, and re-study of previously reported sites such as Harris, Lotus Point, and South Cruger Island (Ritchie, 1958), have rendered the surprising conclusion that in eastern New York the stratigraphic data do not appear to support the temporal priority over Laurentian of a Lamoka point horizon. Rather, the reverse has almost invariably proved to be the case on sites which display either physical or metrical stratigraphy. At Lake George these are the Weinman site and the Knox and Finley sites (Weinman, n. d.; Funk, n. d.); in the middle Hudson Valley, South Cruger Island and Lotus Point; in the lower Hudson Valley, Sylvan Lake Rock Shelter, Tiorati Rock Shelter, Cohasset Rock Shelter, Twin Rock Shelter, and Breackneck Rock Shelter, the last four in or near Bear Mountain Park (Funk, n. d.). In every case, Laurentian artifact types occurred at the base of the cultural deposits, while Bare Island and Lamoka-like points predominated in upper levels. Lamoka-like points found in situ at other sites, such as Parham Ridge, occurred below Late Archaic or Transitional, but not Laurentian, artifacts; these points can be matched easily in the Sylvan Lake collection (Ibid.).

Comparative studies undertaken by William A. Ritchie and the writer, using

projectile points from the Lamoka Lake, Frontenac Island, Sylvan Lake Rock Shelter, Lotus Point, Weinman, Harris, and Dennis sites, disclosed the near-identity of some narrow-stemmed points from the central New York and Hudson Valley stations. In fact, nearly half of the stemmed points from stratum II at Sylvan Lake had to be classified as Lamokas, whereas most of those remaining were just as clearly Bare Island points. Points fitting neither type were placed in the "intermediate stemmed" category. A small percentage of the Sylvan Side-notched points were similar to side-notched specimens from Lamoka Lake.

The data presented above, and other material still unpublished, have wide implications for the northeastern Archaic. It now appears that a horizon of thick, narrow-stemmed points, with regional variations, follows Laurentian manifestations in eastern New York and New England, and in its early stages, at least, precedes the broad point tradition. A similar sequence is indicated for Pennsylvania. The evidence throughout this vast area strongly suggests Laurentian to be the earliest known Archaic tradition.

The meagerness of available stratigraphic information for central New York indicates the urgent need for more work on stratified sites in that area, before the true relationships of Lamoka and Laurentian can be fully resolved.

The problems mentioned in this article are more fully treated in a recently prepared synthesis (Funk, n. d.).

SUMMARY

The Sylvan Lake Rock Shelter has yielded a culture sequence which provides a basic key to prehistoric events in the lower Hudson Valley, especially those of the Archaic stage. Other recently investigated sites in eastern New York have contributed to knowledge of the Archaic.

The earliest-known Archaic occupations of the region are seen to have been manifestations of the Laurentian tradition, including the Vosburg complex. These phases were followed by a vigorous, previously unrecognized or undefined hunting culture referred to by the writer as the Sylvan Lake complex, which appears as a post-Laurentian horizon as far north as Lake George. Among its important traits are thick, narrow-stemmed Bare Island and Lamoka or Lamoka-like points; small, thick side-notched points; notched bannerstones; choppers; and pestles. In its late stages the culture was influenced by, or overlaps in time, complexes of the Susquehanna Soapstone tradition.

Although further research is necessary, the Hudson Valley data have important bearing on the prehistory of the entire Northeast.

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A Postulated Early Owasco Component

THE ROUND TOP SITE

Michael F. Laccetti

Endicott, New York

The results of partially excavating a site in Endicott, New York, called the Round Top site by the author, point toward its designation as Owasco in nature. Portions of its ceramic characteristics, chipped and rough stone artifacts and, to a limited degree, its bone and antler artifacts, indicate affinities to the Snell, Willow Tree, and Turnbull sites. (Ritchie, 1963) There is, at this time, however, no authenticated chronological placement of the Round Top site within the Owasco Aspect nor a full explication of intrusive elements within it, but only indications that it may help elucidate the genesis and development of these late prehistoric peoples. It would be a supposition to attribute its elements as interconnecting Point Peninsula and early Owasco development.

PHYSICAL SETTING

Almost directly on the Susquehanna River, the site lies close and to the west of a prominent landmark of glacially-eroded shale, making up a hill with an elevation of 1072 feet.

In November, 1963, the village of Endicott, New York, completed its purchase from a local industry, the Endicott-Johnson Corp., the area west of Round Top Hill. Designated as Grippen Park and intended for public recreation, preliminary landscaping of the area was begun during the summer of that year.

The preservation of the site has been assured by the civic service of Doctor Vincent L. Casey of Endicott and the executive decision of the present mayor of Endicott, John R. Brunner, in order that excavations will be completed by members of the New York State Museum staff.

EXCAVATION OF PITS

Since the site area had been under previous cultivation, inspection of the top-soil often revealed plow-thrown stained earth, giving the location of a pit. After such an observation, six pits were excavated as early as 1958.

Random test pitting led to the trenching of an area 75 ft, x 3 ft, x 2 ft, on the east end of the site in 1960. It is estimated that the contents of 80 pits were revealed at that time by other excavators than the author.

In 1963, the overgrown western portion of the site was test-pitted by trial and error after bulldozing had removed all growth cover. When the test-pitting revealed discolored circular pit tops, the clearing of the stained topsoil from the pit tops of 3 ft. x 3 ft. or 4 ft. x 4 ft. areas followed. Pit stratification was revealed and removed by horizontal troweling and the artifacts marked in association with each pit stratum characteristics. On the assumption that the pit contents were of a homogenous nature, depth and association records were not kept on all specimens. Profile drawings were made on some of the pits when the need for more exacting records became apparent. The assigning of stake numbers to each pit served in preparation of a site map by Murray Shapiro of Endicott, by the plane survey method. Mr. Shapiro, excavating in 1960 and 1963, served to bring the attention of the site to the Rochester Museum of Arts and Sciences, which designated the site as Apl 2-4. Personal conversation with Dr. William A. Ritchie indicated that his excavations had yielded noteworthy fragments of pottery.

During the excavating, occasional photographs were taken of objects in situ. Time limitations precluded close examination of a large area in the northern quarter of the western section appearing to show the concentrated activity of a settlement pattern.

DESCRIPTION OF PITS

By the spring of 1964, it is estimated that 160 pits had been located and examined. Eleven were clearly disturbed by bulldozing.

The character of the pits was revealed by stratigraphy of a vertical section through the pits as shown by Figure 1. The capping of topsoil ranging from 8 in. to 14 in. in depth, when removed, showed the pit diameters to range from 2 1/2 ft. to 4 ft. Completely excavated to the underlying soil, the pits were found to be basically U-shaped. No evidence of stored food remains was found to indicate the pits serving as abandoned food caches. No hearths were located, although layers of charred wood fragments were often found in association with other refuse layers.

It was observed that flakes of flint and complete and incomplete chipped artifacts were generally found in the topsoil layer or randomly distributed throughout the pits, often in clusters.

Heat-cracked rocks in the plow and bulldozer disturbed topsoil layer also served to locate a pit. Their sporadic distribution within many pits suggested disposal rather than the structural uniformity of a hearth.

The high frequency of red-stained layers of ash was also invaluable in locating pits. These layers ranged from 1 in. to 4 in. in thickness and circumscribed the pits, occasionally being found in more than one layer in a pit. The samples preserved require analysis to reveal their true nature.

The incidence of articles found in the pits show, in descending order, pottery sherds, animal bone, chipped stone objects, rough stone objects, bone implements, and pipe fragments. The highest incidence of recovered objects came from pits numbered 6 and 55. Pit 6, excavated in the eastern section in 1960 by Murray Shapiro, yielded an almost complete rim of Clemson Island ware and many large rim fragments

with patterns Owascoïd in nature. Exceptionally rich in body fragments, of which several hundred were painstakingly excavated, the pit yielded little bone, charcoal, or other debris.

Pit 55 is noteworthy for its heavy concentration of cracked animal bone, including the vertebrae and scales of fish, all fortunately well preserved but as yet unidentified, bone tools, chipped stone, pottery and pipe fragments. In close proximity to pit 55, pit 52 yielded a pipestem similar to those of the former pit.

Study of the osseous remains indicate tentative identification as deer, turtle, bear, fish, and woodchuck. ¹A pH of 6.5 of soil samples from Pit 55 suggests a reason for the excellent preservation of bone. ²Plant remains include charred wood, fiber, acorns, corn, and pignut shell.

ARTIFACTS

Chipped Stone

Examination of lithic debris suggests a pebble industry. Many nodules of local gray chert, either intact or with the rind struck off, were retrieved from both pits and site surface. Those nodules of flint found in the pits were either accidentally heat cracked or served as pottery tempering agent as shown by microscopic examination of fragmented pottery sherds.

Quartzite nodules or flakes and quartz flakes were rarely found despite a preference for quartzite by the Owasco people. (Ritchie, 1961) A fine Levanna-type quartzite point is in the collection of the author.

Rough Stone

Objects of this category are a portion of a cylindrical pestle, one small sandstone celt (in the collection of Shapiro), combination hammerstones and anvils, and double-notched netsinkers, whose great abundance emphasizes the utilization of fish by the inhabitants. A sinew stone was a surface find. Another sinew stone, found between pits with a T-drill, placed both in doubtful association with the usual assemblage. No tools of agricultural activities, such as hoes, were found.

Polished Stone

The pit find of a single small portion of a slate gorget indicates a seeming scarcity of this type object. Another drilled fragment was found on the surface of the site.

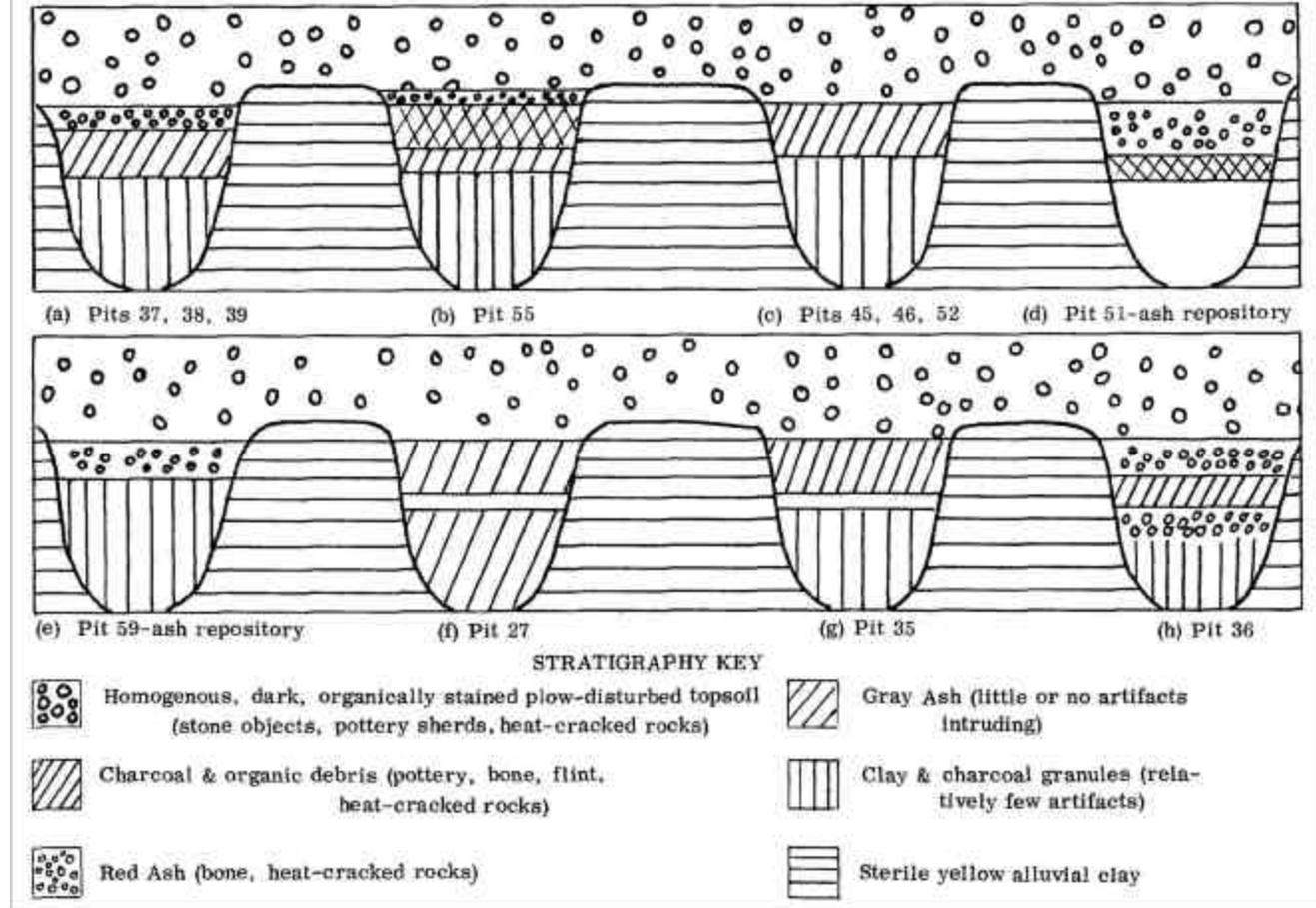
Bone and Antler

Placed within this category are small awls of antler and bone, small blade-like long-bone tools suggesting artisan use. A cylindrical antler flaking tool (collection of Shapiro) revealed the method of flint flaking. Two fragments of bone needles resembling a Levanna site form (Ritchie, 1928) were found in pit 55.

¹Representative osseous remains will be subsequently forwarded to the Curator of Zoology, N.Y. State Museum, for final identification.

²Determination performed by Tioga County Extension Service, Agricultural Department, Owego, New York, March 1964.

FIGURE 1. REPRESENTATIVE PIT PROFILES



Ceramics

Pottery forms have slightly everted rims with conoidal bases. Cord-wrapped patterns are strikingly predominant and are found on the rims and lips, around the circumference of the neck, occasionally obliquely within the mouth of the vessels and often in a herring-bone and oblique or vertical plating on a cord-marked body or cord-on-cord. Thickness of walls often exceeds one-half inch. The lips are often flat, plain, or obliquely cord-wrapped.

Examination of the tempering agents show particles of quartz, granitic materials, and gray flint. It has been occasionally reported that gray clay is found on the nearby river bottoms. Lumps of clay were frequently found in the pits. No evidence of the method of constructing the ware was found excepting small lumps of raw clay with intermixed particles of flint.

Round Top pottery specimens were noted to have similarities to the Levanna (Ritchie, 1928) and Snell site patterns and the Turnbull and Willow Tree (Ritchie, 1953) types to a minor degree. A pit-by-pit analysis, to determine site relationships from ceramic types and trends, is required for certain cultural placement.

SETTLEMENT PATTERNS

The settlement patterns of the Round Top site have not yet been revealed. Post-molds 3" in diameter have been uncovered near pits 25, 40, and 21. An area for future investigation approximately 40 ft. x 60 ft, lying north of pits 15, 16, 17 and consisting of a deeply stained layer of earth at least 1 ft. in. depth overlying sterile clay and seemingly free of refuse pits may reveal these patterns. Further exploration of the area is indicated by the serial grouping of the pits on the south or river side of the site.

SUBSISTENCE PATTERNS

A full description of the food-gathering and hunting activities of the inhabitants has not yet been elucidated from the recovered organic debris. The small size of deer bone implies the taking of the spring-born fawn. Fragments of deer antler suggest fall and winter hunting necessitated by the depletion of foods gathered in the summer and early fall. Such foods would include corn, maturing in August, or acorns and pignuts gathered for winter foods in the fall months.

A shell heap excavated near the river but containing pottery of Iroquoian design suggests the convenience of the site for the gathering of mussels from the river, which has been observed to shallow during the late summer and dry autumns and thus provide easy access to mussels in the shallow water. There is no known instance, unfortunately, of mussel shells being found in heaps in the excavated area. Reportedly, they occur in thin lenses in pits.

Intermittent flooding in the past and as recent as the spring of 1964 has occurred, but no geological verification of such instances previous to Indian occupation is known by the excavators excepting for the presence of alluvial clays making up the substrata of the site. The excellent drainage of the subsoil during flood periods must be considered a factor contributing to the good preservation of the pottery.

PATHOLOGY AND BURIALS

Despite the propensity of prehistoric people to deposit their dead in refuse pits (Ritchie, 1934), no indications of such practices were found, though no systematic search for burials has been made in the surrounding area.

Some dispersed human bone fragments came to light, and several human teeth were excavated from pits. A single incisor was found intermixed with the rich osseous deposit of pit 55. The reasons for its provenience are uncertain.

PROBLEMATICAL OBJECTS

The following objects are tentatively classified as artifacts:

(a) Several roughly circular discs of pottery, $\frac{3}{4}$ " to $1\frac{3}{4}$ ". The edges, which appear to be broken off but not ground, are reminiscent of gaming discs.

(b) Spatulate-shaped sedimentary pebbles, 3" to 4" in length, the frequency of which in the pit debris may have been of a domestic or artisan use.

(c) Flint nodules encrusted with clay on their cracked exteriors, suggesting conditioning in the preparation of pottery clay.

CONCLUSIONS

Throughout the investigation of the Round Top site, the primary purposes were to recover, observe, and record. Some hypotheses were inevitably formed:

(1) A hunting-fishing economy predominated with a subsidiary dependence on gathering wild plant foods and an as yet undetermined agricultural activity.

(2) Portions of the Round Top assemblage show traits with the Owasco Aspect, i. e., Levanna, Carpenter Brook (Griffen, 1952), Snell, Turnbull, and Willow Tree ceramics with Point-Peninsula-like traits of chipped stone as exemplified by the Turnbull site. Portions of the chipped stone complex persist into the Castle Creek Focus found in Broome County (Ritchie, 1939).

(3) It appears that some major intrusive ceramic types (Clemson Island) were absorbed into the traditional Owasco patterns, since some unidentified punctate sherds are found. The traditional patterns appear to remain constant into the Carpenter Brook and Levanna components. Whether or not Point Peninsula forms are ancestral to the corded Round Top types is unknown to the author, as are the ancestral types of the Carpenter Brook and Turnbull sites. The problems may be resolved from sequential Owasco site relationships by Ritchie, following detailed pottery seriation.

(4) In summary, there exists a highly uniform typological Owasco assemblage in Broome County requiring further study and placement culturally and chronologically in the appropriate New York State sequence.

XI. A COMPARATIVE TRAIT TABLE & FREQUENCY

Category	Trait	No.	Snell	Willow Tree	Turn-Bull
CHIPPED STONE					
Arrowpoints	broad, straight base	17	X		X
(Triangular & corner-notched)	broad, concave base, asymmetric	2			X
	broad, concave base	27	X	X	X
	Jack's Reef corner-notched (fragments)	2			
Blanks	trianguloid, broad, rough flaking	3			X
Drills	straight (fragment)	1			X
	expanded, side-notched base	1			X
	y-shaped, expanded base	3			X
	asymmetric, expanded base	2			X
Scrapers	end, serrated	2			X
	end, simple	1	X	X	X
Gravers	chipped on rough spall, finepoint	1	X	X	X
	delicate point, chipped from broken point	2	X		
Strike-a-lights	triangular, biconvex in section	6	X	X	X
POLISHED STONE					
Gorget (?)	fragment, slate, drilled on both sides	2			
Celt	small, thin, rectangular (sandstone?)	1			
ROUGH STONE					
Hammerstones	unpitted scarified pebble	2	X	X	X
	oval bi-pitted pebble	1	X		X
Anvilstones	rectangular, large	2			
	scarified pebbles, bi-pitted	1	X		X
Combination Tools	sinewstones & anvil	1	X		
	hammer & anvil	1	X		
Sinewstones	deep grooves & abraded flat surface	1			
Chopping (?) Tools	thick, flat, compact sandstone				
	roughly chipped to edge showing wear	1			
Pestles	cylindrical, conical end	1			
Netsinkers	double-notched flat pebbles	60	X	X	X
Spatulas (?)	sandstone, flat, elongated				
	rounded edges	32			

X denotes trait as present.

Category	Trait	No.	Snell	Willow Tree	Turn bull
BONE & ANTLER					
Flaker	antler, cylindrical, small	1	X		X
Needles	fragmentary, two-hole, flat	2	X	X	X
Potters Tools (?)	concave-convex long bone, oblique ground end	2			
Awls	deer, ulna	1	X	X	X
	antler whole	1			
Harpoons	fragment, barbs unilateral	1			
CERAMICS					
Surface Finish	corded	X	X	X	X
Pottery types	Carpenter Brook Cord-on-Cord	X	X	X	X
	Snell Incised Platted (?)	X	X		
	Levanna Cord-on-Cord	X	X	X	X
	Owasco Herringbone	X	X		
	Owasco Platted	X	X		
	Owasco Corded Horizontal	X	X	X	X
	Point Peninsula Corded (?)	X			X
	Clemson Island - punctated on opposite side of vessel	X			
Pipes	bowl fragments plain, others unknown	6			
	pipe stems, round or oval in section & smooth	5	X	X	X
	obtuse angle, oval	1			
Miscellaneous	use of jasper	X			X
	use of hematite-powdery masses	X			X
	use of limonite	X			
	settlement patterns -postmolds	X			
	use of dogs	X	X		
	pits u-shaped	X	X		X
	secondary use of cache pits for refuse	?	X		X
	use of corn	X	X		X
	use of acorns	X	X		
	use of hickory nuts	X	X		
	concentration of animal bones in pits	X	X		X
	gaming discs (?) roughly chipped pottery	11			

X denotes trait as present.

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LATE INDIAN GRAVES IN LAUREL, LONG ISLAND, N. Y.

Roy Latham

Long Island Chapter

In 1900, while the foundation of a windmill was being dug in Laurel, Long Island, on the shore of Peconic Bay, just west of Brushes' Creek, an unmarked Indian grave was uncovered at a depth of three feet. The skeleton was described as "in a sitting position", probably flexed. In the lap were blue glass beads, an earthenware pot of European make, and a brass spoon with the round bowl. Three more graves were uncovered while the work was in progress, with additional round-bowl brass spoons association, cylindrical, globular, and barrel-type trade beads of white and blue glass, a trade pipe, and other trade articles. All the graves were the same depth, and the subjects therein in the exact position as described above. No attempt was made to locate graves except those uncovered while digging for the construction involved. Other graves are believed there in the yards and under the boulevard on the northern boundary of the estate.

Part of the material saved is in the Museum of the American Indian, Heye Foundation in New York City, donated by Mr. Daniel Young of Mattituck, Long Island, who saw the graves opened. The Museum's data may not indicate in detail other than the locality that the goods are from these graves. Some of the Heye catalog numbers for the Laurel specimens are: 10/564, trade pipe; 10/565, brass spoon; 10/566, white glass beads; 10/668, cylindrical glass beads; 10/569, barrel-shaped blue glass beads; 10/570, globular blue glass beads.

This cemetery is apparently unrecorded in archaeological history. Its period of usage is uncertain. There were no prehistoric artifacts in the graves examined. The goods in question would indicate the late seventeenth-century period.

PETER HASENCLEVER'S NEW YORK IRONWORKS
A HISTORIC SITES SURVEY

Edward J. Lenik

North Jersey Highlands Historical Society

For several weekends during the spring of 1964 a program of archaeological survey and photography was carried out in Orange and Westchester counties, in New York. This was at the site of two eighteenth century ironworks, namely the Cortlandt and Haverstraw Furnaces. Built around 1766-7 by Peter Hasenclever, a German merchant, these furnaces produced cast iron for England as well as the colonies themselves. The immediate objective of this survey was to provide information on the nature and location of the furnaces. Both sites were physically inspected, photographed, mapped, and described. A few surface artifacts were also recovered. In order to set the stage for the results of this site survey, it is important that the reader take a brief look at the life of Peter Hasenclever.

Peter Hasenclever was born in 1716 in Germany where, during his early years, he worked in his father's Iron and Steel Works. As a commission merchant he traveled extensively throughout Europe, finally arriving in England in 1763. Soon he heard the stories of the rich iron deposits in America, and he became interested in forming a company to exploit this resource. Hasenclever formed a corporation of which he was manager and received authorization to spend between 10, 000 and 40, 000 pounds to develop the business.

Hasenclever then went to Germany, signed a company of skilled iron workers, and induced them to sail with their families for New York. Hasenclever followed, arriving in America in June, 1764. Once here he acted promptly by purchasing an old ironworks in Ringwood, New Jersey. Within a year he had brought over 535 Germans to work, and under his direction they built forges, furnaces, dams, houses, stables, bridges, reservoirs, ponds, mills, and other buildings. He developed iron works at Ringwood, Charlotteburg, and Long Pond¹ in New Jersey and at Haverstraw and Cortlandt in New York.

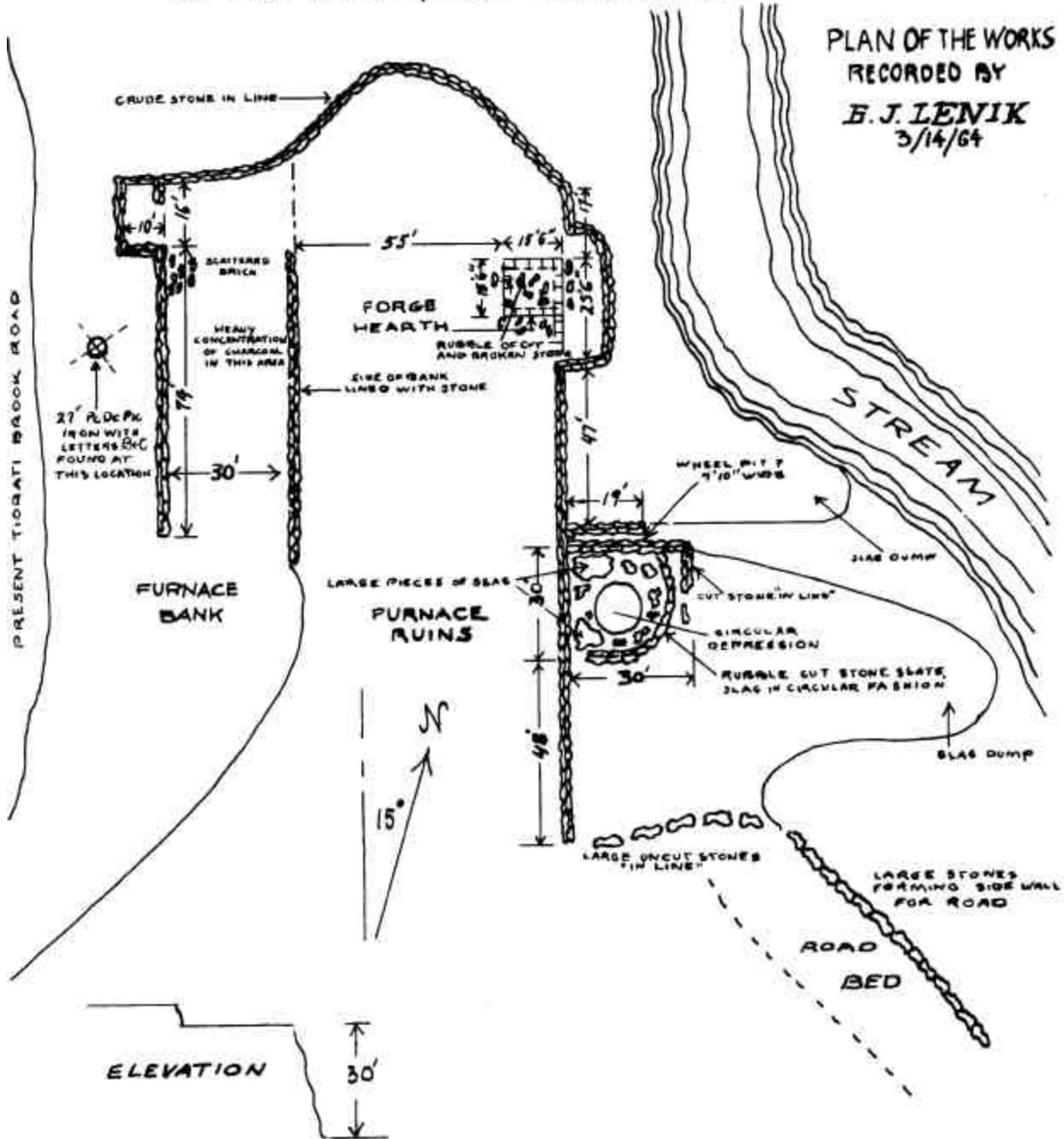
Hasenclever worked energetically but became financially involved. He spent more than the authorized 40, 000 pounds and in the fall of 1766 returned to England to straighten out his affairs. He came back to America in 1767, but left again in 1769, never to return. Altogether he spent 54, 000 pounds and eventually was declared bankrupt.

At this point, let us examine specifically the historical facts relating to the Haverstraw Furnace. Unfortunately, we know very little about its establishment and/or its operation. This furnace was located just below the outlet of Lake Tiorati, in Palisades Interstate Park. It was formerly known as Cedar Pond. Hasenclever, in his autobiography, tells us that after his arrival in America, he made plans to build five furnaces (Hasenclever, 1773, p. 77). It is well documented that he developed four extensive works at Ringwood, Charlotteburg, Long Pond, and Cortlandt. The fifth furnace he began to build in "The Highlands, forty miles above New York on the borders of the North River." The prospects for success at this location looked good, so Hasenclever began to build a dam, a road, log houses and to cut wood for charcoal. However, the iron ore in the area proved to be of poor quality, and the works was soon abandoned.

1. Present day Greenw ood Lake

PETER HASENCLEVER'S
HAVERSTRAW IRONWORKS
CIRCA 1767
AT LAKE TIORATI (CEDAR POND) NEW YORK

PLAN OF THE WORKS
RECORDED BY
E. J. LENIK
3/14/64



These facts are supported by a "Map of the Highlands in the State of New York" drawn by Robert Erskine in July 1779. It was Erskine who succeeded Hasenclever as manager of the ironworks and later became Geographer and Surveyor to George Washington's Army. On this map, Erskine made a notation at the outlet of Cedar Pond that this was the site of "Hasenclever's Intended Works."

Another early source gives us further information regarding the location and operation of this furnace. Green, in his book, The History of Rockland County, stated that this Ironworks operated in conjunction with a mine in the area called the "Hasenclever Mine" (Green, 1886, p. 161). The furnace and bloomery, he adds, were situated on Cedar Pond Brook just below the outlet of the pond itself. Green calls the works the "Cedar Pond Furnace." The second owner of this ironworks was Captain Samuel Brewster, who worked it during the Revolution. Green goes on to say that there were several subsequent owners of the mine and furnace, namely, Bradley, Blackstick, William Knight. The Haverstraw Iron and Mining Company, which was organized in 1844, and finally Colfax and Company.

What does the Haverstraw Ironworks look like today? Remote and picturesque is perhaps the best way to describe the area. The ruins stand in a steep and narrow gorge just below the outlet of Lake Tiorati. The fast flowing stream tumbles over rocks and boulders through the woods past the Ironworks. The stream obviously provided a good source of waterpower for the works. The entire area is heavily wooded and overgrown, and is protected in its natural state as part of Palisades Interstate Park. It is difficult to picture the furnace as the beehive of activity it presented during the eighteenth century.

Surface investigation at the site revealed the stone outline of a furnace and forge.³ These are in an advanced state of ruin, somewhat difficult to discern, and are covered with earth, rubble, and cut stone. The wheel pit and tailrace for the furnace, however, are clearly in evidence. The tailrace ran along the north wall of the furnace, and, in fact, the stonework also acted as one wall of the tailrace. This identical situation was found at the site of Hasenclever's Long Pond Furnace, excavated in 1963 by Roland W. Robbins (Robbins, 1963, p. 4). The furnace ruins stand close to a high "furnace bank" upon which was located the charging bridge leading to the top of the furnace as well as the charcoal house, weighing station, and piles of ore and flux. The top of the furnace bank was covered with a heavy layer of charcoal, and the side was lined with stone. Two slag dumps were in evidence near the stream, and it is clear that this material was dumped along the western embankment, pushing the stream's course into the marsh to the east of the furnace. An old road leading into the furnace is also visible.

During the course of the investigation, a few artifacts were recovered from the site. The most significant of these was a piece of pig iron, 27 inches long, weighing 27 pounds, and with letters "B & C" cast in it. Other artifacts included a possible hoe blade and a piece of strap iron. Slag, charcoal, brick, and iron ore were also found scattered throughout the site.

2. Original in the possession of the Historical Society of Pennsylvania, 1300 Locust St., Philadelphia 7, Pa.

3. The reader should refer to the accompanying drawing for specific details and an overall view.

Now let us turn our attention to the Cortlandt Furnace, about which we know substantially more. This furnace was located just below the outlet of present-day Furnace Brook Pond, which is east of U. S. Route No. 9, between the communities of Crugers and Oscawanna in Westchester County. It was built by Peter Hasenclever at some time between the first of May, 1765 and November, 1766.

This ironworks was a fairly extensive one and consisted of the following:

1 furnace, 1 coal house, 5 frame houses, 1 store house, 1 stable, 4 log houses, 1 barn, 1 blacksmith shop, 1 bridge, 1 pond. The entire ironworks took in 2, 570 acres of land (Hasenclever, *ibid.*, p. 6).

This furnace, states Hasenclever, suffered from the same misfortune that occurred at Haverstraw. The iron ore was of poor quality and could not be used. However, the furnace continued to operate for several years. In fact, Robert Erskine, in a letter written in 1771 (Heuser, 1928, p. 65) to Richard Willis, a stockholder of the American Iron Company, commends Hasenclever for selecting this site for a furnace. He states that "It is the only place for an ironworks, which Mr. Hasenclever . . . , seems to have chosen with judgment." In the same letter he adds further: "Could good ore be found for Cortlandt, it would have great advantages over the other furnaces by its proximity to the river." The Cortlandt Furnace was still operating under Erskine's direction in May, 1774, as indicated by one of his account books. The heading of this book was as follows:

Waste Book
Commencing May, 1774 by Robert Erskine of
Ringwood, Long Pond, and Charlotteburg Iron Works, New Jersey
And Cortlandt Furnace, in New York Province, and Bellgrove Store, New Jersey

According to a subsequent historical account, the furnace was apparently abandoned, and the property sold prior to the Revolution. Bolton (1848) in his book A History of the County of Westchester stated that ore in sufficient quantities could not be found in the area. Hence, it had to be transported, at vast expense, from the Queensbury Mine in the Forest of Dean, Rockland County, to the Furnace. But even in Rockland County, the ore was not found in sufficient quantity, and so the Furnace eventually was closed down.

At the close of the Revolutionary War, a flour mill was built almost on the exact site of the Furnace (Scharf, 1886, Vol. II, p. 419). In fact, only a "few feet" separated the two structures.

What does the Cortlandt Furnace look like today? The visitor to the site will find a tangle of vine-covered ruins that were once the scene of industrial activity. The ruins are those of the flour mill and an old residence. The old furnace has long since disappeared. Vines and weeds scale the fallen and crumbling stone walls in an effort to claim their remains and hide them from view. The old house and mill are fading into yesteryear.

A careful inspection of the flour mill ruins revealed the fact that much of its stonework came from the old furnace. The walls of the flour mill were constructed of sand stone blocks. Several of these sandstone blocks had a smooth glass coating and probably came from the inner lining, or bosh, of the furnace, the glass-like coating, of course, being the result of the tremendous heat generated during the smelting of the

Ore. The flour mill undoubtedly used the watercourse of the old furnace. The water wheel-pit and tailrace of the works are clearly in evidence. These are lined with stone and are of dry construction, i.e., without mortar.

The old house, which stands a few feet downstream from the flour mill, remains a mystery. It stands silent and decaying, and the date of its construction is not known at this point. It appears to be at least contemporary with the flour mill. An old dirt road leads into the ruins.

Slag, charcoal, and old bricks were found scattered throughout the site. Only one significant artifact was recovered; namely an eight-inch piece of pig iron.

The ravages of time and the elements, combined with lack of care and the work of vandals, are fast claiming the ruins.

Acknowledgement

The author is grateful to Mr. Mead Stapler, who so carefully photographed the ruins of these ironworks, and to Mr. Ernest Krauss for his valuable assistance in historical research. July, 1964.

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THE N.Y.S.A.A. BULLETIN

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POSTSCRIPTS

Robert E. Funk. Carbon 14 dates on the Sylvan Lake Rock Shelter, reported by Funk in this issue, were received too late to be incorporated in the text or footnoted. The date for the Vosburg Level is 2800 B. C. and for the Sylvan Lake, that is, stemmed point (Lamokoid-Bare Island), 2300 B. C.

These dates accord very well with dates given for Laurentianistic and BareIsland styles "Projectile Point Varieties present in a Pre-Ceramic Non-Shell-Midden Site in the Lower Hudson Valley," (Brennan, N.Y.S.A.A. Bulletin No. 30, March, 1964) as estimated from correlation with the Fairbridge hypothesis of sea-level fluctuation.

The Buried Treasure of Archaeology. By Louis A. Brennan. Illustrated. New York: Random House. 1964. \$4.95 ... Much more seriously conceived is Louis A. Brennan's "The Buried Treasure of Archaeology," a survey of key prehistoric finds written with force and assurance out of a fund of knowledge. "Enthusiastic" best describes Mr. Brennan's evocations, some of which are: the Stone Age farmers of Jarishof in the Shetlands; the burial mound culture of the Hopewell People, who once sparsely inhabited the Middle West; and the Clovis Mammoth Killers and their Cro-Magnon and Neanderthal predecessors of still earlier glacial times. Mr. Brennan's account of the Star Carr site in Yorkshire, where diggers found, on the fenny shore of a lake long since vanished, the remains of a Mesolithic village, is particularly absorbing. The author, having a genuine passion for his subject, is able, to a considerable degree, to humanize his remote Maglemosizns and Battle-Ax Peoples. A book of solid quality. Edward B. Garside. The New York Times Book Review, Nov. 1, 1964.

Tree of Arrows. By Louis A. Brennan. New York: The Macmillan Company, 1964. \$5.95. Before the white man came to corrupt and destroy, the North American Indian had his own more or less complex social structure and his own mystical vision of life and death. Mr. Brennan's original and imaginative novel successfully evokes this world and leaves the reader with a feeling that this could be exactly how the red man really was. He was cruel and rapacious; he was also honorable. In his own language and on his own terms he was both articulate and lyrical. If he put little value on human life, he was convinced of the reality of the spirit. Tree of Arrows deals with the time of the formation of the Iroquois Confederacy, just before the first white man penetrated what is now upper New York State in the early 17th century. The Confederacy, intended to bring a lasting peace among the related but constantly warring Iroquois tribes, was the dream of an ousted Iroquois chief, Ha-Wa-Ta. To help impose the "Great Peace" upon his people, Ha-Wa-Ta chooses a Shawnee brave, the youthful Hawksbow. Tricked into giving Ha-Wa-Ta his allegiance, Hawksbow finally accepts Ha-Wa-Ta's vision as his own, and before returning to his people with the woman he has made his squaw, destroys a bloodthirsty enemy who has opposed the Confederacy. But then, at the end, the white man appears with Algonkin allies and strange new weapons; clearly, there are undreamed-of changes in store. This novel, a skillful blend of history, mythology, and dramatic action, is an impressive achievement. Russell Thacher: Book-of-the-Month Club News, Feb. 1965.