THE BULLETIN

Number 66 March 1976

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THE BULLETIN

NUMBER 66 MARCH 1976

Field Sketch of Indian Rock Petroglyphs

THE NEW YORK STATE ARCHEOLOGICAL ASSOCIATION

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TWO PETROGLYPH SITES
1. THE INDIAN ROCK PETROGLYPHS: Fact or Forgery

Edward J. Lenik New Jersey

The location of the Indian Rock Petroglyph Site of Bloomingburg, New York, has been generally known for well over 40 years. During this period of time, many groups of visitors have hiked to the site to gaze in wonder at the so-called aboriginal rock carvings. Every visitor to this Orange County landmark has undoubtedly heard the story that the carvings of "braves", horses, tepees, and other symbols are the work of Indians who attempted to record an important tribal event.

According to a 1928 newspaper article which appeared in the *Times Herald* of Middletown, New York, the petroglyph site was originally discovered in 1925 by a Charles Clapham of Bloomingburg and then was lost. (Weisshaar 1928) It was "refound" in 1927 by Edmund and Joseph Lloyd, also of Bloomingburg, New York. The article goes on to say that the site was investigated in 1928 by the Lloyd brothers, Dr. E. A. Bates of Cornell University and Chief Goa-Hia-tha of the Onandaga tribe.

The Times Herald article reports that both Dr. Bates and Chief Goa-Hia-tha believed that the carvings were genuine and were the work of the Delaware tribe which probably carved them in the 1660's or 1670's. The article further notes that the "Pictographs . . . aroused consider able controversy among historians and students of aboriginal America". Several authorities apparently stated that the Indians in this area did not use spears or live in tepees, but these objections were discarded by Dr. Bates. Bates reportedly believed that the Indians had spears and bows, and used tepees on hunting and fishing trips. Several interpretations of the symbols by Dr. Bates and Chief Goa-Hia-tha are also reported in the article.

The Indian Rock Petroglyph site was first brought to my attention in 1973 by Dr. Elizabeth Dumont of Monroe, New York. The exciting story of the symbols and legends prompted me to make two visits to the Indian Rock site for the purpose of studying and recording the petroglyphs.

The Indian Rock Petroglyph Site is located near the village of Bloomingburg, in Orange County, New York. Specifically, the site lies a short distance east of Stone Schoolhouse Road, exactly 3 miles north of Route 17K in the town of Crawford, New York.

The symbols are carved into a flat outcropping of granitic bedrock measuring 12 ft. long north to south by 9 ft. wide from east to west. The land surrounding the petroglyph is heavily wooded and slopes gently from east to west. The remains of several "Yankee" stone walls are also visible nearby, the remnants of farming activity and property lines of an earlier day. A short distance below the site, the ground is wet and swampy, and may have contained a fresh water spring at some time in the past. The Shawangunk Kill lies some 800 ft. northwest of the site.

A total of 28 symbols or designs were found and recorded on this 12 x 9 ft. granite ledge. The designs have been carefully cut or incised into the rock and are easily recognizable. (See Cover) The symbols represent the sun, moon, tepees, horses, a thunderbird, bear and other animals. Human figures are also represented on the stone in the form of braves wearing headdresses and carrying bows, a hunter with a spear, a running figure, a woman with a papoose on her back, and others. The designs have been well formed and executed.

A short distance to the east of the petroglyph rock is a similar outcropping of flat granitic bedrock. This ledge measures 14 ft. long from east to west and 10 ft. wide north to south. There are two designs cut into the ledge: the date "1928" and beneath it an arrow pointing in the direction of the "Indian" rock. (Fig. 1) The workmanship on these figures appears to be similar to that on the adjacent petroglyph rock. It is interesting to note that the 1928 newspaper account of the investigation of Indian Rock fails to mention the existence of this date and arrow.

COVER ILLUSTRATION: Field Sketch of Indian Rock Petroglyphs.

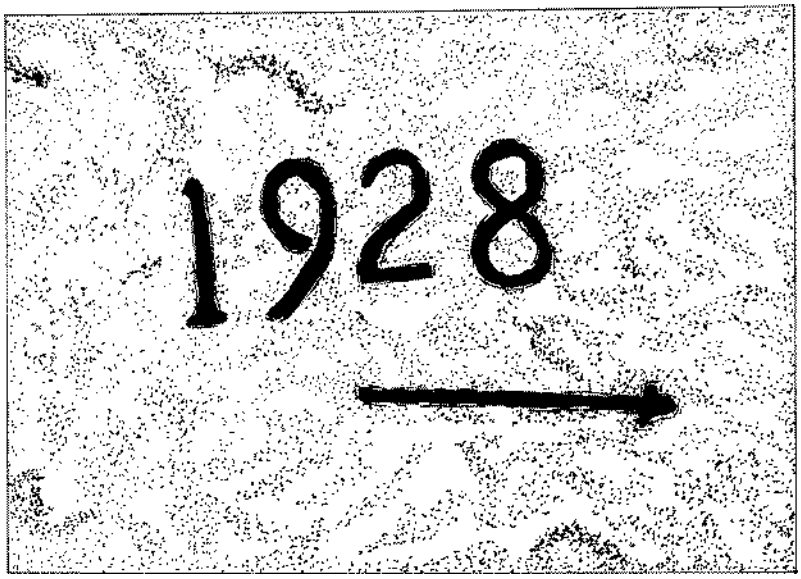

Figure 1: Field Sketch of Date and Arrow on Ledge Adjacent to Petroglyphs. (Not to scale)

On the basis of the evidence at hand, I do not believe that this site is the work of Indians. This conc lusion is based on the following points:

1. The sharpness of the carving technique and the well-formed and easily recognized designs make me believe they are of modern origin. It is totally unlike other petroglyph sites I have investigated thus far.

2. Taken as a group, the designs clearly characterize the western or Plains Indians and not those of the eastern woodlands. The symbols of tepees, full headdresses on human figures, horses, (especially the one pulling a travois), lend weight to this conclusion.

3. Finally, the carved date of "1928" on the nearby bedrock would seem to indicate that the carvings are of modern day origin.

In summary, it is my opinion that the Indian Rock Petroglyph is not of aboriginal origin but is instead someone's recent fanciful representation of the Indian. It is likely that many others will continue to visit the site in the years to come. The passage of time and the forces of nature will serve to obscure the newness of the carvings and, together with the legends, they will be presented as authentic, which they are not. Hopefully this report will serve as a permanent record of the site and that these carvings are modern.

Acknowledgement

I am extremely grateful to Dr. Elizabeth Dumont of Monroe, New York, for telling me about the site. Special thanks also goes to Ralph Robinson of Middletown for guiding me to the site.

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2. THE JERICO, N.Y. PETROGLYPH

Introduction

Standing virtually in the shadow of the Long Island Expressway is the Jericho Petroglyph, an ancient engraving on stone. This stone, bearing five carved and pecked symbols, stands alone and mute, but gives permanent testimony to some ancient message or motive. Our minds race with many questions when viewing the stone: Who carved the symbols? How long ago? What is their meaning?

The Jericho Petroglyph was reported to me by Marjorie Kling of New Hyde Park, New York, who indicated that the property on which the petroglyph stands is owned by Joseph Markowski of Oyster Bay, New York. Accordingly, I contacted Mr. Markowski and made arrangements to visit the site.

On January 4, 1975, Mr. Markowski led me to the site to inspect and record the petroglyph. I photographed the rock both chalked and unchalked, measured and sketched it. In addition, a reconnaissance survey was conducted in the immediate area surrounding the stone in hopes of finding evidence of aboriginal occupation. Unfortunately, none was found as the area is heavily overgrown with trees and brush.

Site Location and Description

The rock on which the designs are found is located at N40°47'10" - W73°33'0", interpolated from the U.S. Geological Survey, Hicksville, New York Quadrangle of 1967, at an elevation of 180 ft. above sea level. The site is within the borders of the town of Jericho, Long Island, New York. (Figure 2)

The Jericho Petroglyph is carved and pecked on a granite boulder which measures 193 cm from north to south and 152 cm from east to west. It is located on a slightly elevated and nearly circular plateau which is about 45 m in diameter. The granite boulder is heavily patinated and has been split into two segments, probably by natural means. At the foot of the boulder there was evidence of some recent excavation, but the nature of this work is unknown. The boulder containing the petroglyph is the only one in the entire area. No other rocks or boulders were visible around the site.

The plateau, on which the petroglyph sits, as well as the surrounding area, is heavily wooded. Most of the trees are of fairly recent growth with oak and grey birch trees predominating. According to Mr. Markowski the small plateau was never farmed, but the adjacent land was cultivated as a cornfield. The Jericho Petroglyph site was part of a large farm complex that has been almost entirely destroyed by road building and commercial development. The small plateau would have made an excellent campsite in an earlier day, providing a flat and dry area on which shelters could be built.

Description of the Petroglyph

The Jericho Petroglyphs are carved on the top face of the boulder which slopes downward from south to north. Two of the designs are on the upper segment of the boulder and three are on the lower portion. (Figure 3).

Design number l, at the top of the stone, is that of a left hand. (Figure 4). It measures 23 cm long at its maximum length. This design has clearly been pecked into the stone with the fingers and thumb rubbed and smoothed in. The palm and thumb of this design are nicely proportioned. However, the index, middle and fourth finger are long and slender while the small finger is short and stubby. The depth of this design varies from 5 to 15 mm, the maximum depth being in the thumb.

Design number 2 is in the middle of the stone (Figure 4). I interpreted it to be that of a star. It has five lines or grooves that have been cut clearly to a depth of 6 mm. and radiate outward from a central point.

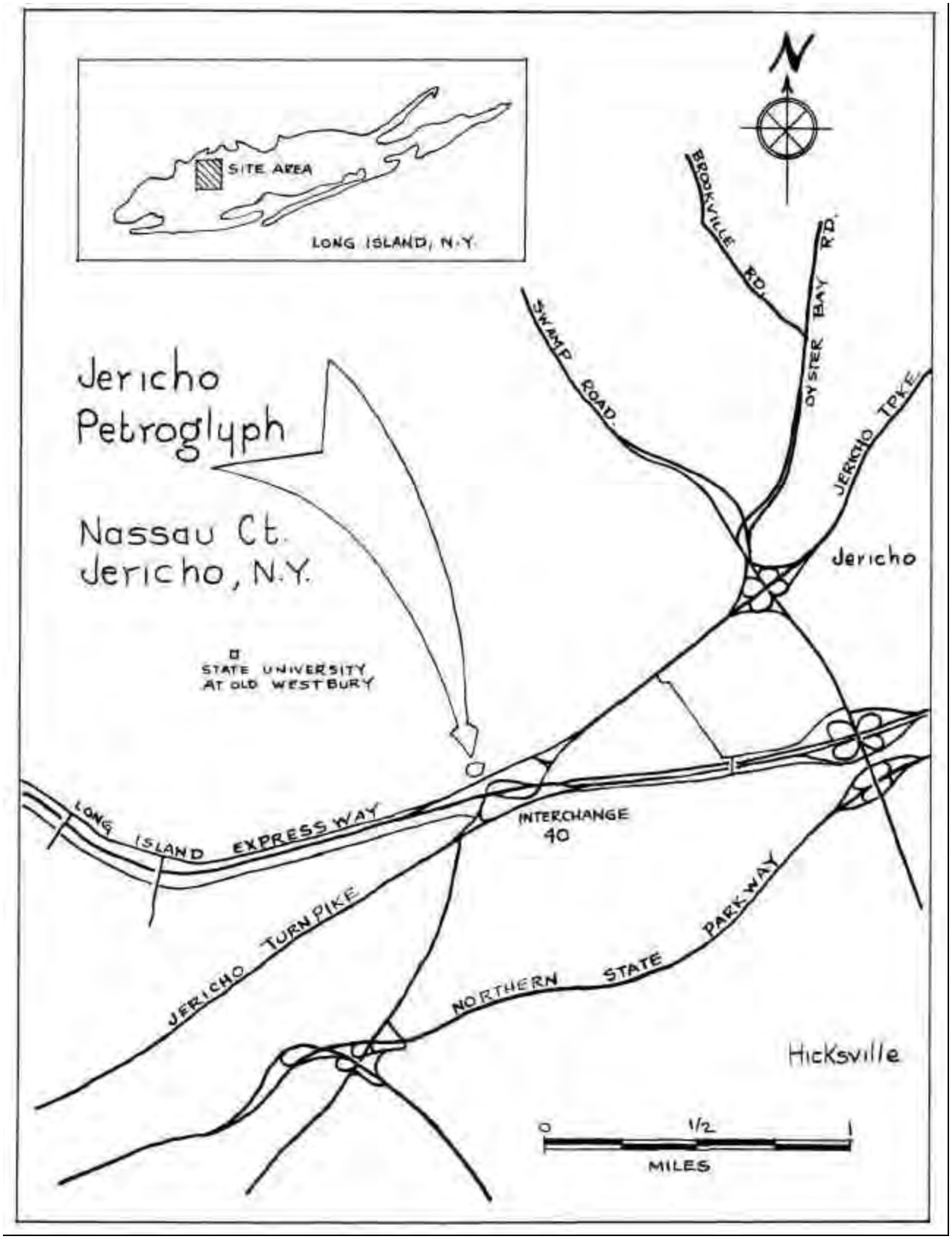

Figure 2: Location of Jericho N Y. Petroglyph

Figure 3: The Jericho, N.Y. Petroglyph

Design number 3 is a triangular hole that measures 3 cm on each side. (Figure 5). It appears that this design has been punched in with a metal drill, as there seems to be a circle or a certain degree of roundness in each angle. The general appearance of this design indicates that part of it has been recently cut, and it may have been "reworked" for emphasis. Designs 4 and 5 are clearly that of an arrow and a bow. (Figure 5). The bow is 12.5 cm long and 3.8 cm wide, and the arrow is 8.5 cm long. These designs have been clearly incised into the rock. The point of the arrow design also appears to have been "reworked" with a metal drill and measures 10 mm. in depth.

Comparisons

A search of the literature on reported petroglyph sites in the northeast has been conducted in an attempt to find similarities between other petroglyphs and the Jericho site. Some comparative information has come out of these examinations indicating several close parallels to the Jericho Petroglyph.

The carving or design of a "hand" seems to occur frequently on petroglyph sites. The hand, designated as design number 1 on the Jericho Petroglyph, closely resembles that on the Minisink Island Petroglyph reported by Herbert C. Kraft and found on Minisink Island in the Delaware River, Sussex County, New Jersey. (Kraft 1969). The hand on both of these petroglyphs was pecked and then rubbed into the stone and both have long, slender fingers. The basic difference is that all of the fingers on the Minisink stone are long and slender, whereas the thumb and little finger on the Jericho stone are short and stubby.

Figure 4: Jericho Petroglyph: Design No. 1 Hand; Design No. 2 Star

The human hand design has also been found on the site called "Petroglyphs Opposite Millsboro" in Fayette County, Pennsylvania. (Swauger 1969). Swauger reports that five such designs appear on this petroglyph. Human hands have also been reported on rock paintings or pictographs in southwestern Ontario, Canada. (Swauger 1962:87).

Design number 2 on the Jericho Petroglyph I have identified as a "star". This design closely resembles the star on a petroglyph knife found at the Pahaquarra Site along the Delaware River in Warren County, New Jersey. (Kraft 1974). The star on the petroglyph knife, however, differs in that it has two incised lines which intersect and form four right angles. Four other incised lines radiate out from each right angle. Swauger also reports finding a "star" design on the Babb's Island Petroglyph Site in the Upper Ohio River valley. (Swauger 1973)

I can find no parallels to the triangular shaped design on the Jericho Petroglyph. Unfortunately, it appears to have been altered and thus I simply refer to it as a geometric design. Design number 4 is that of an arrow and has been found on several petroglyph sites. Two distinct arrows were found on the Francis Farm Petroglyph in Fayette County, Pennsylvania. (Swauger 1964). Another incised arrow design was found on the Thom Petroglyph in Newton, New Jersey. (Lenik 1973). Undoubtedly, many more exist on other sites in the northeast.

Design number 5 appears to be that of a "bow", and yet it may not be. Other observers indicate that this design might be interpreted as a geological feature such as a hill or mountain, with the nearby arrow indicating direction. I have not found any similar designs on other reported petroglyph sites.

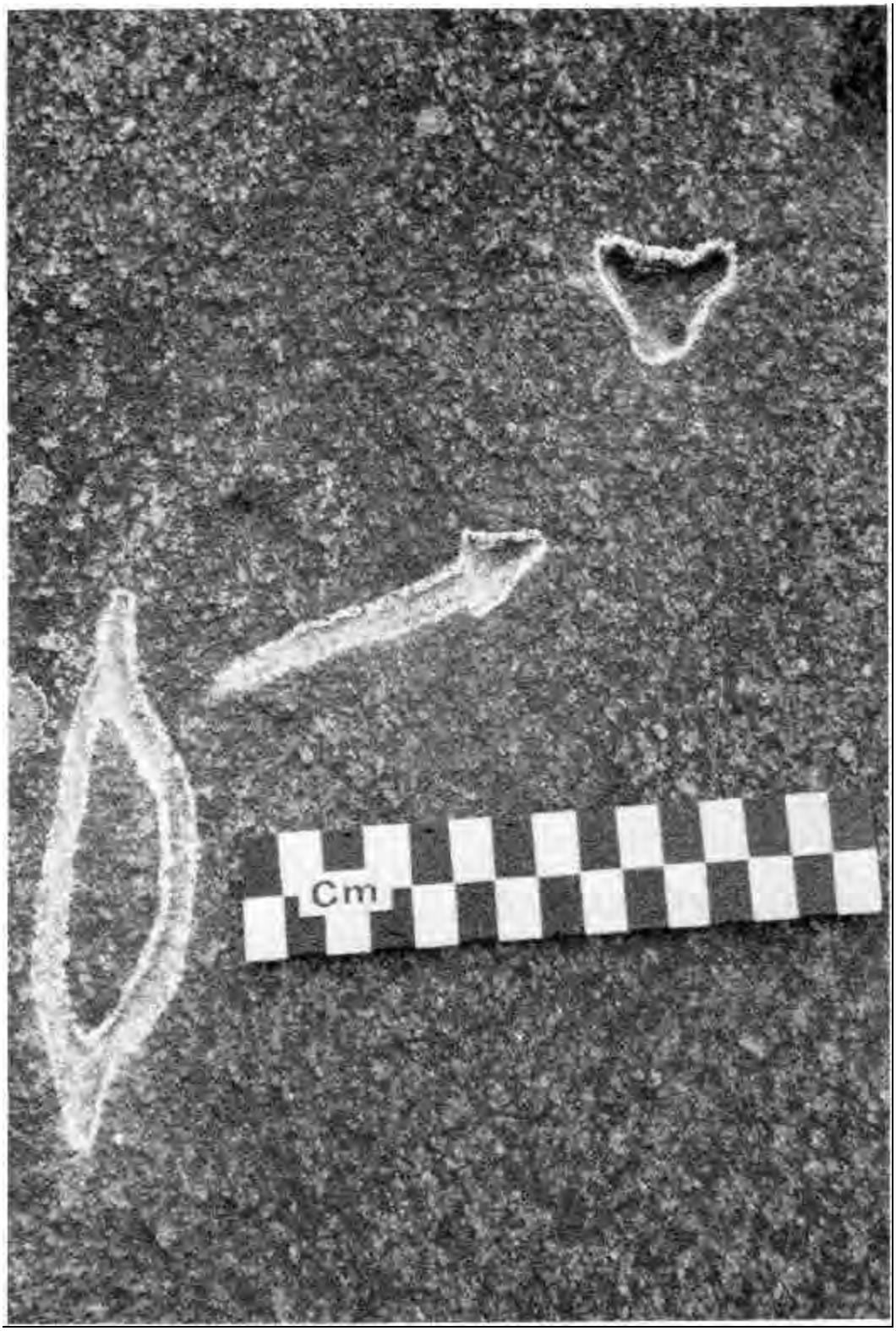

Figure 5. Jericho Petroglyph: Design No. 3, Triangle Design No. 4 Arrow, Design No. 5 Bow.

Summary and Conclusions

In my opinion, the Jericho Petroglyph is of American Indian origin carved probably during the late Woodland period. It is clear that three of the designs, namely the hand, star and arrow, are found on other petroglyphs in New Jersey and Pennsylvania and appear to be genuine.

At a later date, however, two of the designs, the triangle, and point of the arrow, appear to have been reworked or altered, probably with a metal tool. With the exception of these two small reworked areas, the entire petroglyph was heavily patinated, thus lending more weight to its authenticity.

Acknowledgements

I wish to thank Marjorie Kling for calling the site to our attention and Joseph Markowski for granting us permission to inspect the petroglyph. Special thanks also goes to Barbara Corcoran for her valuable assistance in recording the sketching the designs.

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THE DIVERS LAKE QUARRY SITE
GENESEE COUNTY, NEW YORK

Betty Coit Prisch Rochester Museum

In northwestern Genesee County, New York, an outcrop of the flint bearing Onondaga limestone formation towers 70 ft. over a small glacial lake. This is the Divers Lake quarry site (Mda 10-3), also known as Spirit, Hidden or Devils Lake, the second largest known flint quarry in New York state.

The quarry, with its precipitous terrain, is an isolated island of natural beauty ringed by cultivated fields. It was a source of raw material for flint knappers for perhaps 10,000 years. The work terraces, on which the artisans stood to detach raw material from the matrix are still visible. At the foot of the steep descent from the ridge, heavy duty quarrying tools have been found. A mile to the south is Tonawanda Creek bordering the route of the Tonawanda Trail (Parker 1922:560). Along its banks are traces of villages and campsites of the native American people. To the west is Tonawanda Reservation, home of a segment of the Seneca Iroquois tribe. Until 1838, Divers Lake quarry was part of the Reservation and still is said to be considered sacred ground by the Senecas.

In the Seneca mythology, Spirit Lake was believed inhabited by a "monster underwater serpent with horns. Yearly, the sacrifice of a beautiful maiden and her lover were required. Sorrowfully the relatives turned away, dreading to see the serpent arise to swallow them. Of course the lovers never could come back; and of course they never wanted to be devoured by horned serpents. Who knows where they went?" (Anon. 1929).

The Rev. Samuel Kirkland, on his mission to the Senecas in 1788, is said to have visited Divers Lake (Squier 1851; Yates and Moulton 1824). Squier quotes Kirkland, "The old Indians affirm that formerly a demon in the form of a dragon resided in this lake, which frequently disgorged balls of liquid fire. To appease him many sacrifices of tobacco had been made by the Indians" (Squier 1851:67).

No mention is made in the early historical literature of the use of Divers Lake as a flint quarry. European metal tools were traded to the Indians at an early date, and the quarry may not have been in use for perhaps 250 years. The pioneer historians in New York state were interested primarily in the Indian mounds and what was believed to be a string of fortified towns stretching "in all directions through the country" (Turner 1849:24). In the early 1800's it was generally believed that an extinct race of mound builders had previously inhabited the area. The Indians of that day affirmed their ignorance of the origin of the mounds, thus lending support to the vanished people theory. By the early 1900's Parker could write, "Other sites of importance occur along Tonawanda Creek where there are numerous remains of an early Iroquois people and vestiges of the mound builders" (Parker 1922:560), but no mention is made of the Divers Lake flint quarry.

Divers Lake is a kettle lake of glacial origin "lying in a drift piled against the escarpment of Onondaga limestone" (Fairchild 1928:192). The Onondaga limestone is the youngest flint bearing formation in New York state, dating from middle Devonian times (Wray 1948:40). Outcrops occur all across the state in a belt running east from Lake Erie to Utica and continuing south through the Hudson Valley. In England, the "splintery, fracturing flint" is called hornstone, so the Onondaga formation was originally called corniferous limestone (Latin, cornu: horn) (Fairchild 1928:70). The Onondaga flint occurs both as nodules and as thin layers "seldom over four or five inches thick" and not continuous (Wray 1948:41). In western New York, the Divers Lake quarry is the source of most of the common mottled tan and blue-gray variety of flint. Only a few tools of exotic material are in the Divers Lake collection. Most of these are preforms of weathered Little Falls flint (Fonda, New York) or white chalcedony (Flint Ridge, Ohio). One used flake of black flint from southeastern Ohio and a Brewerton corner notched point of yellow chalcedony from Flint Ridge are included in the collection, and the lanceolate Plano point may be of Coxsackie green-gray flint.

Chemical analysis of the Divers Lake flint show the clay to tan variety to be 99% silica with traces of iron, titanium, copper, aluminum, nickel and magnesium. The black to gray variety is 99% silica with traces of iron, copper, aluminum, nickel, magnesium, chromium, molybdenum, cobalt and sodium.

Relatively few flint quarries have been located in New York State. Among them, Divers Lake ranks second only to the eastern New York quarries at Coxsackie (Wray 1948:28). Since Divers Lake is the only major flint quarry known in the western part of New York, the artifact collection from there is an important research resource.

The farmland around Divers Lake is the source of the worked and unworked flint. Although the land has been cleared and in use for many years, it still produces flint tools with every spring plowing. Several heavy concentrations of material have been designated workshop areas. Chips and worked flint, however, are scattered widely through the fields. The tools in the collection, except as noted separately, have been surface collected.

It has been noted that "many flint quarries were not only sources of flint for export, but also industrial sites or factories to which materials such as wood and bone were brought to be worked in the presence of abundant tools" (Bryan 1950:3). At Divers Lake, however, there is no evidence in the form of organic debris that the workshop areas were used for any other work than flint knapping, although the ground or pecked stone tools include pitted stones and

hammer stones, polished celts and pestles. The large number of flint scrapers in the collection raises the possibility of such tasks as hide preparation, woodworking and bone tool making, but no remains are visible. No bone fragments, either dietary or as tool material, are present.

At the West Athens Hill site (Cox 7), Ritchie and Funk infer "considerable domestic and industrial activity" from the "many utilized flakes, scrapers, knives and other tools" found on the site (Ritchie and Funk 1973:32). The West Athens Hill site is characterized by high soil acidity (pH 4.5 to 5.5) accounting for the disappearance of artifacts of bone and antler. The character of the land around Divers Lake has been modified by years of farming, and its original acidity is unknown.

Witthoft comments that the flint tools and chips found at the Paleo-Indian Shoop site in Pennsylvania are almost entirely Onondaga flint which he believes "was carried here from western New York, predominantly as finished tools, but partially as blank forms ..." (Witthoft 1952:471). More than 1,000 performs are included in the Divers Lake assemblage. "The people at the Shoop site were apparently newcomers who did not yet use the flint of the country-side, but who used the stone of their previous abodes" (Witthoft 1952:494). The Divers Lake quarry may have been such a tool factory whose workers lived elsewhere.

The collection was sorted according to function for the more obvious tools such as projectile points or drills and, according to form, for the more ambiguous categories. Those sorted according to form fell into the general categories of scrapers and knives. A large number of performs was also sorted out and further divided into Stage l, 2 or 3 with Stage 3 representing more work done on the tool than Stage 1 or 2 but not so much as shown in the so-called "finished" tools. It is generally agreed that "many of the so-called 'blanks' and 'rejects' are usable tools ... and . . . they were actually used" (Bryan 1950:3). Many Divers Lake scrapers in fact have only minimal flaking but have a fine scraping edge, and, indeed, show usage. Similarly, many knives show a sharp cutting edge without benefit of extensive flaking. There are 31 pieces of flint in the collection that were considered tools solely because they appeared to show wear from usage, as they were not modified by intentional flaking.

The bulk of the collection was surface collected, but two 5 ft. squares in a workshop area were excavated to a depth of 10 in. 61 flint tools were recovered. Only one (broken) projectile point is among the excavated tools, and it is too fragmentary to be typed. Assorted knives, scrapers and preforms are present (see Table I for complete list). In addition to flint, there are pieces of unworked quartzite, a stone chopper, one slate fragment and one sandstone fragment. The collector also reported the recovery from this excavation of 525 "large" or "core" pieces of flint and 1,640 flint chips.

14 cache blades were recovered from a pit in another workshop area. Sizes ranged from 8.0 x 3.2 cm. to 6.6 x 3.4 cm. A small Stage 3 preform, surface collected, may be a Meadowood cache blade (5.0 x 2.0 cm.).

Although the projectile point sample shows that the Divers Lake quarry has been used since the Paleo-Indian stage, it is difficult to attribute the other tools to a specific culture or time period with any degree of certainty.

A prime difficulty in assigning cultural provenience to a collection from a quarry site lies in its attractiveness as a source of raw material to a number of cultures covering a long

Table I

1 projectile point fragment, medial section	2 humpback scrapers
1 scraper/graver	6 scrapers with worked point
1 ovate knife	13 side scrapers
4 backed knives	1 ovate scraper
1 knife fragment, medial section	1 end and side scraper
2 knife tip fragments	5 fragments worked flint
1 flake knife	9 Stage 1 preforms
1 flake scraper	6 Stage 2 preforms
4 end scrapers	2 Stages 3 preforms

time span. It has been remarked, for example, that "many Plano artifacts can be identified positively only if they occur in assemblages rather than in the form of isolated specimens" (Prufer & Baby 1963:25). Many tool forms persist relatively unchanged over a period covering major culture changes. There are in the Divers Lake collection, for instance, end scrapers that resemble those in undisputed Paleo-Indian contexts, but similar forms also seem to appear in the Woodland stage.

Of the 230 typed projectile points, 70% are associated with Archaic stage cultures. Paleo-Indian points (including a pentagonal which may be Middle Woodland) account for 3%, Transitional 6%, Early Woodland 7% and Late Woodland 14%.

A fluted point, which was found on top of the ridge above the quarry, was on temporary loan to the Rochester Museum through the courtesy of Donald Constable, Director of the Holland Land Office Museum in Batavia, New York. The fluted point is from the collections of the Holland Purchase Historical Society. It is illustrated in Fig. 1,f. Made from the local Onondaga flint, it measures 5.5 x 2.5 cm. The flute extends 3.0 cm. on one face and 1.7 cm. on the reverse.

In the collection there are five other possible Paleo-Indian points, but no fluted points. One of these could be a Jack's Reef Pentagonal (Fig. 1, c), but it closely resembles one termed "Folsom implement, pentagonal point" (McCary 1951:12, Fig. 8, #19). McCary further notes, "No one knows where the pentagonal belongs in the eastern cultures," but there is an "apparent" association between fluted and pentagonal points (McCary 1951:15). It measures 4.3 x 2.4 cm. and is of Onondaga flint.

A second point of Onondaga flint (Fig. 1, d), believed to be Paleo-Indian, is very similar to the type called Hell Gap (Irwin & Wormington 1970:25, Fig. 1, e), a "deeply stratified" site near Guernsey, Wyoming. It measures 6.1 x 2.4 cm.

Two other points also of Onondaga flint (Fig. 1, a & b), presumed to be Paleo-Indian, resemble the "unfluted fluted," also termed Midland (Irwin & Wormington 1970:25, fig. 1, c; Quimby 1960:36). Both measure 3.5 x 2.5 cm. A Stage 2 preform for a Midland is also part of the assemblage.

The other Paleo-Indian point is a lanceolate Plano type of green-gray flint (Fig. 1, e), possibly Coxsackie. The base is straight, and all edges exhibit fine parallel flaking. The slightly convex edges taper both toward the point and toward the base. It measures 9.4 x 1.7 cm. A very similar point is illustrated in *Paleo-Indians of Ohio* (Prufer & Baby 1963:20, Fig. 10, Morrow County).

Other projectile points types represented include 54 Lamoka (size range 5.5 x 1.6 cm. to 3.0 x 1.7 cm), 52 Brewerton Side Notched (5.7 x 3.4 cm. to 2.3 x 1.9 cm.), 27 Brewerton Corner Notched (5.9 x 3.5 cm. to 2.5 x 1.9 cm.), 4 Normanskill (5.2 x 2.3 cm. to 3.7 x 1.9 cm.), 14 Genesee (7.3 x 3.2 cm. to 3.9 x 2.7 cm.), 10 Perkiomen Broad (7.2 x 3.5 cm. to 3.5 x 2.6 cm.), 15 Susquehanna Broad (6.6 x 3.0 cm. to 4.5 x 2.3 cm.), 9 Meadowood (7.0 x 2.8 cm. to 2.6 x 1.5 cm.), 7 Adena (7.0 x 3.1 cm. to 5.6 x 3.0 cm.), 13 Levanna (4.3 x 3.3 cm. to 2.9 x 2.5 cm.), 19 Madison (4.1 x 1.9 cm. to 2.7 x 1.6 cm.).

Fragmentary points include 11 medial fragments and 27 with broken bases. An additional 21 points are untyped.

The presence of Paleo-Indian points suggests that some of the other tools may be attributed to the Early Hunter component.

The graving spur is a tool which is considered to be "characteristic" of Paleo-Indian assemblages (Prufer & Baby 1963:38). It frequently co-occurs with an end scraper. In addition to 3 uni-purpose gravers in the Divers Lake collection, there are 14 combination graver/scrapers (Fig. 1,g is an example) and 9 graver/knives (Fig. 4, m is an example) which may be Paleo-Indian in origin. Some of these are delicately worked to a finely sharpened tip while others have a relatively broad graving spur which might be assignable to a scraper category. Two of these eccentrics are illustrated in Fig. 1, j & k (for comparison, see Riddell & Olsen 1969:126, Fig. 4, f & g). Their 'rough and ready' appearance is like those illustrated from the Kouba site in Wisconsin (Ritzenthaler 1967:229, Fig. 3). Ritzenthaler notes that gravers are "relatively scarce" in eastern as compared with western Paleo-Indian sites (Ritzenthaler 1967:228).

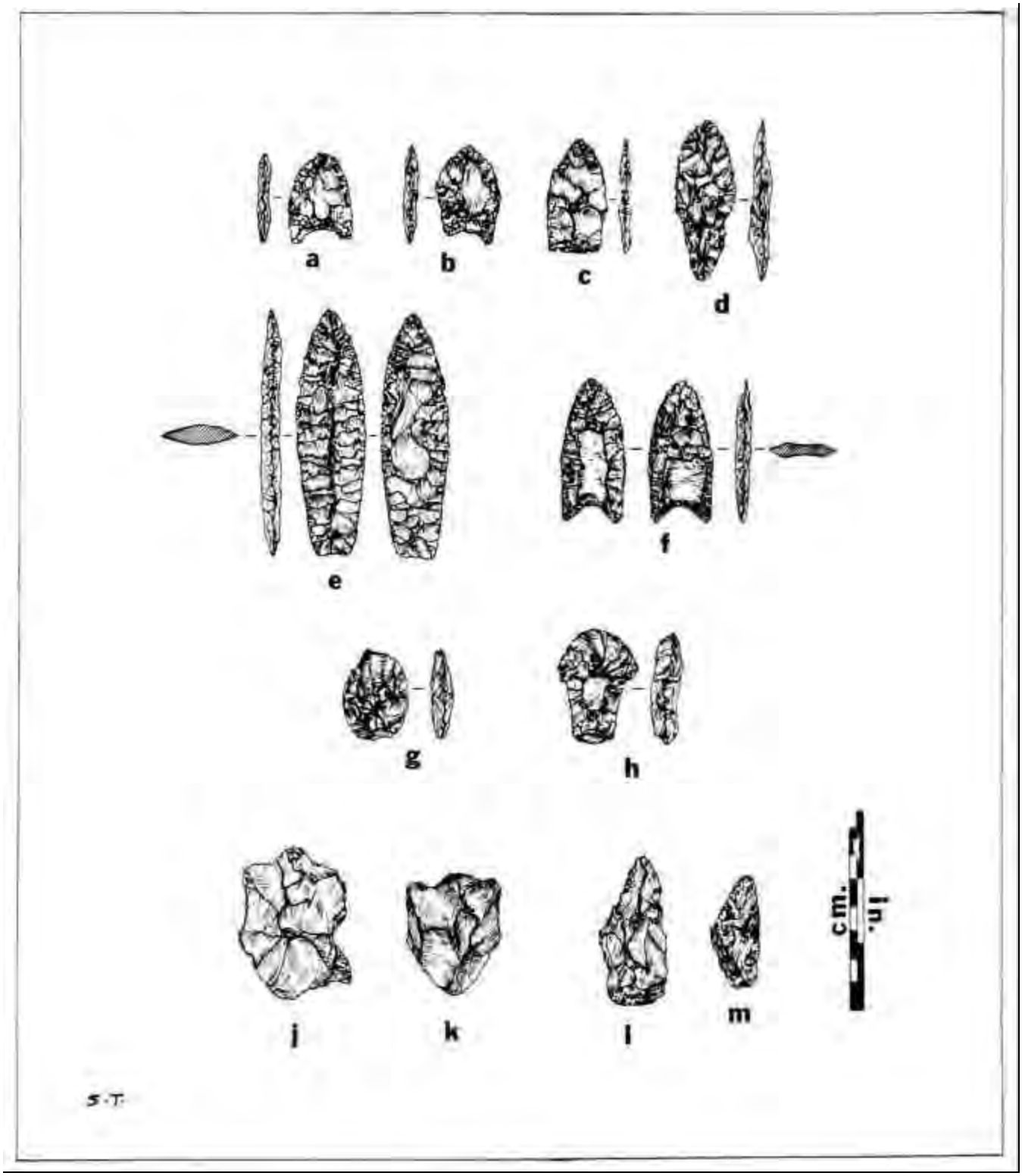

Figure 1. Probable Paleo-Indian Component. a, b - "unfluted fluted" points; c - pentagonal point; d - Hell Gap point; e - Plano point; f - fluted point; g - graver/scraper; h - end scraper; j, k - broad graver/scrapers; 1 - knife preform; m - Hell Gap knife. (a = 3.7 cm.)

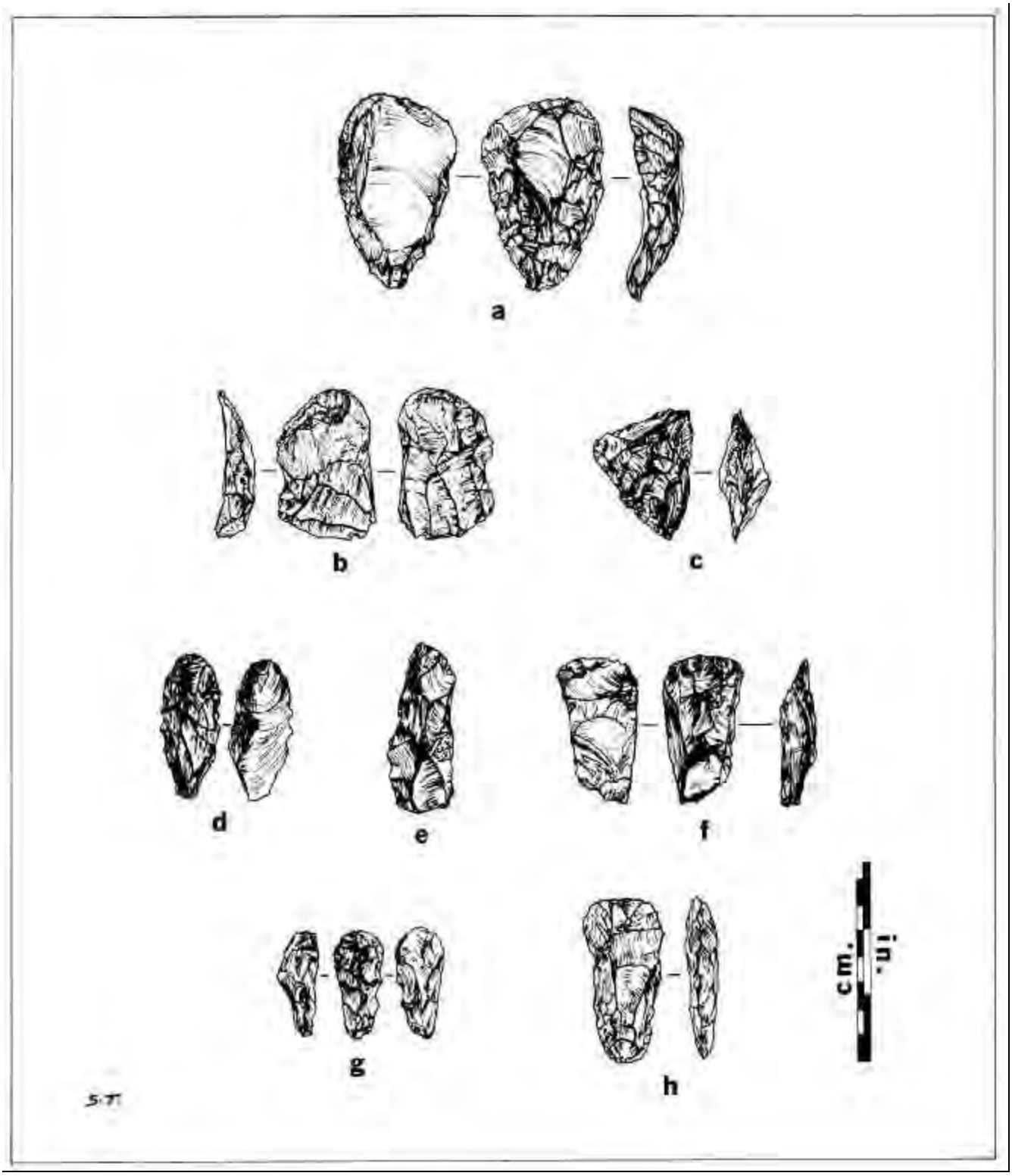

Figure 2. Scrapers. a - heavy duty scraper/ b, f - end scrapers with chisel edge; c - triangular scraper/graver; d, e, g, h - end scrapers. (a = 7.4 cm.).

A second tool form associated with Paleo-Indian assemblages is the snub-nose end scraper (McCary 1951:14, Fig. 9; Ritzenthaler 1967:229, Fig. 4; Irwin & Wormington 1970:26, Fig. 2; Alexander 1963:520, Fig. 5; Prufer & Baby 1963:40, Fig. 24). This form is represented in the Divers Lake collection both in preforms and in finished tools. Similar forms, however, appear to occur in Woodland contexts (Ritchie 1969:260, Plate 88).

Spokeshave scrapers are present. Twenty five show a crushed edge as from usage, but an additional 29 have a sharp, unworn concavity. Some of the spokeshave scrapers are made on a tabular piece of flint which is rectangular in cross section (Fig. 3, j & m). Additional scraping edges are found on some of the spokeshave scrapers (Fig. 3, 1 & k). Ritzenthaler illustrates similar spokeshave scrapers from the Paleo-Indian Kouba site (1967:229, Fig. 3).

A probable knife may also belong to the Paleo-Indian component. It is an asymmetrical pointed oval with a single shoulder (Fig. 1, m). Figure 1, 1 may represent a preform of this tool or of a Cody knife. Similar tools are illustrated in the Irwin & Wormington paper (1970: 28, Fig. 3, c 7 d).

Another tool„also probably a knife, could have been made from a Fulton Turkey Tail projectile point (Ritchie 1961:76, Pl. 9); however, the "tail" is partially a natural formation and partially retouched (6.7 c 3.7 cm.) Fig. 3, c).

There are 22 combination knife/scrapers, 13 "backed" knives, 11 asymmetric, leaf shaped knives, 10 triangular knives and 12 pointed oval knives. Broken knives include 31 medial fragments, 79 tips and 114 basal fragments.

Of 26 drills, 7 are fragmentary, 7 are shouldered, 1 is side notched, 2 are bi-pointed and 1 is straight stemmed. These are essentially square to rectangular in cross section. Five others are larger and heavier, with a triangular cross section, and perhaps are heavy duty perforators. (Size range 8.9 x 2.8 cm. to 2.8 x 2.4 cm).

More than 400 scraping tools are in the Divers Lake assemblage. They vary from thumb nail scrapers (Fig. 1, g), finely bifacially worked on all edges to heavy duty, humpback scrapers with steep bits, unifacially worked (Fig. 2, a). A distinctive portion of the scraper collection is spatulate in outline, sometimes spatulate at both ends with a constricted mid section (Fig. 2, h) (for comparison, see Riddell & Olsen 1969:126, Fig. 4, p & q). Typically longer than wide, some have an angled scraping edge as in a chisel (Fig. 2, b & f). There are 22 scrapers made on core fragments and an additional 21 core fragments without further flaking. One core shows use as a hammer.

Of 81 flake tools, only a few have bifacial work. Included are knives, scrapers, gravers, spokeshaves and a drill (Fig. 3, a, b, e, g, g & h). One used flake is of very black flint, probably from Ohio.

More than 1,000 preforms have been classified as Stage 1 to Stage 3, the latter being divided into preforms for points or knives, for scrapers, for gravers and combinations of these. Fig. 4 illustrates 3 hypothetical sequences of manufacture from a Stage 1 preform to a finished tool.

Ground and/or pecked stone tools include 12 pitted stones, 9 spherical hammer stones, 2 tapered, cylindrical quarry tools, 10 celts, 7 cylindrical ground pestles, 6 pestles oval in cross-section and other unidentifiable ground stone fragments. Two rimsherds, one Owasco and one Iroquois, are among 8 pottery fragments. One European gun flint completes the collection.

In summary, the Divers Lake flint tool collection, in its sequence of projectile points, reflects use of the quarry by the Indians of America over a time span of perhaps 10,000 years. Other tools in the assemblage cannot be assigned cultural proveniences with any great degree of certainty. A comparatively small number of tools can be attributed to a Paleo-Indian component. As more studies of single component sites are produced it may become possible to sort out a quarry assemblage into its constituent cultural parts.

Acknowledgments

This report would not have been possible without the continuing interest over the years of Richard McCarthy. His dedication to the preservation of both the site and its associated arti-

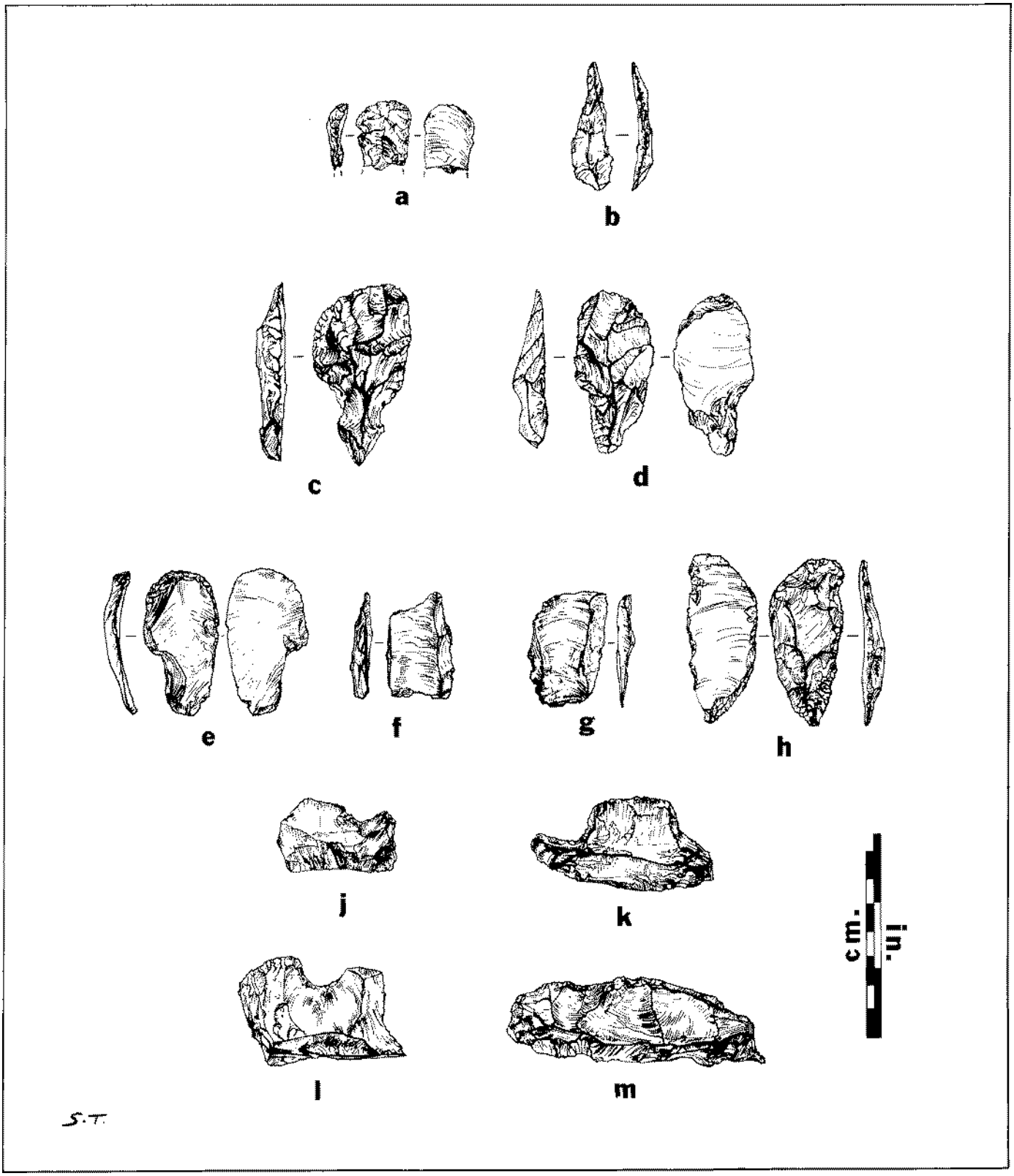

Figure 3. a - thumbnail flake scraper, b - flake drill, c - "Turkey Tail" knife; d - knife/scraper; e - flake scraper; f - flake graver; g, h - flake knife/gravers; j, k, 1, m - spokeshave scrapers. (a - 2.6 cm.)

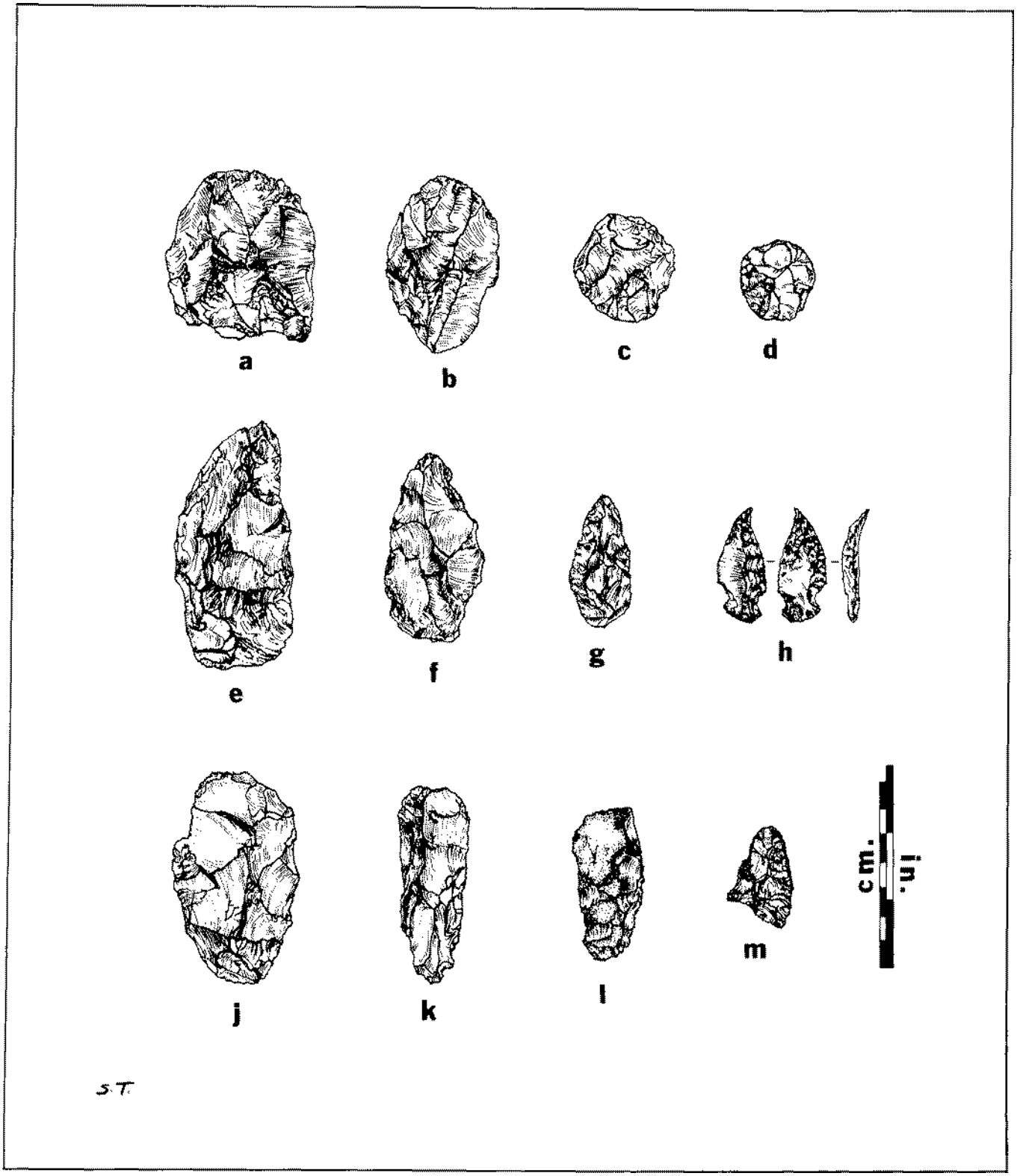

Figure 4. Hypothetical Preform Sequences. a, b, c, d - Stage 1, 2, 3 preforms to thumbnail scraper; e, f, g, h - Stage 1, 2, 3 preforms to point form with twisted drill tip; j, k, l, m - Stage 1, 2, 3 preforms to graver/knife. (a = 7.0 cm.)

facts has been exemplary in the many years of contacts between regional professional and non-professional archaeologists. The Rochester Museum & Science Center gratefully acknowledges the donation by Richard McCarthy, Henry Kisinski and Mr. & Mrs. Herbert Newman, Jr., all of Lockport, New York, of a large collection of flint tools from the Divers Lake quarry. The Rochester Museum also would like to thank Roland Kern, the land owner, for his courtesy in permitting access to the site by Museum personnel and Donald Constable, Director of the Holland Land Office Museum, for the temporary loan of a fluted projectile point from the site. Appreciation is expressed to Sam Tubiolo, artist, for the illustrations. The author wishes to acknowledge the many helpful suggestions contributed to this report by Charles F. Hayes, III, Director, and Lilita Bergs Podsiadlo, former Associate Curator of Anthropology, Rochester Museum.

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THE MASSAPEQUA LAKE BLADE CACHE

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Herbert C. Mills — Geologist, Nassau County Museum

Introduction

Massapequa Lake is located at 40°40' north latitude and 73°28' west longitude in Long Island, New York (Fig. 1). The lake was formed in 1836 by the construction of an earthen dam across a stream which flowed south through the area. This dam presently runs parallel to Merrick Road on the south side of the lake.

In 1967-68, the Nassau County Health Department investigated Massapequa Lake because it was suspected as a source of pollution that was affecting a local beach. The lake was drained in late 1969 in order to determine whether any sewage pipes emptied into it (Jusczak 1971). To accomplish this, a 3.5 ft. diameter concrete pipe was installed in a trench dug through the earthen dam. During the laying of the pipe workers discovered a cache of chipped stone blades. Some of the blades were removed by the workmen who were certain that many others remained beneath the newly installed pipe. Also, a single triangular (Levanna) point base of black chert was found in the backfill (Plate III:D).

Learning of the find, archaeologists from the Nassau County Museum, Garvies Point Branch, visited the site and went through the backfill. A few additional blades were found, along with three small pieces of shell, and some peat and clay. Two beveled pieces of clam shell may have been worked. Museum personnel then tried to locate the rest of the cache, but cramped and increasingly hazardous working conditions made it necessary to fill the excavation before the cache was located.

Field Work

A plan for re-excavating the blade cache was developed by the Museum and the Nassau County Department of Public Works. A coffer dam of sand bags would be built across the mouth, or lake-end, of the pipe to prevent the intrusion of lake water into the work site. Then a 10 x 10 ft. hole, with sheathing to prevent a cave-in, would be dug adjacent to the east side of the pipe to the depth necessary to expose the cache. Pumps would be used to remove any ground water that might seep into the hole. The planning, adverse weather, and the time needed to build the coffer dam resulted in the site not being ready for excavation until March, 1970.

During the re-excavation of the area (Plate I), the backfill was continually examined to recover as many of the blades as possible and to see if any other material could be found which might give a clue as to the cultural affiliation of the cache. Although material discovered in this

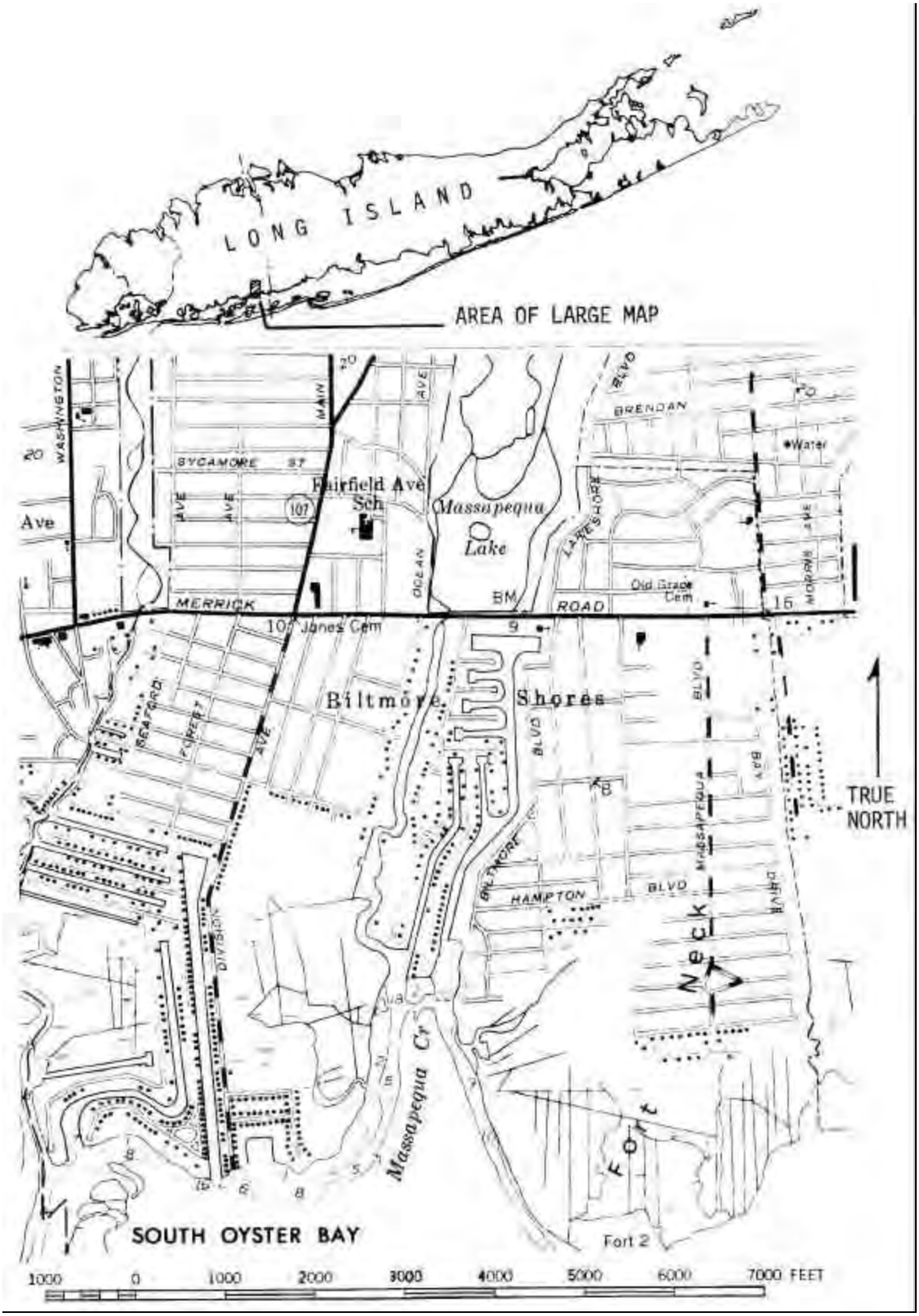

Figure 1. Location of Massapequa Lake.

Plate I. Excavation Scene. Note sheathing, pump hose, and crane bucket.

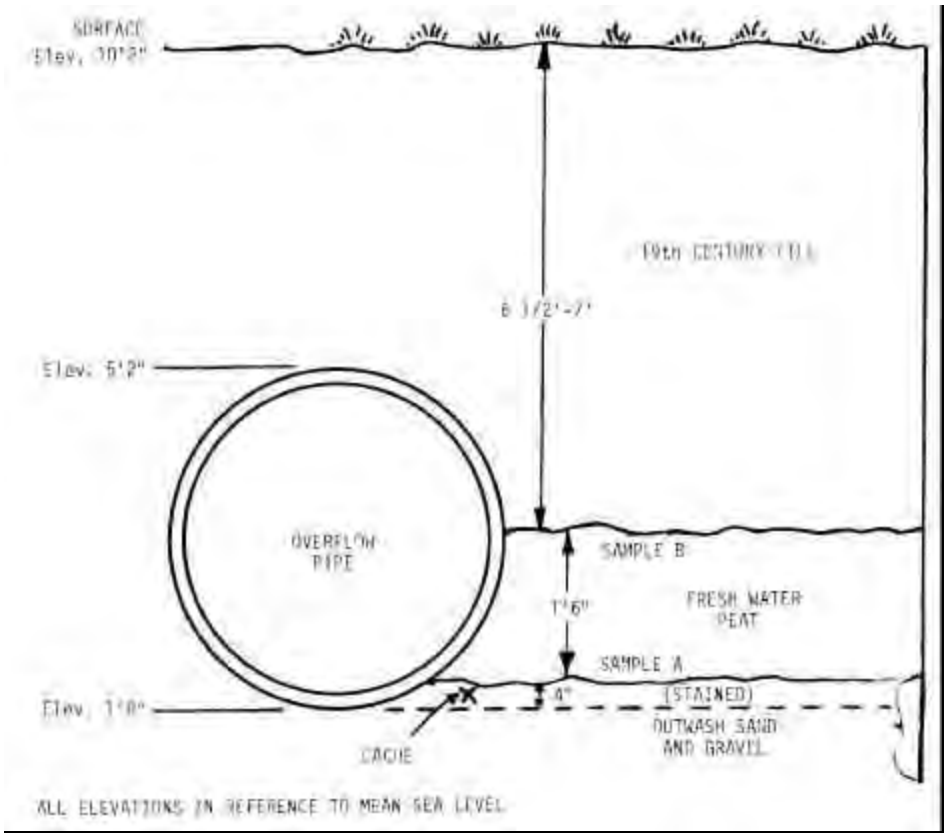

Figure 2. Location of Cache and Stratigraphy

manner was obviously disturbed, it would serve as an indication of what to look for as the digging proceeded.

After removing 6.5 to 7 ft. of fill, 1.5 ft. thick fresh water peat deposit was encountered overlying a stratified outwash sand and gravel. Since this was the suspected horizon of the blade cache, the excavation was extended laterally beneath the pipe. The blade cache was found (Plate II) in the 4 in. thick stained outwash layer immediately below the peat (Fig. 2). The cache measured approximately 1 ft. along its north-south axis. The vertical dimension was 6 in.; however, the top of the cache had been removed during the emplacement of the pipe making accurate measurement of the whole cache impossible. The blades were positioned primarily horizontally, with some tilted slightly from this position. The tilting may have been caused by pressure from above after the dam was constructed, or due to the installation of the pipe. Thus, the blades were apparently purposefully placed in the cache, rather than haphazardly disposed of. There was no evidence of pit outline. The digging was extended into the area surrounding the cache but no further in situ blades or other artifacts were found and the excavation was closed after the appropriate samples and records were taken.

Description Of The Blades

184 complete and fragmentary blades plus smaller fragments were recovered and returned to the Museum for study (Plate II) . The blades appear to fall into two shape categories: lanceolate and triangular. 57 blades were found in situ. Most of the others, as well as the triangular point base, were donated by the workmen who discovered the cache when the drainage pipe was installed. It is estimated that at least an additional 50 blades are in the hands of private collectors who visited the site after working hours and raked through the backfill. These latter blades were not available for examination. Of those measurable, 149 blades have an average maximum length of 81.7 mm. (3-1/4 in.); 143 have an average maximum width of 41.1 mm. (1 5/8 in.)/ and 173 have an average maximum thickness of 10.1 mm. (3/8 in.). The blades vary in maximum length from 60 to 115 mm. (2-3/8 to 4-1/2 in.); in maximum width from 28 to 62 mm. (1-1/8 to 2-7/16 in.); and in maximum thickness from 7 to 17 mm. (1/4 to 11/16 in.) The blade length was measured by holding the long axis of the blade parallel to the long axis of a pair of sliding calipers (perpendicular to the measuring arm of the slide).

The majority of the blades are bifacially chipped. The predominantly broad, flat flake scars are irregular in outline and non-uniform in size and shape. They are generally perpendicular to the edge on which they originate, although occasional scars in the central portions of the blades are randomly oriented (Plate II; Plate III: E, e, r/e; Plate IV: F, f, R/F, r/f, G, H, r/h). The primary flake scar pattern appears to indicate the percussion method of flaking. Commenting on Kaplan's presentation of this paper at the 1970 annual meeting of the New York State Archaeological Association, Dr. Ralph Solecki of Columbia University has suggested that the blades may have been shaped with a wood baton, rather than with a hammerstone. The blades were apparently made from thick blanks and not trimmed down from cores. This is illustrated on several blades which have few, or no, primary flakes removed from one side. Thus, they are essentially unifacially chipped (Plate III: A-C, R/A-R/C). One of these blades has a prepared striking platform as indicated by several discontinuous flakes at the bulb of percussion. A sample of 119 blades was examined to obtain an idea of the extent of secondary chipping (small flakes removed along the edge of the blade). Most of the blades had secondary chipping on only one side (Plate IV: F, f, R/F, r/f). Of the blades with bifacial secondary chipping, about one third had most the flakes removed from one side. On many of the secondary bifacially chipped blades, this secondary chipping occurs on one part of the edge on one side of the blade and on another part of the edge on the other side of the blade. On the majority of the blades with unifacial secondary chipping, this chipping was continuous (most of the edge was chipped), whereas on most of the bifacially chipped blades, the chipping was discontinuous (the chipping was scattered on the blade edge). No marks of utilization were apparent on a sample of the blades. However, weathering (see below) would tend to obliterate any such marks if they were present. There was no evidence of water wear.

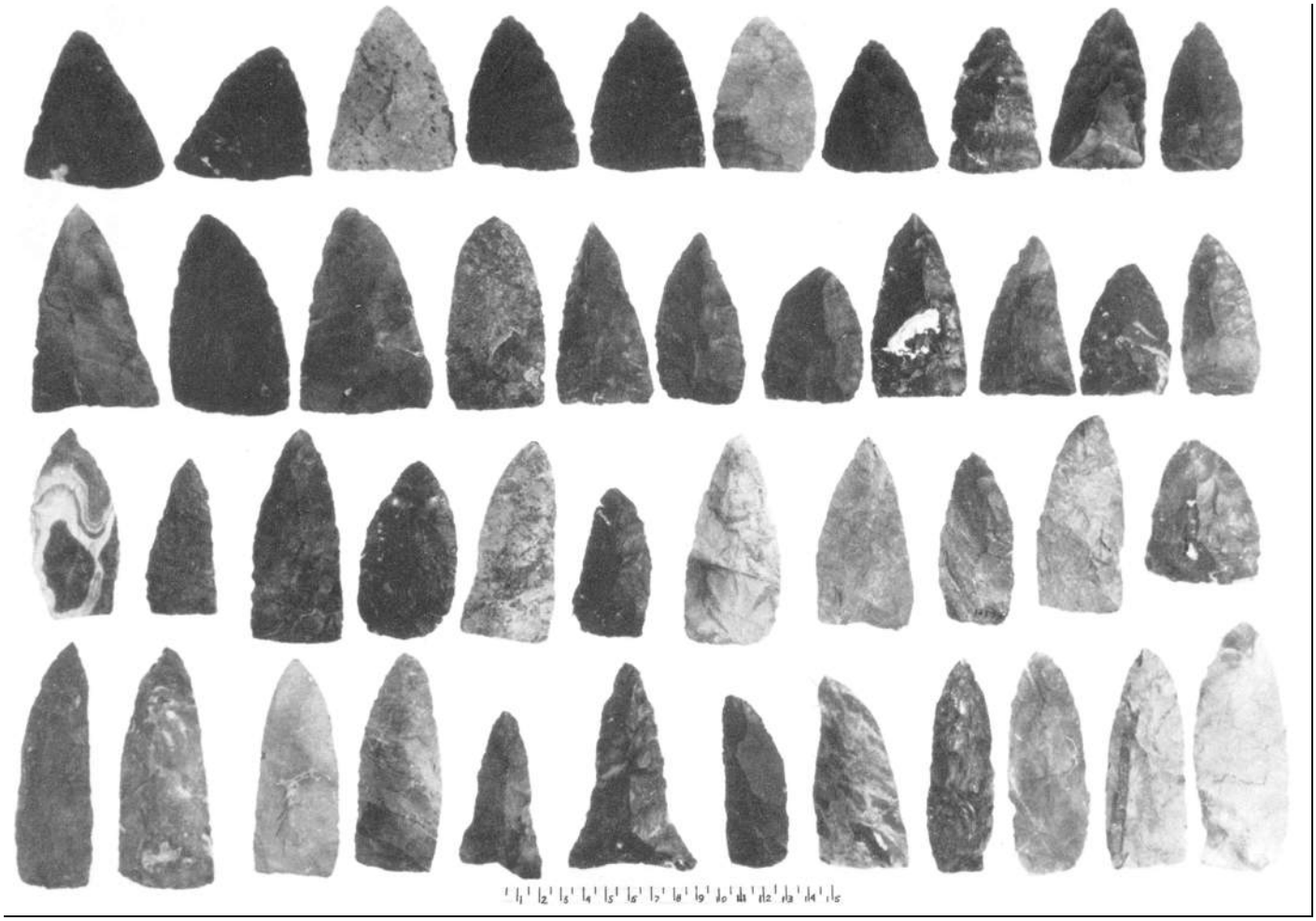

Plate II. Representative Sample of Massapequa Lake Cache Blades.

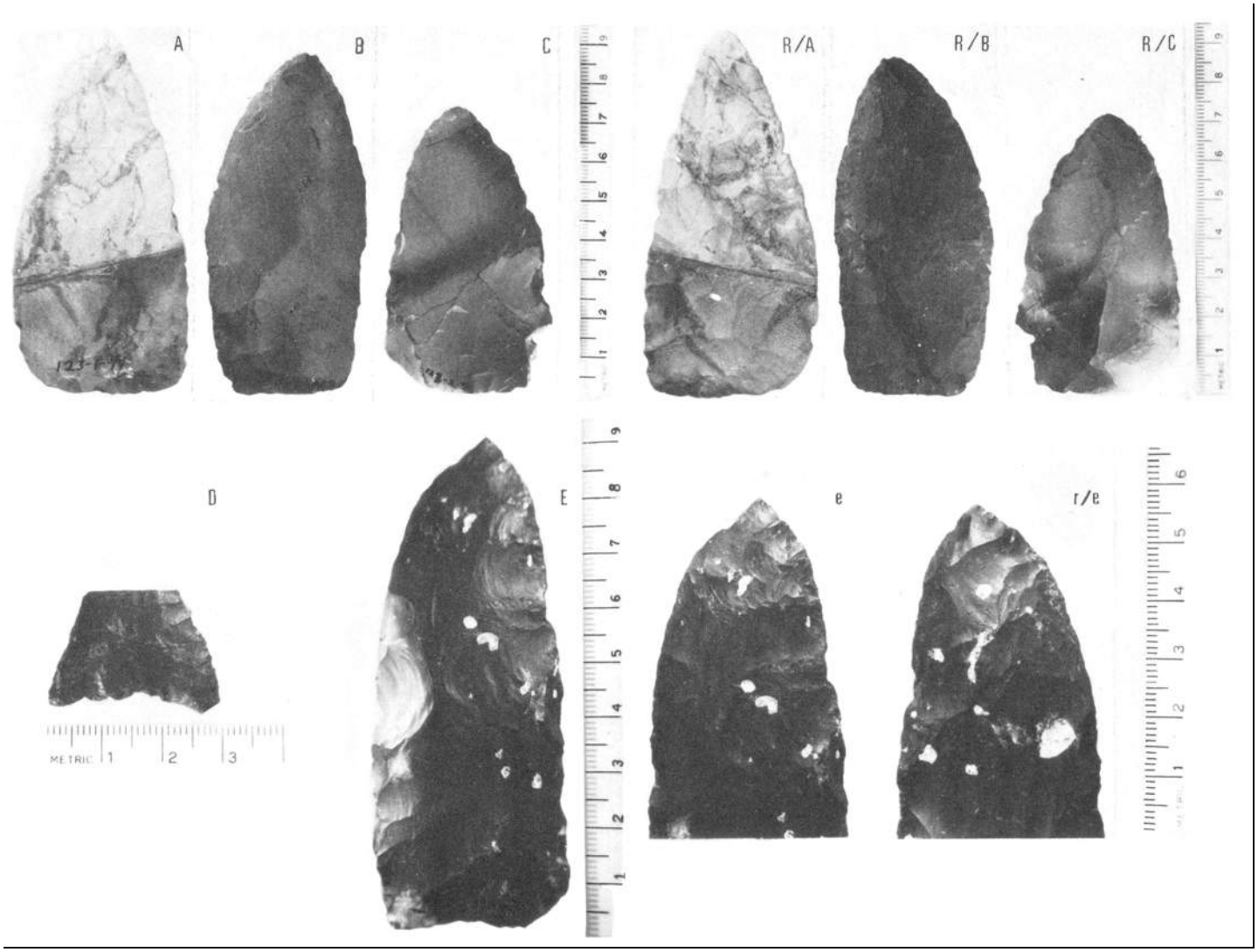

Plate III. Cache Blades and Levanna Point (D) Capital Letter = complete blade; small letter = close-up of part of blade; R(r) = reverse.

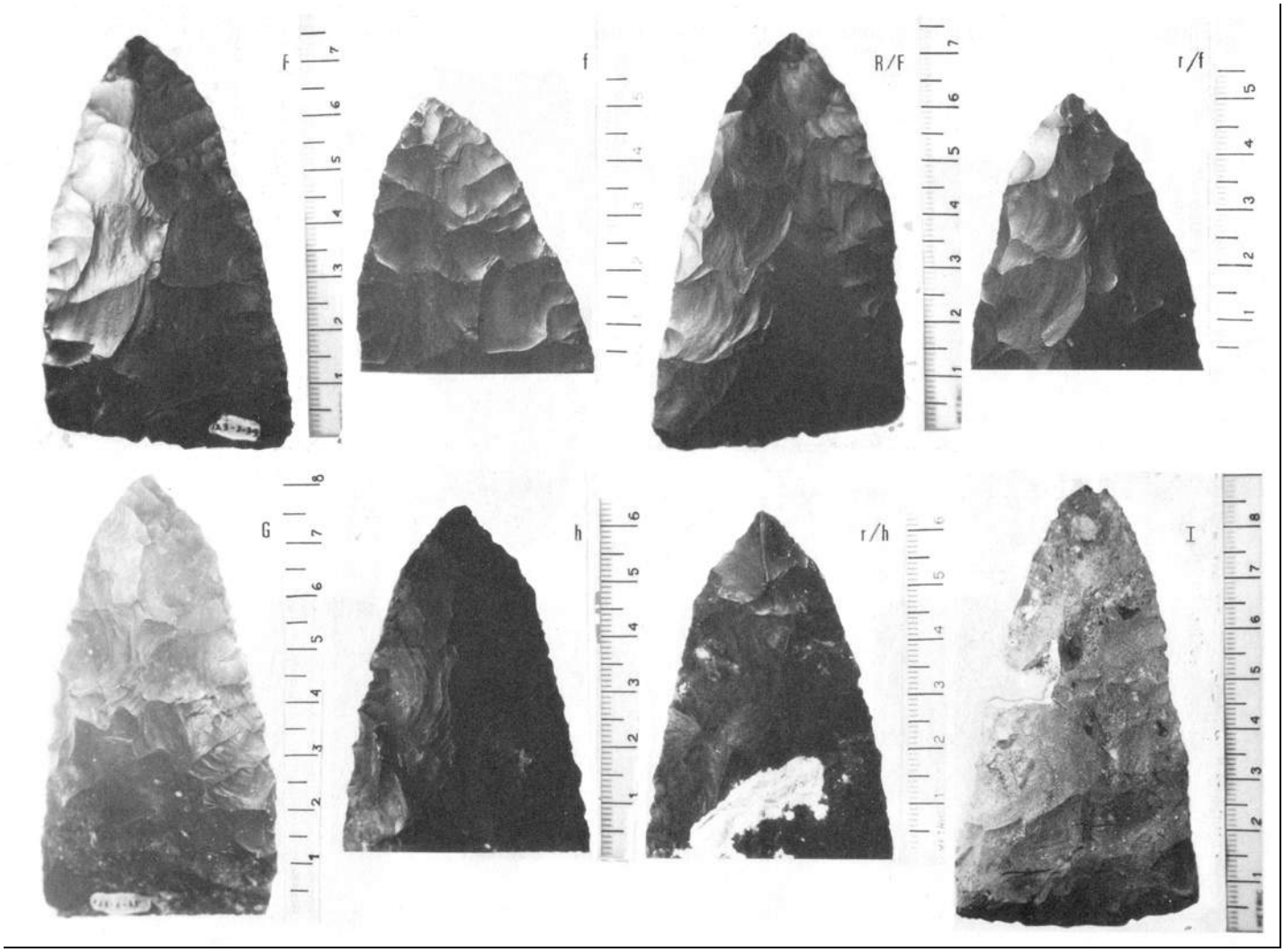

Plate IV. Cache Blades Capital letter = complete blade; small letter = close-up of part of blade; R(r) = reverse.

The blades are made of yellow and brown jasper, although this is not immediately apparent. The surface color varies from a chalky light blue to pale blue to a dark blue black. Some blades are predominantly light, others predominantly dark, and some are intermixed. A few of the blades have holes "eaten" into or through them from weathering (Plate IV: I). The matrix around the holes is often white in color. The surface color is due to chemical reaction with dissolved minerals and organic acids in the ground water (weathering) where the blades were buried. The darker surface colors probably indicate a first step in the alteration process. The white color represents a later weathering stage. The original rock was probably a limestone, which was replaced by jasper, but the stone was undoubtedly fresh, unweathered jasper when chipped by the Indians.

The interior color of the blades may be seen on specimens freshly broken during installation of the drainage pipe. When matched with the Munsell Soil Color Charts, the variations in color include yellowish brown, dark yellowish brown, olive brown, light olive brown, and dark brown. Some of the blades have more than one shade. Unlike the surface colors, the interior color variations are probably due to differences in iron oxide content, rather than changes brought about by later weathering.

A sample of the blades was sent to Dr. William A. Ritchie, then New York State Archaeologist. Ritchie suggested that the jasper may have come from quarries in eastern Pennsylvania. He indicated that the Massapequa blades do not appear to resemble the Pennsylvania jasper, but this might be due to the weathering. However, inclusions of pure chalcedony or clusters of quartz crystals are diagnostic of the Pennsylvania quarries, and some of the Massapequa blades have such inclusions. In addition, the jasper found in the blades does not resemble the jasper from New York and New England quarries (Ritchie 1969a). Without highly sophisticated analyses (e.g. neutron activation analysis of the blades as well as samples from quarries and outcroppings) accurate determination of the source of the jasper is not possible.

Discussion

The artifacts found at Massapequa Lake are called blades since this term does not imply any function. It is suspected that they are unfinished artifacts of a particularly desirable stone which were brought into the area for trading purposes. Jasper is far superior for working to the abundant local quartz because it is finer grained and can be chipped in a more homogeneous and controllable manner. However, jasper was not commonly utilized in manufacture of Long Island projectile points. In a study of 1,949 Woodland points from Long Island, only 59 (3%) were made of jasper (Rutsch 1970:9). The blades are believed to have been fashioned into their present form in order to facilitate transportation and increase their trade value over unmodified chunks of quarried stone. There are no projectile point types from the coastal New York area with the same form as the Massapequa blades, which were presumably meant to be reworked into knives or projectile points. The blades may have been used in their present form although there is no evidence of use.

The reworking of blades into points, knives, and drills is described by Dincauze (1968:73) for the Mansion Inn blades of the Watertown variety in Massachusetts. Mansion Inn Blades were also used as haftless knives and scrapers without other modification. These blades were fashioned by bifacial thinning of a flake. Discontinuous, bifacial, minimal retouch was employed to regularize the outline but not to alter the blade shape (Dincauze 1968:17). Unlike the Massapequa blades, the Mansion Inn blades have had their corners removed to produce a contracting stem (Dincauze 1968: Plate XVI, 2-6).

Another possibility is that the Massapequa blades were used for ceremonial purposes. The cache itself might have had ceremonial meaning, or it might have been a depository of objects for subsequent ceremonial use. Items which might indicate ceremonial activity would include the use of the blades as mortuary items, their association with known ceremonial objects, or their physical arrangement in a suggestive manner. However, no indications of ceremonial activities were found at the site. It is interesting to note that the Mansion Inn blades were also used as mortuary items (Dincauze 1968:17).

Cultural Affiliation

The absence of any specifically diagnostic culture-historical material in definite association with the blades makes it impossible to determine with certainty the age or cultural affiliation of the people who made or received them. Blades which are generally similar have been attributed to various cultures. An attempt was made to obtain some idea of the cultural affiliation of the Massapequa cache. The literature was examined for illustrated articles depicting blades similar to the ones found at Massapequa. In addition, a number of actual cache blades were examined. Those blades which were similar in shape were further examined for similarities in size and chipping pattern. Unfortunately, unless specifically mentioned, the thickness of the blades in the photographs is indeterminable.

Caches of chipped stone blades are known from three cultural entities associated with the Northeast: the Meadowood phase, and the Adena and Hopewell cultural traditions. Comparisons with caches of unknown cultural affiliation are not considered in this paper.

A comparison of the Massapequa blades with the Meadowood blades illustrated and described by Ritchie (1969b:183, 184) shows a similarity in outline. However, this resemblance is superficial as blades of the Meadowood phase are actually smaller, thinner, more finely chipped and more uniform in configuration than are the ones found at Massapequa Lake. A Meadowood association was therefore discounted.

Hopewell influence in New York is essentially limited to the Squawkie Hill phase and other Hopewell-related manifestations in the western part of the state. Two Squawkie Hill components have been radiocarbon dated: Lewiston at A.D. 160 ± 80 and Kipp Island #2 at A.D. 310 ± 100 (Ritchie 1969b:217, 218). Some blades from the Squawkie Hill site and the Geneseo mound (Ritchie 1944:211, 226), and especially from the Cain mound (Ritchie 1969b:221) are similar in size and outline to specimens from Massapequa Lake. However, these sites are geographically remote from Long Island; in addition, they postdate the Massapequa blade cache by several hundred years (see Environmental Reconstruction section).

In New York State, Adena is represented by the Middlesex phase. Ritchie considers Middlesex to be the result of contact between indigenous peoples and Adena groups entering the New York State and New England area from the south (Ritchie 1969b:201, 202). 14 radiocarbon dates (ranging between B. C. 610 ± 120 and A.D. 325 ± 400) indicating the period of northward Adena migration have been obtained from five locations in West Virginia, Maryland, Delaware, and New Jersey. At least half the dates are prior to B.C. 70 + 150 inclusive (Ritchie 1969b:204205). However, Fitting and Brose (1971:31-32) point out that the fact that artifacts made from materials similar to materials from Ohio, as well as artifacts made of Ohio material, are found on Middlesex sites could merely represent trade goods (artifact diffusion) or the return of New Yorkers who visited Ohio. In addition, Thomas (1971:57) notes that a trade network in the eastern United States could be responsible for the distribution of artifacts from the Ohio Valley in the Middle Atlantic area.

Leaf-shaped blades are numerous in the Adena culture, and blade caches are not unusual (Solecki 1953:350). Among the items which Ritchie lists as the most prevalent in Middlesex sites and which are also distinctive of the Adena culture, are ovoid and triangular cache blades (Ritchie 1969b:202). Middlesex caches themselves, however, are apparently uncommon. A single cache of leaf-shaped blades is noted for only 1 of the 19 sites in Table 3 (Diagnostic Adena Traits in the Middlesex Complex) of *The Eastern Dispersal of Adena,* although these blades have been found on 10 of the sites listed (Ritchie and Dragoo 1960:72). The same situation (i.e., the caches are not as frequently found as the leaf-shaped blades) seems to hold true for the Adena from the upper Ohio valley (Ritchie and Dragoo 1960:71). Characteristic Middlesex traits, such as the blocked-end tubular pipe, are unknown from Long Island, and Ritchie does not know of any Middlesex manifestations from the Long Island region (Ritchie 1969a). Cache blades from the Middlesex phase (Vine Valley Site, Yates County, New York) shown in Plate 72 of Ritchie's *The Archaeology of New York State* (revised edition) are similar to the lanceolate blades found at Massapequa Lake. These Middlesex blades which measure approximately 2-3/4, 3-1/4, and 3-3/4 inches in length have an irregular pattern of chipping.

Blades found at the Adena mound excavated near Natrium, West Virginia are also similar to the Massapequa blades (Solecki 1953: Plates 24, i and 28, a-o, especially k-o. These blades, found in various places throughout the mound, vary in length from 68 to 220 mm. (2-11/16 - 8-5/8 in.), with the average between 90 or 100 mm. (3-9/16 - 3-15/16 in.). The widths vary from 25 to 50 mm. (1 to 2 in.) with an average near 40 mm. (1-9/16 in.) The thickness varies from 6 to 14 mm. (7/16 to 9/16 in.) with an average of around 10 mm. (3/8 in.). The blades at Natrium thus tend to be generally longer, narrower, and about the same thickness as the Massapequa blades. However, there is overlapping of blade sizes from the two sites. Solecki distinguishes four types of blade bases: 1. round or ovate (leaf-shape or ovate); 2. flat (triangular); 3. flat-based with straight-sided stems; 4, round or ovate based stems. Solecki has concluded that Adena was the only culture represented at the mound (Solecki 1953:350, 367).

Ritchie has indicated that the true Adena cache blade is not really like the Massapequa blades. However, complexes influenced by Adena (probably Middlesex in the case of the Massapequa blades) do have similar blades (Ritchie 1969a).

Caution is called for in making comparisons with other so-called Adena components. The fact that known Adena artifacts are found on a site does not necessarily mean the site should be categorized as Adena. For example, although ceremonial assemblages in the St. Lawrence drain age have blocked-end tubes, broad knives, "Robbins" stemmed and leaf-shaped blades, slate pendants, rolled copper beads, and burial mounds, the sites are best interpreted (according to Fitting and Brose) as belonging to the burial complex of the Lake Forest Middle Woodland, specifically, Point Peninsula occupation (Fitting and Brose 1971:32).

Further, confusion occurs because the terms leaf-shaped and lanceolate do not appear to have been applied consistently to the same blade form by at least one author. For example, in *Mounds for the Dead,* the leaf-shaped blades depicted do not always resemble each other, and in at least one instance a leaf-shaped specimen resembles a lanceoloate blade (Dragoo 1963:120, 236-237, 262-263, 284-285). The terms leaf-shaped and lanceolate used here are the terms used by Dragoo to describe the blades pictured. Another problem is that there is a scarcity of published illustrations of blades from known Middlesex sites which could be used for comparative purposes.

It is concluded that the Massapequa Lake blade cache had its origins in an Adena-influenced manifestation, probably the Middlesex culture. As there were no other artifacts found in definite association with the Massapequa cache, this conclusion is based on the radiocarbon date, and the known association of similar cache blades with Adena (Middlesex) manifestations. The Levanna point fragment was not found in *situ* and cannot be definitely associated with the cache. It is interpreted as an incidental inclusion in the earth used to dam the creek in the 19th century. In addition, blade caches are not a late Woodland trait.

The idea of an "Adena-influenced Middlesex manifestation" may not be the only way of looking at the overall archaeological framework into which the Massapequa blades can be incorporated. Fitting and Brose have suggested that another interpretation would be obtained if Adena, Middlesex, Glacial Kame, Red Ocher, Old Copper, etc. were examined as a single unit with a continuous distribution of any one trait, rather than as separate entities. Geographical areas of high density of a particular artifact, or areas showing a clustering of different artifacts would then be examined (Fitting and Brose 1971:48, 49).

The Massapequa Lake blade cache is not unique on Long Island. Caches of blades were found at Rockville Centre, Peconic (Saville 1926:42-45; collection at the Museum of the American Museum, Heye Foundation); Baldwin (private collection), Mattituck; and 2 from Southhold (Booth 1949:20). An asymmetrically shaped projectile point from the Peconic cache (Saville 1926:44, 45; in the collection at the Museum of the American Indian, Heye Foundation) exhibits similarities to the point types Brewerton Corner Notched (Archaic stage) and Perkiomen Broad (Transitional stage). Two copper celts were found in association with the cache from Rockville Centre (Saville 1926:42; in the collection at the Museum of the American Indian, Heye Foundation). Thus far, except for a few blades from the Baldwin and Peconic caches, the caches observed first hand have not yielded any specimens similar to those from Massapequa Lake. Nor have any of the other caches been identified as to their culture-historical affiliation.

Environmental Reconstruction

The location of the blade cache immediately below 1.5 ft. of moist fresh water peat made it possible to establish a minimum date of burial for the cache. For this it was assumed that the blades were buried prior to the beginning of peat deposition. This condition can be considered virtually certain since it is extremely unlikely that a burial site would have been selected in a shallow water pond containing organic sediments. Also, the peat above the blade cache shows no evidence of disturbance, exhibiting the same horizontal stratification as the rest of the exposed deposit. Therefore, by obtaining a C-14 date for the bottom of the peat, it can be safely concluded that the blades and their time of burial predate the oldest peat.

A sample of the bottom 1 in. of the peat layer in the vicinity of the blade cache was sent to Geochron Laboratories for dating. The age was computed at 2325 ± 110 years (GX-2113) based upon the Libby half life of 5570 years. Correcting for a 5730 year half-life and dendrochronological cross-dates (Ralph, Michael, and Han 1973) a final date of B.C. 435 is arrived at for the bottom of the peat.

In addition to dating the peat, pollen and spores were extracted from the bottom 1 in. (Sample A) (Fig. 2) to provide additional information on the local environment when the peat began to accumulate. Also, a sample of the top inch (Sample B) was processed to determine what environmental changes may have taken place during the interval of peat deposition. Table I shows the pollen and spore counts and relative percentages of AP (arboreal pollen) and NAP (non-arboreal pollen) in samples A and B.

The evidence suggests that the blades were buried at an "easy to relocate" site near the intersection of a prominent southerly flowing stream (Massapequa Creek) and what may have been a major east-west trail, essentially where Merrick Road is today. In 1690 an east-west Indian foot path did exist in the vicinity (p. 60, Book "B", Oyster Bay Town Records, in Cox 1916:357-359), but it should be noted that the presence of the 17th century Indian trail is, at best, only suggestive of a much earlier trail. However, the location of the trail immediately north of the widening south shore estuaries (creeks) represents a likely route for a southernmost east-west trail across Long Island.

The fresh water peat layer immediately over the cache gives evidence of a modification of the burial site by flooding. Once the site was drowned and the landmarks altered, recovery of the blades would have been extremely difficult. The commencement of peat deposition coincides closely with the end of the warm, dry Subboreal climatic stage (C2 pollen zone) and the beginning of the moist, cooler climate of the Subatlantic stage (C3 pollen zone) (Sirkin 1968:238). The increased precipitation at the onset of the Subatlantic would have resulted in increased surface runoff in streams such as Massapequa Creek. At many locations along the stream courses, especially in the broad flat valleys near the mouths, this additional flow would have caused water to spill over the pre-existing banks. Where this overflow became impounded a fresh water marsh or swamp would have been created with deposition of organic rich sediments.

The overflow and flooding of the cache area probably occurred rapidly (i.e., during a particularly heavy rainy season), leading to a sudden coverage of the site. However, this local alteration of the stream channel and banks, coupled with the more gradual climatic trend toward moister conditions, probably marked the onset of bcal fresh water organic deposition. The thickness of the present peat and the comparison of the pollen and spore assemblages in Sample A and Sample B show that once established the flooded condition persisted for some time. In fact, the decrease in *Sphagnum*, *Osmunda*, and *Polypodicaeae*, and appearance of *Typha* and *Cyperaceae* from "A" to "B" suggest an increase in the depth of water with more pools of standing water. Also, the increase in *Compositae* percentage and the appearance of *Chenapodiareae* and *Gramineae* could indicate that some local ecological disturbance such as a fire or land clearing may have affected this area during the period of peat deposition.

Acknowledgements

The writers wish to express their appreciation to the following people: laborers and equipment operators from the Nassau County Department of Public Works (South Shore Construction

TABLE Ia
Massapequa Lake
Fresh Water Peat - Sample "A"
(C^{14} date = 2325 ± 110 years B.P.)

AP (Arboreal Pollen)	#	%	NAP (Non-arboreal pollen & spores)	#	%
Alnus (Alder)	261	35.56	*Sphagnum* (Peat Moss)	166	30.13
Betula (Birch)	108	14.73	*Osmunda* (Cinnamon Fern)	163	29.55
Ilex (Holly)	77	9.55	*Polypodiaceae* (Fern)	60	10.80
Pinus (Pine)	62	8.46	*Ericaceae* (Heath)	33	5.98
Quercus (Oak)	61	8.33	*Compositae*	20	3.62
Corylus (Hazel)	32	4.36	*Lycopodiaceae* (Club Moss)	10	1.81
Carya (Hickory)	16	2.18		452	81.90
Tsuga (Hemlock)	12	1.64	NAP (Uniden.)	100	18.10
Castanea (Chestnut)	1	.14		552	100.00
Nyssa (Black Gum)	1	.14			
Fraxinus (Ash)	1	.14			
Liquibardum (Sweet Gum)	1	.14			
	633	86.40			
AP (Uniden.)	100	13.63			
	733	100.03			

TABLE Ib
Massapequa Lake
Fresh Water Peat - Sample "B"

AP (Arboreal pollen)	#	%	NAP (Non-arboreal pollen & spores)	#	%
Pinus (Pine)	43	18.30	*Sphagnum* (Peat Moss)	35	11.62
Alnus (Alder)	41	17.43	*Graminaceae* (Grass)	33	10.96
Quercus (Oak)	33	14.05	*Osmunda* (Cinnamon Fern)	28	9.32
Betula (Birch)	21	8.94	*Cyperaceae* (Sedge)	25	8.33
Carya (Hickory)	16	6.81	*Compositae*	23	7.65
Nyssa (Black Gum)	14	5.95	*Polypodiaceae* (Fern)	13	4.33
Corylus (Hazel)	12	5.11	*Umbelliferae*	13	4.33
Tsuga (Hemlock)	6	2.55	*Ericaceae* (Heath)	12	4.00
Ilex (Holly)	4	1.70	*Chenopodiaceae* (Goosefoot)	11	3.66
Acer (Maple)	3	1.28	*Lycopodiaceae* (Club Moss)	5	1.66
Fraxinus (Ash)	3	1.28	*Typha* (Cattail)	3	1.00
Ulmus (Elm)	1	.42		201	66.66
Ostrya (HopHornbeam)	1	.42	NAP (Uniden.)	100	33.33
Tilia (Linden)	1	.42		301	99.99
Castanea (Chestnut)	1	.42			
Picea (Spruce)	1	.42			
	201	85.50			
AP (Uniden.)	34	14.50			
	235	100.00			

Crew) who originally reported the find, donated to the Museum the blades they found, and helped in the archaeological excavation; officials of the Nassau County Department of Public Works (especially Joseph King) whose enthusiasm for the project made it possible; Dr. William A. Ritchie, for his help in interpretations; Museum of the American Indian (Heye Foundation), for permission to examine materials in the collections; Walter Saxon, for preparation and analy-

sis of pollen from the peat samples; Martin Garille, for his help in the botanical reconstruction based on the pollen evidence; Kathryn R. Sowinski, for the plates and figures, Ronald J. Wyatt, for advice and help during the excavation and in the writing of the report (last four, Nassau County Museum); and to all who may have been inadvertently left off this list.

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MARIAN, AN APPRECIATION

This is not a formal necrology for Marian E. White whose recent death, after a long fight against cancer, left us all with the feeling that fate is less than just in its meting out of rewards and deserts. I could not write such a piece because I know almost nothing about Marian's personal life, where and when she was born, who were the members of her family, what schools she attended, even what the E in her name stands for. And when, as editor of *The Bulletin,* I cast about for someone who could supply biographical detail, so that she could take her proper place in the dictionary of the distinguished, I found the same lack of personal knowledge. This note should still be written and I put it on the conscience of whoever has the information to write it, for publication in *The Bulletin.*

I know that Marian took her doctorate at the University of Michigan under Dr. James B. Griffin and that she joined, soon afterward, the faculty of the University of Buffalo, before it became, as I remember, SUNY Buffalo. From my post of observation, her teaching and research duties at Buffalo became her life, and she lived in dedication and satisfaction for herself, and fruitfully for us. For no one, in the 60 year history of the New York State Archeological Association, ever contributed more to its health and welfare. About that I am in position to know.

My membership in NYSAA goes back to 1954, my first attendance at the state conference to 1955, my first conference paper to 1956. Though my recollection runs that Marian, then a graduate student, had been present at the 1955 conference I did not become aware of her keen concern for NYSAA until the 1956 meeting in Rochester. She was, as I recall, program chairman for that meeting, and she set up a session on the sensitive issue of professional-amateur relations. During the discussion there was introduced from the floor the concept that has since become the Awards and Fellowship program. Whether she had planted the idea, or took advantage of a stray suggestion that said something that was on her mind I cannot be sure. But she sponsored the idea strongly and Dr. William A. Ritchie, then NYSAA president, was persuaded to set up a committee, with Marian as chairman, to work on the standards for fellowships, awards and other categories of recognition. As I, who was a member of the committee, well know, she went at the job forthwith and with drive. The committee had been appointed in July. For the November *Bulletin* of that year, 1957, Marian had ready the basic outline and standards by which Awards and Fellowships has operated ever since. The first awards and fellowships were announced the following April, 1958. That was the way she worked.

Having got this program firmly established, she turned the chairmanship over to me and shifted her attention to another problem. Those whose experience runs back that far will remember the annual conferences of the 50's as impersonal, rather grim and colorless affairs, with little commingling among the scant few who attended. They attracted no more than 50 attendees out of a total NYSAA membership of less than 250. New York had the lowest ratio of archaeological membership to total population of any state in the Union at that time. It was clear that as an organization it was moribund and that one of the symptoms, (some say one of the causes) was the annual meeting. It was held in a pendulum pattern, one year in Albany and the next year in Rochester. The meetings in Rochester were endurable; those in Albany were deadly.

Marian set about to change this. She backed and promoted into office an administration, headed by Charles Wray, that undertook to break the grip of bad practice. In 1960 the first NYSAA meeting at any other location than Albany or Rochester was held at the historic Beekman Arms hotel in Rhinebeck, under the auspices of the then exuberant Mid-Hudson Chapter. It was a great meeting in every way, archaeologically and socially. Those who attended went home talking, and in 1962, at Glens Falls, for the first time in its history an NYSAA meeting attendance passed 100. There can be no doubt that the policy adopted in 1960 by which annual meetings are held each year at the home of a different chapter initiated our re-invigoration and expansion.

As it happened 1960 was the year that Charles Knoll, who had been editor of *The Bulletin* for five years and for 16 of the first 18 numbers handed in his resignation, since he was leaving the area. By this time Marian was chairman of the publications committee, a post she must have chosen for herself with a very clear objective in mind. Nothing can be more obvious now than that a state archaeological society justifies its existence only through its publication and continues healthy only by publishing. I was not at all well known in NYSAA circles at the time but Marian, and her committee colleague, Bill Cornwell, came to me to take over the editorship because they had found out that I was a writer and journalist and should therefore have some primary notions about editing.

I had never handled anything like *The Bulletin* before and I had my problems. One of these was a dearth of material. And if there was nothing to print why publish a periodical? But Marian had gauged it shrewdly. I was a writer, all that empty space was tempting so I wrote-about half of those early 60's issues, with three quarters of the rest of the space going into routine chapter reports. Both as a writer and a journalist I resented having to devote publication space to this latter use, and Marian supported me when I asked for permission to drop the chapter reports as too routine for such expensive exposure. The move meant more writing by me to fill all that space but somehow *The Bulletin* was now raising itself by its own bootstraps. The membership actually began to be interested in it and contributions begun arriving in the mail. With her quick perception of opportunity Marian now made her next move; she sponsored a resolution to elevate *The Bulletin* to the status that had been held by *Researches and Transactions,* that of the principal publication concern of NYSAA. Pragmatically this meant more money, and more pages. With more space available, suddenly longer, more meritorious and more "professional" contributions began to show up. *The Bulletin's* reputation, which had been about that of the Toonerville Times, began to glow faintly and then to bloom; which helped to encourage more and more submissions. About 1964 it became a genuine archaeological journal.

But Marian had not finished. Our format and printing arrangements were pretty shabby, for a genuine archaeological journal. She undertook to improve them. I was dubious because I could see us trading the space, an editor's most precious asset, that we had won for archaeological literature, for mere appearance. By now she was president of NYSAA, and Charles Hayes was publications chairman. Between them they came up with our present printer, Braun-Brumfield who has given us eminently satisfactory service ever since, that is, since July, 1966.

My point now makes itself. The two functions by which and for which NYSAA now exists, the annual meeting and the publication program, principally *The Bulletin,* are the creations, in their current successful dynamic, of Marian's sense of problem and of means and end. She had the green thumb. Whatever she touched flourished.

Nor were these the last of her creations. In the middle 1960's she became involved in salvage, synonymous with contract, archaeology. She found it malfunctioning at every level by reason of carelessness, timidity and bureaucratic arrogance. Since she had none of these in her constitution she was annoyed, and her annoyance, her sense of problem, always meant action, not bluster. She knew that what was needed to deal with the deliberate sleaziness of official attitudes and the equivocation of politicians was a position of strength. She created it, the New York Archaeological Council, out of the scattering few of those who were, by profession, in this state, committed to archaeology. She did not create it by any snap of the fingers. Characteristically she planted the seed and nourished it into corporate flower. At her passing it was, and is, a force to be dealt with, an institution with a paid director, and a large, for archaeology, budget,

and it is now on the attack, in court, on the arbitrariness of government and the obtuseness of officialdom. No matter how well NYAC survives Marian's passing, it will never be what it would have been had she lived. To few are given her kind of intuition, her special touch.

She knew how to use power. From her first NYSAA post as program chairman of an annual meeting, to her final one as president of NYAC, she held office to accomplish something, a something that was always clear in her mind. As soon as she had accomplished that something she relinquished the office. She had no sense of self-importance and we trusted her because she had none. Those who didn't know her history were suspicious, when NYAC was founded, that it was intended to draw a line between the amateurs of NYSAA and the professionals of NYAC. How absurd. How could she have wanted to reject that which she had labored like a mother to bring up hale and hearty. As long as she was the moving force in NYAC there was never any danger that a schism would be allowed to develop between it and NYSAA. And she has left that legacy to NYAC.

That we who knew her longest knew her least, biographically, could mean that she was, to use the current cant phrase, a very private person. I doubt that easy interpretation. The real Marian, the entire Marian, the Marian she thought of herself as being, was the Marian we knew. She had her students, and she had her work, the problems her lucid mind was continuously perceiving. What she did was what she was, a very valuable human being.

Her passing came as no shock. It came at the end of a deepening dismay that the miracle she so richly deserved was not going to be vouchsafed. Her twin monuments are NYSAA and NYAC; her epitaph: to know her was to believe in her.

L.A.B.

THE HAMBURG SITE (Ctl 29)

Paul L. Weinman, NYSAAF — Auringer-Seelye
Thomas P. Weinman, NYSAAF — Auringer-Seelye and Morgan

In the Fall of 1973 we discovered a small Late Woodland campsite 20 yds. south of the Corlear Kill creek, approximately 1 mi. north of the Rip Van Winkle bridge and .3 mi. north of Hamburg, Greene Co., N.Y. The site lies in a small, flat circular area 12 ft. west of and 4 ft. above the Hudson River high tide mark. Its eastern periphery was 6 ft. from the shore's edge. To the north of the creek and directly adjacent to the site on the west was a high, steep incline of Upper Normanskill shale. A narrow strip of flat land, generally 8 to 12 ft. above the high tide level, leads to Hamburg and is again backed by the shale plateau.

Local residents remarked that the heavy wave action caused by the passage of large tankers has eroded up to 15 ft. of shoreline. However, possibly because the site is in a small cove of the creek, little of its river frontage was said to have been destroyed. Immediately to the south, a large area of higher land had been reportedly washed away, diminishing the cove area. Numerous stemmed projectile points were said to have been picked up from the beach where this bank had been. We did discover two small, stemmed points on the southern periphery of the area. These may have been associated with the possible component of the Sylvan Lake complex on the immediately adjacent beach.

The Hanburg Site was very small in size, oval in shape, and contained within only 15 excavated five-foot squares. Testing in immediate areas beyond revealed scanty to negative aboriginal debris.

The Stratum I overburden resting on the prehistoric level was a clayey brown sand, 8 in. thick at the western edge and 13 in. thick at the riverside. Although the modern land was relatively even before excavation, vertical profiles of Stratum II showed a slight eastward-dipping incline. Recent downward movement of soil must have leveled the surface. The occurrence of

several cut nails and kaolin pipe fragments with the aboriginally occupied zone might be accounted for by this disturbance. Stratum II was easily identified by its dark brown to black color. At the western, north western, and north eastern areas it was from 1 to 4 in. thick, whereas toward the River, it thickened to as much as 11 in. However, at its thickest (and darkest) edge, the zone abruptly narrowed upward to show the brown, clayey sand that lay beneath the entire site. Where tested, this Stratum III was sterile of artifacts to 3 ft. beneath the surface.

Stratum I produced no prehistoric objects other than several flint chips near the junction with the next level. Some Eighteenth, Nineteenth, and Twentieth Century objects such as glass, bottle caps, nails, and crockery were present.

Historical objects found in Stratum II were a Rose-head nail, four cut nails, four kaolin pipe bowls (one marked with TD - Thomas Dexter). Two unidentifiable historical objects are a hemisphere of oxidized pyrite with a 16 mm circumference and 9 mm thickness, and a thin rectangular brass piece 6 mm in width and 14 mm in length. One end of the brass item is folded over by 3 mm. Whether or not these were of Indian use is not possible to determine.

The stone artifacts include:

a. 3 Levanna points (one well-worn by water-probably picked from the River's shore), and a triangular point blank
b. 1 Wading River point
c. 1 small, untyped stemmed point with down-pointing shoulders
d. a typical, finely-made Iroquoian ovate knife
e. 3 point fragments
f. f. 3 point-like blanks
g. g. 8 knife or blade fragments
h. 2 endscrapers and an end-side scraper
i. 1 unique tool, 76 mm long, with a triangular tip and parallel 22 mm wide sides flaring at the base to a width of 47 mm. The base is 18 mm thick, while the tip section was thinned to 4-5 mm. Both sides (20 mm long) of the tip are worn. We suspect that the base was held in the hand while the tip edges were used to open clam shells.

Most of the chipped stone artifacts were made from local Normanskill flint; a few appear to be of local Eastern Onondaga flint. One knife was fashioned from Pennsylvania jasper. Except for 6 quartzite netsinkers and two quartzite hammerstones, the following are made from Normanskill grit:

a. 1 broken (rectangular in cross-section) muller which was carefully chipped into form and was much worn on one side. This was 145 mm long, 70 mm wide, and 35 mm thick
b. 2 mauls, each encircled by a pecked groove with both ends showing batter scars
c. c. 26 netsinkers (including the 6 of quartzite). These ranged from 57 mm to 80 mm long and from roughly notched grit fragments to symmetrical, well-notched, water-worn pebbles
d. 2 netsinker-like pieces (discoidal and rectangular) which were bilaterally chipped to thin the entire circumference
e. 1 bilaterally chipped disc, such as are found on some Chance Horizon sites, but of unknown use.

Bone tools include 2 awls-one of deer bone, one of turkey bone. A third tool is of deer bone ground on two sides of the point to form a 5.5 mm wide sharp end. This may have been used to open clams.

The marked ceramic remains from Statum II appear to represent twelve separate pots:

a. 9 pieces of an untyped pot with 4 horizontal incisions beneath a row of short, oblique nicks along a flat rim with short oblique interior nicks. Beneath the four horizontal lines is a row of short, nearly horizontal incised lines underlined by 3 more rows of encircling incised lines. The lowest row is slightly broken by deep vertical punctations around the base of the applied collar. Not noted on other Late Woodland Hudson River sites, this is also dissimilar to Iroquois types and may be a purely Hudson Valley Algonkian type.

b. 1 untyped collared rim section in 5 pieces which show a flattened lip, plain on the interior, with short vertical nicks on the exterior above 3 horizontal incised lines. These in turn are directly above triangular incised lined plats. The base of the collar is missing. One moderate castellation is apparent.

c. 1 small, flat-lipped rim piece with external oblique nicks just below the lip, above 4 horizontal incised lines

d. 1 small, flat-lipped rim fragment, decorated on the exterior with 3 horizontal incised lines beneath oblique, external nicks along the edge of the lip. An open section of an incised, triangular plat underlies the horizontal lines.

e. 2 pieces of a rim with a slightly protruding flattened (on top and outside) lip bearing tiny internal nicks and external vertically linear indentations. Below the lip is a line of vertical indentations at a small oblique angle.

f. 3 collar base sections with crude, slightly curved vertical incised lines abutted by oblique vertical lines. Deep notches are stamped at the collar base angle.

g. 2 Cayadutta Incised (?) collar base fragments. These show a strongly everted collar with notches below triangular plats of incised lines.

h. 2 basal fragments of a Cayadutta Incised collar with triangular motifs of incised lines. The rim is missing.

i. 2 Deowongo Incised collar base fragments. These show a strongly everted collar with light basal indentations beneath triangular plats of incised lines. The rim is lost.

j. Deowongo Incised rim sherd with long, thin basal notches under incised triangular motifs, under two parallel horizontal incised lines. The flattened rim is vertically nicked. A portion of a slight castellation is apparent.

k. 1 small flattened rim castellation with 5 parallel incised horizontal lines.

The other rim sherds exhibit: 1. notches on a collar base, 2. incised lines, 3. interior nicks on a split, flattened rim. 7 shoulder fragments show parallel punctations. One sherd has 2 parallel, horizontal incisions above and below the punctations. The 146 body fragments were smoothed, well tempered with grit, and averaged 5 mm in thickness.

The only ceramic pipe (a stem fragment) was a well-made straight piece with a 5 mm hole diameter.

Food refuse remains include deer, turkey, and duck bones. Fresh water clam shells, sturgeon plates, and a dog or wolf canine complete the list, suggesting a Fall or Spring occupancy of the site. The paucity of charcoal granules and fire-cracked rocks attest to a brief period of stay. Although some temporal admixture of pottery fragments may exist, we believe the Hamburg site to have been visited for a short period at approximately 1450 AD to 1500 AD, or during the late Chance Horizon period (Ritchie, 1952, 1965).

The lack of any cord-marking and the complete predominance of incising on the pottery would place the Hanburg Site closer to Iroquoian times than nearby sites such as the Kingston (Ritchie, 1952), the second level of the Rip Van Winkle I site (Weinman and Weinman, 1971), and the Rip Van Winkle II site (Weinman and Weinman, ms), all of earlier Chance Horizon times. The presence of several Chance Incised sherds and the apparent lack of early Historic objects of European manufacture would put the Hamburg site somewhat earlier than the Contact period upper level at the Rip Van Windle I site.

Undoubtedly many historic and near historic River Indian (Algonkian) sites have been destroyed by cities, highways, dredging, industry, etc. However, there appears to be little evidence of large village sites along the middle and upper Hudson River comparable to Iroquoian and late pre-Iroquoian sites in the rest of the State. It is well-known that corn, beans, and squash were grown in great quantities by these inland groups. Perhaps because the vast food resources of the Hudson River lessened the River Indian's dependence on agriculture, this might have given less reason to have large working forces and large village communities. If true, this would most likely have led to differing ways of certain life patterns between the late Riverine Indians and the inland Iroquois. In addition, Dr. Robert E. Funk (State Archeologist), suggests by verbal communication that the lesser dependence on agriculture meant less competition for farm land, hence less need for defensive alliances, fusion, or strong political controls.

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ATTENTION

Following publication of his ROCK ART OF THE UPPER OHIO VALLEY, James L. Swauger, Carnegie Museum of Natural History, 4400 Forbes Avenue, Pittsburgh, Pennsylvania 15213, is expanding his study of American Indian petroglyphs and pictographs to include those occurring in all states east of the Mississippi. He would like to hear from others interested in these phenomena and will much appreciate any information sent to him.