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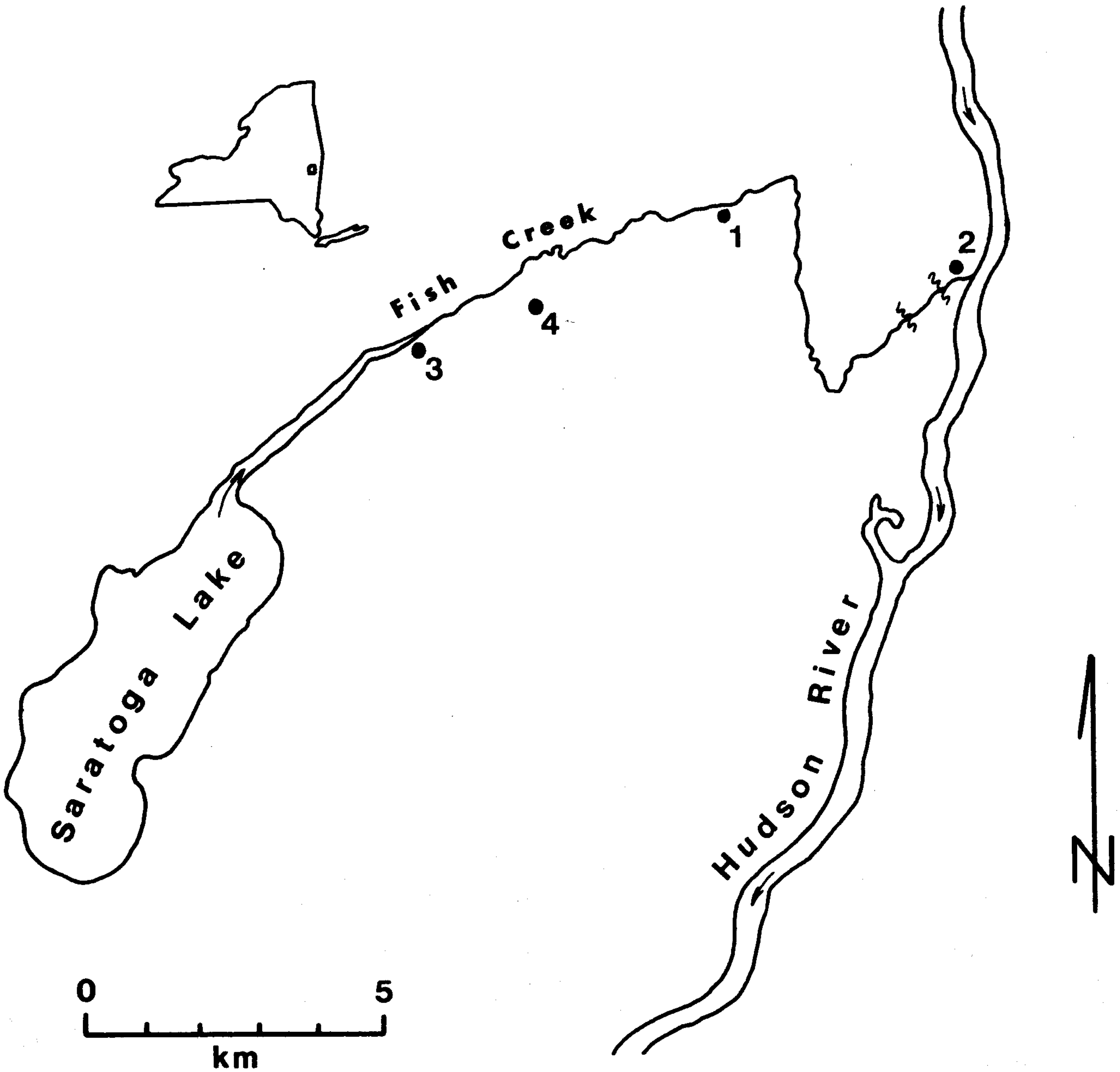

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WINNEY'S RIFT: A LATE WOODLAND VILLAGE SITE IN THE UPPER HUDSON RIVER VALLEY

Hetty Jo Brumbach State University of New York at Albany
Susan J. Bender Skidmore College

ABSTRACT

It is argued that Winney's Rift, a large multicomponent site in the upper Hudson Valley of New York, is not a Mohawk fishing camp as it has been described in the literature, but a village habitation of the Algonkian-speaking "Mahican". Archaeological data recovered from Winney's Rift and two adjacent sites suggest that the site is part of a local settlement system which became increasingly nucleated and seasonally extended at Winney's Rift during the course of the Middle to Late Woodland periods. Support for this interpretation also derives from seasonality studies of faunal remains and from trace element analysis of ceramic artifacts.

INTRODUCTION

During 1984 and 1985 students from Rensselaer Polytechnic Institute and Skidmore College carried out field investigations at the Winney's Rift Site under the direction of Drs. Hetty Jo Brumbach and Susan Bender. In the context of these investigations, both 1 X 2 meter squares and shovel test units, numerous artifactual data of all types as well as extensive ecofactual remains were recovered. Several major features were also unearthed, including hearths, fire pits, middens, and pits whose functions are not immediately discernible. Laboratory analyses of the resultant data are currently in process. Rather than discuss the particulars of these findings, it is our purpose here to share with you some of the major interpretive implications of the work to date.

Winney's Rift is a multi-component site located along Fish Creek, a small tributary of the Hudson River that debauches into the main drainage about 50 km north of Albany, New York (Figure 1). As the name suggests, Fish Creek is famous in local lore for its plentiful fish populations, although they have dwindled, both in numbers and diversity, in recent times due to dam construction and pollution. There is, however. ample historic and ethnohistoric evidence to suggest that at one time Fish Creek hosted large, year-round fish populations, as well as major late spring-early summer runs of anadromous species; shad, herring, and alewife being the most prominent (Brumbach 1978). As a result, prehistoric human populations are thought to have inhabited the Fish Creek area on a seasonal basis in order to take advantage of the major resource bulge represented by the spring runs of anadromous fish. Brumbach's (1978) analysis of a Middle Woodland site at Schuylerville, New York (Figure 1), certainly lends clear support for this seasonal occupation model.

Like the Schuylerville Site, Winney's Rift is located near rapids that would have momentarily impeded the upstream movement of the migrating fish; thus both sites are situated in ideal fishing locales. As a result, Winney's Rift has been consistently interpreted as a seasonal fishing camp, analogous to Schuylerville. Moreover, Ritchie and Funk, among others, have argued that, due to stylistic similarities in ceramic assemblages, the Late Woodland components at Winney's Rift are a result of the seasonal incursions of the otherwise more westerly dwelling Mohawk Iroquois. The fact that the Mohawk had no access to similar fish runs in their own drainage is taken as further support for this reconstruction (Ritchie and Funk 1973:307; Funk 1976:27-28). Finally, the ethnohistoric literature indicates that at least by the 1640s, the Mohawk were occupying seasonal fishing camps in the Fish Creek-upper Hudson River drainage (Jesuit Relations 29:49-51, 31:93, 39:61-67; Talbot 1935:270).

REINTERPRETATION OF WINNEY'S RIFT

The results of our field investigations are, however, beginning to call this interpretive model into question on two points. First, we believe that Winney's Rift is clearly part of a developing local settlement system generated by Algonkian-speaking populations, identified as "Mahican" in historic era accounts (Brasser 1974:2). Accumulating evidence suggests that Winney's Rift is best explained in the context of interactions with local Hudson River drainage-oriented sites, rather than as a seasonal outpost of a settlement system otherwise centered elsewhere. Second, while the model of a seasonal fishing occupation might account for the earlier components at Winney's Rift, it does not coincide well with data from the later time periods, excluding the post-contact deposits.

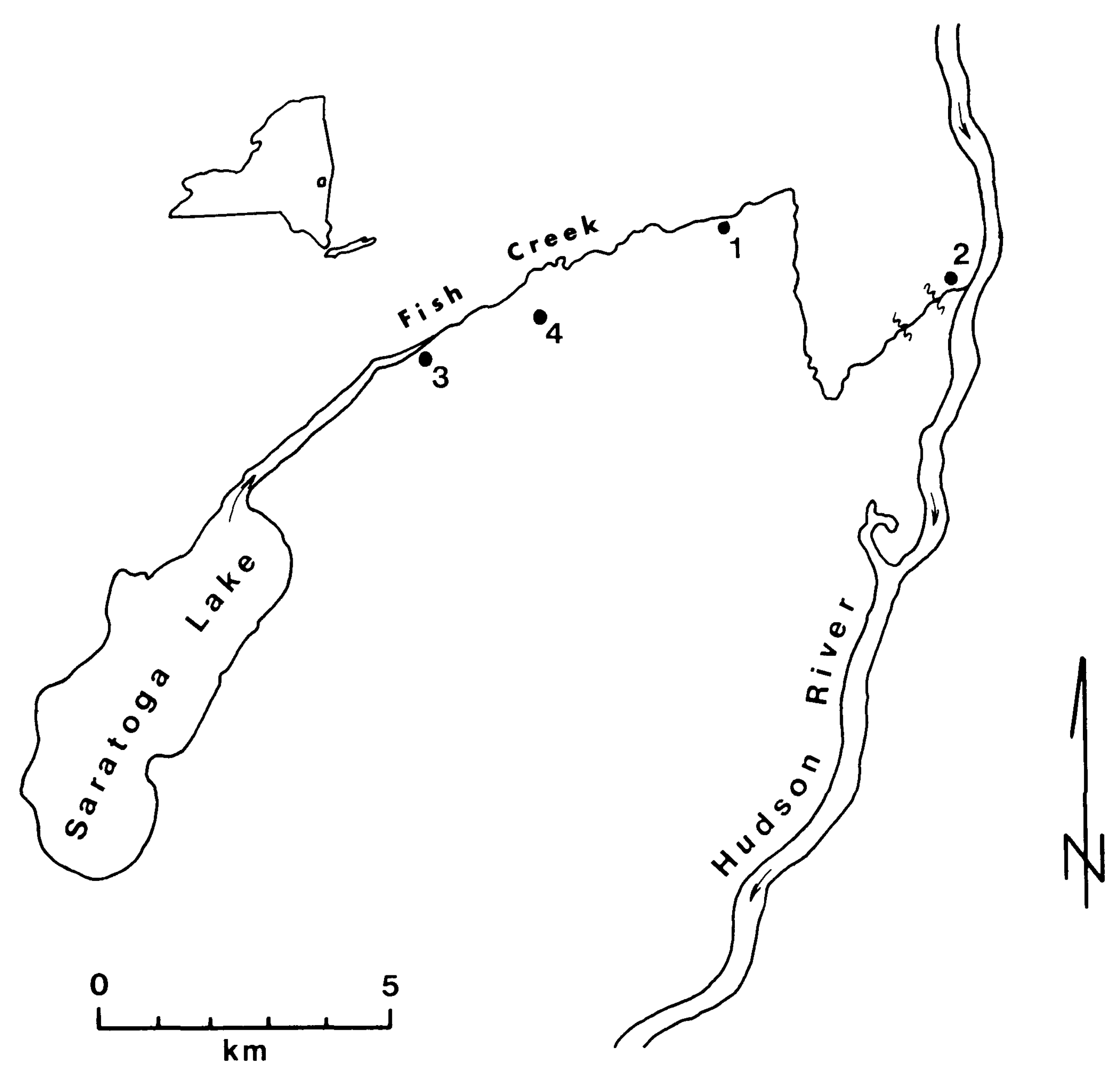

Figure 1. Location of Winney's Rift (number 1), 5chuylerville (2), Stafford's Bridge (3), and Sucker Brook (4) on Fish Creek, Saratoga County, New York.

Information concerning the prehistoric occupations at Winney's Rift derives from three primary sources. One is, of course, our own excavations at the site which have, unfortunately, been forced to work around severe disturbances created by unethical collectors. The second source is an invaluable surface collection amassed during 50 years of dedicated walking of plowed fields by Louis E. Follett of Schuylerville, New York. Mr. Follett's collection also contains artifacts from 11 other sites located along the Fish Creek drainage, providing a much-needed local prehistoric context for Winney's Rift. The third source is a collection recovered in excavation by members of the Auringer-Seelye Chapter of the New York State Archaeological Association. Complementary data from these three sources demand a revised interpretation of Winney's Rift.

Area excavations, combined with systematic shovel testing, confirm that the site is both vertically and horizontally stratified, producing cultural material diagnostic of Late Archaic through early contact periods. Ceramic artifacts, being particularly sensitive temporal indicators, reveal stylistic components attributable to most phases of the Middle and Late Woodland periods. However, the Follett and Auringer-Seelye collections contain projectile points that may extend the site's chronology to the even older Early and Middle Archaic periods. Such a long, continuous sequence at one site is unique in the Hudson Valley, and it is suggestive of the extraordinary importance of Winney's Rift in the explanation of prehistoric settlement systems.

The most intense occupations have been attributed to the Middle and Late Woodland time periods. Typical of our excavation units located near the intermittent stream bank were stratigraphic columns as deep as 86 cm uniformly blackened by heavy occupational activity. In all such cases, the earliest components were dated by diagnostics J to the late Middle Woodland period. Moreover, subsequent laboratory analyses have revealed that within these units the hate Woodland components consistently yielded the highest volumes of bone and lithic debitage (Table 1). These two classes of data were subjected to quantification because they clearly represent primary discard and thus probably monitor occupational intensity more directly than other types of data. Our excavations therefore seem to suggest increasingly intensive occupation at Winney's Rift through time.

We next decided to examine the perceived pattern of occupational intensification in the context of coeval changes at other Fish Creek sites. Were the changes at Winney's Rift linked to or reflected in changes at other locations? Our framework for analysis was an examination of inter-site variation in the relative frequencies of diagnostic projectile point types recovered from three sites represented in the Follett Collection: Winney's Rift, Sucker Brook and Stafford's Bridge (Figure 2). We found that among-site variation in type frequency reveals a pattern of comparability among the three sites for all time periods except the Middle and Late' Woodland. Here we see a decrease in relative projectile point frequencies at Sucker Brook and Stafford's Bridge, while at Winney's Rift there is a clear increase for these same time periods.

These data, in concert with the excavated information, suggest firm cultural systematic links among the Fish Creek sites. The intensification of debris at Winney's Rift seems to reflect a concomitant lack of activity at nearby loci, including the Schuylerville site which appears to have been nearly abandoned or only intermittently occupied following the Middle Woodland period. Since these changes occur during the time periods when populations in the Northeast were, in general, becoming increasingly sedentary and introducing cultigens into the subsistence base, it is argued that Winney's Rift reflects this process, having become the focus of seasonally extended habitation along Fish Creek. Further, our evidence suggests that such a process may well have included some population nucleation at Winney's Rift. The site's location on fertile agricultural lands adjacent to a prime fishing station would have made it a highly desirable village habitation locale.

Table 1. Bone and lithic refuse, by level, from excavation units at the Winney's Rift Site, Saratoga County, New York.

	LITHIC		BONE	
	Late Woodland	Middle Woodland	Late Woodland	Middle Woodland
SQUARE 3	264.3 gm	108.3 gm	531.1 gm	314.5 gm
SQUARE 6	151.8 gm	221.6 gm	373.5 gm	148.8 gm
SQUARE 1	682.4 gm	401.7 gm	758.2 gm	432.0 gm

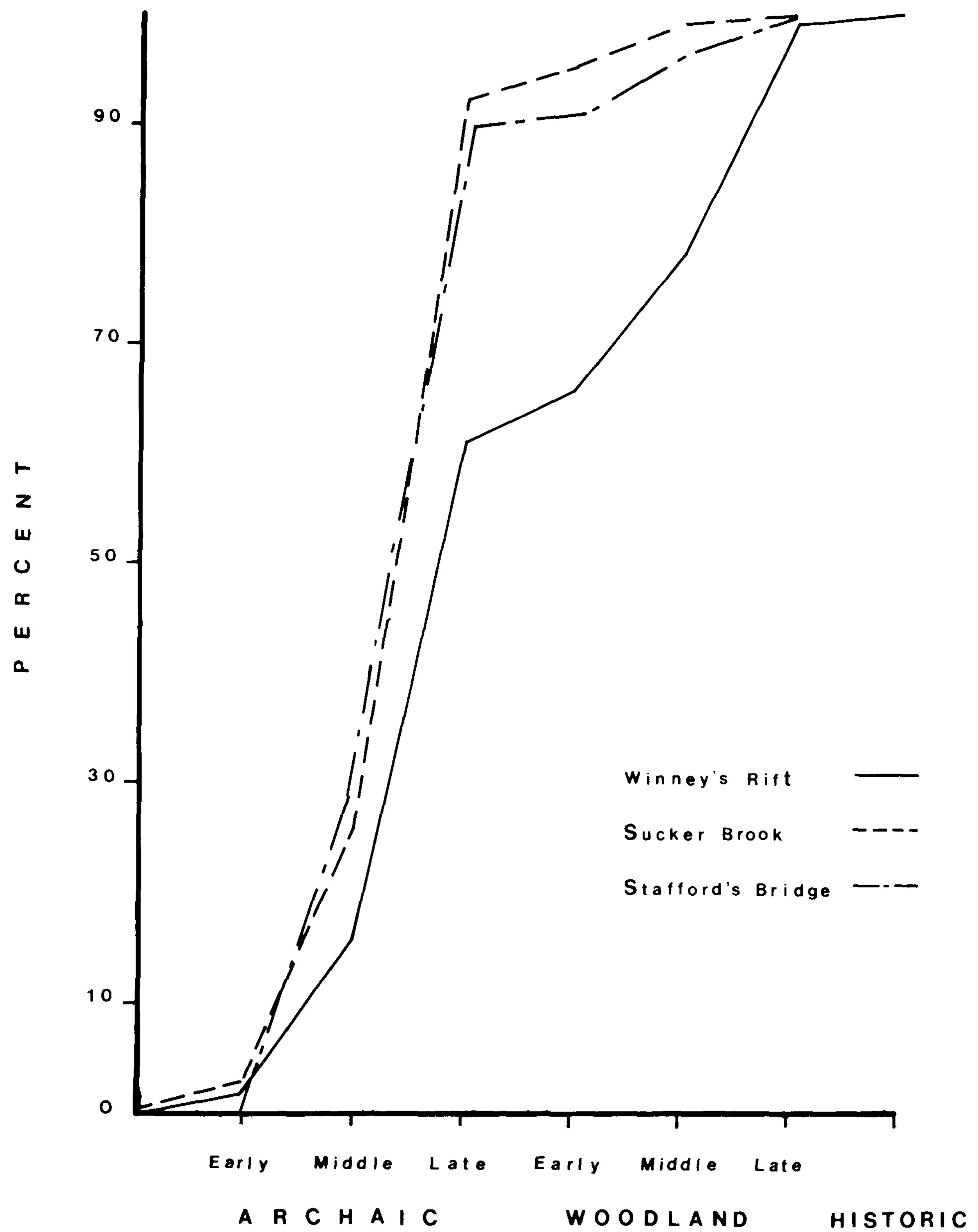

Figure 2. Relative frequency of projectile point types by time period for three Fish Creek sites.

Species identification and studies of seasonality of faunal remains will help to determine if the Late Woodland occupations were seasonal, multi-seasonal, or year-round in duration. Results of these studies, some of which are not vet complete, will also help clarify the ethnic identity of the site's occupants. If the site were occupied year-round, this would lend additional support to our interpretation of Winney's Rift as an integral part of a local settlement system rather than a seasonal Mohawk fishing camp.

Analysis of tooth eruption, deciduous tooth wear, and dental annuli of white-tailed deer, undertaken by Arthur Spiess of the Maine Historic Preservation Commission, indicates that hunting was multi-seasonal. Data recovered from a small series of deer teeth and jaws suggest hunting was carried out from at least August to March. These dates complement the period of availability of anadromous fish during the late spring and early summer months of April through early July (Brumbach 1978). In addition to the remains of deer, bear, and smaller mammals such as beaver and raccoon, often interpreted as evidence of fall or winter hunting, the site produced remains of presumed warm-weather resources including fish, bird, turtle, clam and mussel. Other supporting indicators of seasonality are being pursued through study of mussel annuli and species-level identification of turtle. Flotation studies are also underway to recover a more representative sample of smaller floral and faunal material. However, the presently emerging pattern for the Middle to Late Woodland deposits is one of multi-seasonal occupation.

To reiterate these arguments, then, Winney's Rift is part of a long sequence of occupation clearly documented for the Fish Creek drainage, beginning probably in the Early Archaic. Moreover, coincident with similar processes in other areas of the Northeast, resident populations in the Fish Creek drainage appear to have seasonally extended and concentrated their activities at Winney's Rift in a village-like habitation throughout the Middle and Late Woodland periods. For reasons which we will now explore further, we believe that the resident population along Fish Creek was Algonkian-speaking and not a seasonally intrusive Mohawk Iroquois group.

IDENTIFICATION OF WINNEY'S RIFT AS AN ALGONKIAN SITE

Ethnohistoric sources demonstrate that the occupants of the upper Hudson Valley at the time of Hudson's explorations in 1609 were Algonkian-speakers, often referred to as "Mahican" and that replacement by the Mohawks did not occur until the 1620s or 30s. According to Brasser (1974:2; 1978), the homeland of the Mahican at the beginning of the historic period extended from Lake Champlain southward into the western part of Dutchess County, New York, and from the valley of Schoharie Creek on the west to south-central Vermont on the east. This places Fish Creek in the westernmost lands occupied by the Mahican and close to the easternmost boundary of lands controlled by the Mohawk at the time of the European 'entrada'. Archaeological evidence, already discussed, lends support to our interpretation of Winney's Rift as a permanent and probably year-round village settlement, rather than a seasonal, special purpose camp, during the prehistoric and proto-historic periods.

In addition to faunal evidence suggesting that the site was not a seasonal camp, other archaeological data fail to support the hypothesis of a pre-contact Mohawk presence. Despite the striking stylistic resemblance to Mohawk types, ceramic artifacts appear to be local manufactures. Trace element analysis of ceramic artifacts from Winney's Rift was undertaken by Robert Kuhn, PhD candidate in anthropology at SUNY-Albany. A sample of 85 vessel sherds was found to differ in composition from both Mohawk and Huron pots and from ceramics recovered at sites in the middle Hudson Valley. Rather than being imports from other areas, the Winney's Rift pots were found to be manufactured of local clays.

In addition to the potsherds, Kuhn also studied a sample of 30 clay pipe fragments. While it is unlikely that the large and cumbersome bowls would have been transported with any regularity, we reasoned that the pipes, being smaller articles of personal gear, might have been carried from site to site by their owners. Of the 30 pipe fragments analyzed, it was determined that 27 or 90% were also manufactured of local materials, while 3 or 10% were manufactured of non-local clays, which were found to be most compatible, not with Mohawk pipes, but with pipes recovered from sites in the Middle Hudson Valley. This would suggest that goods, such as pots or pipes, were not regularly transported from Mohawk sites to Winney's Rift during the pre-contact period, but that most identifiable interaction of this kind was with other Algonkian or Mahican-occupied sites to the south. While this preliminary analysis does not clarify the nature of the pre-contact relationship between the two populations which resulted in the stylistic similarity in their ceramic assemblages, it does demonstrate that Winney's Rift was not a Mohawk fishing outlier. Rather, it was occupied by people whose major sources of social contact were with Hudson Valley populations.

MOVEMENT OF THE MOHAWK INTO THE UPPER HUDSON VALLEY

In 1614, a permanent trading post was established by the Dutch at Fort Nassau near present-day Albany. This location was adjacent to a Mahican village which soon forced the Mohawk to pay tribute for the privilege of coming to the Fort. In 1628, almost continuous hostilities forced the Mahican to abandon their territories west of the Hudson River except for hunting, although they were able to maintain their villages, gardens, and other territorial rights east of the River (Brasser 1974:10-14; 1978:198). Soon after, the Mohawk began to seasonally occupy the upper Hudson drainage for purposes of fishing.

Much of the data on historic Mohawk fishing in the Hudson Valley comes from the accounts of the Jesuit missionaries, especially those of Father Isaac Jogues. According to these records, on May 15, 1642, Jogues visited a Mohawk fishing camp at an unspecified location on or near the Hudson River. The occupants had built "cabins" in which they dwelled while they caught and smoked fish to bring back to their village, said to be about four days travel away (Jesuit Relations 39:61-67). The following year, Jogues accompanied the Mohawk on at least two fishing expeditions. On March 15, 1643, they departed the village located southeast of present-day Auriesville and traveled by canoe down the Mohawk River, up the Hudson, and finally ascended Fish Creek to the outlet of Saratoga Lake where a fishing camp was located (Talbot 1935:270). It is not clear if this is the same or a different fishery than that visited by Jogues in the previous year. In August, the Mohawk went to fish at a location some seven or eight "leagues" below the Dutch settlement at Albany (Jesuit Relations 31:93). Finally, on June 1, 1646, Jogues visited a location, probably the same or very close to the fishing camp near the outlet of Saratoga Lake, noted for the presence of small fish ". . . the size of a herring" (Jesuit Relations 29:49-51).

Based on these records, it is apparent that by the 1640s the Mohawk were fishing in the upper Hudson drainage, at least from mid-March to June 1, a time which coincided with the upriver migrations of several species of small, anadromous fish. While the Mohawk villages provided access to riverine fish species, the presence of the imposing Cohoes Falls on the lower Mohawk River proved to be an insurmountable barrier to the anadromous species which once enriched the Hudson and its other tributaries. We suspect therefore that it is only the very late occupations along Fish Creek that reflect Mohawk activity.

SUMMARY

Bringing together the archaeological and ethnohistoric evidence, we can conclude that prior to contact, or prior to the initial impact of the European-oriented fur trade, Algonkian-speakers occupied both the east and west sides of the upper Hudson River. Although their villages were concentrated on the east side, at least one village was established in the western lands along Fish Creek. With the initiation of the fur trade and the establishment of a post in Mahican territory in 1614, relations with the Mohawk became increasingly hostile. European trade goods recovered at Winney's Rift have been dated to the 1620s and 30s, suggesting that the Mahican occupation may have lasted until this time period. Soon after, hostilities forced the Mahican to abandon this location and remove to the east side of the Hudson. For a period of time, the two groups may have used the Fish Creek drainage differentially, with the Mahican continuing to hunt during the colder months of the year as Brasser (1974; 1978) argues and the Mohawk seasonally occupying certain locations to take advantage of the spring runs of anadromous fish.

One of the major contributions of Winney's Rift may be its identity as a village settlement of the Algonkian-speaking Mahican, who were residents of the upper Hudson Valley at the time of contact. This would make the site unique, since the only other reported and professionally excavated proto-historic or contact period sites of these people represent small, temporary camps.

While Northeastern archaeology has been enriched by data recovered from professionally excavated village sites of the Mohawk and other Iroquoian peoples, there is no comparable information from Mahican settlements. Therefore, the identification of a Mahican village site of the Late Woodland and proto-historic periods will present archaeologists with the opportunity to investigate several interesting questions about the development of ethnic identity and diversity. First, the long archaeological sequence from Winney's Rift suggests an entirely different settlement model from that documented for the neighboring Mohawk. Second, the position of this site along an ethnohistorically defined ethnic boundary suggests that its archaeological assemblage should reflect processes of interaction between distinct socio-cultural groups. The nature of the relationship between the pre-contact Mahican and Mohawk is an intriguing area of study which would be of interest to many anthropologists. In this regard, several questions arise.

Most archaeologists who have examined the ceramics from the upper Hudson Valley and from Mohawk Iroquois sites have remarked on the stylistic similarities between the two collections. However, there has not necessarily been agreement about the cultural dynamics involved. Some have argued that the stylistic similarity is a measure of social distance while others have preferred different interpretations. The intent of this paper is not to argue for one interpretation or explanatory model over another but to point out that systematic recovery and analysis of data from Winney's Rift may contribute to the study of the development of ethnic identification and ethnic identity maintenance, and to offer archaeologists the opportunity to formulate and test hypotheses concerning these aspects of socio-political relations.

Finally, Winney's Rift is also important because it is one of the few material documents of the pre-contact history of the Mahican people. While some mixed descendants of the Mahican still reside in the Hudson Valley today, most have moved to other areas, many to Wisconsin, and little is known from the archaeological record of their pre-contact history. Certainly the Winney's Rift Site, with its long archaeological sequence, is a unique record of this people's history in the Hudson Valley.

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INTERACTION PATTERNS IN EASTERN NEW YORK: A TRACE ELEMENT ANALYSIS OF IROQUOIAN AND ALGONKIAN CERAMICS

Robert D. Kuhn Van Epps-Hartley Chapter

This study presents the results of a trace element analysis of ceramic pipes from the Mohawk and Hudson Valleys in eastern New York. The goal of the research was to identify pipes of exotic origin using compositional data collected by X-ray fluorescence analysis. The results indicated that ceramic pipes were trade items that were exchanged between communities within the Hudson Valley. Exchange of pipes was interpreted as functioning to reinforce social and political ties between these communities. The results also demonstrated that no trade or exchange of pipes between Mohawk and Hudson Valley groups was occurring. These results were interpreted as indicating that the linguistic and political divisions, known to have existed between these groups during the Historic Period, had prehistoric origins.

INTRODUCTION

An understanding of trade and interaction systems is important to the archaeologist concerned with reconstructing prehistoric social networks and political relations (Wright 1974:3). Yet, isolating trade artifacts and measuring intensities of interaction using archaeological materials is often problematic (Wright 1967, Plog 1980). This study attempts to make some assessments of interaction patterns in eastern New York by isolating trade artifacts that may have been moving within and between groups in that region. Specifically, a trace element analysis of ceramics was conducted in order to test the hypothesis that ceramic smoking pipes were trade artifacts. If this hypothesis could be accepted, then pipes could be used to reconstruct trade networks and, by inference, interaction patterns. The results presented here are part of a larger study which focused on interaction patterns in the northeast in general (Kuhn 1985).

Ceramic pipes were chosen as the focus of this study because it seemed likely that they were prehistoric trade items. The pan-northeast range of many pipe styles (White 1968:21, Tuck 1971:224, Weber 1971:56) has led some to the conclusion that the Iroquois "traded their pipes far and wide along the east coast" (Brasser 1978:83). As West (1934:292) has written, "the wide distribution of pipes of many types would lead to the conclusion that pipe-making tribes fabricated pipes as a medium of exchange with other tribes, long before contact with the white man. . . ." The documentary evidence supports such a conclusion. Lawson (1709:217), discussing tobacco pipes of the Carolina Indians, wrote that they were "often transported to other Indians, that perhaps have greater plenty of deer and other game."

There are also statements in the primary source documentation indicating that pipes were often the object of gift giving and reciprocity. The Jesuits and Sagard recorded that, in Iroquois dream guessing, pipes were among the many items often dreamed for and given as gifts (Tooker 1964:110). The gifts that were presented by the Indians to the first Europeans would probably have been items that were commonly recognized gift items among the Indians themselves. In this regard Smith's (1608:118) statement that "60 of these giant-like people [Susquehannocks] came downe, with presents of venison, tobacco pipes, baskets, targets, bows and arrows," would seem significant.

Give this evidence, it would seem likely that a research project undertaken to identify trade pipes could generate productive results.

MATERIALS AND METHODS

Trace element analysis on over 600 ceramic artifacts was conducted to test the hypothesis of trade in ceramics. Control samples of pottery were utilized to demonstrate differences in the elemental composition of regional clay resources, and ceramic pipes of known provenience were then identified as to their probable region of origin.

The trace element analysis of ceramic pipes involved two comparisons. First, a comparison between two groups of Hudson Valley sites was conducted in order to determine if trade or exchange of pipes was occurring between Hudson Valley communities. Second, research was conducted in order to determine if trade in ceramic smoking pipes existed between the Mohawk-Iroquois and the Algonkian groups of the Hudson Valley.

The general procedure for this research project involved the following. First, trace element data was collected on potsherds and pipe fragments from sites in each of the regions to be compared. Second, the pottery samples were used as a control group to determine if clay resources being used by inhabitants of the different regions could be successfully differentiated based on trace element content. If the two regions could be differentiated, then trace element data on pipe specimens of known provenience could be used to determine their region of origin. In this way, it could be determined if pipes were made locally, or if they derived from a different region.

One issue of immediate concern was the decision to use pottery samples as control groups. The pottery samples from each region were presumed to represent the local clay resources that were being exploited by potters of that region. Adopting this approach was based on two considerations. First was the likelihood that most pottery on Late Woodland sites was manufactured of local clays, and second was the extreme difficulty in locating the actual clay sources and using them as the control groups. It does seem likely that the majority of pottery found on Late Woodland sites was made of locally occurring clays. Pottery was being produced in vast quantities during the Late Woodland Period and adequate clay resources were available throughout the northeast. Cross-cultural ethnographic research has consistently demonstrated that potters generally travel only short distances to procure their primary clay resources (Arnold 1980:149, Fry 1980:14). Therefore, it seems unlikely that potters were traveling beyond the immediate vicinities of their sites to procure clays (Rands and Bishop 1980:19-20). Likewise, finished pottery was undoubtedly not traded much. Typically, pottery was bulky and fragile and not well suited to long distance transport. Therefore, it seemed that use of pottery as a control group was a workable assumption, and indeed this approach has been advocated and used by others conducting similar research (Perlman 1984).

The use of pottery as a control group seemed even more appropriate when the difficulties with using clay resources were considered. The search for clay sources is a time consuming and often unprofitable task (Perlman 1969, 1984:130) and it could not be hoped that all the sources in a region could be located (Brownell 1951:12, Abascal et al. 1974:93, Underwood 1977:21). This is especially true for the Iroquois who were making vessels not only of clays, but of silt materials containing no clay minerals (Sideroff 1980:180). Also, differences between ceramics and control groups could represent elemental changes incurred during the manufacturing process-rather than trade ceramics-if clay sources were used (Shepard 1968:vi).

Acquiring the necessary ceramic artifacts for study was in some cases a difficult task. This was especially true for the Hudson Valley because of the paucity of Late Woodland sites discovered and professionally excavated in the region (Funk 1976:300-302). However, in most instances the necessary samples were available for analysis. Over 600 ceramic specimens from 19 sites were included in the analysis. Table 1 lists the number of pottery and pipe fragments analyzed from each site, the total number of pipes excavated from the sites, and the percentage that were available for this study. Table 2 and Figure 1 present the locations of the sites in the study. The regional samples included:

1) HUDSON-These sites are all located in the Hudson Valley and are presumed to represent Mahican or groups ancestral to the Historic Period Mahican. Ritchie (1952:11-13) and Ritchie and Funk (1973:307) considered some of these to be Mohawk communities, however Funk (1976:301-302) considered them Algonkian occupations ancestral to River Indian groups. The total sample included 162 pottery and 30 pipe specimens from 8 sites. Most of these come primarily from the large Chance Phase Kingston site (Ritchie 1952) and the Winney's Island site. Although it is a multicomponent site (Funk 1976:27-28), a large, permanent Chance Phase component seems to be represented at Winney's Island. Most of the pipes in the sample from the site seem to relate to the Chance Phase on stylistic grounds. The rest of the sites in the sample are small semi-permanent occupations.

The Hudson Valley sites were compared with the Mohawk sample, and also divided into two groups

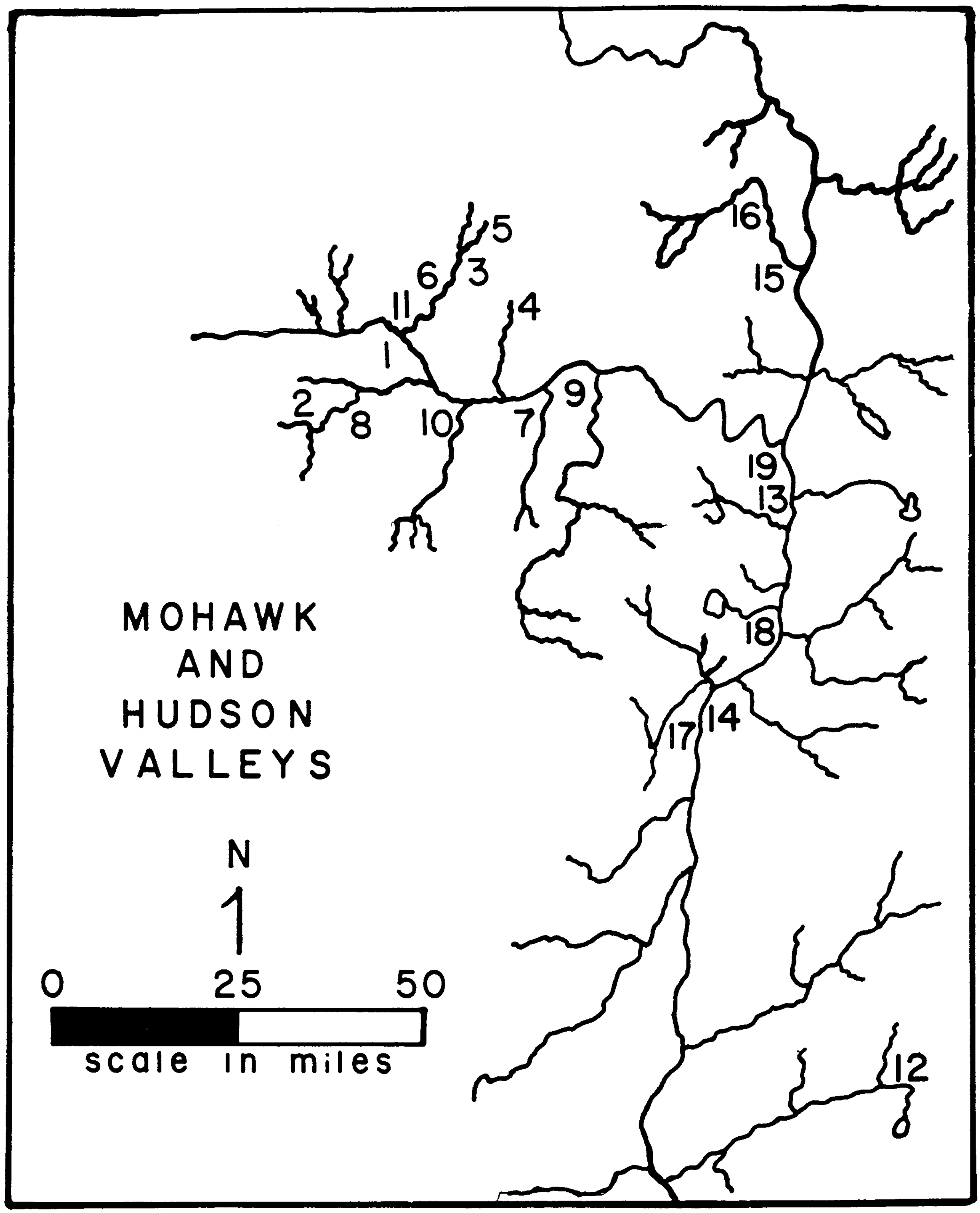

Figure 1. Map of sites in the study. For site numbers, see Table 1.

Table 1. Ceramic samples included in the trace element analysis are listed under the columns labeled pots and pipes. The total column indicates the total number of pipes excavated from the site. The percent column indicates the percentage of all pipes that were included in the trace element analysis.

REGION	SITE	POTS	PIPES	TOTAL	PERCENT
MOHAWK	LITTLE (01)	36	29	29	100%
	ELWOOD (02)	50	22	440	5%
	GAROGA (03)	10	68	74	92%
	GETMAN (04)	10	54	54	100%
	SMITH (05)	10	10	10	100%
	KLOCK (06)	10	8	19	42%
	NAYLOR (07)	32	17	17	100%
	OTSTUNGO (08)	7	5	5	100%
	BAUDER (09)	5	0	–	–
	ALLEN (10)	30	0	–	–
	JACKSON-EVER (11)	5	10	10	100%
HUDSON	SYLVAN LAKE (12)	11	0	–	–
	DENNIS (13)	1	0	–	–
	TAYLOR (14)	2	0	–	–
	SCHUYLER MAN (15)	3	0	–	–
	WINNEYS ISLE (16)	85	30	?	?
	KINGSTON (17)	45	0	–	–
	BRONCK HOUSE (18)	11	0	–	–
	MENANDS BRID (19)	4	0	–	–

for an intra-Hudson Valley comparison. The upper Hudson group consisted of a sample of 88 pottery and 30 pipe specimens from Winney's Island and Schuyler Mansion. Both of these sites are located along Fish Creek, North of the Mohawk River confluence. The middle Hudson group consisted of 74 sherds from the sites of Menands Bridge, Bronck House, Taylor, Kingston, and Sylvan Lake. All of these sites are located at or south of Albany below the Mohawk confluence.

2) MOHAWK-This sample consisted of 205 potsherds and 208 pipe specimens selected from 11 Mohawk sites dating between 1400 and 1680 AD. All of the sites are year-round permanent village sites presumed to be occupied for a period of 10 to 20 years. The total sample was used in comparison with the Hudson Valley sample.

X-ray fluorescence was selected as the method of choice for analyzing these samples because it was readily available, rapid, nondestructive, and proven by past studies to be useful for differentiating ceramic samples. X-ray fluorescence has the capability of collecting both proportional and quantitative data. For the current research only proportional data was collected. Ratios, or the relative proportions of trace elements, were measured in the number of characteristic X-rays observed in a fixed time. The sample to be analyzed was bombarded with X-rays from a radioisotope. The absorption of these primary X-rays cause the sample to emit fluorescent X-rays whose energies are characteristic of the elements presented in the sample. A lithium doped silicon diode and high energy resolution solid state detector were employed for collecting data. Energy spectra were displayed on a microcomputer using a 512 channel pulse height analyzer (Figure 2).

Six trace elements were considered including Iron (Fe), Rubidium (Rb), Strontium (Sr), Yttrium (Yt), Zirconium (Zr), and Barium (Ba), because these elements have been utilized in other trace element research (Joron et al. 1977, Sideroff 1980, Trigger et al. 1980, Mello et al. 1982), and because preliminary observations suggested that they would be useful for differentiating the samples in this study. The radioisotope Cadmium 109 was used to excite the sample for collecting data on these elements.

No sample preparation, other than standard cleaning of the surface of each sherd was undertaken. One measurement was made on each sample. This seemed sufficient since a number of studies have demonstrated that individual sherds are elementally homogeneous (Hall et al. 1973, Shenberg and Boazi 1975:459, Trigger et al. 1980:123). Bishop (1980), and Rands and Bishop (1980:23-24), point out that elemental variability as a result

Table 2. Locations of sites in the study.

SITE	LONGITUDE AND LATITUDE	CTY.	ST.
LITTLE	LAT.42° 57′15″N.,LONG.74° 38′45″W.	MON	NY
ELWOOD	LAT.42° 57′10″N.,LONG.74° 43′30″W.	MON	NY
GAROGA	LAT.43° 1′05″N.,LONG.74° 32′00″W.	FUL	NY
GETMAN	LAT.42° 57′42″N.,LONG.74° 30′ 5″W.	MON	NY
SMITH	LAT.43° 1′10″N.,LONG.74° 31′30″W.	FUL	NY
KLOCK	LAT.43° 00′16″N.,LONG.74° 34′30″W.	FUL	NY
NAYLOR	LAT.42° 53′15″N.,LONG.74° 30′15″W.	MON	NY
OTSTUNGO	LAT.42° 55′40″N.,LONG.74° 41′40″W.	MON	NY
BAUDER	LAT.42° 53′20″N.,LONG.74° 27′ 5″W.	MON	NY
ALLEN	LAT.42° 54′20″N.,LONG.74° 35′ 5″W.	MON	NY
JACKSON-EVERSON	LAT.42° 58′30″N.,LONG.74° 37′30″W.	MON	NY
SYLVAN LAKE	LAT.41° 35′30″N.,LONG.73° 47′00″W.	DUT	NY
DENNIS	LAT.42° 42′00″N.,LONG.73° 42′00″W.	ALB	NY
TAYLOR	LAT.41° 55′00″N.,LONG.73° 59′00″W.	ULS	NY
SCHUYLER MANSION	LAT.43° 05′30″N.,LONG.73° 34′00″W.	SAR	NY
WINNEYS ISLAND	LAT.43° 06′00″N.,LONG.73° 37′30″W.	SAR	NY
KINGSTON	LAT.41° 56′35″N.,LONG.73° 59′10″W.	ULS	NY
BRONCK HOUSE	LAT.42° 17′30″N.,LONG.73° 52′00″W.	GRN	NY
MENANDS BRIDGE	LAT.42° 42′00″N.,LONG.73° 42′00″W.	ALB	NY

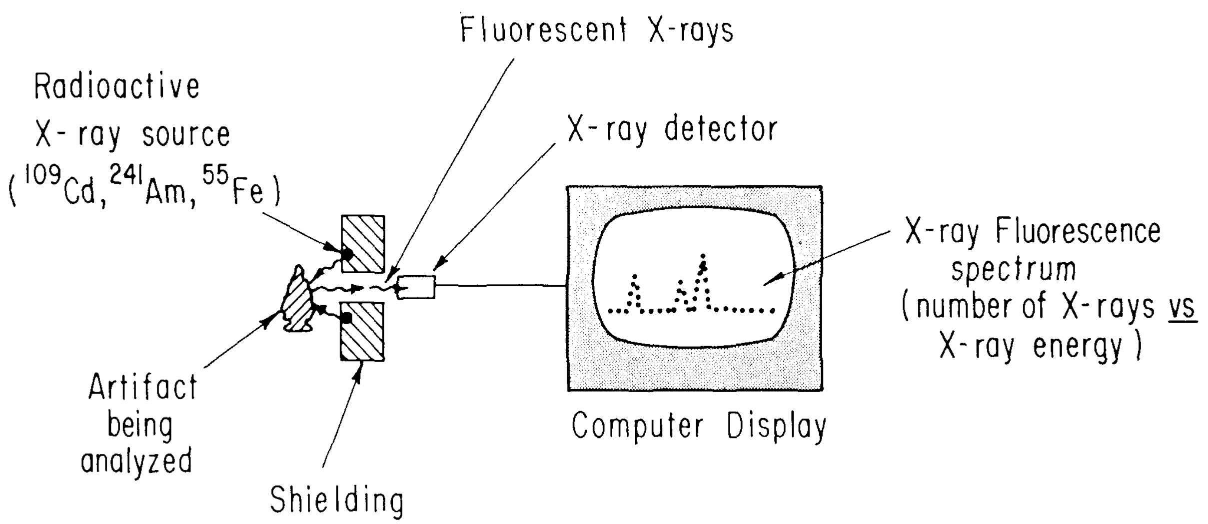

Figure 2. The X-ray fluorescence analyzer.

of differences in tempering can confound the study of sourcing ceramics using trace elements. For the present purposes, in selecting an area for analysis on each sherd, an effort was made to avoid surficial pieces of temper, and to focus the detector on the clay matrix. All of the pipes analyzed in this study were tempered. While pipes were usually manufactured with a finer grained temper than pots, it is believed that consciously avoiding temper sufficiently controlled for this variation. Generally, it is believed that the data collected reflects primarily the clays of which the ceramics were manufactured. Finally, numerous studies have demonstrated that tempering does not significantly alter the elemental composition of the ceramic (Abascal et al. 1974:90, Brooks et al. 1974:53-54, Perlman 1984:131-132). Even if some tempering was being included in the data collection, it is doubtful that this would confound the results given the fact that most pipes are tempered with the same materials as pottery at a site (cf. Gutierrez 1985:60).

Table 3. Discriminating variables.

STEP NUMBER	VARIABLE ENTERED	U-STATISTIC	F-STATISTIC
1	Sr/Yt	.5953	108.756
2	Fe/Ba	.5351	69.070
3	Rb/Sr	.4973	53.233

Ratios of Iron/Barium, Rubidium/Strontium, Rubidium/Yttrium, Zirconium/Rubidium, Strontium/Yttrium, Strontium/Zirconium, and Yttrium/Zirconium were calculated from the trace element data collected with the Cadmium source for all specimens. Multivariate discriminant function analysis (Dixon 1981, program BMDP7M, version April 1977) was used to analyze these data. This statistical approach has been advocated for trace element research by Luedtke (1979) and others (Frurip et al. 1983, Leese 1985).

"The mathematical objective of discriminant analysis is to weight and linearly combine the discriminating variables in some fashion so that the groups are forced to be as statistically distinct as possible" (Nie et al. 1975:435). Variables significant for differentiating the groups are entered into the analysis in a stepwise fashion (tolerance .01, F-to-enter 4.0). Variables not useful for differentiation purposes are not entered into the analysis. Discriminant analysis produces classification functions using that set of trace elements which best discriminates among the pottery groups. These functions may then be used to classify pipe specimens based on their trace element composition. Discriminant analysis also produces jacknifed classification results which may be used to evaluate the accuracy of the classification functions. In the jacknife technique "each case is classified into a group according to the classification functions computed from all the data except the case being classified" (Dixon 1981:520). In this way, the data are used to evaluate the discriminant functions ability to correctly identify individual ceramic specimens. Likewise, posterior probabilities are computed from the Mahalanobis D statistic as a means of evaluating the classification of individual pipe specimens. Individual specimens classified with an 85% probability or higher were considered worthy of evaluation. In the first analysis, the upper Hudson Valley pottery sample was compared to the middle Hudson Valley pottery sample using discriminant function analysis. The upper Hudson Valley pipe sample was then classified accordingly. In the second analysis, the total Hudson Valley sample of pottery was compared to the Mohawk Valley sample of pottery, and the pipe samples from both regions were classified accordingly.

RESULTS

The results of the upper Hudson-middle Hudson Valley comparison are presented in Tables 3, 4, 5, and Figure 3. Table 3 presents the discriminating variables in order of each variable's ability to discriminate between the groups. The increasing discriminatory power is statistically demonstrated by the decreasing value of the U statistic, which is tested for significance with a standard F test. Those variables which did not significantly add to the amount of group centroid separation were not entered into the equation. Table 4 presents the jacknifed classification results of the upper and middle Hudson Valley pottery, and the classification of the concomitant pipe samples. Figure 13 presents the relationship between the three samples graphically, through a plot of the canonical variable.

The jacknifed classification results indicate that the trace element data can be used to correctly identify pottery samples approximately 88% of the time. The 12% error factor inherent in the system undoubtedly represents overlap in the range of elemental variation in the clays of the two regions, or measurement error in data collection. Of 30 upper Hudson pipe fragments, 13 were identified as middle Hudson, far exceeding the 12% error factor inherent in the system. Of these 13 pipes, 3 were classified with an 85% posterior probability. These 3, or 10% of the sample, are undoubtedly non-local pipes. All 3 were actually identified with more than a 95% posterior probability (Table 5), and all three lie well outside the entire range of the upper Hudson Valley ceramic control group as demonstrated by Figure 3.

Table 4. Jacknifed classification results.

GROUP	PERCENT CORRECT	NUMBER OF CASES CLASSIFIED INTO GROUP MIDDLE HUDSON	UPPER HUDSON
MIDDLE HUDSON	91.9%	68	6
UPPER HUDSON	84.1%	14	74
TOTAL	87.7%		
UPPER HUDSON PIPES		13	17
UPPER HUDSON PIPES EXCEEDING 85% POST. PROBABILITY		3	

Table 5. List of Hudson Valley trade pipes.

CASE	POSTERIOR PROBABILITY	PERCENTAGE OF PIPES IDENTIFIED AS NONLOCAL IN ORIGIN
164	96.1%	3/30 = 10%
186	96.4%	
192	99.5%	

The results of the Mohawk-Hudson Valley comparison are presented in Tables 6 and 7, and Figure 4. Using the classification functions generated by the multivariate discriminant analysis, ceramic samples were classified correctly approximately 70% of the time. Classification of pipe samples using the classification functions generated by the discriminant analysis indicated that 4, or approximately 13%, of the Hudson Valley pipes were classified as Mohawk in origin, while 47, or approximately 23%, of the Mohawk pipes were classified as Hudson Valley in origin. In both instances these percentages do not exceed the 30% error factor that exists in the classification system, suggesting that these pipes represent misclassification rather than trade pipes. Furthermore, all of these 51 pipes were classified with less than an 85% probability of the classification being correct. This would seem to suggest that no trade in ceramic pipes existed between the Mohawk and Hudson Valley groups.

INTERPRETATION

The primary focus of this study was an attempt to determine if ceramic smoking pipes were trade items among northeast Late Woodland groups. Therefore, the first consideration involves whether or not the results conclusively indicate that any pipes were traded. Fortunately, the results indicate quite clearly that at least some pipes in Late Woodland assemblages were of non-local manufacture. In the upper Hudson Valley-middle Hudson Valley analysis, three upper Hudson Valley pipes were identified as non-local at the 95% confidence level. Furthermore, these three specimens fell outside the entire range of the upper Hudson Valley control sample. These specimens undoubtedly represent pipes of non-local origin that found their way to the upper Hudson Valley region through trade or exchange.

Exchange of pipes is probably best interpreted as a function of aboriginal social and political relations. As Heidenreich (1978:378,385) has written for the Huron, "contact with neighboring villages was purely on a social, and perhaps semi-political, basis" and "pre-European trade should be seen in terms of its social and political importance rather than as an important occupational or economic activity." This conclusion probably applies to most of the Woodland groups of the northeast. In fact, the

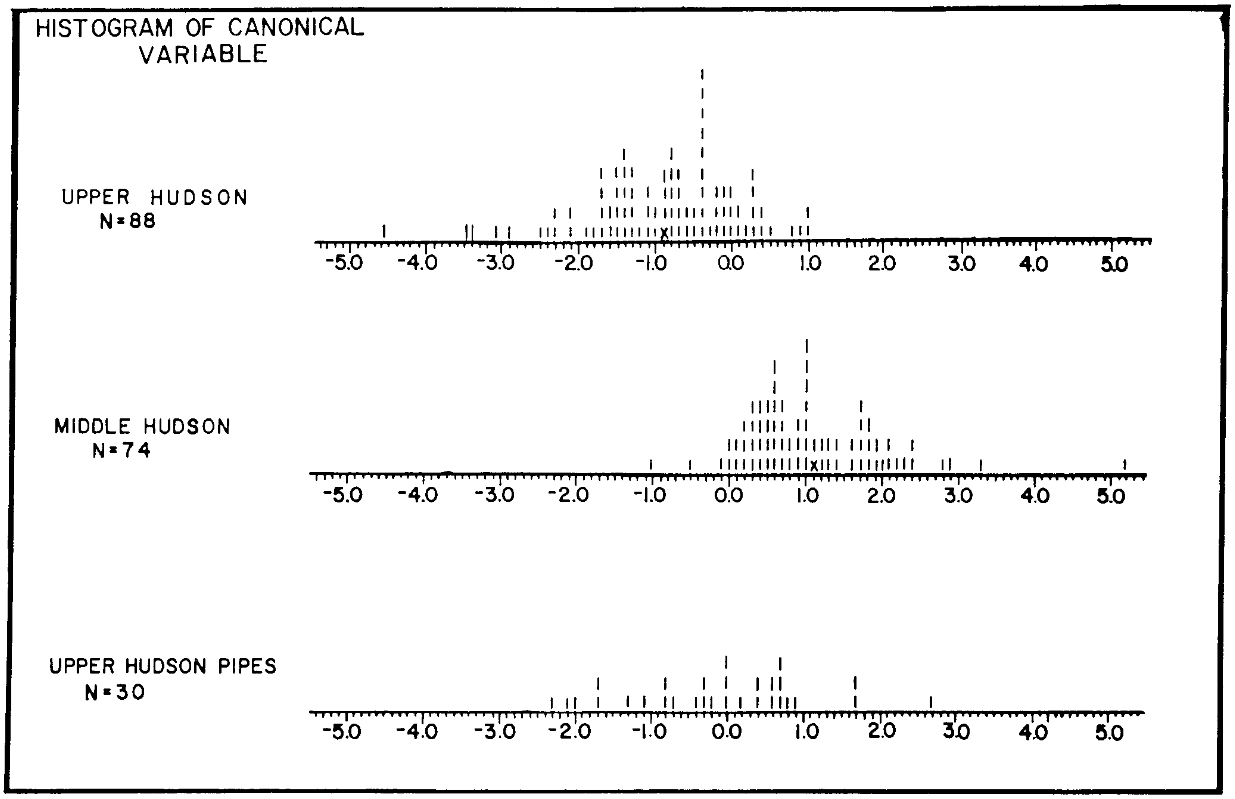

Figure 3. Histogram of canonical variable-upper Hudson versus middle Hudson Valley.

Table 6. Discriminating variables.

STEP NUMBER	VARIABLE ENTERED	U-STATISTIC	F-STATISTIC
1	Rb/Yt	.8546	61.921
2	Fe/Ba	.7887	48.632
3	Rb/Sr	.7750	35.026

historical documentation is quite clear concerning the role of trade, specifically gift exchange and reciprocity, as the mechanism for individual acquisition of social status and political rank. Social and political position in native American society was based on prestige. Unlike most modern societies, the conversion of trade into prestige was not based on the acquisition of goods and accumulation of wealth, but on the acquisition of goods in order to dispose of them through gift giving and reciprocity (Heidenreich 1978:380,384). Lavish gift giving produced prestige and incurred social obligation upon others.

In summary, it would appear "that the need for trade had its major roots in prestige factors (Ritchie 1954:2)." While this explains why trade was occurring, it does not explain why pipes may have been the focus of this trade. The answer to this question undoubtedly lies in the symbolism of pipes and tobacco which made smoking an important part of native social and political life. Smoking was viewed as integrally related with shamanism, witchcraft, and supernatural power. As Hamell (1983) has elegantly pointed out, other native trade items functioned in much the same way. Shell, crystal, and native copper were being exchanged prehistorically, "not simply as physical substances, but as physical and ideological substances," and this exchange "should not be only understood in terms of the potential exchange value of these goods, but also in terms of their symbolic value (Hamell 1983: 6, 25)." Hamell (1983) terms these items "symbolically-charged" goods, and it is argued that ceramic smoking pipes also fall under this

Table 7. Jacknifed classification results.

GROUP	PERCENT CORRECT	NUMBER OF CASES CLASSIFIED INTO GROUP MOHAWK	HUDSON
MOHAWK	71.7%	147	58
HUDSON	69.1%	50	112
TOTAL	70.6%		
MOHAWK PIPES		161	47
HUDSON PIPES		4	26
MOHAWK PIPES EXCEEDING 85% POST. PROBABILITY			0
HUDSON PIPES EXCEEDING 85% POST. PROBABILITY		0	

rubric. The individual on the receiving end, was not simply acquiring a ceramic pipe, but acquiring supernatural power in the form of a material object.

Individual motivations concerning trade and exchange represent only one aspect of this practice. On another level, it is clear that trade had important adaptive significance. One of the most important functions of trade was undoubtedly to reinforce socio-culturally important ties between communities, and to establish and maintain ties between tribal groups necessary for peace or war.

Individual communities were linked through a variety of ties, including intermarriage (Tuck 1971:221-222). Even more important may have been fictive clan ties, which have often been interpreted as a unifying device (Fenton 1951:51, Tooker 1970:93, 1971:358-359), or medicine societies which cross-cut lines of kinship and clan affiliation (Tuck 1971:213, Ritchie and Funk 1973:367, Trigger 1981:38). It is probable that exchange of pipes moved along one of these lines, helping to reinforce intercommunity bonds.

Given these conclusions, the lack of interaction, based on pipe exchange, between the Mohawk and Hudson Valley groups provides evidence concerning the prehistoric relations between these groups. First of all, the analysis provides evidence concerning the long-held assumption that certain Hudson Valley sites were actually Mohawk communities. Ritchie (1952) included the Kingston Site in his analysis of Mohawk Chance Phase components, and Ritchie and Funk (1973:307) have suggested that the Mohawk frequented the Winney's Island Site prehistorically to fish. These assumptions derived from emphasizing the artifactual similarities between the Hudson Valley sites and Mohawk components. Also, regarding the Winney's Island site, the Jesuits recorded a Mohawk occupation there in the seventeenth century. In recent years, there has been a growing consensus however that Hudson Valley sites probably represent proto-Algonkian groups, possibly ancestral Mahican rather than Mohawk (Ritchie and Funk 1973:368, Brumbach 1975, Funk 1976:301). Important artifactual differences between Hudson Valley and Mohawk components exist to support this conclusion. These include stylistic differences in pottery (Ritchie 1952, Witthoft 1959:30), and projectile points (Funk 1976:301). The results of the present analysis add weight to this evidence. The Hudson Valley sites were demonstrated to be interacting and exchanging pipes, but no such phenomenon was occurring between the Hudson Valley and Mohawk sites. If any of the sites in the Hudson Valley were Mohawk villages, it should be expected that they would be interacting with other Mohawk communities in the Mohawk Valley. Yet no interaction was observed between the Mohawk and Hudson Valley regions. This would tend to support the inference that the Hudson Valley sites are not Mohawk but probably proto-Mahican.

Finally, some explanation for the lack of Mohawk-Mahican interaction at the regional level may be proposed. In the past, numerous authors have argued that extensive Mohawk-Mahican interaction must

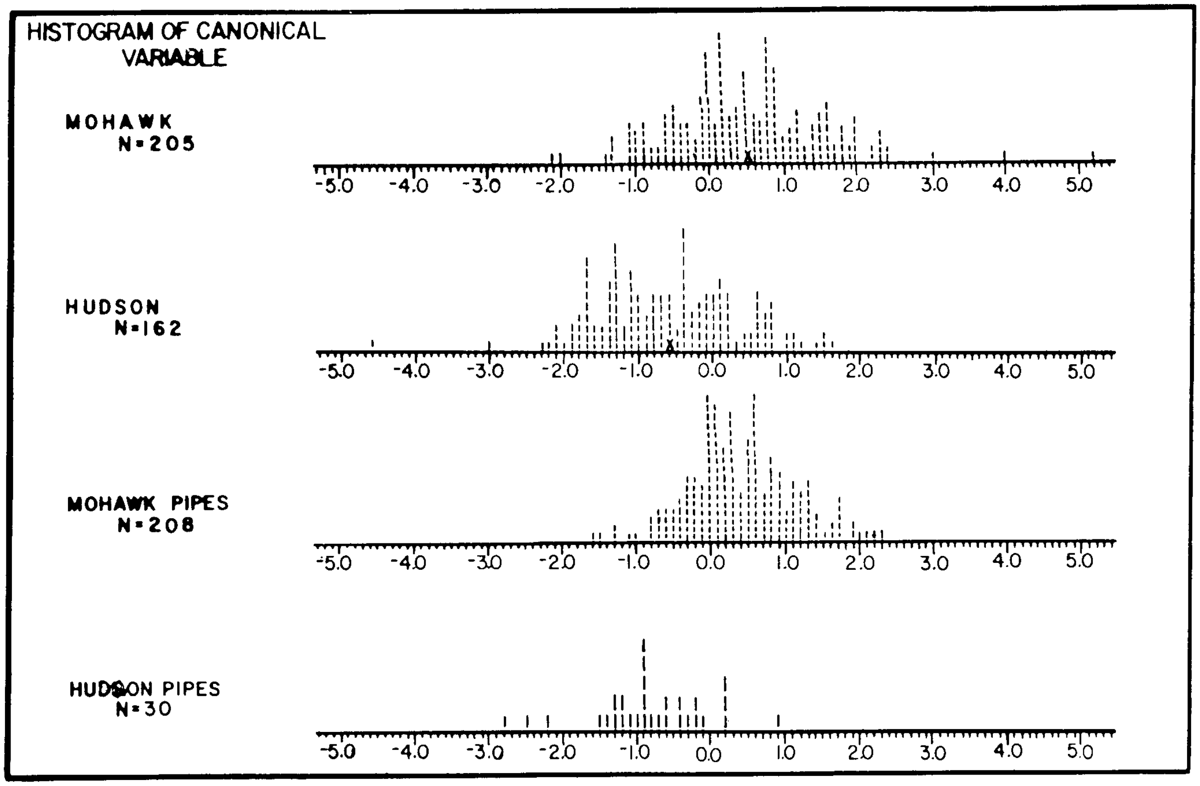

Figure 4. Histogram of canonical variable-Mohawk versus Hudson Valley.

have characterized the Late Woodland Period (Brasser 1974:3, Brumbach 1975). The results of this analysis suggest that this position needs reevaluation. Most likely, previous explanations for the trait differences between Mohawk and Hudson Valley components are also pertinent to the lack of interaction. Ritchie and Funk (1973:368) have argued that the artifactual differences "could reflect significant disparities in social and religious institutions between the resident [Hudson Valley] groups, probably Algonkians, and the Iroquoians." In addition, Funk (1976:302) has suggested that the artifactual differences may indicate "that the linguistic and political divisions of the contact period, with their constant militaristic overtones, has some depth at least as far back as Oak Hill times." Each of these factors may have played a role in limiting interaction between the Mohawk and Mahican. However, this analysis indicated that pipes were being exchanged between Mahican communities, and a related study indicated that exchange of pipes was also occurring between Iroquois communities (Kuhn 1985). This probably indicates that the social and ideological manifestations that underly exchange of pipes were not dramatically different between the two groups. Therefore, more emphasis is placed on linguistic differences and the probability of extended hostilities between the Mohawk and Mahican, as an explanation for the lack of interaction. The Mohawk were members of the Iroquoian language family (Lounsbury 1978), while the Mahican spoke an Eastern Algonkian language (Brasser 1974:3, Goddard 1978), and there is little question that this difference existed during the late prehistoric period. Historic documents indicate that as early as 1613/14 the Mohawk and Mahican were enemies (Lenig 1977:77, Brasser 1978:202), and it is suggested here that this animosity was a prehistoric phenomenon as well, dating to at least the Chance Phase.

CONCLUSION

In conclusion, the results of this study demonstrate that ceramic smoking pipes were a common trade item prehistorically. The identification of trade pipes suggests that interaction between Algonkian communities in the Hudson Valley was extensive. The movement of pipes between communities probably represents gift giving and reciprocity which functioned to reinforce social and political ties. No trade in pipes between the Mohawk and the Hudson Valley groups appears to have existed during the Late prehistoric and historic periods. This may indicate that the Historic Period conflicts between these groups had prehistoric origins.

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RENDEZVOUS WITH PREHISTORY-THE RIFFLES SITE

Robert J. Gorall Lewis Henry Morgan Chapter

ABSTRACT

Much evidence of aboriginal occupation has been located and recovered from western New York State along the Genesee River, the Finger Lakes region and the upper reaches of the Ganargua River in Ontario County. Very little material however has been uncovered downstream on the Ganargua as it journeys through Wayne County. It has been the author's belief that some early people must surely have lived in Monroe's sister county to the east. The great Seneca villages of the eastern group (Wray & Schoff 1953) did settle some of their populace along the Ganargua in its travel from the Bristol Valley. This waterway does in fact continue to flow heavily and with its most abundance through Wayne County to its final termination at the present village of Lyons. Where the river today spills into the New York State Barge Canal it is almost directly across the Canal from the Canandaigua Lake Outlet and only a short distance from the Clyde River. In pre-canal times, the Ganargua River and the Canandaigua Outlet apparently joined together to form the Clyde River (McIntosh 1877:18). Although conditions seemed proper for early habitation somewhere in this area other than near the large and famous sites in the furthest reaches of the county close to Savannah, not much material had been uncovered and even less documented from central and western Wayne County.

Recognizing the potential for success, it has therefore become the author's objective to initiate the discovery and recording of any sites located in this vicinity. Considering the rural nature of Wayne County, it was hoped that a good chance of success would result. When expressed on a county map the large size of the area in question becomes quickly apparent and for that reason this paper should be considered as just a beginning expedition into the unwritten past of western Wayne County. It is the start of a series of site reports with hopefully useful data covering this disparity in our knowledge. If the reader permits, it is a RENDEZVOUS WITH PREHISTORY. . . .

THE RIFFLES SITE

During the last lee Age much of the earth's water was impounded in gigantic ice caps. Ocean levels were lower and as the climate warmed and the ice retreated northward, large lakes and waterways resulted over the land which is now Wayne County. In that time period between the retreat of the 1000 foot thick ice sheet, over 12,000 years ago and the cultivated fields of the Late Woodland Iroquois, other humans inhabited this ancient countryside.

For countless centuries the stream which is today known as the Ganargua* River, has flowed generally from a westerly direction toward the present day village of Lyons, New York. Feeder streams and rivulets attach themselves to the Ganargua from both the north and south giving the waters the nourishment needed to continue the journey to their drainage into the New York State Barge Canal system. The headwaters of the Ganargua are located in the Bristol Hills in Ontario County, many miles to the southwest. The environment of the river borderlands is marked by seasonal weather changes. Summers can be hot and winters tend to be cold, with much snow. Temperatures can drop to below zero and have

*The Ganargua River has been listed on some maps by its original name and on others as the "Mud Creek". Since the latter term is one that the author cannot warm up to, 1 prefer and in this report will use the more lyrical Indian name of GANARGUA. The name itself has several spellings: GANARGUA, GANAGUA, GANGWEH, or GANAGWEH (Indian spelling?). However, trying to search out the correct Indian spelling has proved to be a humbling experience. The Ganargua is listed by Lewis Henry Morgan (Morgan 1851) as having several meanings: GA-NA-Gweh, meaning "Village Suddenly Sprung Up"; GA-Nhweh (Clyde River), meaning "River At a Village Suddenly Sprung Up"; and Ganarg-WEH (Palmyra), meaning "The Village Suddenly Sprung Up".

risen to over one hundred (Fahrenheit). The frost free growing season varies between 131 and 182 days. Annual precipitation averages 36.41 inches (U.S. Dept. Agriculture 1978).

Approximately three miles from the termination of the Ganargua River into the canal, there occurs a rather long stretch of rapids or rifts in the waters. It is directly adjacent to these rapids on the south bank that a newly discovered habitation site is situated. The site (RMSC Site No. Pal 3-4) location is in the present flood plain of the valley, but the author is unable to determine whether this bottomland was always flooded. It is possible that inundation has occurred only since historic times and is caused by the timbering-off of forest cover within the drainage system.

A high and steep drumlin rises directly south of the site location and from its lofty summit an encompassing panoramic view of the river valley is possible. Good springs emit from the lower eastern base of this hill. They are today utilized by the present owner of the land, but in early times the springs undoubtedly flowed downward into the river. The field bordering the riffles has been farmed for many years and, although yields include wheat, peas and hay, the primary crop is corn. The present owner of the property is Mrs. Jean Rae and the author wishes at this time to warmly thank Jean, who with the late Mr. Pete Rae extended their kind permission to surface hunt the land. The Rae family's gracious hospitality and interest added greatly to the enjoyment of the task.

The field on which the site is located is level or slightly sloping in a gradual decline northward to the river bank. The river shallows border this area for approximately 120 yards. Mr. Rae had related to me that the older residents of the vicinity claimed that directly across the water from the site, where a feeder stream enters the river, once stood two very old and tall trees. This spot was referred to as "the meeting place" and the shallows were known as the "Indian stepping stones". Rae further informed me that a number of years ago during very low water, he could cross the river by stepping on the stones and hopping over a small sluiceway in the center.

Although some early historians have suggested that central and western Wayne County possessed too many rough elements to enable native peoples to inhabit the area comfortably and without illness (Turner 1851: 386, 391, 394), my investigations have indicated four other surface sites along the lower Ganargua River within a few miles of the Riffles Site. There is little reason to doubt that more await discovery. Further, it is the author's belief that unlike the early European settlers, the Indian population did not suffer from unacceptable levels of sickness. Possibly they had built up antibodies against, and used herbal medicines for, the treatment of the local diseases. Thus, the native people would not have been immunologically deficient in this area. Just as the resident population had no defense against the influx of European smallpox, so too did the European lack the necessary immune system to ward off new world viruses, as evidenced by the great toll of workmen during the construction of the Erie Canal and the early settlers' afflictions of "Genesee Fever" in the area of the lower Genesee. Although the first white inhabitants of this section of the country suffered illnesses, this fact does not preclude the possibility of a large native population.

Many fur bearing animals such as muskrats, mink, beaver and raccoon inhabit the waterways in the vicinity of the Riffles Site and unquestionably these were even more common during earlier times. Waterfowl and fish such as pike, bass, catfish, suckers, bullheads and smaller pan fish could have drawn humans like a magnet to this easy food resource. Rabbits, woodchuck and the white-tailed deer are common.

Prehistoric artifacts, the many necessary tools for survival, and possibly even works of art or fancy made of wood or bone have gone the way of most organic materials and are now dust. Certain "hot spots" however, have shown up and consist of flint projectile points, scrapers, utilized flakes and knapping debris. (Figure 1).

To hypothesize too strongly from what is essentially surface find evidence is a risky enterprise. For example, a large and well-made beveled adze was recovered at the site and such an artifact undoubtedly belongs to the Lamoka people. We cannot conclude however that the site was strictly Lamoka for some material which has been found proves that inhabitants other than Lamoka also used the area. Trubowitz suggests, "The local Lamoka bands probably made seasonal rounds, fishing at major streams and lakes during spawning periods, hunting deer and collecting nuts in the upland in the Fall, and collecting wild plants on the floodplain. . . ." (Trubowitz 1982:13-20). It is quite possible that the "Riffles People" were also diversified collectors and fishermen, but certainly not exclusively Lamoka although that group apparently did visit the site at some time. At this stage the material recovered suggests a multi-component

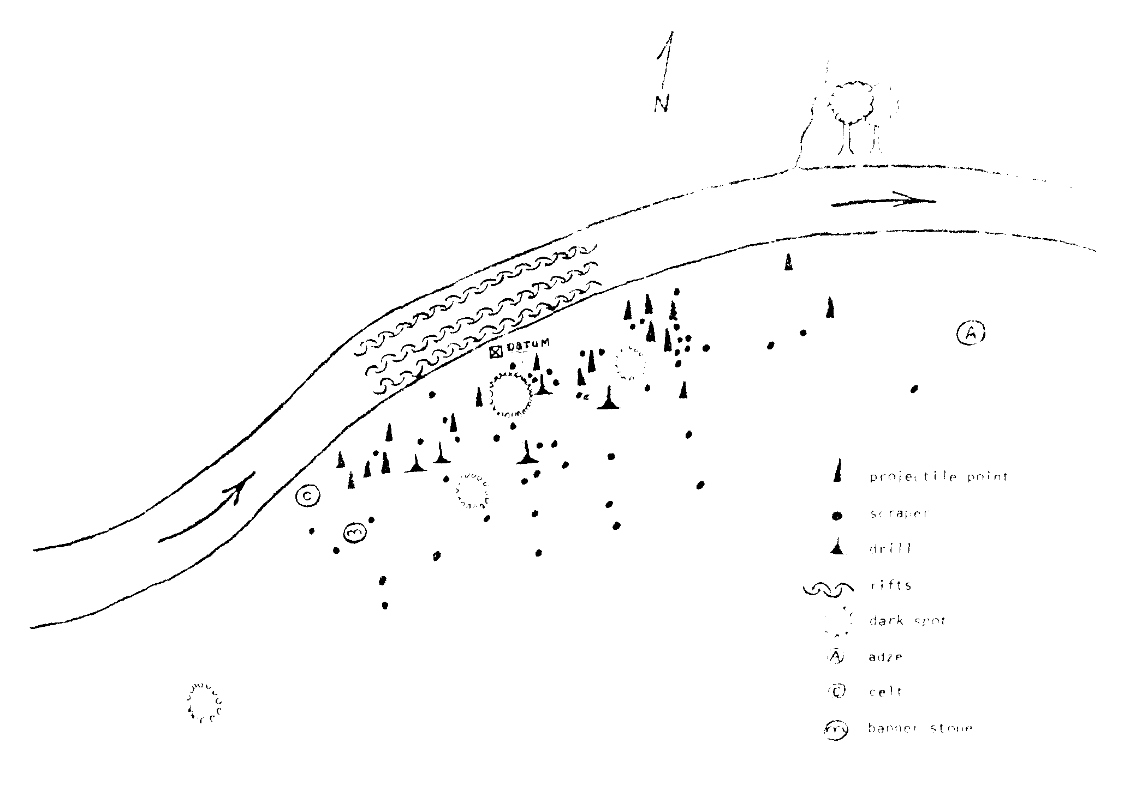

Figure 1. Artifact distribution at the Riffles site. Rifts extend for about 120 yards (109.7m).

or mixed site, possibly used as a fishing station. (See Figures 2-7). Late aboriginal material is very rare with no pottery fragments and only one Madison projectile point being discovered. Four distinct dark spots can be seen when the soil is freshly plowed. Possibly these are the remnants of roasting or drying pits.

The most obvious attraction to this location is, of course, the rapids or shallows in the river. Their existence both in prehistoric times as well as the present is a most persuasive symbol of why the place had drawn such early inhabitants. It is the author's belief that this site represents a seasonal fishing station such as described by Ritchie, "During the Spring run of fish the bands gathered along stream rifts . . . employed barbless hooks, gorges, barbed harpoons and nets. Traps and weirs certainly existed." (Ritchie 1955:23-27) and Fenton, ". . . forays were interspersed with removals to fishing stations, where weirs of converging stones directed the fish under the spears of waiting men or into basket traps. Prodigious runs of fish ascended the Mohawk from the Hudson, the outlets of Oneida Lake from Lake Ontario, the Oswego River, and the outlets of the Finger Lakes." (Fenton 1978: 301).

Although early man derived much of his sustenance from local game animals and the static foods such as nuts, berries, fruits and roots, without doubt his diet also included a great deal of fish when available. To be successful, fishing techniques needed to envelop both simple methods and positive results. Few if any implements are as deadly to fish as traps and nets or as easy to construct under the proper conditions. In most parts of the world and far back into time, such devices were used and undoubtedly were universal in their appeal to mankind's constant search for food. In the eastern United States, "Traps were constructed by placing walls or dams of stone in the form of one or more V's with the apex or constricted ends of the V's on the downstream side of the structure. These V's were built to take advantage of the main or deeper channels of the river and the number of V's were dictated by the number of deeper channels occurring by nature at the shallow area chosen for the trap structure. When the trap was not in use the nets or wicker baskets were removed from the V outlets permitting the fish to move up or down the stream

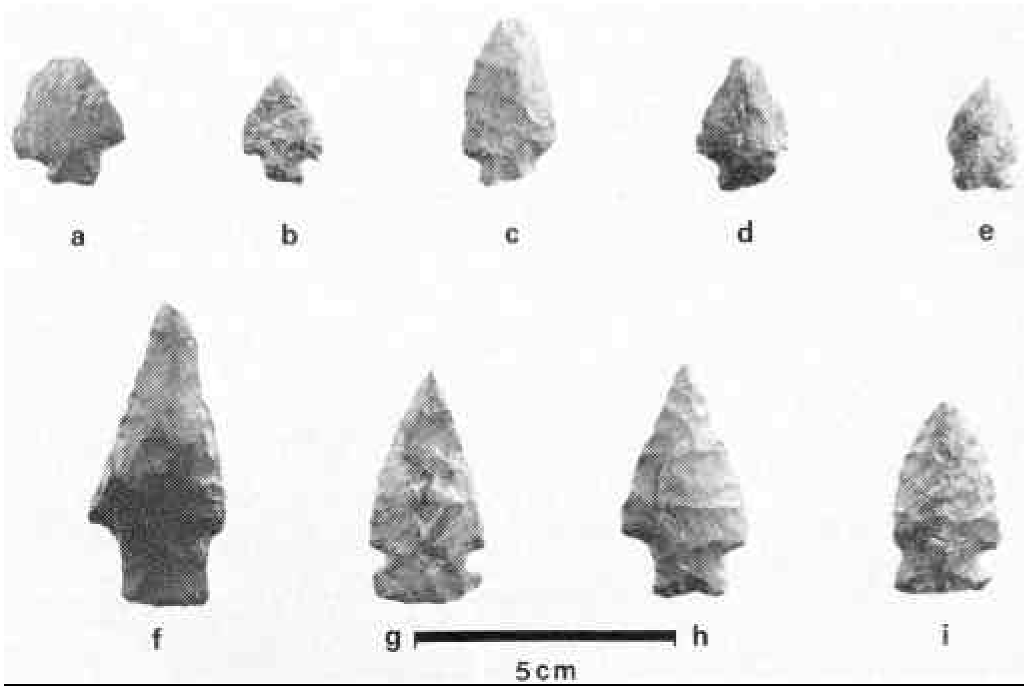

Figure 2. Riffles site projectile points. a-e, corner notched; f, Genesee; g, Meadowood; h, i, probable Laurentian.

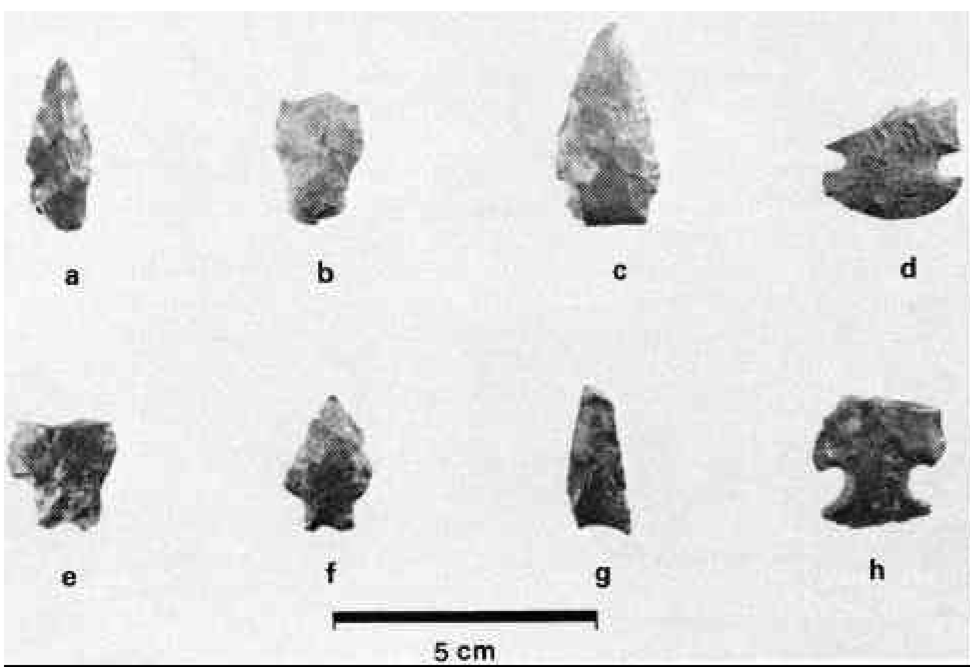

Figure 3. Riffles site projectile points. a, b, Lamoka; c, d, Meadowood; e, f, Neville; g, Madison; h, Jack's Reef.

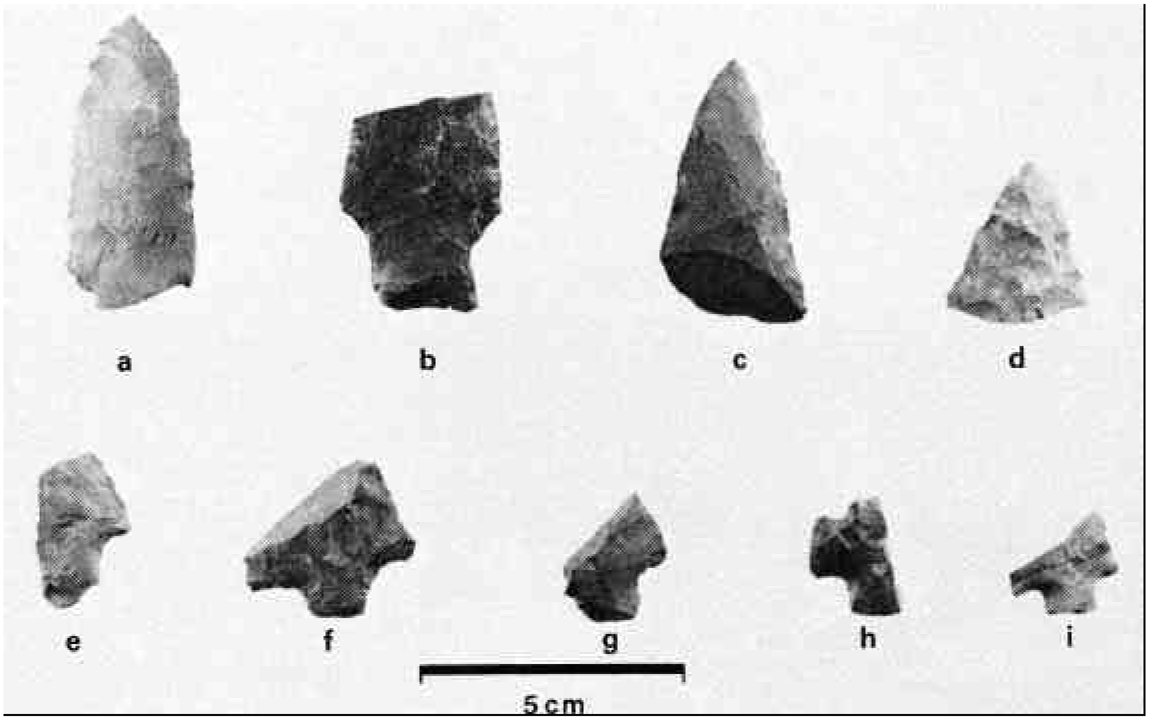

Figure 4. Riffles site spear and projectile points. a-d, spear fragments; e-i, projectile point fragments.

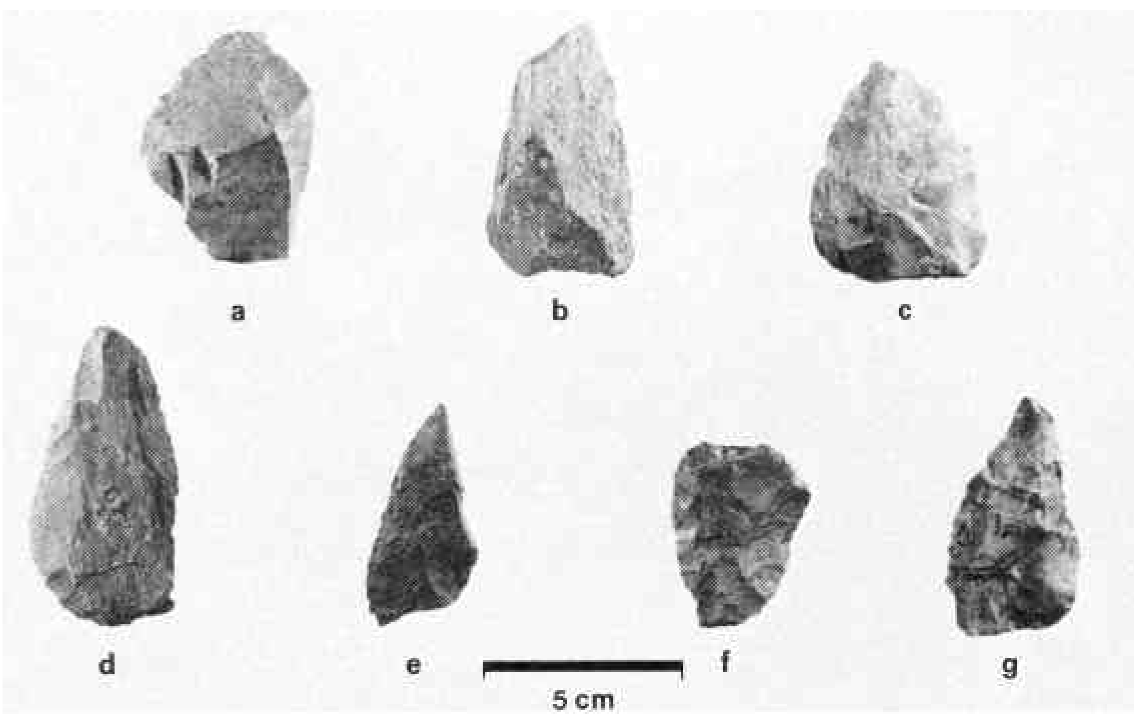

Figure 5. Flake knives from the Riffles site (a-g).

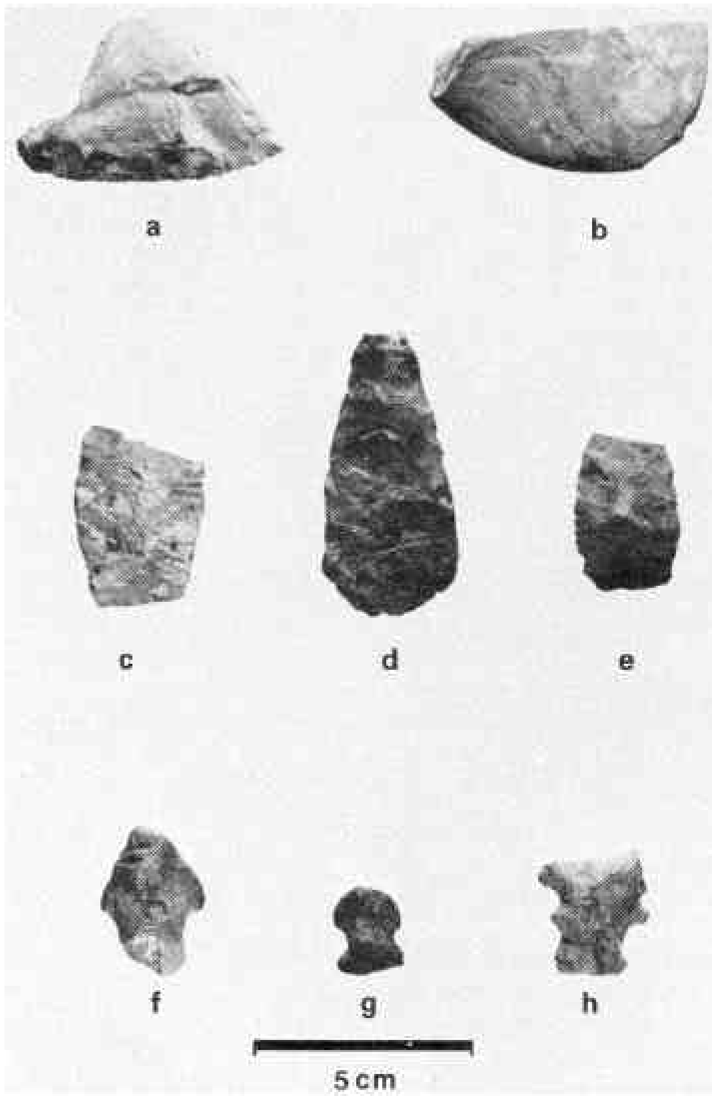

Figure 6. Miscellaneous artifacts from the Riffles site. a, Unusual scraper (fillet knife?); b, Winged bannerstone fragment; c, Possible Paleo artifact; d, e, Knives; f, g, Fire starters showing considerable battering; h, Possible scraper/engraver (multi-notched).

at will." (Peck 1977:2-8) (See Figure 8) and "We know that there are many more structures of the types reported in this paper in rivers throughout the eastern half of the United States. We have seen them in the Shenandoah, the James, the Delaware, and the Schuyllkill rivers. Structures which may be fish traps have been reported in the Mohawk, the Upper Hudson, and in many rivers as far west as Iowa. Many village sites have been located near these structures." (Stranberg and Tomlinson 1969: 312-319). The reliability of the fish "running" at a regular time or season of the year guaranteed to operators of fish traps a good return for their efforts. When the spring run of fish occurred there would also be available an abundance of new (young) wildlife and the foraging for spring plants would take place. The stones lying in the Ganargua River at the Riffles Site appear to be quite similar in their placement to the parallel-opening-type structure as shown in Figure 8.

During the autumn, low water insured an easier time in using the established traps in conjunction with the harvesting of nut crops and the practice of fall hunting. It is the writer's contention that these riffles were constructed by the native population as fish traps and were used because they were both simple and effective.

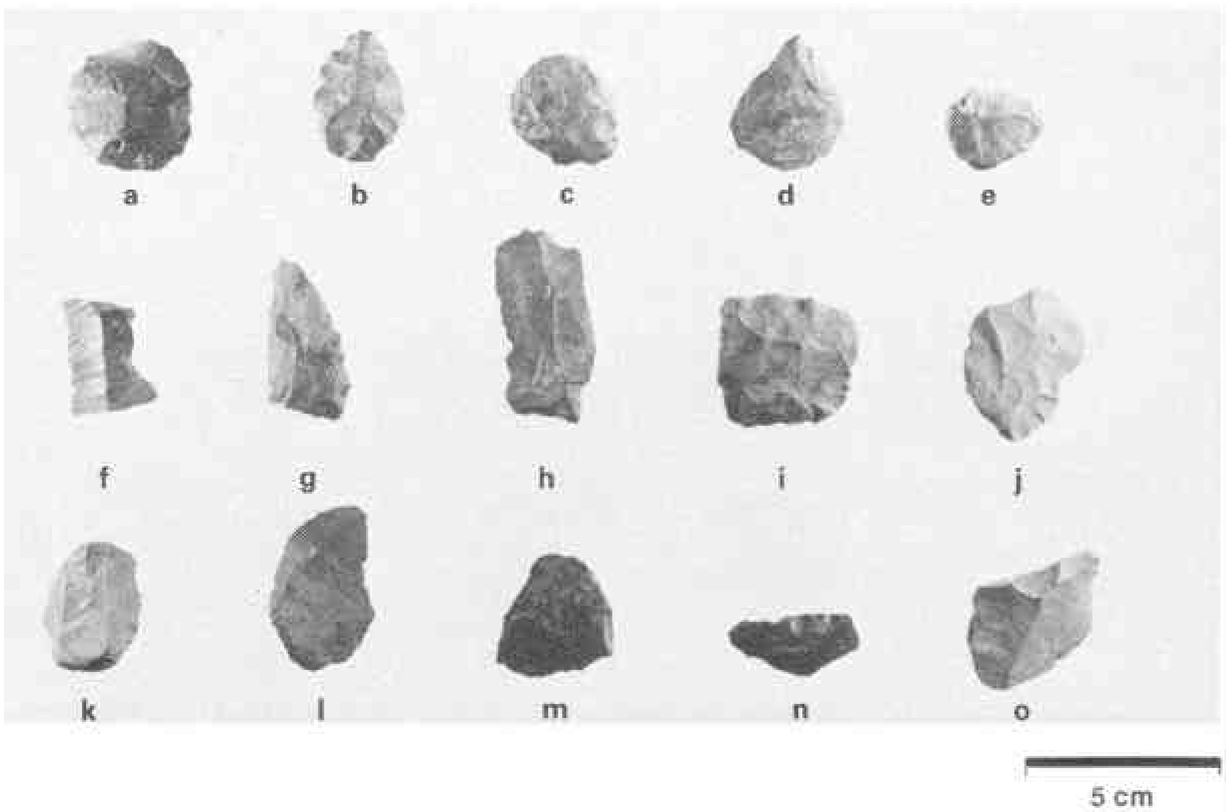

Figure 7. Scrapers and Flakes from the Riffles site. a -e, Thumbnail scrapers; f-j, Side scrapers; k-o, Utilized flakes.

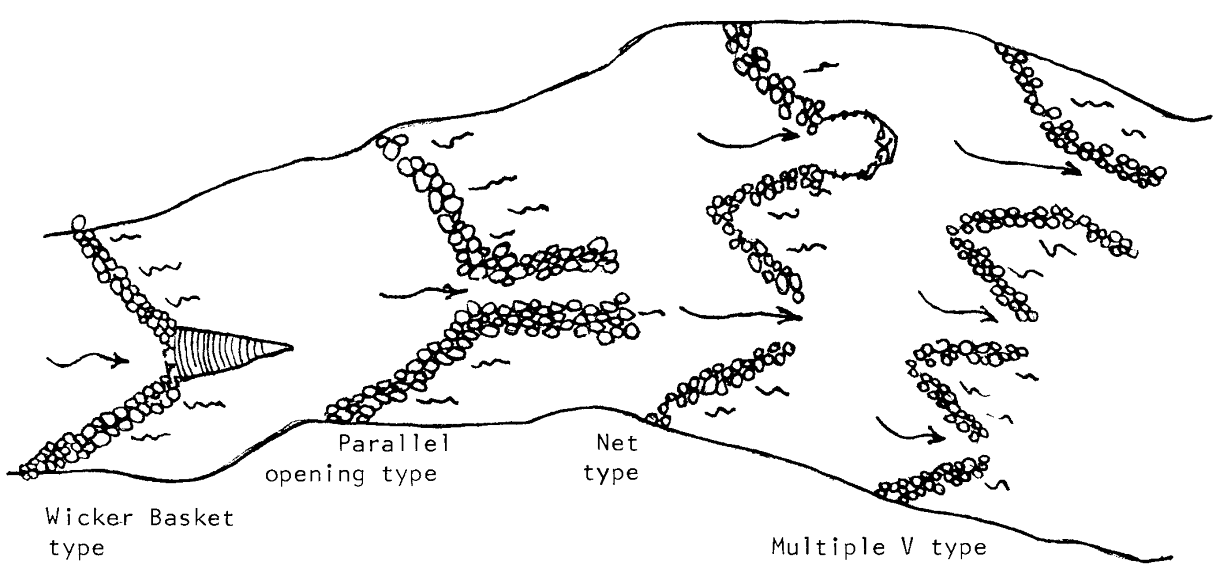

Figure 8. Types of fish traps (After Peck 1977).

The accumulating evidence of prehistoric occupation is becoming more clear in central and western Wayne County, but much remains to be done. Obviously such a task will take considerable effort and time. Although the span reflected by the artifactual material of this single location suggests possibly five millennia of human activity, the early native peoples did in fact leave precious little testimony of their passing in the surface of "Mother Earth".

INVENTORY OF LITHIC MATERIAL

Material

By far the major part of this surface collection consists of artifacts and debris made from the Onondaga flint of western New York. There is also evidence of some limited use of central New York Onondaga flint, gray slate and rhyolite. Occasionally pieces showing color change by heat alteration were noted but whether the heat exposure was accomplished by accident or design is unknown. The presence of some artifacts and waste flakes of material other than that of local origin indicates that raw materials (nodules, cores, etc.) were brought to this site for processing thereby suggesting contact with other regions by trade or travel.

Projectile Points

There is a great variety in the projectile points from the Riffles Site including many that have been damaged and/or reworked. In order to identify types the author consulted the generally used standards of identification for reference (Ritchie 1971, revised) (Converse 1973, revised). When doubtful identification occurred due to the rudeness of the point or when a possible transitional piece turned up, another opinion was sought out and such relevant co-appraisal is listed with the references.

Complete (identified)
Darts, Javelins and Projectile Points:

1	Genesee-central N.Y. Onondaga flint. (Fig. 2f)
1	Laurentian corner-notched (similar to Meadowood)-Onondaga flint. (Fig. 2h) (C. Wray, per. comm.)
1	Laurentian-type, stemmed-Central N.Y.-Onondaga flint. (Fig. i) (C. Wray, per. comm.)
1	Meadowood-Onondaga flint. (Fig. 2g)
5	weakly, corner-notched, small points-western N.Y. Onondaga flint. (Fig. 2a-e)
1	Lamoka-Onondaga flint. (Fig. 3a)
1	straight stemmed Archaic type western N.Y. Onondaga flint. (not shown)
1	small, slightly serrated Neville-type-Onondaga flint. (Fig. 3f) (T. Weinman, per. comm.)
12	fully complete projectile points.

Incomplete (identified)

2	Meadowood-Onondaga flint. (Fig. 3 c, d)
1	Madison-Onondaga flint. (Fig. 3g)
1	Lamoka-Onondaga flint. (Fig. 3b)
1	Jack's Reef corner-notched-Onondaga flint. (Fig. 3h)
1	small, Neville-type, lower 2/3rds-Onondaga flint. (Fig. 3e)
6	incomplete but identifiable projectile points.

Incomplete (unidentifiable)

6	small point tips
3	bases of points (Fig. 4 f, h, i)
1	point similar to Point Peninsula (multiple-notched)-Onondaga flint. (C. Wray, per., comm.)
4	Archaic type, straight stemmed-western N.Y. flint.
1	Laurentian type, stemmed-Onondaga flint. (C. Wray, per., comm.)
15	incomplete and unidentifiable projectile points.

Spears:
8 separate parts of spears were recovered, no complete specimens-5 western N.Y. flint and 3 central N.Y. flint. (Fig. 4 a-d).

Drills:

3 straight stemmed drills-western N.Y. flint.
2 expanded base drills-western N.Y. flint.
5 complete drills
3 pre-forms-western N.Y. flint.
2 strike-a-lites-western N.Y. flint. (Fig. 6 f, g)
1 piece of soapstone from Pennsylvania or Maryland. (C. Wray, per., comm.)
1 fragment of winged bannerstone-gray slate. (Fig. 6b)

Knives:

2 flint knives with both edges having been utilized-western N.Y. flint. (Fig. 6 d, e)
7 flint flake-type knives which take advantage of one or more long thin edges-western N.Y. flint. (Fig. 5 a-g)
9 total knives
1 unidentifiable lanceolate-type spear or knife (possible Paleo-Indian)-lithic material is similar to Kettle Point, Lake Huron. (C. Wray, per., comm.) (Fig. 6c)
1 multi-notched spokeshave (Fig. 6h) 1 broken celt
1 6.35 cm (2.5 in) diameter hammerstone
1 6.35 cm (2.5 in) flint hammerstone showing considerable battering on all sides.
1 beveled adze approximately 15.24 cm (6 in) in length.

Scrapers:

8 end scrapers
11 thumb nail scrapers (Fig. 7 a-e).
10 side scrapers, one of rhyolite from Pennsylvania, one of Reynales limestone flint from the Rochester area (Fig. 7 f-j).
1 combination spokeshave and scraper-Onondaga flint; the material had been burned.
1 special and unique scraper which had possibly been used for a filet knife (Fig. 6a).
18 utilized flake scrapers (Fig. 7 k-o).
49 various scrapers.
2160 flint chips.

The author wishes to thank Charles F. Wray for his very kind and useful assistance in identifying the various lithic materials. . .
Photographs by Tricia Miller

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THE OSSINING ROCKSHELTER

Stuart J. Fiedel Louis A. Brennan Lower Hudson Chapter

The Ossining Rockshelter is situated about 3 kilometers (2 miles) east of the Hudson River, in the village of Briarcliff Manor, in the town of Ossining, Westchester County. The shelter is formed by a 7.1 meter high, nearly vertical outcropping of Fordham gneiss. This cliff faces west. A large slab, approximately 5.5 meters in diameter, lies in front of the cliff, separated from it by about 1 meter. This slab slopes upward from west to east, and is supported by smaller stones on its northern, western, and southern edges. It thus forms a roofed chamber, 2 meters high at its entrance, on the eastern side. A small, shallow pond, which is often dry, lies 12.5 meters to the northwest of the shelter. The Pocantico "River", which is really only a small stream at this point, flows southward at a distance of about 30 meters east of the site.

The rockshelter was brought to my attention in 1982 by a resident of the suburban neighborhood that surrounds it. Inspection of the slope lying in front of the cliff revealed bits of bone and small flakes of quartz and chert, which suggested that excavation of the site would be productive. When I began excavation, with a class of archaeology students from SUNY Purchase, 1 was not aware of any previous investigation of the site. However, in 1983, I came across a reference, in a general history of Westchester County, to excavations conducted by Leslie V. Case at the "Ossining Rockshelter". I then found Case's own report of his finds in a very brief and inadequately illustrated article in the Quarterly Bulletin of the Westchester Historical Society (1929). Case's description of the location of the shelter that he excavated, relative to the township boundaries, topographic features, and nearby roads, permits its identification as the site I have described. However, I have not been able to establish the exact correspondence of features shown in Case's small and blurry photograph of the site to actual features of the rockshelter as it exists today. It is possible that changes in the site's appearance might have been caused by blasting. Even 55 years ago, Case warned that the rockshelter was endangered by suburban development, and noted the presence of blasting holes in the rocks. We observed two such holes drilled into the top of the roof slab; it was also evident that the face of the southern half of the cliff had been sheared off by fairly recent blasting. Nevertheless, despite these recent alterations of the site's appearance, there is no reason to doubt that the roofed chamber and the crevice at the southern end, where we found a cache of Late Archaic points and preforms, existed in prehistoric times (Fiedel 1984).

Case noted the presence, in the vicinity of the Ossining Rockshelter, of two other rockshelters that were reputed haunts of the famous "Leatherman", an indigent eccentric who wandered about Westchester in the late 1800s. According to Case, these sites had been disturbed by people searching for the Leatherman's alleged treasure. We discovered no other rockshelters in our explorations of the area, but it is possible that one of the sites mentioned by Case was the Hanotak Rockshelter. This site, which no longer exists, lay less than 1.5 kilometers northwest of the Ossining Rockshelter. It was excavated by Louis A. Brennan in the 1960s, and yielded numerous artifacts, mostly of Archaic age. It should be noted that the catchment area exploited by the occupants of the Hanotak site would have overlapped considerably with the area accessible from the Ossining Rockshelter. Any explanation of the Ossining site's place in the subsistence and settlement patterns of the Archaic residents of the area must take account of this fact.

Case found a few points and other chipped stone artifacts during his first excavation season. Judging from his dark and blurry photograph, one of the points seems to be corner-notched, perhaps of Vosburg type. Artifacts of ground and polished stone included a slate knife, a gouge, a gorget, and a magnetite plummet. Besides these lithic artifacts, Case recovered numerous potsherds that he was able to fit together to reconstitute most of a single vessel. This pot, decorated with an incised zig-zag line running along its shoulder, had been tempered with shell. Shell-tempered pottery is rare or absent at other sites in the lower Hudson region. However, we recovered 74 shell-tempered sherds from the Ossining site, 5 of which display incised lines. These pieces either belong to the same vessel that Case found, or to very similar pots.

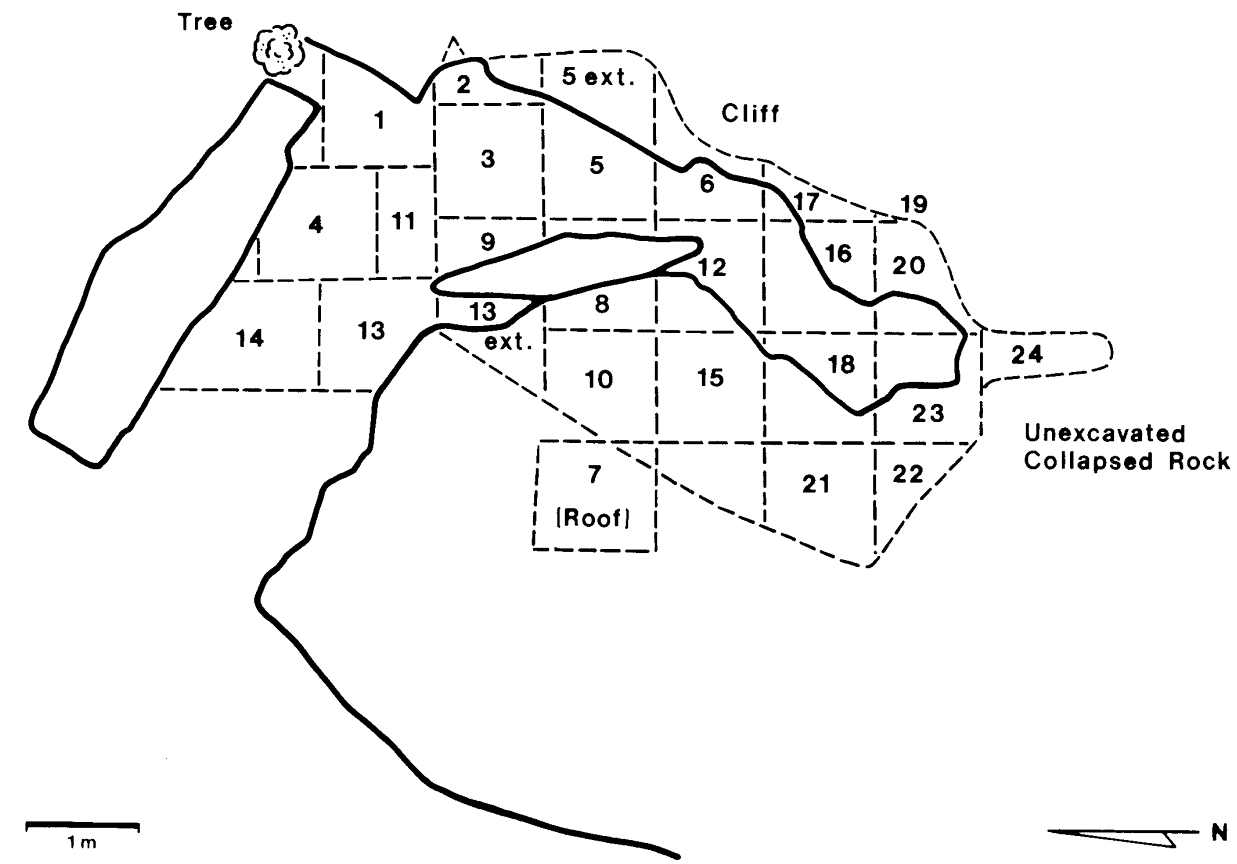

Figure 1. Plan of excavations, Ossining Rockshelter

In 1931, encountering rocks that were difficult to remove, Case stopped digging at the rockshelter. He died a few years later. His 1929 finds were reportedly deposited at the county seat in White Plains, but our efforts to locate this collection have been unsuccessful.

The SUNY Purchase excavations of 1982-1983 yielded remains of Late Archaic, Transitional, and Late Woodland occupations. This dating is based on typological analysis of projectile points and pottery. Organic remains-bones, oyster shells, and nutshells-which might have served as samples for C-14 dating, were recovered; however, in view of the site's lack of stratigraphic integrity, such dates would not be very meaningful, because there would be no way to determine their cultural associations.

The rockshelter floor was excavated in 1 meter squares, proceeding from the northern end. Partial units were excavated where the site's topography made this necessary. Large and heavy rocks had to be removed as the work progressed, making it difficult to maintain square boundaries. All excavated soil was sifted through screens with 1/4 inch mesh, which allowed recovery of very small flakes and bone fragments that would probably have passed through 1/4 inch screens. When artifacts were found in situ, their depths were determined in relation to the surface and to a datum point established on an upright slab at the northern end of the shelter.

Excavation revealed a layer composed largely of fallen rocks of varying size, which was covered by a thin overburden of recent soil and debris (wood, plastic, rusted metal, etc.). Below this rocky layer was a layer of dark brown to black soil that contained many fragments and flecks of bone. Most of the lithic artifacts, and some potsherds, also were found in this layer; however, many potsherds came from the rocky layer, particularly in units on the northern side of the shelter. A tree standing at the northern end of the shelter had sent forth a large root that had pushed southward, along the cliff, through the dark

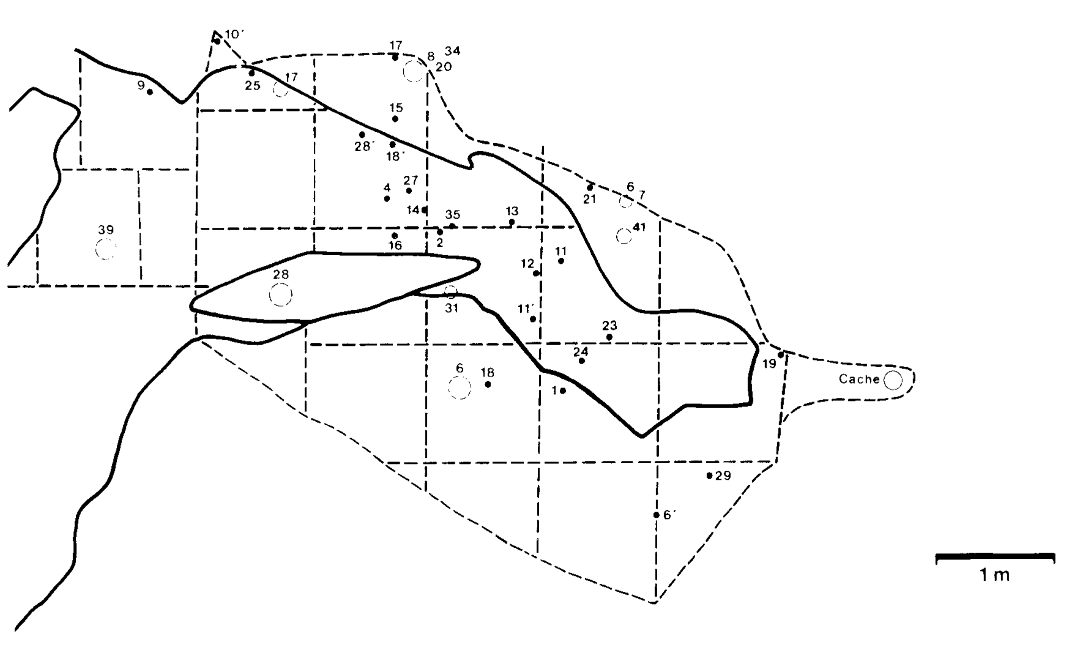

Figure 2. Distribution of In Situ Artifacts (Numbers correspond to numbered illustrations;' refers to Figure 4; dashed circle connotes approximate locus)

brown layer. On the northern side of the shelter, a layer of yellow-reddish sandy silt, devoid of bone and artifacts, lay below the dark brown soil. This sterile deposit also existed in some spots on the southern side, but often the dark brown layer rested on bedrock in this sector. Projectile points and other lithic artifacts were concentrated at a depth of 80 to 140 cm below datum, 60 to 110 cm below the surface. Squares 5 and 6 yielded the greatest quantities of artifacts, bone, and shell. It is likely that Case did little if any digging in the area of these squares, which lie just beyond the mouth of the roofed chamber. A small heap of oyster shells was encountered in Square 6, and a Levanna point was found lying in contact with the shells, at a depth of 1 meter below datum. Several Late Archaic points were found at lesser depths; on the other hand, one Woodland potsherd lay at a depth of 138 cm below datum. Obviously, these objects were not found in their expected stratigraphic relationship. The apparent disturbance of the deposits can be attributed to the activities of roots, worms, insects, and burrowing rodents. Because of this disturbance, it is impossible to assign typologically indistinguishable artifacts or faunal remains to particular periods of occupation.

Thirty three whole or nearly whole projectile points were found, as well as 8 tips, 9 bases, and 1 mid-section piece. These artifacts are listed here in approximate chronological order, according to type. The numbers in parentheses correspond to the artifacts' numbers in the accompanying photographs (Figure 3); other data record excavation unit, depth of specimens found in situ, and lithic material.

Vosburg: 3 whole points ((1): Sq. 18, 53 cm below surface (bs), 114 cm below datum (bd), brown chert; (2): Sq. 12, 78 bs, 98 bd, brown chert; (6): Sq. 17 (conjoined with piece from Sq. 15), 59 bs, 124 bd, grainy brown chert (?)); 2 bases ((3): Sq. 17, screen. find, tan siltstone; (4): Sq. 5, 115 bs, 112 bd, fine grey chert); 1 tip (5): Sq. 5, screen, dull grey-brown chert (probable Vosburg)

Brewerton Eared-Notched: 2 whole points ((7): Sq. 17, 59 bs, 124 bd, tan sandstone (?); (8): Sq. 5, ca. 105 bs, 100 bd, dark brown chert)

Sylvan Side-Notched: 1 whole ((9): Sq. 1, 38 bs, 10 bd, grey chert)

Beekman Triangle: 1 whole ((10): Sq. 3, screen, quartz (possibly a knife))

Narrow Stemmed: 16 whole (cache: (2) grey slate, (3) tan siltstone (?), (4) brown chert, (5) quartz; (11): Sq. 16, 57 bs, 123 bd, grey, tan-mottled chert; (12): Sq. 12, 92 bs, 112 bd, brown chert; (13): Sq. 16, 75 bs, 136 bd, quartz; (14): Sq. 5, 97 hs, 106 bd, black chert; (15): Sq. 5, 120 bs, 109 bd, brown chert; (16): Sq. 8, 89 bs, 89 bd, quartzite; (17): Sq. 5, ca. 100 bd, brown chert; (18): Sq. 15, 57 bd, fine light grey chert; (19): Sq. 24, 47 bs, 112 bd, quartz; (20): Sq. 5, ca. 100 bd, fine grey chert; (21): Sq. 17,

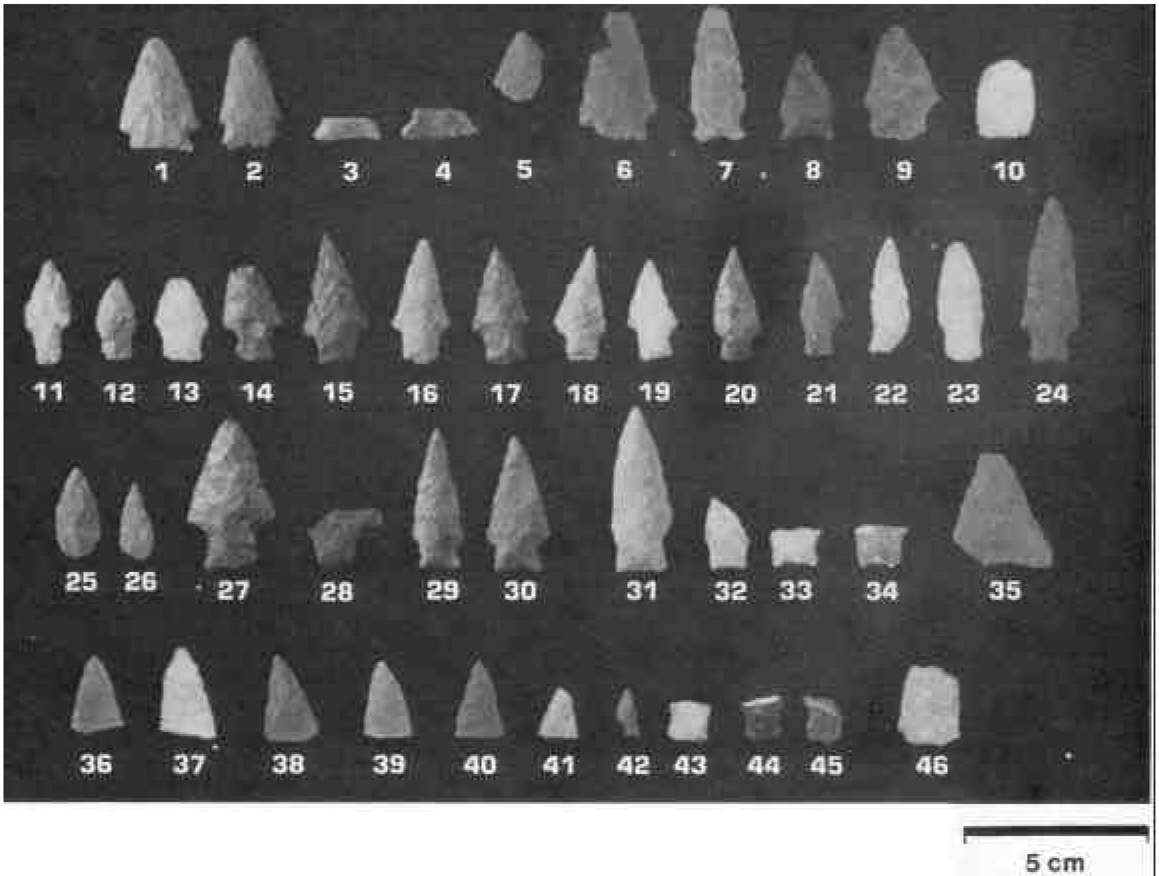

Figure 3. Whole and fragmentary projectile points.

55 bs. 120 bd. brown chert; (23): Sq. 6, 80 bs, 100 b(1, quartz; (24): Sq. 18, 64 bs, 125 bd, black quartzite): 1 mid-section ((46): Sq. 5, screen, quartz); 3 bases ((43): Sq. 20, screen, quartz; (44): Sq. 6, screen. black chert; (45): Sq. 12, screen, black chert); 7 tips ((36): Sq. 16, screen, dark grey chert; (37): Sq. 6, screen, quartz; (38): Sq. 5, screen, dark grey chert; (39): Sq. 4, 30 bs, tan siltstone (same material as Vosburg base from 17); (40): Sq. 16, screen, dark grey chert; (41): Sq. 15, screen, quartz; (42): Sq. 18, screen, grey chert

Atypical Narrow Stemmed-Eared: 1 whole ((22): Sq. 6, surface find, quartz)

Teardrop: 2 whole ((25): Sq. 2, 82 bs, 60 b(1, grey chert; (26): Sq. 12, screen, grey chert)

Broad Stemmed (Bare Island-like): ((27): Sq. 5, 118 bs, 115 bd, fine dark grey chert)

Snook Kill: 1 base ((28): Sq. 13, screen, brown chert)

Normanskill-like: 1 whole ((29): Sq. 22, 80 bs, 122 bd, brown chert)

Dry Brook (Susquehanna-like): 1 whole ((30): Sq. 11, screen, dark greenish-grey quartzite)

Orient Fishtail: 1 whole ((31): Sq. 12, 110 bs, 130 b(1, quartzite); 3 bases ((32): Sq. 5, ca. 100 bd, quartz; (33): Sq. 18, screen, quartz; (34): Sq. 11, screen, fine light grey chert)

Levanna: l whole ((35): Sq. 6, 80 bs, 100 bd, grainy grey chert (?))

Apart from whole and fragmentary points, other lithic artifacts include:

Knives: 6 whole (3 quartzite, 3 chert) (Figure 6, #s 2, 3, 4, 5, 10, 19)

Drills: 1 nearly whole (Figure 6, #l, black chert); 1 quartz tip (#31)

Scrapers: 4 whole (2 quartz, 1 quartzite, 1 chert) (Figure 4, #s 6, 7, 8, 9)

Spokeshave: 1 whole, chert (Figure 6, #20)

Pre-forms: 21-15 of these were found in the cache (Figure 5); the others are #s 11, 12, 14, 15, 29 and 30 in Figure 6. Six of the pre-forms (Figure 5, #s 1 and 2, and Figure 6, #s 11. 12, 14, 29) could have been used as knives. Materials are chert, quartz, siltstone, grey and red slate.

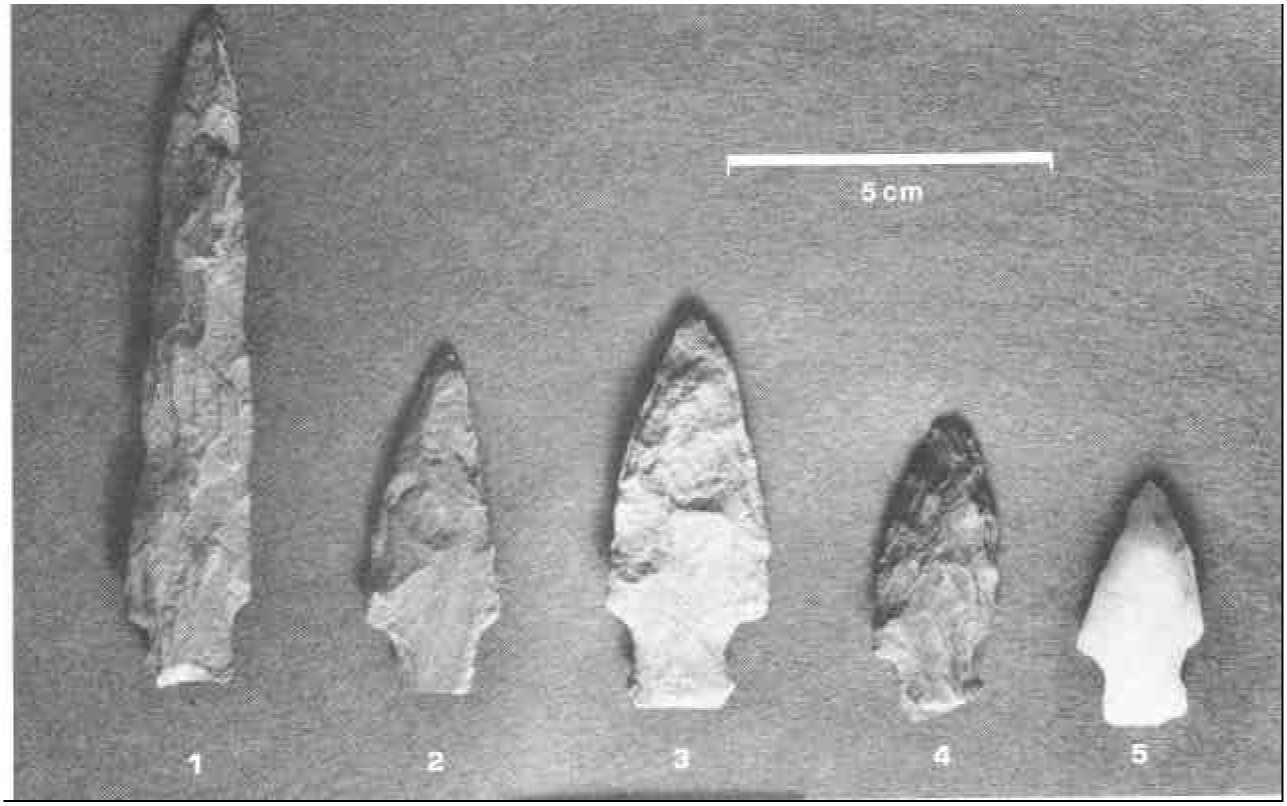

Figure 4. Projectile points from the cache.

Biface segments: 15 (12 are illustrated in Figure 6, #s 13, 16, 17, 18, 21-28).
Polishing or coloring stone, ferrous red material, with artificially planed edges (Figure 6, #36).

Lithic debitage comprised: 2072 pieces of quartz (1214 flakes, 858 chunks and shattered pieces), weighing ca. 7500 grams; 781 pieces of chert, weighing 730 grams; 75 pieces of quartzite (650 grams), 36 pieces of siltstone (29 grams), and 3 small pieces of red slate (2 grams). Several chunks of quartz and one quartzite core were quite large, demonstrating that the knapping activity at the site involved more than mere re-sharpening of bifaces. Some of the quartz chipped at the site may have been derived from a vein of quartz that protrudes from the cliff a few meters north of the shelter. Many quartz pieces, some of which appear to be artifactual, lie on or near the surface below this vein. Most of the chert used by the site's inhabitants was probably collected locally, in the form of glacially transported pebbles. This is indicated by the presence of pebble cortex on numerous flakes, as well as on a few pre-forms. One chert variety, represented by 239 flakes, a knife (#3), 2 whole points and a base (#s 4, 20, 27), was readily distinguished by its clear grey color, almost glassy texture, and minute tan-colored imperfections. Apart from thin biface reduction flakes, only one core remnant of this material was recovered from the site. This piece seems to have been derived from a tabular core, not a pebble. This suggests that this particularly fine chert may have been obtained by trade or expedition from an extra-local quarry. I have been able to re-fit 6 flakes of this distinctive chert, including 2 sequential reduction flakes. The other flakes are all so similar in form and color as to suggest that they were produced during a single chipping episode at the rockshelter.

Although no intact hearths were found, 130 pieces of fire-cracked rock attest to the use of fire at the site, an inference that is confirmed by the numerous fragments of cooked bone that we recovered. Seven water-worn cobbles may have been collected for use as boiling stones, but an impact fracture on one of them suggests that it was used as a hammerstone.

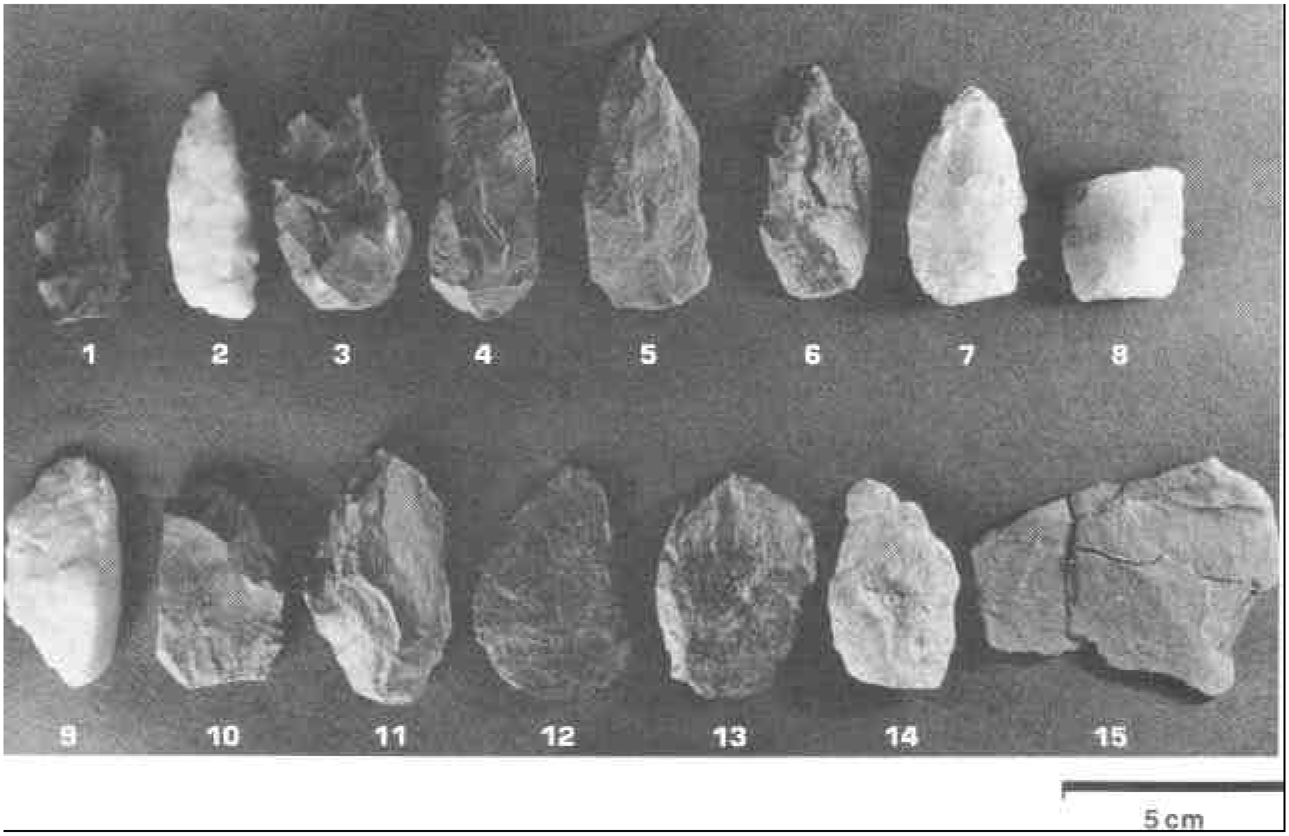

Figure 5. Pre-forms from the cache.

A stone with a roughly pecked encircling central groove may have been used as a netweight (Figure 7). Very few such objects have been found in other Hudson Valley rockshelters (Funk 1976).

Two broken tips of bone tools, perhaps awls, were found at the site (Figure 6, #s 33 and 34). An antler tine, bearing a few whittling marks, evidently was modified for some use, perhaps as a projectile tip (#32). Several other pieces of bone (e.g., #35) and a fragment of turtle shell display polished surfaces or edges, but are too small and amorphous to permit determination of their original form and function. A total of 162 ceramic potsherds were found at the site. These could be divided into 2 lots, on the basis of their temper. One lot consists of 74 sherds tempered with crushed oyster shell and vegetal fibers; the other includes 88 sherds tempered with small chunks (maximum size, 2-3 mm) of a black mineral that has been identified as pyroxenite.

The grit-tempered sherds are cord-marked on the exterior, smooth on the interior. Their color ranges from light yellowish brown (Munsell 10 YR 6/4) to reddish brown (5 YR 4/4). The sherds range in thickness from 5 to 11 mm. Sixteen sherds derived from shoulders or necks of vessels bear clear impressions, in parallel rows, of z-twist knots. Faint traces, observed in molds of these impressions (Figure 9), of regularly spaced strands connecting the rows of knots, suggest that basketry or coarse fabric was used to make the impressions. One of the pots represented by these sherds had a slightly raised collar, decorated with diagonal rows of knot impressions (Figure 8); below the collar, the neck bore at least 5 closely spaced horizontal rows of such impressions, about 1 mm apart. Other decorated sherds, which have rows separated by 2 to 4 mm, may be derived from another vessel. The vessels represented by these cord-impressed sherds appear to be related to the Owasco Corded Horizontal type. Comparable vessels of this type are illustrated by Ritchie and Funk (1973: plates 135-7), and Funk (1976:120, no. 5) shows a similar potsherd from the Claverack Rockshelter. C-14 dates associated with this ware at the Bates site indicate a date of c. A.D. 1100-1200. However, the raised collar and diagonal impressions of the Ossining

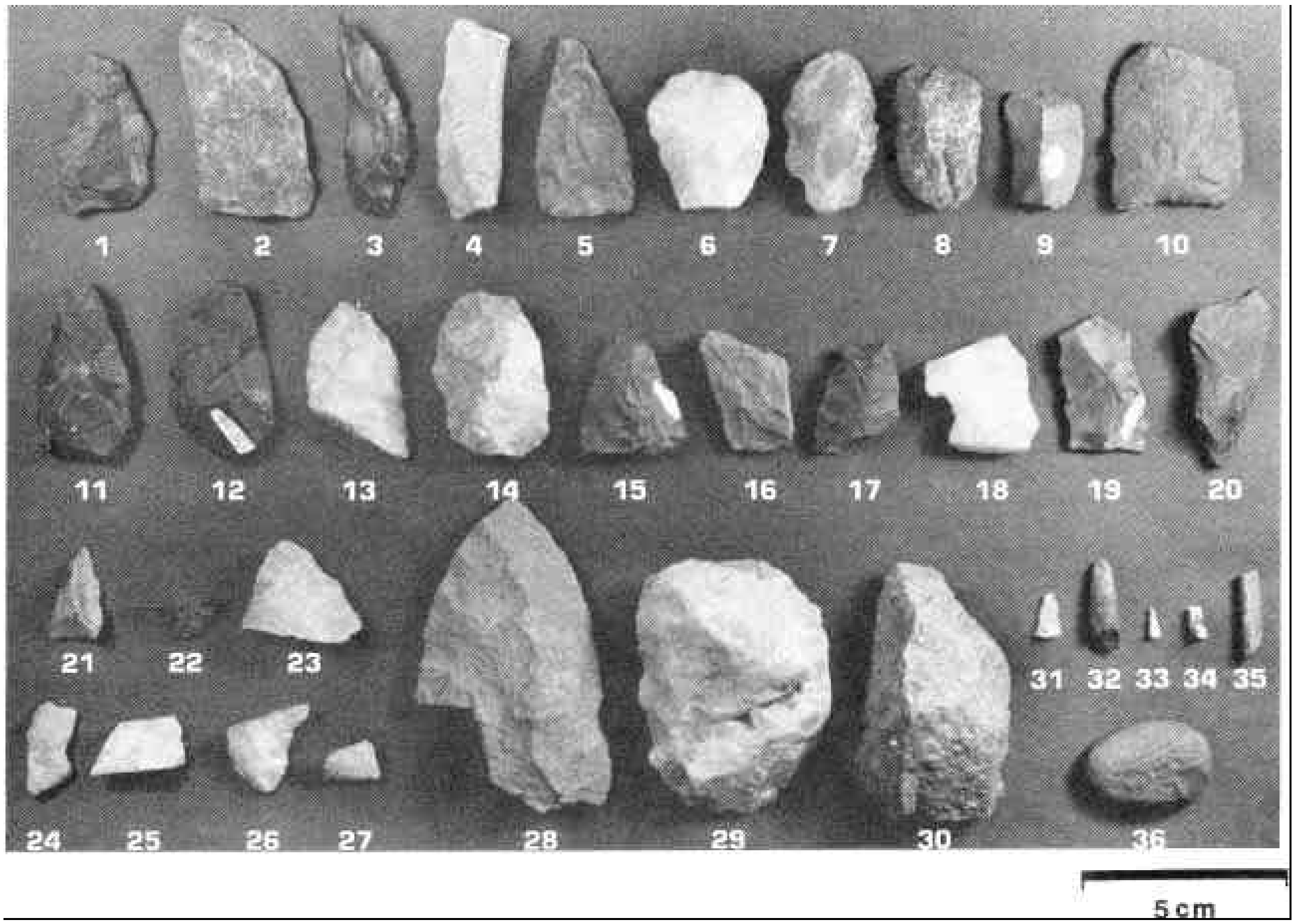

Figure 6. Tools and pre-forms.

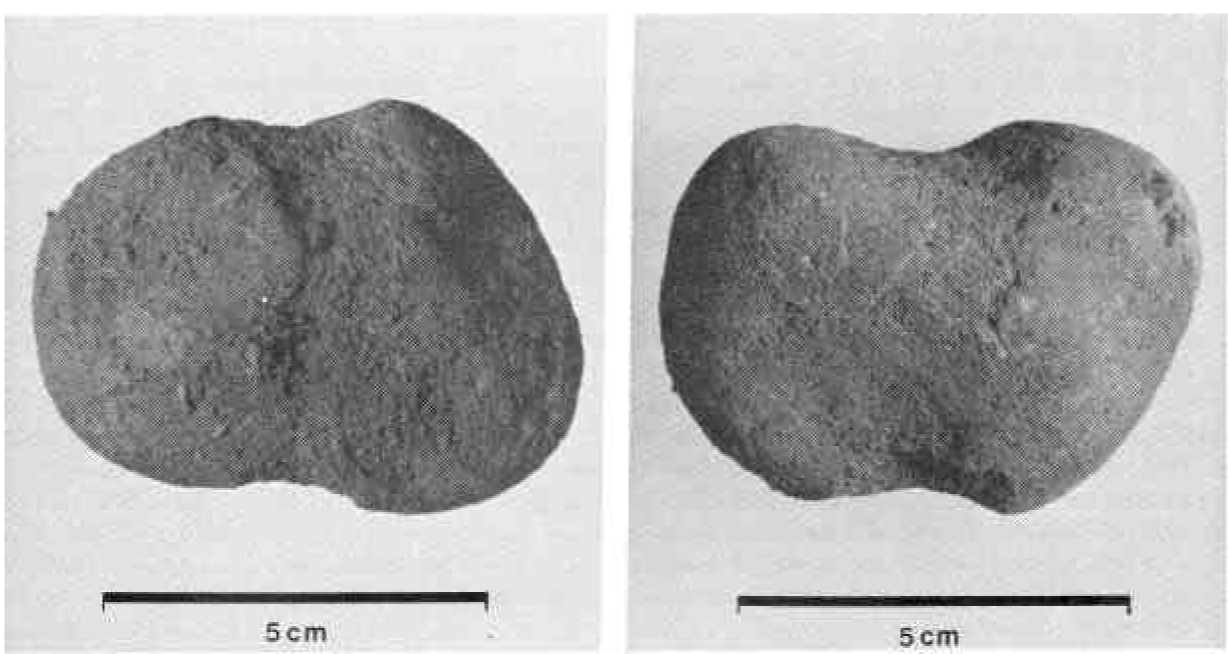

Figure 7. Netsinker (obverse and reverse).

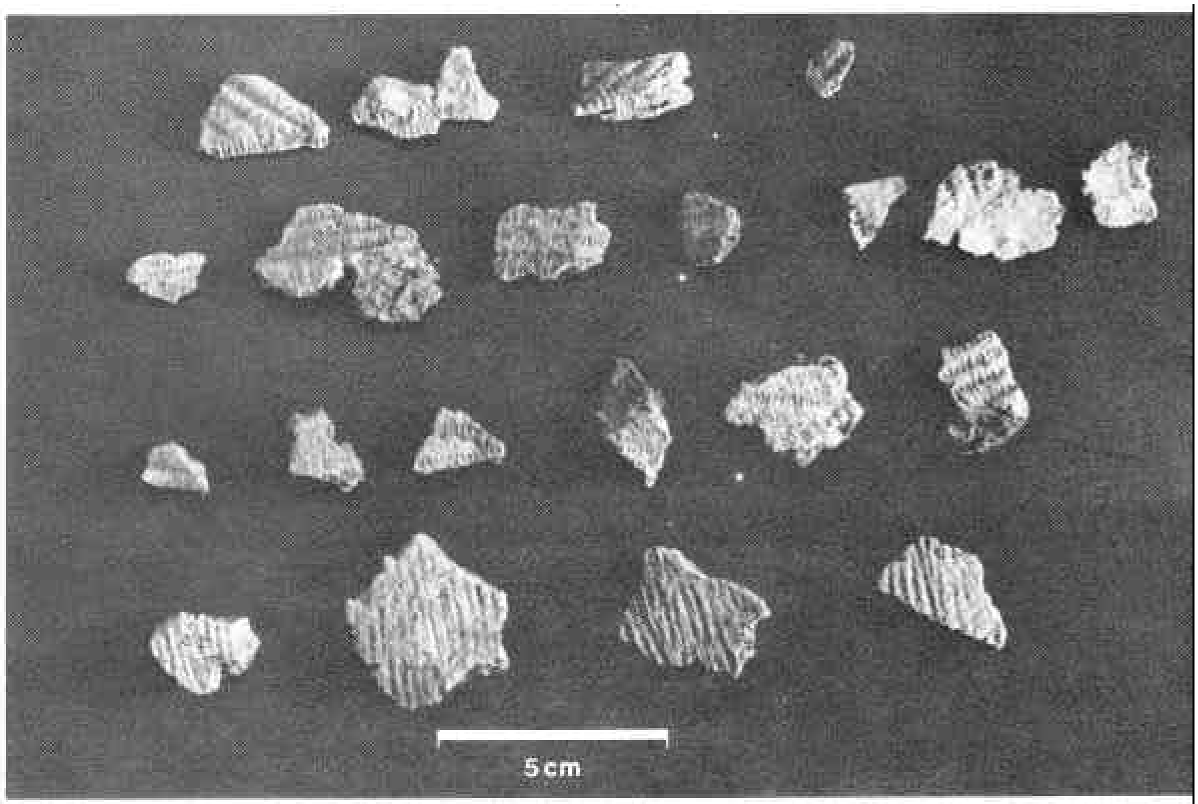

Figure 8. Selected Potsherds with grit temper and cord marking.

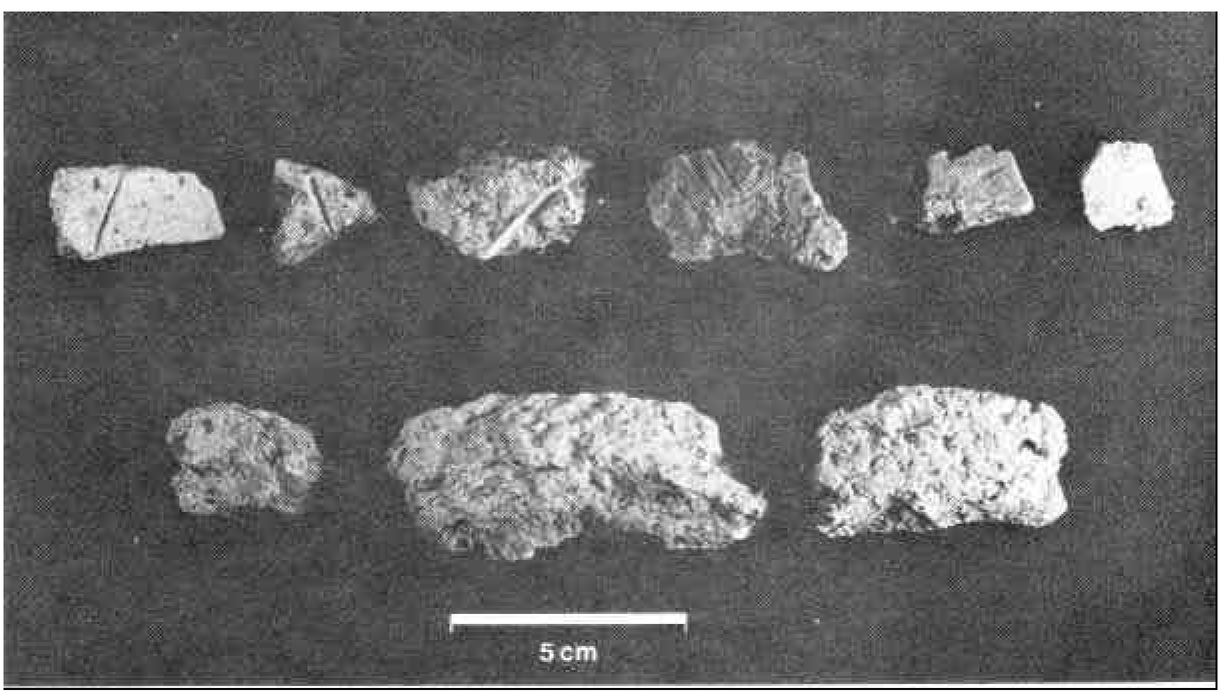

Figure 8a. Selected potsherds with shell temper.

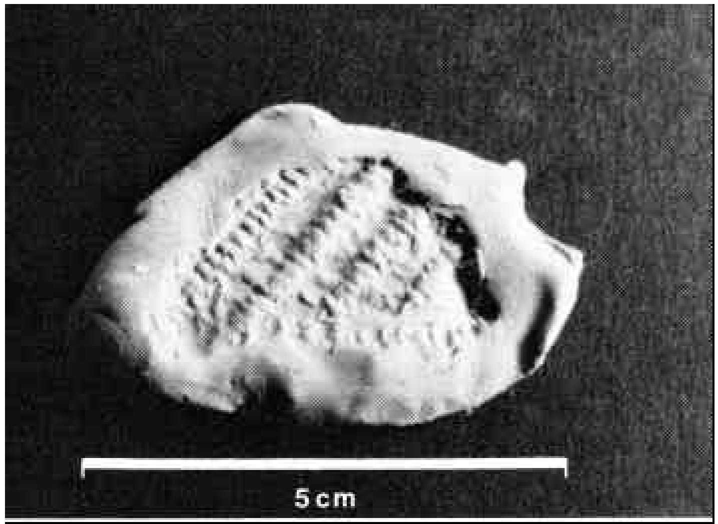

Figure 9. Negative impression of cord-marking, sherd #1.

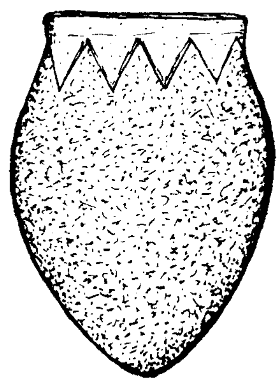

Figure 10. Shell-tempered pot, Ossining Rockshelter. Drawing from sketch by Case 1929.

sherds are also seen in a sherd that Ritchie and Funk assign to the type, Jack's Reef Corded Collar (1973:164, plate 80, no. 6). This is a Middle Woodland type, associated with a C-14 date of AD. 630±100 at the Kipp Island site. So, the Ossining sherds probably date to some time between A.D. 600 and 1200. Occupation of the rockshelter during this period is confirmed by the presence of a Levanna point.

As mentioned above, Case discovered shell-tempered sherds that he arranged to form a nearly complete vessel (Figure 10). This pot measured 14 inches in diameter and 16 inches high. Its rim was slightly flared and was stamped with fine parallel lines. A zig-zag line was incised on the vessel's shoulder. It is possible that some of the shell-tempered sherds we found (Figure 8a) belong to the same vessel. An estimate of the original vessel's diameter, based on the curvature of the largest sherds found, is 33 cm, which agrees quite well with Case's estimate. The incised lines, 2-3 mm wide, found on the exterior surfaces of 5 sherds (Figure 8a), may well have formed part of the zig-zag design illustrated by Case. On one sherd, 2 parallel lines occur; parallel lines can also be seen in Case's photograph. However, the dark grey color of this sherd may imply that it came from another, but similar, pot. The color of most of the shell-tempered sherds ranges from light reddish brown (5 YR 6/3) to light brown (7.5 YR 6/4) on the exterior surface, with a brown (7.5 YR 5/2) interior. Sherd thickness ranges from 6 to 14 mm. The interiors are smooth, but the exteriors are generally roughened. Both surfaces display a slight gloss, perhaps the result of burnishing. A vague stylistic similarity to Ritchie and Funk's Castle Creek Incised Neck type (1973: plate 161, no. 8) and to the coastal Bowman's Brook Incised type suggests a Late Woodland date for Case's pot and our shell-tempered sherds.

Our discovery of 3 small lumps of buff-colored clay, one of which had clearly been kneaded between someone's fingers, raises the possibility that pottery was actually made at the rockshelter. There are clay deposits along the nearby stream, and fragments of the oyster shells that had been carried to the rockshelter from the Hudson could have been used for temper.

Several thousand bone fragments were recovered from the rockshelter (see table). Animals represented by these remains include: white-tailed deer, turkey, turtle, snake, skunk, raccoon, woodchuck, rabbit, squirrel, and fish. Geese may also be present, and other unidentifiable small birds are represented by small, thin-walled, broken and burned bones. The woodchuck bones include a nearly intact skull and several mandibles, as well as whole limb bones and vertebrae. None of these bones show evidence of having been cooked, which suggests that the woodchucks were not eaten by the human inhabitants of the site, but instead died there while hibernating. The same is probably true of the chipmunks, voles, and shrews.

About 120 more or less intact oyster valves, and numerous oyster shell fragments, were found, as well as many small pieces, and 1 whole shell, of ribbed mussel. These shells must have been carried from the Hudson River to the rockshelter. Four pieces of scallop shell, and 84 pieces of the shells of small clams, were probably brought to the site from Long Island Sound. It was apparently not unusual for shellfish to be carried for considerable distances away from the shore, as Harrington (1909) found shells in rockshelters near Armonk, some 15 miles from the Sound. The oyster shells from the Ossining rockshelter measure from 4 to 9 cm in length; oysters of this size are associated with Late Archaic and Transitional artifacts in middens along the Lower Hudson. Brennan (personal communication) found ribbed mussel shells only in "giant oyster" middens, which may date to Middle Archaic times. However, at the rockshelter, mussel shells were clearly associated with small oyster shells. The seeming association of oyster shells with a Levanna point, as well as the inclusion of crushed shell in Late Woodland pottery, indicate that oysters were still being taken from the river in Late Woodland times. Recent finds at the Piping Rock site, on the east bank of the Hudson, support this conclusion (Wingerson, personal communication).

Charred pieces of hickory nutshells are the only remnants of the vegetal portion of the prehistoric inhabitants' diet. These nutshells imply occupation of the rockshelter during the fall. The fish vertebrae, shellfish valves, snake vertebrae, and turtle shell and bones suggest that the site was occupied during the spring, summer, or fall. Analysis of the deer remains provides rather tenuous evidence of fall occupation. Based on comparative study of the teeth, it seems that a minimum of 3, possibly 4 deer were butchered at the site. Their ages at death were: 1) 1 year, 4-5 months; 2) 2 1/2 years; 3) 8-10 years; 4) more than 6 years (possibly the same individual as #3). Deer generally give birth in late May or early June; thus, we can infer that deer #1 was killed in September or October, and deer #2 was probably killed around November. These death-dates support the assumption that rockshelters were occupied primarily during the fall and winter.

Point typology indicates that the earliest occupation of the Ossining Rockshelter occurred c. 3400-2300 B.C. (uncalibrated dates for the Vosburg complex). The site was most frequently used by makers of Narrow Stemmed points (c. 2400-1600 B.C.). The catch-all category "Narrow Stemmed" used here subsumes several types that have been referred to by different names in the literature on Northeastern prehistory: Lamoka, Wading River, Sylvan Stemmed, Taconic, and Bare Island. These distinctive names may correspond, to some extent, to regionally varying cultural traditions. However, Funk (1976:158) found that the 173 points from Stratum 2 of the Sylvan Lake Rockshelter, which could be broken down into groups corresponding to named types, nevertheless belonged to a single component, and "had obviously been made and used by a single people" (1976:247). He suggests that the term "Sylvan Stemmed" should be applied to all such points from the Hudson Valley. Funk leaves open the question whether the observed morphological variation should be regarded as essentially random, or might reflect functional, chronological, or micro-traditional factors. Brennan (1967) had previously noted variation in shape and stem form in points he assigned to the "Taconic" tradition, and sought to arrange the variants as a chronological series. Funk (1976:248) notes that Kinsey, Holzinger, and Kent, who examined points from the Wading River, Hornblower, and Sylvan Lake sites, agreed that each assemblage included "one or two" Bare Island points, whose average length is 2 inches. Four of the stemmed points from the Ossining Rockshelter can be classified, on the basis of size and shape, as Bare Island points (Figure 3, #s 24 and 27; Plate 2, #s 2 and 3). The points in Figure 4 were associated with a Lackawaxen Stemmed point (#1), in the cache (described in detail in Fiedel 1984). The Lackawaxen type seems to have been indigenous to the Delaware Valley and intrusive in the lower Hudson region. Similarly, Bare Island points appear to be more characteristic of Late Archaic assemblages in Pennsylvania and New Jersey than in New York. In my earlier paper dealing with the implications of the cache, I suggested that the Lackawaxen might have reached the Hudson Valley after a series of inter-band exchanges. The occasional presence of Bare Island points at sites in eastern New York may be ascribed to similar exchanges, although we cannot rule out the possibility that northward-migrating groups may have penetrated the Hudson Valley from time to time. The Ossining cache might conceivably represent such a group's brief occupation of the rockshelter.

The chronological significance of the narrow stemmed points also calls for some discussion. Recently, narrow stemmed points have reportedly been found in association with Woodland ceramics at several sites in southern New England. If these associations bear up under further scrutiny, we will no longer be able to treat narrow stemmed points as reliable indicators of the Late Archaic age of sites that cannot be dated by other means. However, it should be noted that the great majority of stemmed points found by Funk (1976) at Sylvan' Lake and several other stratified sites were restricted to strata of Late Archaic age. The stemmed points from the Ossining Rockshelter display a degree of stylistic uniformity that suggests that they might have been produced over the coarse of a few hundred years perhaps, but not 3 millennia. I therefore continue to assign these points to the period from 2400 to 1600 B.C.

A Normanskill-like point, and a Dry Brook or Susquehanna-like point, which resemble one another enough to be regarded as variants of a single type, indicate occasional occupation of the shelter around 1900-1500 B.C. (River phase). The Snook Kill base dates to about 1600-1500 B.C., and the complete Orient Fishtail point and basal fragments can be dated to about 1000-700 B.C. There are no points in the collection that can be assigned to the Early or Middle Woodland periods. One Levanna point indicates occupation during late Middle Woodland or Late Woodland times (c. A.D. 900-1300); the potsherds found at the site also date to this period. The apparent gap in occupation from 700 B.G. to A.D. 900 is consistent with the general pattern observed at other rockshelters in the Hudson Valley (Funk 1976). Possible explanations of this pattern are: 1) decreased population, 2) a shift in settlement pattern, and 3) persistence of Late Archaic stemmed point types into Woodland times. Even if we were to accept attribution of some of the stemmed points to the post-Archaic period, we would still have to explain the paucity or absence of recognized Early and Middle Woodland points, such as Rossville, Adena, Lagoon, Meadowood, and Fox Creek, at the Ossining site and in other rockshelters in the Hudson Valley.

Obviously, in view of the unknown quantities of artifacts removed from the Ossining Rockshelter by Case, and the relatively small sample of points at our disposal, it would be unwise to use the relative percentages of artifacts present as the basis for estimation of Late Archaic vs. Woodland populations or frequency of site visitation. However, the larger, intact collection from the nearby Hanotak Rockshelter conveys the same impression of intensive Late Archaic occupation and a subsequent near abandonment of the site. The Hanotak collection includes 12 points of Vosburg or Brewerton type, 91 narrow stemmed points, 7 Snook Kill-like points, 1 Susquehanna Broad point, 1 Genesee point, 4 Orient Fishtail points, 3 Jack's Reef Pentagonal points, 9 Levanna points, and 6 which may be Beekman triangle or Levanna points. As in the smaller Ossining Rockshelter collection, Early Woodland types are absent. Also noteworthy is the paucity of Transitional material, relative to the abundance of Late Archaic stemmed points. This situation contrasts sharply with that observed in surface collections from the northern shore of Long Island Sound, where Orient Fishtail points are much more numerous than any other type. Funk (1976:266) has noted that only 6.5% of Susquehanna Broad points and 5.2% of Orient Fishtails found in the Hudson Valley came from back-country rockshelters. He suggests that the people who made Orient Fishtail points often camped along major inland streams, and also set up camps on high bluffs overlooking the Hudson, during the fall and winter. I have recovered significant quantities of deer bone from oyster shell middens at Croton Point which also yielded points of Transitional and Early Woodland types. If deer hunting was primarily a fall activity, as is generally assumed, the evidence from Croton Point would be consistent with Funk's model of Transitional settlement patterns. Concerning the Early Woodland material from the Hudson Valley, Funk observes that "Both Adena and Meadowood points are quite

Rarely encountered in rockshelters, where they are actually less common than nearly all other types", and he further notes "the extreme rarity of Vinette pottery on inland rockshelters" (1976: 278). He concludes that Early Woodland groups camped near the Hudson or its major tributaries throughout the year, rarely moving inland. The absence of Early Woodland material at the Ossining and Hanotak sites is consistent with this model. The overall scarcity of Meadowood and Adena-Middlesex material in the Hudson Valley raises the possibility that, not only did the settlement pattern change, but a significant reduction of population also occurred in the Early Woodland period.

The predominance of Narrow Stemmed points in the Ossining collection, and the presence of Vosburg points, fit the pattern discerned by Funk at other inland rockshelters in the Hudson Valley. He suggests that Vosburg bands camped beside rivers, streams, and lakes during the spring and summer; in the fall and winter, these groups dispersed into nuclear families or small multifamily units, which used rockshelters as hunting camps "while fishes, turtles, mussels, and other aquatic species were not accessible in frozen streams, while migratory birds were far to the south, and while certain mammals were in hibernation" (Funk 1976: 246). He notes that "inland rockshelters and open camps invariably fail to produce such items as plummets, ground slate points, and ulus. Only two shelters have contained gouges" (1976: 245). Funk observes that "of the classic non-projectile point Laurentian traits, only the ulu is moderately numerous in the lower Hudson Valley, and this is due to its remarkably high incidence on the Bannerman site. The gouge is unreported south of the Hudson-Catskill area, to the writer's knowledge. Plummets are absent from collections south of the latitude of Newburgh. Ground slate points or knives are unknown south of Coxsakie" (1976: 244). In view of Case's report of a slate knife, gouge, and plummet found at the Ossining Rockshelter, the known distribution of these Laurentian traits must now be extended southward.

Funk reconstructs the subsistence-settlement pattern of the Sylvan Lake (Narrow-Stemmed) complex as essentially the same as that of the preceding Vosburg complex. Campsites on lakes, tributaries, and on the banks of the Hudson were "warm-weather hunting, fishing, and plant-collecting stations … In the fall, Sylvan Lake groups began to disperse to back-country locations where they concentrated their skills on tracking and killing deer. During the cold months some hunters – accompanying their families – took refuge in rockshelters or caves and small open camps, but others, occasionally perhaps in parties of band size, seem to have lived on bluff sites, or inland streams" (Funk 1976: 252).

If we assume, as seems reasonable, that most of the food debris from the Ossining Rockshelter, like the great majority of the lithic artifacts, is of Late Archaic age, this material suggests a more complicated situation than that outlined by Funk. Apart from the numerous deer bone fragments, remains of turtles, snakes, oysters, fish, and small birds were also found at the rockshelter. A probably net weight was also found, which offers further evidence that the site's inhabitants were doing fishing, in a stream, that was not yet frozen. The remains of animals that would have been most readily taken during the spring, summer, or early fall imply that the Late Archaic occupation of the rockshelter was not limited only to the winter months.

As suggested above, the proximity of the Hanotak Rockshelter must be taken into account in seeking to explain the role of the Ossining site in the Late Archaic settlement-subsistence pattern. There are strong similarities between the narrow stemmed points found at the two shelters, as one would expect to find at sites that are so close to one another. These points are numerically predominant at both sites, which argues against the possibility of alternating use during successive prehistoric periods. However, we obviously do not have fine enough chronological control to rule out the possibility that a single family may have camped at the Ossining Rockshelter one year, and at the Hanotak site the next. Indeed, this seems to be the most likely explanation of the situation. Otherwise, groups occupying these sites contemporaneously would have been exploiting virtually the same catchment area, which would have been a big-risk strategy during seasons when resources were no abundant. The diversity of activities represented by the finds from the Ossining site – hunting (points), butchering (knives), hide or wood-working (scrapers, drills, bone awls), stonechipping, and cooking and consumption of food – refutes the idea that the site might have been used only by specialized task groups, such as hunting parties. However, the possibility remains that the shelter may have served, at different times of the year, as a base camp, transient camp, or hunting camp. Binford (1982) has observed such multiple use of sites among the Nunamiut Eskimo.

The significant finds that resulted from excavation of the Ossining Rockshelter show that reinvestigation of previously excavated sites may be a very rewarding endeavor. Early diggers were often careless; when Harrington (1909) sifted his own backdirt pile at Finch's Rock House, he recovered no fewer than 95 projectile points, in addition to other artifacts. Fortunately, most of Harrington's finds from rockshelters in the Armonk region are still stored at the American Museum of Natural History, unlike Case's finds from the Ossining Rockshelter, which have disappeared. Re-examination of the extant collections, and new excavations of rockshelters, may yield further insights into the problems of chronology and cultural reconstruction that have been raised here.

FAUNAL REMAINS

White-tailed deer (*Odocoileus virginianus*): 175 identifiable pieces, 4425 small fragments
Turtles (probably *Chelydra serpentina* (snapping) and *Chrysemys picta* (painted)) 329 pieces (303 carapace or plastron fragments, 6 claws, 4 beaks, 16 bones)
Birds (species?): 286 larger pieces, 1617 small fragments
Turkey (*Meleagris gallopavo*): 11 pieces
Goose (*Branta canadensis*): 1 piece
Woodchuck (*Marmota monax*): 46 identifiable pieces, 27 fragments Eastern squirrel (Sciurus carolinensis): 17 identifiable pieces
Eastern cottontail rabbit (*Sylvilagus floridanus*): 16 identifiable pieces
Striped Skunk (*Mephitis mephitis*): 12 identifiable pieces
Voles (*Microtus* sp.): 10 identifiable pieces
Least shrew (*Cryptotis parva*): 3 pieces
Chipmunk (*Tamias striatus*): 3 pieces
Raccoon (*Procyon lotor*): 3 pieces (1 mandible, 2 teeth)
Small mammals, non-ID: 140 pieces (135 limb bones, phalanges, scapulas, and 5 teeth)
Snake (species?): 36 vertebrae
Fish (species?): 4 vertebrae
Beaver (*Castor canadensis*): 1 incisor fragment
Human (*Homo sapiens sapiens*)?: 1 orbital fragment of frontal, possibly from a neonate
Oyster (*Crassostrea virginica*): 152 valves and numerous fragments
Ribbed mussel (*Modiolus demissus*): 1 valve, ca. 215 fragments
Hard clam (*Mercenaria mercenaria*): 1 definite fragment
False quahog (*Pitar morrhuana*): 1 valve, 82 thin-walled pieces could be either Mercenaria or Pitar
Bay Scallop (*Aequipectens irradians*): 4 fragments
Snail (species?): 31 whole shells and fragments

FLORAL REMAINS

Hickory (*Carya sp.*): 46 charred nutshell fragments

ACKNOWLEDGEMENTS

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Map enhancements by Tricia Miller

THE ACHIEVEMENT AWARD

Charles M. Knoll (1958)
William A. Ritchie (1962)
Thomas Grassman O.M.F. (1970)
Robert E. Funk (1977)
Louis A. Brennan (1960)
Donald M. Lenig (1963)
Paul L. Weinman (1971)
Peter P. Pratt (1980)

FELLOWS OF THE ASSOCIATION

Roy Latham
William A. Ritchie
Charles F. Wray
Alfred K. Guthe
Julius Lopez
Marian E. White
Donald M. Lenig
Thomas Grassman O.F.M.
Bruce Rippeteau
Franklin Hesse
Gilbert Hagerty
Donald A. Rumrill
Richard L. McCarthy
R. Arthur Johnson
Stanley Vanderlaan
Robert E. Funk
Edward J. Kaeser
Robert Ricklis
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Bert Salwen
Herbert C. Kraft
Peter P. Pratt
William Engelbrecht
Louis A. Brennan
Paul Weinman
Thomas Weinman
Audrey Sublett
Theodore Whitney
William S. Cornwell
Gordon K. Wright
James A. Tuck
Paul Huey
Dolores Elliott
Monte Bennett

CERTIFICATE OF MERIT

Franklin J. Hesse
Stanford J. Gibson
Peter P. Pratt
Monte Bennett
Richard E. Hosbach
Gordon DeAngelo
Neal Trubowitz
William F. Ehlers
Dolores N. Elliott
R. Michael Gramly
George R. Walters
Elizabeth Dumont
Marjorie Pratt
George R. Hamell
John H. McCashion
Roger Ashton
William D. Lipe
Marilyn C. Stewart
Beth Wellman
Lewis Dumont
Henry Wemple
James Walsh
Charles Vandrei
James Bradley
Daniel M. Barber
Harold Secor
Albert D. LaFrance
Gwyneth Gillette