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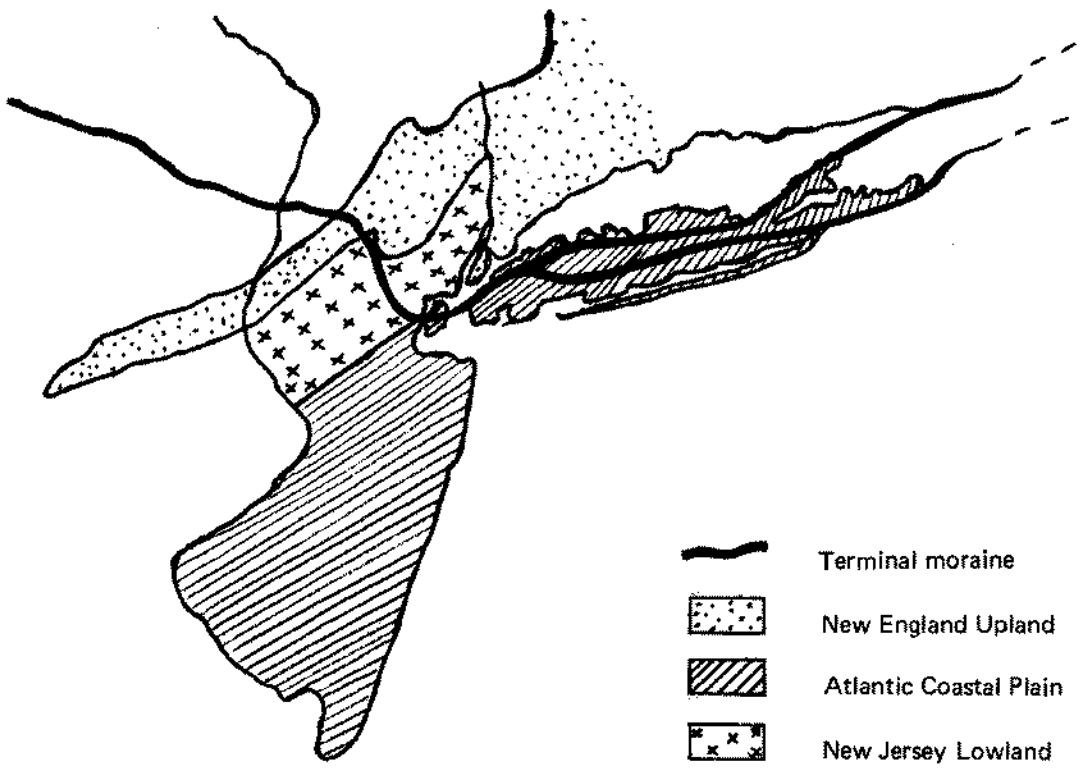

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AN ANALYSIS OF THE LITHIC MATERIALS USED IN THE MANUFACTURE OF PROJECTILE POINTS IN COASTAL NEW YORK

Edward S. Rutsch Metropolitan Chapter

Introduction

This study analyzes the 8227 projectile points from eight counties of coastal New York State found in the study collections of the Heye Foundation's Museum of the American Indian. The artifacts resulted from the serious excavation by such pioneers in local archaeology as Alanson Skinner, as well as from gifts, purchases, and random collecting throughout the museum's half-century of history. They are first grouped into their respective point types and then analyzed by material of manufacture. Finally, they are organized by county of origin.

The collection examined is extensive, although its generally incomplete documentation renders it less useful in some ways than artifact assemblages from recent serious archaeological endeavors. Effects of factors such as selectivity of artifact retention by collectors are apparent, but impossible to assay. Certainly unavailable are chippage and field notes regarding exact geographical location and/or stratigraphy.

Yet collections such as this one, which reflect in quality much of what is available in the museums in which I have worked, do have a value. Inspection of these artifacts reveals factors of lithic composition, morphology, and wear patterns. Provenience, although usually general, is often helpful, such as in the present case where the geographical unit is a county. Finally, the tremendous volume of material alone in such a collection aids the analyst in discovering basic trends by giving him a perspective unavailable to those researchers dealing with small numbers of artifacts.

Geographical Area

The geographical area of this study is coastal New York State. It includes eight counties: three in the physiographical New England Upland Province -Westchester, Bronx, and New York; and five in the physiographical Atlantic Coastal Plain Province-Richmond, Kings, Queens, Nassau, and Suffolk (Schuberth 1968: front cover; see also Fig. 1). Only Westchester and the Bronx are on the mainland. Kings, Queens, Nassau, and Suffolk comprise Long Island, and New York and Richmond are themselves islands. A breakdown by county follows.

Westchester County, the northernmost, is situated between the Hudson River on the west and Long Island Sound and Connecticut on the east. Putnam County is to the north and Bronx County is to the south.

Bronx County is bounded on the north by Westchester County, on the east and south by Long Island Sound, and on the west by the Harlem and Hudson Rivers.

New York County includes Manhattan Island--14 miles long and 2.3 miles wide-and several small islands. It lies between the East and Hudson Rivers. The Harlem River separates Manhattan from the Bronx to the northeast, and New York Bay is to the south.

Richmond, or Staten Island, is an island of about 60 square miles southwest of Manhattan across New York Bay, which forms its eastern boundary. It is separated from New Jersey on the west by Arthur Kill and on the north by Kill van Kull. Raritan Bay is directly to the south.

Kings County, or Brooklyn, is located on the extreme southwest portion of Long Island. Its boundaries are as follows: on the west, Lower New York Bay, the Narrows, Upper New

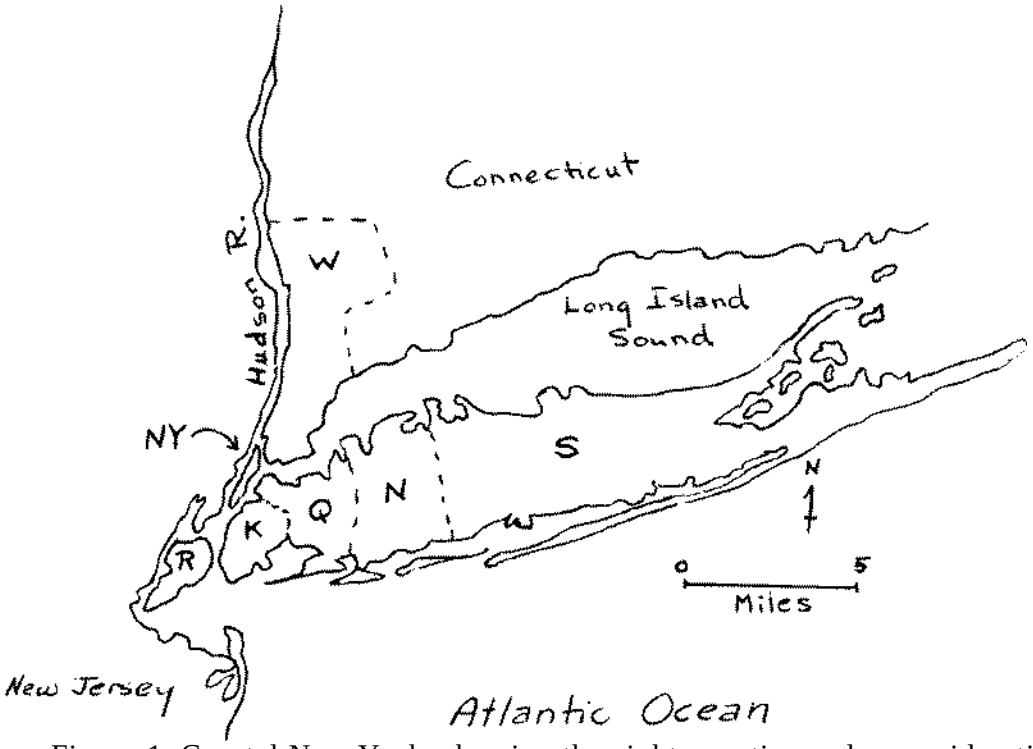

Figure 1. Coastal New York, showing the eight counties under consideration.

York Bay; on the north, the East River and Queens; on the east, Queens and Jamaica Bay; on the south, the Atlantic Ocean.

Queens County is separated from the Bronx on the north by Long Island Sound.

Nassau County is to the east, Jamaica Bay and the Atlantic to the south, and Kings County and the East River to the west. Nassau County, approximately 16 miles wide, is bounded by Queens to the west, Long Island Sound to the north, Suffolk County to the east, and the Atlantic to the south. Suffolk County is bounded by Nassau County to the west, Long Island Sound to the north, and the Atlantic to the east and south. Thus, Staten Island and Long Island constitute the Coastal Plain Province, which include the terminal moraines of two advances of the Labrador ice cap. On Long Island, the moraine lies closer to the north shore than to the south, where we find outwashes from it. In general, the low hills to the north and the marine climate tend to give Long Island a distinctively milder climate than the surrounding mainland (Smith 1950: 101). In Richmond, the moraine is located

Table I

Projectile Point Distribution by County

County	No. Points
Westchester	565
Bronx	538
New York	165
Richmond	816
Kings	139
Queens	142
Nassau	1282
Suffolk	4580
	Total 8227

in the extreme north; a generally flat, sandy plain extends over the remainder of the island.

In the New England Upland Province the glaciers left low, rounded hills, fast-moving streams, and much erratically deposited glacial debris.

Point Distribution by County

The breakdown on page 2 (Table I) of all the projectile points studied reflects, of course, the total amount of field work done by the museum in each area. This, in turn, reflects in part the availability of aboriginal sites in the area at the time when most of this field work was done (ca. 1900-1940). The areas of highest urban density in New York City tend to have fewer known sites and have produced fewer artifacts.

Point Distribution by Type

The 8227 projectile points studied were classified according to the types specified by Ritchie in his Typology *and Nomenclature for New York Projectile Points* (1961). As Ritchie suggests, this typology is a first attempt at regularizing both the terminology and the classifying process for the prehistorians that study the area. I agree with Ritchie when he states that "continuing research within the area will lead to the addition of new types, and, with some probability, to certain revisions of the series. . . ." (Ritchie 1961:5).

The concept of a typology that is determined by morphological features alone is being reexamined. Most types defined by Ritchie have proved to have cultural and historical reality; therefore, their use for the purposes of this study seems justified. Soon new methods, such as functional and petrographical analyses, will add much to our present knowledge, and may very well lead to substantial revisions of the existing data concerning use and cultural affinity of stone tools.

Table II lists alphabetically the types as they are defined by Ritchie with the total number of specimens of each type found in the coastal New York collection of the museum. In my research, I have attempted to group the points into pre-Woodland and Woodland periods, and I have compared the materials found in each period, asking myself two questions. Had trade or travel for desired material changed over a long period? Had there been some change in the popularity of local material?

Point Distribution by Material

Instead of restating the petrological nomenclature, I direct the reader to the work I used as a standard source for this study: Horace G. Richards, *Petrology of the Chipped Artifacts of the State of Delaware* (1941). Table III gives the breakdown of the projectile points by material of construction.

Point Distribution by Material and Geography

When taken as a single unit, the eight-county area would seem to consist of three geological areas that relate to the physiographical provinces already discussed and shown. Westchester, Bronx, and New York counties, part of the New England Upland Province, have a similar geological makeup, reflected in the materials used for tools. Geographically, these three counties lie closer than the other five to the upriver chert sources, as well as to the earliest route to them-the Hudson Valley. Therefore, it is not surprising to

Table II

Projectile Point Distribution by Type

Type	No. Points
Adena	52
Bare Island	168
Brewerton Corner-Notched	63
Brewerton Eared-Notched	36
Brewerton Eared-Triangle	52
Brewerton Side-Notched	630
Clovis	5
Jack's Reef Corner-Notched	63
Jack's Reef Pentagonal	265
Lamoka	3898
Levanna	1770
Madison	253
Meadowwood	48
Normanskill	37
Orient Fishtail	166
Perkiomen Broad	2
Poplar Island	274
Rossville	62
Snook Kill	75
Steubenville Lancelate	90
Steubenville Stemmed	166
Susquehanna Broad	52
Total	8227

find chert in great abundance here. (We cannot forget the fact that glacially moved chert appears in each area in as yet unknown quantities).

The Long Island counties-Kings, Queens, Nassau, and Suffolk--reflect the sandy moraine and glacial outwash characteristic of the Atlantic Coastal Plain Province. Quartz was commonly used for tools from these counties. In historic times, the aborigines had close ties with the coastal Indians of Connecticut, perhaps indicating that some of their prehistorical stone sources were actually in Connecticut. The very small percentages of materials other than quartz and quartzite in Nassau and Suffolk, the two easternmost counties, seem to suggest a surprisingly slight amount of contact, by trade or seasonal movements, with peoples to the west and northwest. The western counties of Long Island-Kings and Queens-show a more mixed use of material. Upriver cherts and western New Jersey and Delaware River materials were utilized as well as the native sources.

As already mentioned, Richmond County belongs, with Long Island, to the Atlantic Coastal Plain Province. It is materially tied to New Jersey and the Delaware Valley, sources of the felsite and argillite used by the Staten Island aborigines. (My study has proved useful in discovering that some materials thought to be exclusively exotic have local sources as well. Jasper, for example, considered a Delaware Valley material, is found in Staten Island in various shades of brown: Rutsch 1968). In historical times, the Delaware Indians actually lived across this area. In fact, the Canarsee Indians of Kings County were a branch of the Delaware people, possibly accounting for some of the New Jersey material found there (Bolton 1920:271).

Table IV and the map in Fig. 2 show the possible directions of the influx of lithic materials into the coastal area. Table V shows the breakdown of points by material and county.

Point Distribution by Period and Material

To determine if a relevant change occurred in the materials used in time, I divided the points into two groups: Woodland and pre-Woodland. I listed as Woodland points those so listed by Ritchie (1961), with the exception of Steubenville stemmed and Steubenville Lancelate, found in Woodland sites in the New York coastal area (see Table VI; Kaeser 1968).

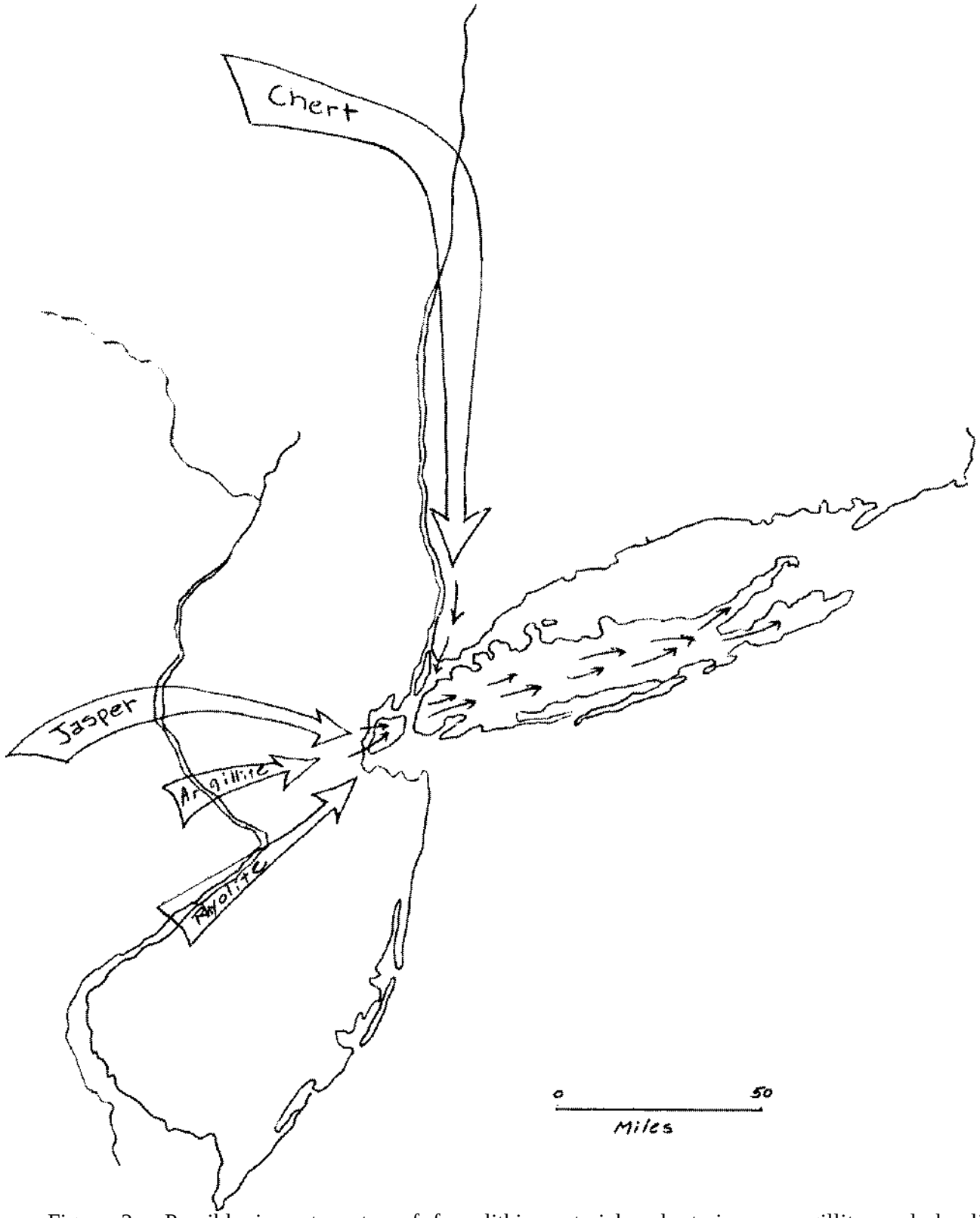

Figure 2. Possible import routes of four lithic materials -chert, jasper, argillite, and rhyolite (felsite)-used by coastal New York aborigines.

Table III

Projectile Point Distribution by Lithic Material of Construction

	Material	No. Points
Cryptocrystalline Quartz	Quartz	5316
	Quartzite	293
Cryptocrystalline Quartz — Chert	Black	326
	Gray	782
	Green	31
	Creamy	103
	Jasper	269
	Chalcedony	15
Igneous	Felsite	335
	Granite diabase	239
Sedimentary	Argillite	446
	Red shales	45
	Gray shales	18
	Red sandstone	9
	Total	8227

Table IV

Source of Lithic Materials Used in Projectile Point Manufacture

Exotic to Coastal N. Y.	Possible Sources
Chert: Black, Gray, Green	glacial movement — North
Jasper*, Creamy Chalcedony	generally West
Felsite, Argillite	
2307 total	

Local to Coastal N. Y.	Possible Sources
Quartz, Quartzite, Granite diabase, Shales, Sandstone	local outcroppings
5920 total	

*As previously mentioned, some small amounts of jasper are found in Staten Island (Rutsch 1968).

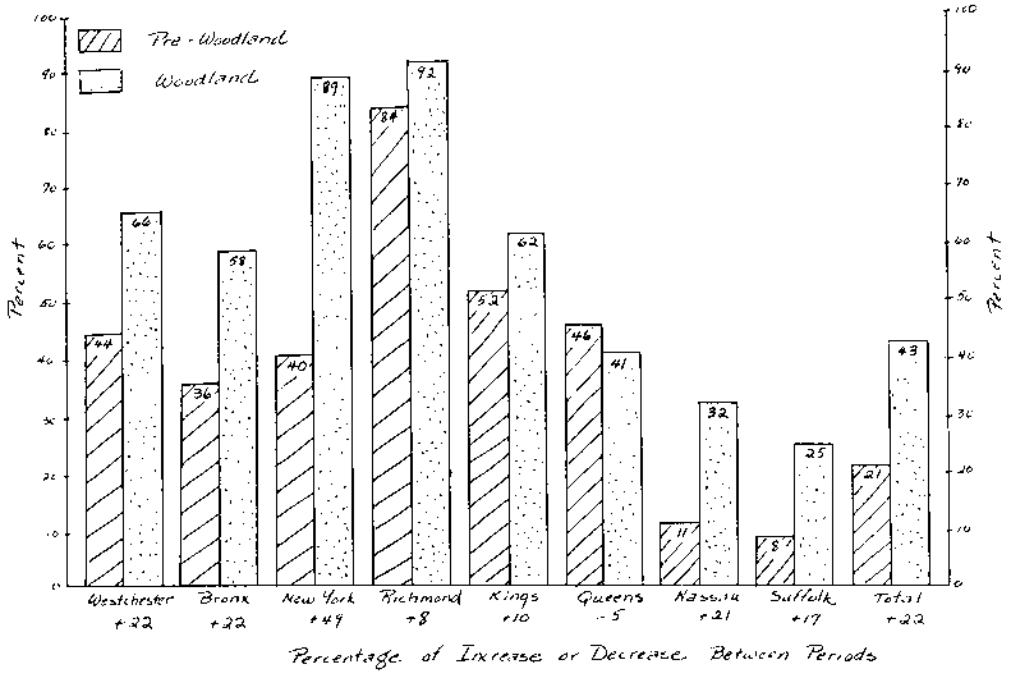

Figure 3. Percent of exotic lithic material used in projectile points during the pre-Woodland and Woodland periods.

Table V

Projectile Point Distribution by Material and County
Material and County

Material			County*							
			W	B	N.Y.	R	K	Q	N	S	Total
		Quartz	198	261	31	27	33	59	909	3798	5316
Cryptocrystalline Quartz		Quartzite	49	26	6	8	7	5	33	159	293
	Chert	Black	46	44	16	68	8	5	43	96	326
		Gray	175	77	30	157	16	21	103	205	784
		Green	5	1	2	7	-	-	6	10	31
		Creamy	7	7	5	14	3	1	37	29	103
		Jasper	7	8	9	158	4	6	24	51	267
		Chalcedony	3	2	-	4	3	-	2	1	15
Igneous		Felsite	14	29	6	118	22	6	62	78	335
		Granite diabase	23	32	30	57	20	8	26	43	239
Sedimentary		Argillite	30	57	17	175	25	24	32	86	446
		Red shales	7	2	11	3	-	-	4	18	45
		Gray shales	2	-	1	5	-	1	2	6	18
		Red sandstone	1	-	-	1	-	3	1	3	9
		Totals	569	546	164	802	141	138	1284	4583	8227

* To conserve space, the counties are indicated by their first initials: W, Westchester; B, Bronx; N. Y., New York; R, Richmond; K, Kings; Q, Queens; N, Nassau; and S, Suffolk.

Tables VII and VIII give the point distribution broken down by period, material, and county. When these data are shown, as in Fig. 3, an interesting relationship emerges in every county. Whereas both local and exotic (imported, non-native) material emerges in both periods, a greater proportion of foreign material appears in artifacts of the more recent Woodland period from every county. This trend probably indicates the increased trade and travel that undoubtedly occurred in Woodland times, perhaps reflecting the greater contact between the corresponding greater populations.

Conclusions

From the data gathered in this study, several basic relationships were evident among

Table VI

Classification of Point Types and Distribution of Points by Period

Woodland:	
Adena	52
Jack's Reef Corner-Notched	63
Jack's Reef Pentagonal	265
Levanna	1770
Madison	253
Meadowwood	48
Steubenville Lancelate	90
Steubenville Stemmed	166
Total	2707
Pre-Woodland:	
Bare Island	168
Brewerton Corner-Notched	63
Brewerton Eared-Notched	36
Brewerton Eared-Triangle	52
Brewerton Side-Notched	630
Clovis	5
Lamoka	3898
Normanskill	37
Orient Fishtail	166
Perkiomen Broad	2
Poplar Island	274
Snook Kill	75
Susquehanna Broad	52
Total	5520

material, type, and county provenience. All the coastal counties are generally devoid of chert, except as it occurs in glacial deposits.* Those counties nearer to out-of-area chert deposits showed a higher percentage of chert tools. The blue-green cherts, probably native to the west slope of the Hudson south of Albany, were most common in Westchester County, the northernmost county in the sample. Points of argillite, found in deposits west of the coastal counties, and of the aforementioned jasper, also most commonly found to the west, occurred in higher percentages in the more western counties.

Grouping the point types into two time periods-Woodland and pre-Woodland-revealed that in every case, foreign materials were in greater use in each county during the most recent Woodland period. We may thus conclude that whereas local resources supplied materials for stone tools, some trade and/or travel involving tool materials occurred throughout prehistoric times. Woodland people apparently used greater percentages of foreign material in manufacturing their projectile points than did the pre-Woodland people.

Finally, I hope that this study shows that large archaeological collections, despite some poor recording, can be useful tools for research in gross analysis.

Acknowledgment

The author wishes to extend sincere thanks to Dr. Bert Salwen of the Graduate Department of Anthropology, New York University, for his help in the conceptualization of this study and for his critical reading of the manuscript.

* Some local sources are completely researched. For example, jasper is reported native to Staten Island in small quantities (Rutsch 1968:77).

Table VII
Woodland Projectile Point Distribution by Material and County
Material and County

Material			County*							
			W	B	N.Y.	R	K	Q	N	S	Total
		Quartz	34	39	3	3	16	16	417	747	1275
Cryptocrystalline Quartz		Quartzite	18	12	-	1	4	-	20	120	175
	Chert	Black	16	17	5	51	4	1	23	42	159
		Gray	84	40	10	95	11	7	65	110	422
		Green	1	-	-	2	-	-	5	6	14
		Creamy	6	2	5	8	2	-	33	17	73
		Jasper	1	4	6	108	4	4	18	33	178
		Chalcedony	2	2	-	4	-	-	2	-	10
Igneous		Felsite	7	9	3	64	15	3	52	61	214
		Granite diabase	6	8	1	25	6	2	13	13	74
Sedimentary		Argillite	3	8	3	31	8	-	14	22	89
		Red shales	3	-	-	1	-	-	1	4	9
		Gray shales	1	-	-	5	-	-	-	4	10
		Red sandstone	-	-	-	1	-	3	-	1	5
		Totals	182	141	36	399	70	36	663	1180	2707

*To conserve space, the counties are indicated by their first initials: W, Westchester; B, Bronx; N. Y., New York; R, Richmond; K, Kings; Q, Queens; N, Nassau; and S, Suffolk.

Table VIII
Pre-Woodland Projectile Point Distribution by Material and County
Material and County

Material			County*							
			W	B	N.Y.	R	K	Q	N	S	Total
		Quartz	164	222	28	24	17	43	492	3051	4041
Cryptocrystalline Quartz		Quartzite	31	14	6	7	3	5	13	39	118
	Chert	Black	30	27	11	17	4	4	20	54	167
		Gray	91	37	20	62	5	14	38	95	362
		Green	4	1	2	5	-	-	-	4	17
		Creamy	1	5	-	6	1	1	4	12	30
		Jasper	6	4	3	50	-	2	6	18	89
		Chalcedony	1	-	-	-	3	-	-	1	5
Igneous		Felsite	7	20	3	54	7	3	10	17	121
		Granite diabase	17	24	29	32	14	6	13	30	165
Sedimentary		Argillite	27	49	14	144	17	24	18	64	357
		Red shales	4	2	11	2	-	-	3	14	36
		Gray shales	2	-	1	-	-	1	2	2	8
		Red sandstone	1	-	-	-	-	-	1	2	4
		Totals	386	405	128	403	71	103	621	3403	5520

* To conserve space, the counties are indicated by their first initials: W, Westchester; B, Bronx; N. Y., New York; R, Richmond; K, Kings; Q, Queens; N, Nassau; and S, Suffolk.

Table IX
Point Distribution by Type and County

Type	West-Chester		Bronx		New York		Rich-mond		Kings		Queens		Nassau		Suffolk		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	Nos.
Adena	6	11.5	5	9.6	0	0	3	5.8	1	1.9	2	3.8	8	15.4	27	51.9	52
Bare Island	16	9.5	13	7.7	2	1.2	62	36.9	5	3.0	8	4.8	16	9.5	46	27.4	168
Brewerton Corner—Notched	8	12.7	5	7.9	1	1.6	16	25.4	0	0	2	3.2	5	7.9	26	41.3	63
Brewerton Eared—Notched	4	11.1	3	8.3	3	8.3	6	16.7	0	0	1	2.8	4	11.1	15	41.7	36
Brewerton Eared—Triangle	2	3.8	2	3.8	2	3.8	3	5.8	0	0	0	0	18	34.6	25	48.1	52
Brewerton Side—Notched	47	7.5	26	4.1	5	0.8	65	10.3	5	0.8	9	1.4	136	21.6	337	53.5	630
Clovis	1	20.0	0	0	0	0	1	20.0	0	0	1	20.0	0	0	2	40.0	5
Jack's Reef Corner—Notched	11	17.5	4	6.3	0	0	13	20.6	0	0	2	3.2	11	17.5	22	34.9	63
Jack's Reef Pentagonal	17	6.4	11	4.2	1	0.4	33	12.5	16	6.0	3	1.1	144	54.3	40	15.1	265
Lamoka	261	6.7	250	6.4	86	2.2	127	3.3	43	1.1	65	1.7	382	9.8	2684	68.9	3898
Levanna	113	6.4	84	4.7	25	1.4	243	13.7	28	1.6	21	1.2	443	25.0	813	45.9	1770
Madison	20	7.9	24	9.5	5	2.0	35	13.8	7	2.8	0	0	19	7.5	143	56.5	253
Meadowood	2	4.2	1	2.1	1	2.1	6	12.5	0	0	3	6.3	11	22.9	24	50.0	48
Normanskill	9	24.3	1	2.7	0	0	2	5.4	0	0	3	8.1	1	2.7	21	56.8	37
Orient Fishtail	9	5.4	39	23.5	7	4.2	13	7.8	2	1.2	3	1.8	12	7.2	81	48.8	166
Perkiomen Broad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	100.0	2
Poplar Island	5	1.8	34	12.4	17	6.2	106	38.7	8	2.9	13	4.7	22	8.0	69	25.2	274
Rossville	1	1.6	4	6.5	0	0	1	1.6	2	3.2	0	0	11	17.7	43	69.3	62
Snook Kill	8	10.7	14	18.7	5	6.7	12	16.0	3	4.0	1	1.3	5	6.7	27	36.0	75
Steubenville Lanceolate	4	4.4	5	5.5	1	1.1	25	27.8	9	10.0	4	4.4	9	10.0	33	36.7	90
Steubenville Stemmed	9	5.4	7	4.4	3	1.8	41	24.7	9	5.4	1	0.6	18	10.8	78	47.0	166
Susquehanna Broad	12	23.1	6	11.5	1	1.9	3	5.8	1	1.9	0	0	7	13.5	22	42.3	52
Total Numbers	565		538		165		816		139		142		1282		4580		8227

*During delivery of this paper to several groups of archaeologists, requests were made for information regarding the distribution by county of the individual point types. In Table IX, I hereby include these data, showing numbers and percentages in each case.

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THE TWOMBLY LANDING SITE II

Louis A, Brennan, NYSAAF — Metropolitan Chapter
Charles W. Merritt — Metropolitan Chapter
Roberta Wingerson — Metropolitan Chapter
Carolyn Merritt — Metropolitan Chapter
Karyn Landauer — Briarcliff Center

The Twombly Landing Site is about one-quarter acre in area and consists of a shell midden and an associated non-midden area located between the 90 and 100 ft, contour lines on a bench of the Hudson River above Twombly Landing (Hackensack Quadrangle) in Palisades Interstate Park, New Jersey, directly opposite Yonkers, New York. It was partially dug (about 40%) by the Center for Hudson Valley Archaeology quartered at Briarcliff College, between September, 1965, and November, 1967. A pothunter had burrowed and pitted randomly through the site but it is believed that what materials he had removed were of the same character as those recovered by our excavation and the detraction does not compromise the synoptic archaeological-ecological-geological conclusions already published (Brennan, 1968 pp. 11-28).

Our excavation amounted to about 90 five-foot squares in trenches running east-west across the main midden deposit, and north-south along the axis of the midden, with several additional test squares. Depth of excavation varied from 1 ft, in non-midden areas, where artifacts were within the surficial 8 in., to 4 ft. in. the heaviest shell deposit. The work was financed in part by a grant from the Ottinger Foundation, obtained through the good offices of Congressman Richard L. Ottinger, 25th District, New York.

Site Geology

The shell midden deposit was a ridge or bank about 50 ft, long, running north-south across the slope down from a very narrow terrace that lies at the base of the talus of the Palisades cliffs. Varying from 15 to 25 ft, in width, the midden had been, in effect, a dam across the slope and, as soil built up behind it, had extended the area of the terrace by about one-third. Both the terrace itself and the midden, as weathering and soil infiltration rendered its surface walkable, had been occupied. The soil of the terrace was very thin, 4 to 6 in. deep, and meaningless for depth provenience. The midden ridge itself was a stratified horizon in that it had been built up entirely-at least the 30 ft, length we dug, beginning at the northern end-by the stemmed point-making Taconic tradition people. They had camped seasonally at the site for a very long time, so long that the early heaps had had time to weather down flat and form humus surfaces for later people making the same style of projectile point to camp on. Though the shell deposits were "stratified", the cultural materials were the same throughout the several strata within the main or ridge deposit, which culminated in a kind of dome or peak.

One other cultural period related to shell accumulation was identified. The midden ridge had long been in existence when a people making Vinette I pottery and typically small side-notched projectile points deposited a line of small shell heaps along the down-slope edge of the midden ridge. Fortunately a line of large stones, placed by unknown persons at an unknown time, had preserved the whole midden situation from scattering down hill.

The midden ridge and its basal adjunct heaps had also fixed the under-midden soil, so that there was saved the only instance of sediment of the immediately post-glacial Lake Hudson (Newman et al, 1969**)** we have encountered in this area. The midden rested on a thin former humic soil, compressed and/or eroded to about 1 inch and not always distinguishable, and this, in turn, lay on a stratum of fine clayey still-water deposit, without stones or sand. It can not have been of origin other than still-water (at 90 ft, above

present Hudson level) lake sediment and may be used as a reference by those seeking evidence of the height of Lake Hudson in the lower valley. Large boulders protruded up through the layer of sediment from the underlying still, which was of a much coarser texture of clay and contained boulders and water-rolled pebbles and cobbles of other materials than the diabase and sandstone of the Palisades formation. There were, in the sediment layer, pieces of the local sandstone and shale which had slipped down from above. Exposures of this sandstone are abundant in the vicinity and it is the base rock under the site. This Newark sandstone was much used for choppers and other artifacts. The sediment layer had been the recipient of much charcoal that had been water-percolated down through the shell of the midden.

The archaeological stratigraphy, then, was vertical, not horizontal, and consisted of the Taconic tradition midden ridge and the Vinette I (side-notched of the Taconic tradition midden ridge and the Vinette I (side-notched points of the type found here-there was also a steatite gorget in the association-have been found at the Montrose Point site, not yet published, with steatite pot sherds) adjunct heaps. These two occupations provided almost all of the shell still existing at the site. Though there is evidence that several other cultural groups used the site, they left very little shell behind and it is assumed that the site, because it is well situated for anything but a northeast wind, was a favorite spot regardless of whether the Hudson was in an oyster-producing phase.

Geologically the Lake Hudson sediment was an important find.

Subsistence

How much of the shell deposited at the site still remains it could only be irresponsible to guess. Oyster shell decomposes readily when exposed to open weathering, much less readily when protected by an overlying "seal" of a soil composed of humus and shell detritus. Shell has been deposited by human agency for about 5000 years, as we know from C-14 tests, of 4750 ± 120 (Y1716) and 4725 ± 60 (GX0762) on a hearth from a later-than-initial deposit of shell. (Initial occupation was much earlier, on the evidence of a MacCorkle point found on the terrace). Thus, whatever shell was present and exposed during the past 5000 years has been decaying and the great bulk of it has disappeared completely. Under these circumstances the composition of the midden can also only be guessed at, but most observers would probably agree that it is 98% oyster (Crassostrea virginica); but present, in sufficient trace to indicate they were gathered and carried up the 90-foot bluff for eating, were hard clams (Venus mercenaria) bay scallop (Aequipectens irradians), ribbed mussel (Modiolus demissus) and channeled whelk (Busycon canaliculatum).

Even as the amount of shellfish meat consumed is not validly calculable from the remaining shell, the animal bones recovered can hardly be used by any formula of probability to reckon the game taken. Some 2900 pieces of bone were recovered from the digging and submitted to John Guilday of Carnegie Museum for identification. His reply was as follows:

> The collection is too small to do anything on a quantitative basis. The following species were represented: White-tailed deer, raccoon, woodchuck, gray fox, dog or wolf, beaver, gray squirrel, elk, cow, sheep, pig, turkey, bird (duck size), rattlesnake, box turtle (including a cup fragment), sturgeon, fish (unidentified). The cow (ulna, shank cut metal saw) sheep and pig were obvious modern contaminants. About all one can say is that the Indians may have been shell fishing, but not to the exclusion of hunting.

The senior author has taken it upon himself to guess, from easily recognized bones such as jaws, astragoli, teeth and other common bones and from the length and thickness of bone splits and splinters that at least 80% of the bone was from deer or elk. Probably not over

50 pieces, if that, would be designated as sturgeon and the unidentified fish. There was not found on the site a single article of fishing gear--net sinkers, hooks, gorges, et cetera.

Vegetal food preparation is represented by about 20 manos and one slab metate of granite. Though we have found pestles on other river bank sites along the Hudson, there were none at this extensive site and it seems fairly certain that the Taconic people did not use them. There is no basis for estimation of how much vegetal food was eaten.

In fact, despite the attempts to do so, there is no basis for an analysis of the dietary habits of these riparian campers at all. It would have to depend on the assumption, wholly unrealistic, that the shell mounds are total refuse heaps. They are nothing of the sort. They are heaps of shell cast aside by shuckers, as corn shuckers throw husks aside, in a pile to keep the area clear for moving about. You would no more scatter sharp-edged fresh oyster shells around, to be trod upon by bare or moccasined feet, than you would scatter around broken glass. The heaps, outlines of which are often discernible, are dumps of from two to five or six bushels, the discards of short-stay camping by small groups; they are relics of shell-shucking, not housekeeping. There was no reason to throw rubbish bone carefully in a heap when there were bluffs to throw it over, or a wide woods to throw it into. And certainly there must be taken into consideration, when arguing dietary ratios from remaining bone, how much of it was carried off by scavengers. It is one thing to calculate meat on the hoof from archaeological bone on a site like Star Carr in England, where the habitation site was built on a log platform on the swampy edge of a lake and the refuse was thrown into the surrounding preservative mud, and quite another to estimate confidently what the food intake was at an open camp, in an acid forest soil environment, where the only preservative is a shell midden located away from the cooking place, at a distance not determined. Most of the bone at the Twombly Landing site was not deposited in the shell, at the time of shell deposit, but on it, on surfaces that weathering had made suitable for camping by later - much later - occupants.

At Twombly the midden is a jumble of such surfaces, but there are two sites in the Lower Hudson where there is a midden horizon in which the shell is in whole, pristine and shell-on-shell condition, except for the weathered top, which has acted as a seal. (This horizon, called the GO horizon, is dated 5863 ± 200 years [Y 1315] at Croton Point 5650 ± 200 years at Montrose Point [L-1038-E]. The bone in this horizon is exactly that which was casually and randomly tossed in with the shell as the shell was being discarded. It is very scarce, but it is there, and is mainly the bone of large animals, deer and elk. It could hardly be maintained that the three elk vertebrae we found (amongst other pieces of bone) on the Montrose Point GO horizon, or the elk astragolus from Croton Point mean that only the backbone of the elk was brought to the former site and only a lower leg to the latter. Where are the rest of the bones of these animals? It should be obvious that these bones clue us to the approximate ratio of bone from meals which found its way to the shell heap, maybe 1:50 or 1:200. The GO midden yields flakes, and artifacts (no diagnostic artifacts have been found in about 30 cubic yards of GO midden) occur as sparsely as bone and for the same reason: there was only one activity being carried on at that spot, the accumulation of discarded shell after shucking. The centers of other activities were elsewhere, and the refuse of those activities is elsewhere.

What we know about subsistence at Twombly Landing is that the campers there ate an unknown quantity of vegetal food, gathered shellfish when these were to be had, hunted all the edible animals in the vicinity and fished, by some unknown means but not as much as one would expect, since the Lower Hudson is even today one of the richest fishing grounds in the country (Boyle, 1969).

It is a relief to have had identified the sturgeon and fish bone. Those riverbank campers could have refrained from taking, during the spring run of sturgeon, which Boyle says are in the river all year long by the millions and are very active in cold water, or the striped bass which move upriver from the Atlantic to spawn near Storm King Mt. is incredible. The questions that remain are: how were the fish taken, and why were not more of them

taken; or, more to the point, why did not a river fishing culture develop along the Lower Hudson? The answer to all questions may be simple: The fish were so plentiful as to be easily taken, by spear or by hand, and other foods were so plentiful that not many fish had to be taken. The inhabitants of the area could live where they chose, and they chose not to live as fishermen along the river banks.

Pottery

The pottery is a sparse collection of odds and ends which, nevertheless, cover the whole Woodland period. The Twombly Landing site was evidently a traditional camping spot from before shell midden accumulating times as will be shown later from projectile point finds, until proto-historic and probably contact times. Oysters could not have been the site's only attraction because, after about 2500 years ago, the Hudson produced oysters sporadically and for very short periods. Voluminous shell heaps containing large oysters of ages over five to eight years are not found, our twenty years of experience in midden-digging has shown, with occupations later than Vinette I times.

Vinette I is the only ware found in an archaeological context at Twombly. As previously mentioned it was found in and under the heaps thrown later against the base of the midden ridge. Talus or slump from the midden ridge had covered those heaps and preserved them from disturbance, wherefore the association of Vinette I with the usually small (though there are three sizes, from small to large) side-notched points we call Twombly side-notched is indubitable. These Vinette I heaps are the last bulky, well-defined heaps at Twombly, and also such appears to be the case at the Parham Ridge and Croton Point sites.

Pottery after Vinette I times occurs only superficially and need not have been associated with shell deposits at all, though it must be pointed out that the post-2500 B,P, shell is so small and thin that it decays quickly and disappears into the general back-ground at a shell-midden site. The point that is being made here, for the Lower Hudson as well as Twombly Landing, is that not all the users of shell midden sites left shell heaps behind. It is to be doubted that the Twombly Landing site was ever used by parties of more than ten people at one time, but it was used for more than 5000 years.

The following pottery was found:

Partial vessel:

Abbot Farm zoned dentate (incised); dentate stamping is both primarily impressed and impressed within previously incised lines, in parallel horizontal lines under everted, notched rim. A design or zone of these lines pyramids up into arrangement of horizontal lines.

Rim sherds:

a. Eastern incised; (East River focus); low castellation, plain, wide collar, zoned scratch-like incising with converging parallel lines running transversely from rim to collar creating a pyramidal "window" or zone crossed by parallel incised lines. 1 sherd.

b. Eastern incised; flat, out-slanting rim of body gauge with the same pattern of incised lines, which are broad, as the above. Design is like the above with the collar missing. 1 sherd. Non-rim sherds of same type - 2.

c. Bowman's Brook Type, everted rim, flat, cord-marked, very fine paste, light buff exterior as though slipped, but black interior. 1 sherd

d. North Beach type, rounded lip of body gauge; line of elongate punctates (3-4mm.) at oblique angle to rim under lip; incised straight line under punctates is parallel to rim; punctates continue under this line. 2 sherds, matching.

e. Windsor brushed type; rounded lip thinner than body gauge; incised line 1 cm. below rim. 1 sherd

f. Probably Clason's Point focus; thickened, rounded lip with wipeout line under thickness. Apparently section of castellated rim. 1 sherd.

g. Probably Bowman's Brook focus; thickened, crowned lip; close-set, elongate punctates to lip edge, with transverse incised lines under punctates. 1 sherd.

h. Probably Bowman's Brook focus; rounded, body gauge rim, with dentates below a smooth horizontal zone under rim. 1 sherd.

Body sherds

a. Vinette I, interior, exterior cord-marked 26 sherds.
b. Cord-marked interior-exterior, exterior markings in roughly cross-hatched pattern 1 sherd.
c. Cord-marked interior, smoothed exterior - 7 sherds.
d. Cord-marked exterior, smoothed interior - 2 sherds.
e. Smoothed interior and exterior, thick, 8-9mm - 7 sherds.
f. Smoothed interior with exterior smoothed and slipped, thin, 5-6 mm. - 8 sherds.
g. Smoothed interior and exterior, medium, 6-7 mm. - 2 sherds.
h. Smoothed interior and exterior, shell-tempered - 2 sherds.
i. Stippled, with incised line - 1 sherd.
j. Incised, thin - 2 sherds.
k. Smoothed over interior - exterior cord marked - 6 sherds.

Ornaments - Ceremonial Objects

As is usual at shell midden sites, artifacts of ornament or suggesting ceremonial use were rare.

l. Half a soapstone gorget with two holes; for balance the other half should have two holes. Found with Vinette I pottery.

2. Slate pendant, a .5 in, wide strip about 3 in, long, the only marking an incising at one end to catch a string. No association.

3. Siltstone pendant or a mulet of vaguely humanoid shape; possibly a "clay baby" from clay deposits at Croton Point. Clay babies are found often enough in riverbank sites to hint at usage as amulets or fetishes.

4. Straight section of antler 2.5 in, long drilled lengthwise. Could be shaman's sucking tube. Taconic association.

5. Leg-of-lamb shaped piece of sheet mica 2.5 in, long. No association.

Polished Stone

1. Bitt fragment, about 1.5 in, long of a fine, thin bevelled adze of green shale; in midden ridge with Taconic points.

2. Freshly polished, full-grooved rectangular ax, found with two round polished pebbles, one coarse, one fine; with Vinette I pottery.

3. Triangular shaped ax of sandstone with bitt at the narrow end; resembles "Guilford Ax". Flat, ground sides but bitt formed by chipping - 5.5 in, long. Outside midden.

4. Small specimen of above, 3.5 in. long, made entirely by broad chipping; reported here because it belongs to same category as above. Outside midden.

5. Short bitt fragment, 1.5 in, probably bevelled adze of thick, Lamoka type; of local red sandstone. In Taconic association.

6. Section (4 in.) of narrow (1.875 in.) celt, pecked but never polished, possible because it split in manufacture. Local gray sandstone. Taconic association.

TWOMBLY LANDING SITE

Inventory of Artifacts Classified as to Style and Material

	Quartz	Quartzite	Flint—Chert	Newark Series	Shale	Siltstone	Argillite	Arkose	Basalt	Chalcedony	Exotic Sand.	Jasper	Slate	Rhyolite	Granite	Limestone	Gneiss	Total
CHIPPED STONE PROJECTILE POINTS (Brennan 1967)																		
Class A - The Shankless																		
Pattern I - Arcuate																		
Type 1 - lanceolate																		
Variety 1 (Lanceolate A)																		
5.5cm	1										1							2
Variety 2 (Lanceolate B)																		
7—9cm				4	1													
5.5cm	3	1		3														
4.5cm	5		4	3														24
Variety 3 (Lanceolate C)																		
4.5cm			1															
3.5cm		1	1															3
Type 2 - ovoid																		
6cm	1	3		2	1		1											
5cm	7	1	1	2					1									
4cm			3	4	1				1									
3cm	9		2															40
Type 3 - none																		
Pattern II - Rectilinear																		
Type 4 - pentagonaloid																		
2.5—3cm	3	4	2	1									1					11
Type 5 - triangular																		
Variety 1 (Nicked)																		
4cm	1			1					1									
3cm	3		2	2														10
Variety 2 (spirate)																		
4.5cm	3			1		1												
3.25cm			2															7
Variety 3 (broad)																		
3cm			3	2														
2.75cm	2	3	8		1													
2.25cm	3	1	8		1													32
Variety 4 (mini-triangles)																		
2cm				2														2
Type 6 - none																		
Class B - The Shanked																		
Pattern III - Stemmed																		
Type 7 - full stemmed																		
Variety 1 (Taconic standard narrow blade)																		
5.5—7cm	3	1	4	5	3	2	1		2		2							
4.5—5cm	12		8	4		1		1					1					
3.5—4cm	26	3	62			2		1				12	7					
3—3.5cm	13		7	3					1									176

Twombly Landing Site (continued)
Class B (continued)

	Quartz	Quartzite	Flint—Chert	Newark Series	Shale	Siltstone	Argillite	Arkose	Basalt	Chalcedony	Exotic Sand.	Jasper	Slate	Rhyolite	Granite	Limestone	Gneiss	Total
Variety 2 (Taconic broad stemmed narrow blade)																		
3.5—4cm	3	3	1						1	1								9
Variety 3 (Taconic standard stem broad blade)																		
3.75—4.5cm	5	1	8	4	5													
3—3.5cm	23		22	1	3				1	1		1						
2—3cm	8		3															86
Variety 4 (Taconic standard stem oval blade)																		
4—5cm	1		2										1					4
Variety 5 (Taconic pinched stem narrow blade)																		
5.5—6cm				1														
4—4.5cm	1		10		1													13
Variety 6 (Taconic pinched stem broad blade)																		
4—4.5cm	1																	1
Variety 7 (Notched stem broad blade)																		
2.5—3.5cm	2		3															5
Variety 8 (Toed stem narrow blade)																		
4—4.5cm	1		1							1				1				4
Variety 9 (Toed stem broad blade)																		
4—5cm		2	3	2					1					1				9
Variety 10 (Stemmed, fishtail)																		
3—3.5cm			3															3
Variety 11 (Stemmed, Perkiomen)																		
4cm												1						1
Variety 12 (Dwindle stemmed, Rossville)																		
4—4.5cm				3														
3—3.5cm	1					1												5
Pattern IV																		
Type 8 - straight side notched																		
Variety 1 (Nyack side—notched)																		
4.5—5.5cm	2	2	2															
3.5—4cm	3		3															12

Twombly Landing Site (continued)
Pattern IV (continued)

	Quartz	Quartzite	Flint—Chert	Newark Series	Shale	Siltstone	Argillite	Arkose	Basalt	Chalcedony	Exotic Sand.	Jasper	Slate	Rhyolite	Granite	Limestone	Gneiss	Total
Variety 2 (Twombly side notched broad blade)																		
5.5—7cm	2	1				1		1										
3.5—4cm	3		10		1			1	1				1					
3—3.5cm	3	1	10		1							1		1				
2—2.5cm	7	1	6	1														54
Variety 3 (Susquehanna)																		
2.5cm												1						1
Variety 4 (Tappan)																		
3cm			1															1
Type 9 - none																		
Type 10 - neck and yoke																		
Variety 1 (Straight edged)																		
4—5cm			1	2														
3cm			1															4
Variety 2 (Serrated edge)																		
4cm			1															
3cm			1															2
Untyped - lopped base narrow blades																		
4cm	5																	5
Broken blades and tips	60	3	42	29	1								3		2			140
NON-WEAPON TOOLS																		
Drills																		
Expanded base 5.5 cm			1															
Side notched base 5cm			1															
Triangular 3.5cm	1																	
Lobate base 3.5cm	1																	
Taconic stemmed base 3cm	1																	
Twombly side notched base 3cm	1																	
Flakes with drill tips 3cm			2															8
Perforators																		
Broad stem base 2.5cm		1	1															
Triangular base 3.5cm			1															
Flakes, perforator tips	4		5	1														13
Bunts																		
Taconic stemmed	1		1															2
Scrapers																		
Hafted side notched 2cm			2															
Flake hafted 3cm	3	1	3	4														
Thumbnail snub nosed 1.5cm			2									2						
Snubnose end and side 2—4cm	1		6															
Elongate side steep sided 3—4cm	1		4															
Elongate side knife edged 3—4cm	1		1															
Elongate end knife edged 2—4cm	2		2	2														
Large steep edged	4		6	2														
Large polyhedral thin edged 3—3.5cm	4	1	4	5														
Hollow (concave) end trianguloid 3—4cm	4		1	1														
Flake end knife edged 3—4cm	4		5	3						1		1						84

Twombly Landing Site (continued)
Non—weapon tools (continued)

	Quartz	Quartzite	Flint—Chert	Newark Series	Shale	Siltstone	Argillite	Arkose	Basalt	Chalcedony	Exotic Sand.	Jasper	Slate	Rhyolite	Granite	Limestone	Gneiss	Total
Prismatic and Lamellar Flakes 3—5.5cm			7	4														11
Teshoa Flakes 6—12cm		8	1	1	1						2				1	1		15
Blades and Cores																		
Bifacial blades reamer end 3.5—5cm	2		3		1													
Ovoid unifacial blanks pebble cortex 4cm			3															
Unifacial blanks lanceolate	1			3	1						2							
Rough cores	10	4	9	24	1				1		3							
Bifacial knives lanceolate large 7—10cm		2	1	1	1											1		
Narrow blade one shouldered knives or blanks 6—7cm	1	2	1		1													
Narrow parallel edged knives and/or blanks (broken) 5—8cm	2		1	12	4				1									
Medium bifacial blanks 5—7cm	7	2	8	3	2				2		1							
Small projectile point blanks 4—6cm	6		19	5								1						
Round base blanks and/or knives fragments	10		7	1	1													
Asymmetric knives and/or blanks (one straight edge, one concave)	4	2	6	10	3													
Knife and blade tips	7		4	16	1							1						
Very large bifacial blanks	1		1	5								1						
Flake knives	7	3	16	18	2							1	2	2				287
Choppers																		
Semi—lunar large	2	1		11	1				2									17
Grubbers																		
Elongate large				5					4						1		2	12
Hammerstones or round mullers																		
4.5—7cm					1						15				8			24
7.5—11cm		8									5				7			20
Hammerstone edged	1																	1
Rubbing stones elongate and flat—sided				1							7				1			9
Metate 35 x 25cm															1			1
Axe full ground polished bitt																1		1
Axe hafted chipped pointed bitt full grooved																		
14cm											1							
9cm											1							2
Steatite gorget 2 drilled holes 1																		1
Pendants						1							1					2
Mineral fragments																		
Mica 1																		1
Feldspar cleavage frament 1																		1
Bone																		
Antler tip drilled as ornament or ceremonial object 1																		1
Antler plug 3cm 1																		1
Antler tips (tools?) 7																		7
Antler tip 1																		1
Bone points 3																		3
Bone awl 1																		1
Long bone fragments (possible points) 2																		2
Non-weapon tools																		
Chipped stone adzes				1							1							2
Discoidal knife or chopper 10—12cm				1														1

Twombly Landing Site (continued)
Non—weapon tools (continued)

	Quartz	Quartzite	Flint—Chert	Newark Series	Shale	Siltstone	Argillite	Arkose	Basalt	Chalcedony	Exotic Sand.	Jasper	Slate	Rhyolite	Granite	Limestone	Gneiss	Total
Pestle															1			1
Celt pecked stone narrow long 11 x 5cm									1									1
Celt bitt fragment polished				1														1
Adze bitt fragment polished and beveled					1													1
Double end tamper				1														1

Projectile Points

The Taconic midden ridge, dated at 4750 years ago, and probably begun earlier, at about 5000 years ago,* provides an initial date for only the shellfish gathering phase of its occupation. We have tested for midden of the 5500-6000-year-old GO horizon and not found it. This is not too surprising. During GO horizon time's sea level was 40 feet lower than at present; during Taconic tradition times it was only 27 feet lower than at present. We have assumed that during GO horizon times there must have been a beach at Twombly Landing near water level suitable for camping, and this beach was submerged when sea level rose about 13 feet between 6000 and 5000 B. P. forcing campers to the site 100 feet up on a bluff.

The position is taken here, on the evidence of projectile point types that the site had been in use before anybody was forced by lack of space at river level, to lug baskets of oysters up the bluff. Perhaps GO horizon people ate oysters at river level spots and camped on the bluff; if we ever find a projectile point in the GO horizon we will know this quickly enough. But it seems certain that occupation at Twombly Landing began long before that. Several types of points were found there which do not fall into the established categories of this region and these we assign to the pre-shell period, looking to the South for their relationships. These early types are:

MacCorkle: One large point of exotic flint is certainly of that type and a smaller one may be. The type is bifurcate with serrated blade edges. It was first named in West Virginia, having been found at the St. Albans site on the Kanawha River by Bettye Broyles (Broyles, 1966) where it dates at about 7000 years B. C. The type is believed to be older by diggers in West Virginia "mountain top bear wallow" sites, possibly as old as the oldest Kirk points, circa 8000 years B. C. After the ESAF conference in November, 1969, the senior author visited one of these mountain top sites (about 3000 feet high) outside of Madison, West Virginia, where Clovis points have been found, and was given a MacCorkle on loan from the site, for the purpose of comparison, by Seybert Linville, who had recovered it. The Twombly MacCorkles and the West Virginia MacCorkle are shown in Plate I. It is not suggested that MacCorkle points arrived in the Lower Hudson from West Virginia; the early Archaic point types from West Virginia closely resemble those from Joffre Coe's Carolina Piedmont Early Archaic (Coe, 1964) and it is more likely that MacCorkle point makers would have come up the coastal plain from that point of origin. The MacCorkles were found outside the midden. They are not of local material. Plate I.

Sneeden Yoke base: The basal concavity is semicircular, rather than deeply indented, and ground. Probably related to the MacCorkle. Three were found, all of local materials. They resemble the St. Albans site Kessell point, contemporary with Kirks. Found outside midden. Plate I.

*A recent C-14 date from Montrose Point of 5075 ± 120 yrs (GX-1919). From shell over square stemmed, narrow-bladed points confirms this estimate.

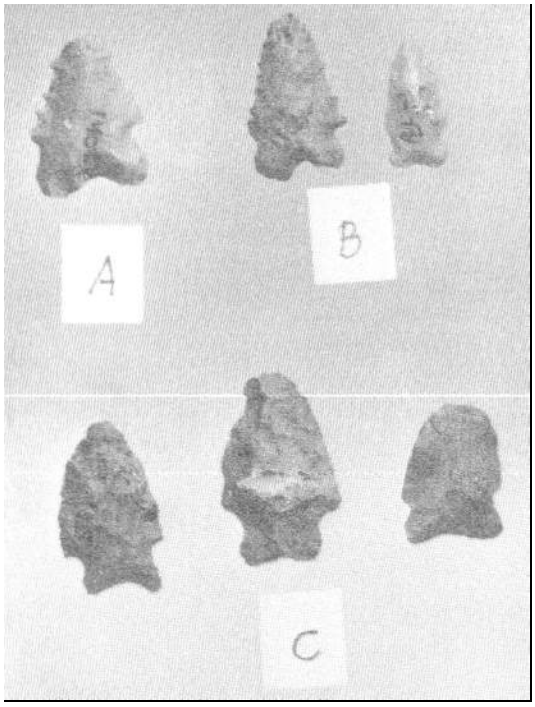

Plate I. A. MacCorkle point from “bear wallow" mountain top site near Madison, West Virginia; B. MacCorkle style points from Twombly Landing site; C. Sneeden yoke-base points from Twombly Landing; they resemble points from zone 36 of the St. Albans site on the Kanawha River, West Virginia with a C-14 date of 9850 years B. P.

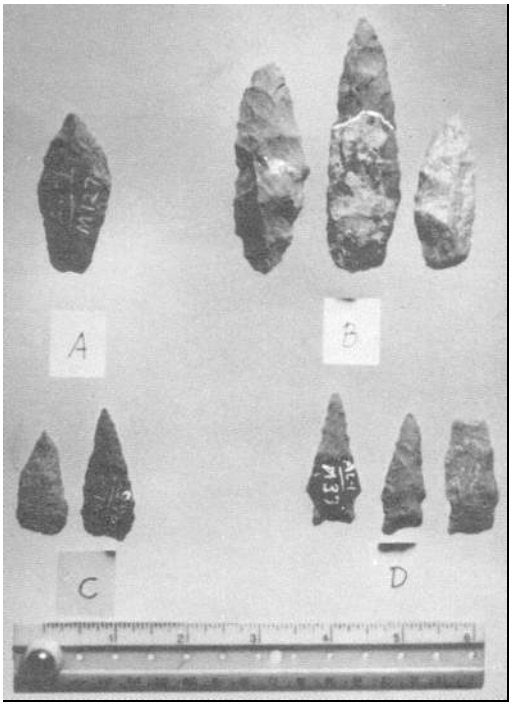

Plate II. A. Lanceolate A; B. Lanceolate B. C. Lanceolate C; D. Excelsior Toed-stem.

Excelsior Toed Stem: Of narrow, sharply triangular blade with acute shoulders square stem with a projection or toe at one corner. Toe may be vestigial from base of an ancestral form. Fourteen points have been classified in this variety but some specimens are difficult to distinguish from a variety of Taconic stemmed. The materials include the local sandstone, shale, flint, quartz, quartzite and chalcedony, positively not local. From outside midden. Plate II.

Lanceolate A: A single specimen is of a dark, fine-grained exotic quartzite, is very broad at just above mid-point and narrows decisively toward base. No grinding. Outside midden. Plate II A.

Lanceolate B: Long, narrow, asymmetric (one straight, one excurvate edge) points (there is no particular edge used to show that they are knives) that constrict very slightly at base into hint of a stem. They are mostly of local material and difficult to classify in many instances. They could fall into a Lerma-like tradition. The specimens came from outside the midden area. Plate II B.

Lanceolate C: These are trianguloid with greatest width near the base. Of three specimens found one is definitely of the type (a few examples have been found elsewhere in the area), one is a possible (it is the only certain point found indisputably in the subsoil under

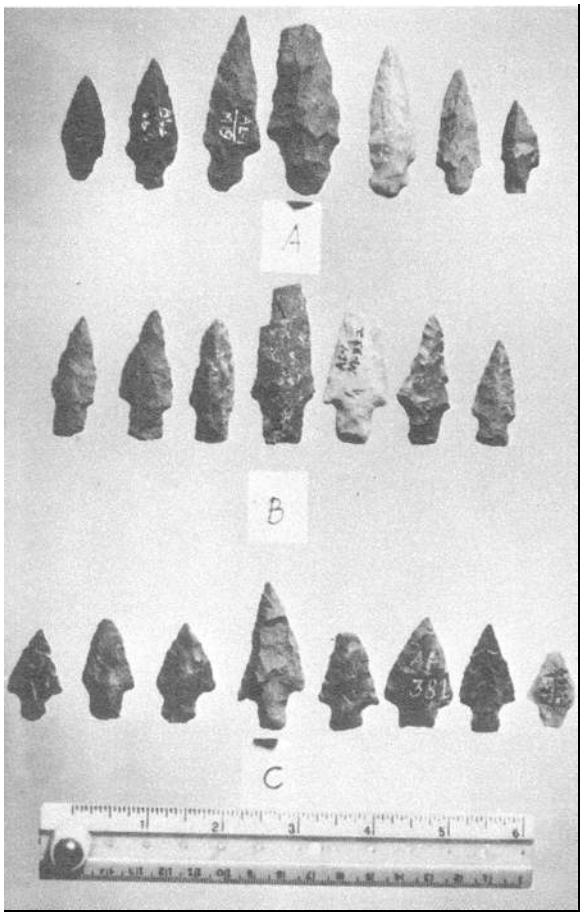

Plate III. Row A, Taconic knobby stems, range of sizes; Row B, squared stems, range of sizes; Row C, Taconic broad blades, range of sizes.

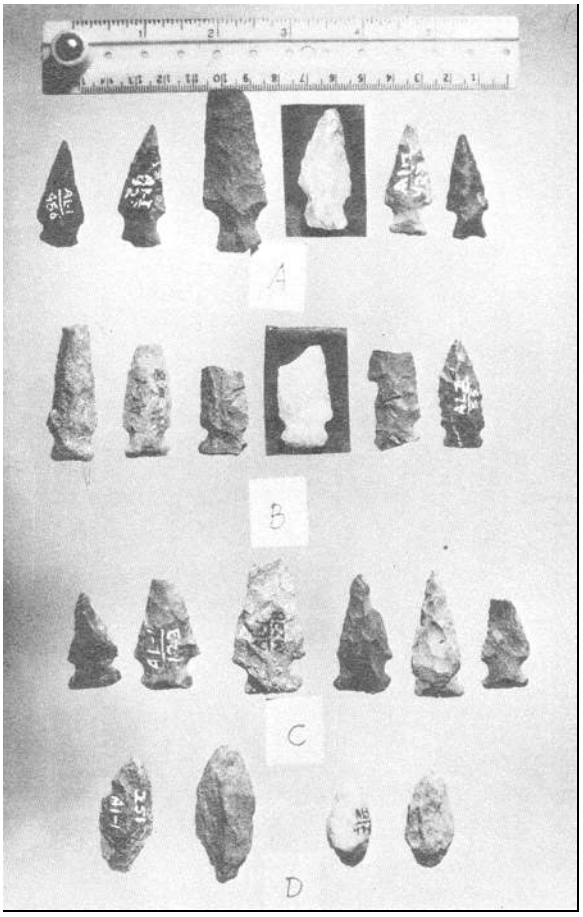

Plate IV. Row A, expanding or "pinch" stemmeds, Taconic tradition, range of sizes;
Row B, Nyack side-notched; Row C, Twombly side-notched; Row D, Rossville "dwindle" stems.

the shell midden) and one is fragmentary (though it was found with the possible specimen). The type resembles the Wheeler Excurvate of Alabama, but in shape only, not in workmanship. Plate II, C.

The Taconic Tradition
Plate III

Of the almost 600 points found at Twombly Landing about 300 have been classified as being in the Taconic stemmed point tradition. The tradition consists of three, possibly four, sequential phases. In phase 1 the stems are knobby and often not basally finished. In phase 2 the squaring of the stem makes for a broader one and this phase is comparable to what has been elsewhere designated the Bare Island (Ritchie, 1960). In phase 3 the squarish stem is indented to form a flared or pinched stem, as in the Normanskill (Ritchie, ibid.) It is the view of the senior author that Hudson River fishtail points are a phase 4 of the Taconic. All through the tradition there turns up points with one rounded and one acute shoulder. But a fishtail point is nothing more than a stemmed or flared stemmed

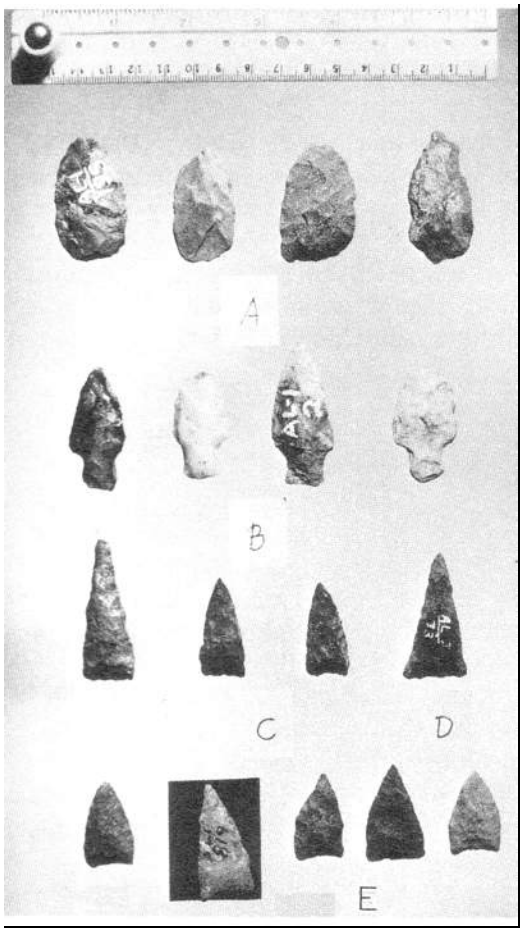

Plate V. Row A, ovoids found with Taconic tradition; ace-of-spades Taconic subvariety; Row C, three spirate triangles of Taconic age; Row E, penta-triangles of probable Taconic age.

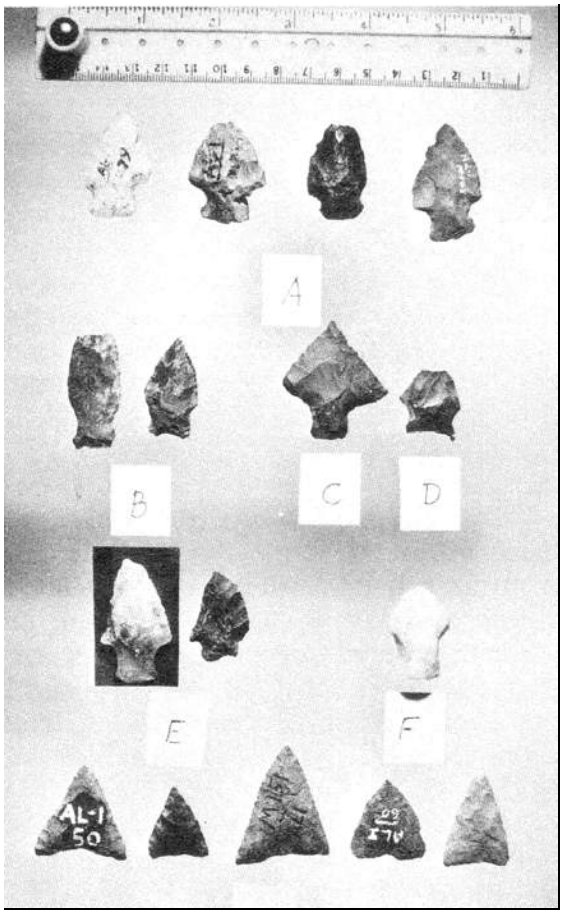

Plate VI. Row A, "pinched" stem broad blades, probably fraternal with "pinched" stem narrow blades of Taconic tradition; Row B, Fishtails; Row C, Perkiomen; Row D, Susquehanna; Row E, styles occurring regularly but sparsely in Lower Hudson; Row F, bunt in Taconic style; Row G, Levanna-like triangles.

point with two rounded shoulders and some of these were definitely made in pre-fishtail times.

Not only were twin rounded shoulder points being made in pre-fishtail times, but recognizably Taconic stemmed points were being made during the fishtail period; we have found them in middens at Croton Point with Vinette I pottery. The reason is simple enough. The narrow-bladed Taconic stemmed point is an eminently practical tool. It can be made very quickly by free direct percussion out of almost any small piece of any kind or quality of stone, and it served the purpose because it is essentially a simple sliver of stone. Wherefore phase 1 type Taconics were indubitably made under the straitened circumstances, in the Lower Hudson where there is no flint and other good materials are scarce, all through Taconic times, even as phase 2 points continued into phase 3 times, and phase 3 points into phase 4 times.

Companionate with the narrow-bladed Taconics, as the "Steubenville" stemmeds and lanceolates are companionate, or fraternal are a series of broader bladed stemmed points, differing from the main sequence only in the width of the blade. Though the width of

Taconic points does vary and a gradation series from very narrow to wide can be laid out from any site yielding Taconics in any numbers, certainly two modes of width are represented. The wide blades are almost always small, from under 1 in. to 1.5 in., with most falling into a 1.25 in. class.

Also occurring with Taconic points sparely but repeatedly are ovoid points, (Plate V, Row A) all very much of a size, about 1.75 in. long and in shape, which is bulbate. They do not seem congruous in the Taconic tradition for, even if they were blanks they would not reduce to Taconic points, or anything else Taconic. They occur too infrequently to be knives and though some show a little edge use, this does not seem to represent the main purpose of the tool. These ovoids have been found also at the Montrose Point, Crawbuckie and Parham Ridge sites, and one was found in the GO midden at Croton Point. We do not feel we have fixed their provenience satisfactorily.

Co-Taconic

There occurred within the Taconic midden two long (1.75 mm.) narrow-based or spirate triangular points which appeared not to be of the same variety. The lower one (it should date at about 4500 B. P.) was of quartzite, (Plate V, C., no. 1) thick and with nearly parallel sides for about half its length. The higher and presumably later point is thin, expands all the way to the base and has nicks at the base for lashing.

Points of this generalized spirate triangular theme occur in all sites of any size in the Lower Hudson. At the Montrose Point site a spirate Beekman triangle was found 2 ft. from and in the same very thin clay lens, probably sedimentation through the overlaying shell layer. The corresponding dates on a Taconic point at Twombly and on the Vosberg-Beekman horizon at Sylvan Lake Rock Shelter, as previously mentioned, confirm the contemporarity of the two types.

There are several varieties of these spirates in the Lower Hudson, the most typable of which verges on the pentagonal, (Plate V, Row E) rather like the earlier spirate of the Taconic midden, with the very distinct difference that they are shorter and thinner. The largest collection we have of these "penta-triangles", about 25, came from the Crawbuckie site, just below the mouth of the Croton River, from the same locus that yielded our largest collection of snub-nosed scrapers, most of them thumb-nail size. We therefore associate the penta-triangles with snub-nose thumb-nail scrapers and wherever we find the one we are sure to find the other, though we have not been able to prove the association. A few penta-triangles occur at Twombly, and a like few (10) thumb-nail scrapers, but as part of what appears to be an experimenting kind of variation on the spirate triangular theme. Nevertheless these penta-triangles have been found as far south as the Accokeek Creek site (Stephenson, 1963) on the Potomac River opposite Mt. Vernon where stemmed points of Taconic pattern are found abundantly.

There is no plausible explanation for point varieties on the spirate theme in the Lower Hudson other than that the theme co-existed with, but apart from, the Taconic tradition; the two are stylistically too unlike and, if the snub-nose scrapers are associated with the penta-triangles, they are positively different. No penta-triangles were found in the Taconic midden at Twombly.

The spirate triangle tradition is likely to emerge as an important element of the Archaic in this area and southward.

Post-Taconic

The span of the Taconic through phases one to three is probably from 5000 B. P. to about 3800 B. P., the date of the River Phase (Ritchie, 1965, p. 126) of the Upper Hudson,

characterized by Normanskill points comparable to the flared or pinched stems of the lower Hudson. The thesis was advanced above that Taconics of phase 1 continued to be made as a technological recourse in straitened or emergency circumstances. But after the pinch stems of phase 3, which may have lasted until 3500 B. P., projectile point patterns took a turn toward the definitely side-notched, it would seem, either by technological evolution or by influence from elsewhere, possibly upriver, on existing cultures. There is no good reason to suppose that there even was a turnover in population in the Lower Hudson after the incursion of the Taconic stemmed point people at 5000 B. P. despite the apparent diversity of projectile point types. The stemmed point tradition actually seems to change very little. Post-Taconic points may include:

Nyack side-notched: This series (12) of very standardized points with almost parallel blade edges and low, shallow, small side-notches relates easily to the pinched stems of phase 3. The most obvious difference is in the reduction of the size of the notches. Plate IV, Row B.

Tappan pinch-stemmed: a small series of 6 points with ace-of-spades blade and a stem distinctly narrower than the blade, which has been notched out to narrow it further. This type is illustrated for the Accokeek Creek site by Stephenson as D of Plate XXVI (Stephenson, 1963) and the 9 points of this type were called Group H. Plate V, Row B.

Rossville: There were 3 of these at Twombly, with one found near the top of the Taconic midden at the inland edge. Plate IV, Row D.

Susquehanna: The one small, broken Susquehanna was of yellow jasper, the material of all but one of the few Susquehannas we have found in the Lower Hudson. Only one or two are ever found on a site and it seems obvious that the makers were not residents. Witthoff (1953) has suggested that the Susquehanna broad spear makers were aquatic nomads, traveling long distances in their canoes in search of fish, waterfowl and riverbank game, and Fred Kinsey, in a soon-to-be-published book, has suggested that they traveled up the Hudson after sturgeon. An alternative attraction would have been the spring shad run. We have yet to find soapstone vessels with Susquehanna points in this area. The one good steatite pot association is with Twombly side-notched points. The Susquehanna at Twombly came from the edge of the Vinette I heap. Plate VI, D.

Perkiomen: The one Perkiomen from Twombly was a complete and handsome specimen of red jasper. Perkiomens are of the same rarity here as Susquehannas. Witthoff places the Perkiomen people with the Susquehanna and Lehigh point makers in the Broadspear tradition of the Transitional. It is beginning to be clear that none of the Broadspear people were ever permanent residents of the Lower Hudson. The Twombly Perkiomen was in near association with a Vinette I heap. Plate VI, C.

Twombly side-notched: (Plate IV, Row C) These points come in small, medium and large sizes, are from indifferently (with unfurnished bases) to crisply executed, and reference has already been made to their association with Vinette I pottery and a steatite gorget at Twombly Landing, and with steatite sherds at Montrose Point. The 54 Twombly side-notched points comprise the second largest series at the site. There can be no doubt that the Twombly side-notched point makers were permanent inhabitants of the Lower Hudson from steatite through Vinette I times. Funk finds the Twombly side-notched points identical with the Sylvan side-notched points which, with certain stemmed varieties, he includes in the Sylvan Lake complex, with a C14 date of 4160 ± 140 years. The discrepancy of 800 to 900 years between side-notched points of Sylvan Lake and their like in the Lower Hudson seems too great for close cultural ties. No explanation of the discrepancy suggests itself.

Fishtail: One of the three fishtails, though tip-broken, is easily typed. One base fragment and a short, somewhat atypical, point are less certainly fishtails. Plate VI, B.

Levanna triangle: (Plate VI, G) A series of 32 triangular points of various sizes of more or less Levanna type are all we have to assign to the Woodland period after Vinette I times. Taken together with the sparse pottery they make a case for only intermittent use

of the Twombly Landing site for the ceramic period. This may be a delusion, however. The site is in a public park open to park users for the past 70 years; it has been camped on by Boy Scouts and others and featured in "The New York Walk Book" (1910). A great deal of surface material has probably been carried away and pottery, in particular, certainly has been destroyed. What the pothunter took from the site was probably only a fraction of what has disappeared over the decades that the site, obvious because of its shell, has been exposed. The large equilateral triangles, usually thought of as Owasco, which occur on sites in the Ossining area and northward, (and which would be very conspicuous on the surface) were not found. Their absence is indicative, probably, of their removal.

Madison triangle : Only one point that would be called Madison was picked up, on the surface.

Point Types Not Present

As significant as are the projectile points, the principal cultural clue for most of the span of habitation at Twombly Landing, equally illuminating, are the types not present. Vosburg points, which have been dated at 4730 B. P. at Sylvan Lake and 4474 ± 350 at the Bannerman site about 40 miles upriver from Twombly Landing, and which have been found in the Croton River mouth area, are not in the Twombly Landing collection; nor are any of the several Brewerton Laurentian styles, nor Snook Kills. There is, then, a marked difference in the sequence of projectile points between Twombly Landing and the area north of, as nearly as it can be ascertained, Ossining, just below the mouth of the Croton River. The difference is such as to amount to a cultural boundary. As it happens, that there is a cultural boundary at approximately this point has been proposed by Stephenson, in his Accokeek Creek site report (Brennan, 1969); it is the northern extremity of what he calls The Middle Atlantic Seaboard Cultural Province, extending southward to the Rappahannock River valley. The actuality of the province, at least from the entrance of the Taconic people into the area, seems confirmed.

Other Materials

The artifacts collected from the site other than those discussed are listed in the inventory. They were found in indeterminate contexts and attested to the general hunter-gatherer nature of the site. It is still not possible to draw up a trait list for the Taconic tradition, though one new trait, a bunt with a Taconic stem, was discovered. The Taconic people, outside their projectile points, seem to have made no strongly idiosyncratic artifacts; they seem to have relied, at midden sites at least, on casual flake scrapers and knives of whatever stone, good, bad or indifferent, was handy. But the ubiquitous stemmed point makers are assuming a growing importance in eastern archaeology and they must be investigated more thoroughly and analyzed more fully. Such an ambitious project is not within the scope of this report.

Summary

Use of the terrace above Twombly Landing as a campsite began, on the evidence of the MacCorkle point, at 7000-8000 years ago. It was probably used intermittently by subsequent groups. The first shellfish gathering culture to use it was the Taconic tradition people of about 5000 years ago. A group making spirate triangular points in a tradition that includes the Beekman triangle was contemporary with the Taconic tradition, though the two groups would appear to have used the site at different periods; as a suggestion the Taconic

people used it one season, the triangle-makers at another, or the Taconic people used it when oysters were there and the triangle-makers when they were not. Vinette I times were the last during which large oysters were abundantly produced, but the site continued to be used by Indians until they left the area after white contact.

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Addendum

A comment on the relation of the lithic data in this article and those of Rutsch in the preceding article seems appropriate. Though the large MacCorkle seems of exotic material, the rest, even the three jasper pieces, are very probably local, though not all sources can be identified. The site was thick with pebbles, worked and unworked, and the source of the abundant Coxsackie Flint was certainly pebbles. There must have been a narrow gravel beach in the vicinity when the Hudson was lower or streams running through glacial till washed out usable pebbles. The importation of materials at Twombly Landing is to be regarded with suspicion.

THE PARRISH SITE - A VERGENNES COMPONENT

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While surveying for Indian sites within the Fort Ann quadrangle, we discovered a small, isolated habitation area which produced Vergennes phase artifacts of the Laurentian tradition (Ritchie, 1969). Named after the owner, Mr. Lester Parrish, this single component site (FtA 2) lies approximately 3.5 mi. east-north-east of Fort Ann and 11 mi. west of the Vermont border.

The artifacts were found scattered over a sandy knoll that rose only slightly above the surrounding clay flats and slopes, the entirety of which was encompassed on the north, east and west by nearby Ordovician limestone cliffs. We surface-hunted the area after plowings in 1967 and 1968, isolating the site to a 25 yd. by 30 yd. plot by the frequency of flint debris. In an attempt to collect a larger representation of artifacts, as well as a long-hoped-for sample of charcoal for C-14 dating of the Vergennes phase, we excavated 22 five-foot squares in a pattern designed to test all sections of the site.

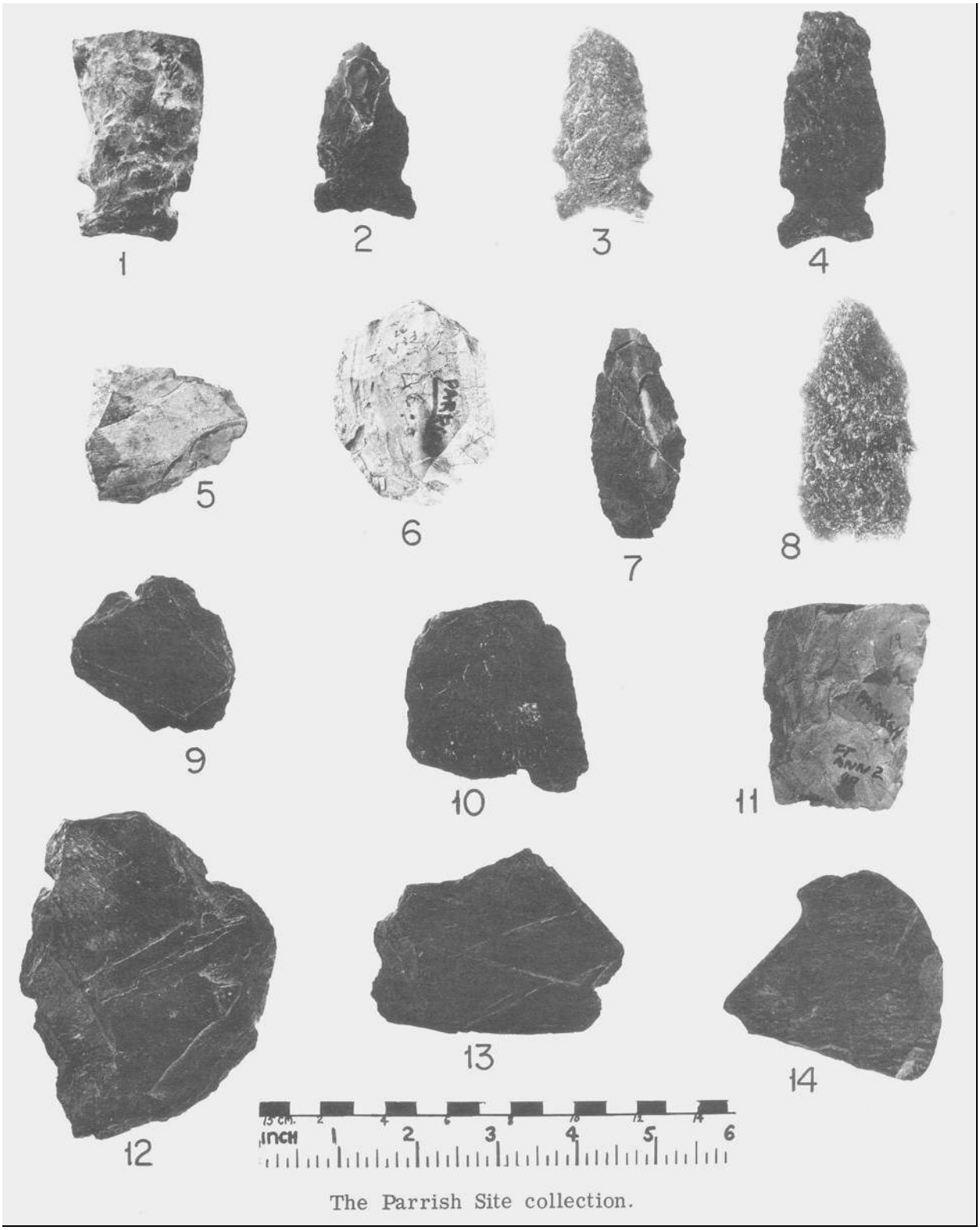
Unfortunately, the charcoal which we did collect from the only unearthed feature, an excellently preserved roasting pit, was dated at 250 ± 100 years A. D. by the Yale Radiocarbon Laboratory (Y-2524). This obviously is far younger than the age of 3000-3500 B. C. that Ritchie (1968) suggests for the Vergennes and the even older date of 4000--5000 B. C. that Funk (1965) proposes. The feature was oval, 2 ft. 9 in. long, 1 ft. 6 in. wide, and 11 in. deep below the 10 in. thick plow zone. The upper portion of the pit was undoubtedly mixed with the brown topsoil of the plow zone, making it indistinguishable from the surrounding soil. Just below the plow zone, however, the feature was easily distinguished by the large black charcoal and carbonized bone chunks within a matrix of gray ash. This section of the feature was bowl-shaped with a maximum thickness of 4 in. The bottom, or remainder of the feature, was a tan to brown color and could be easily seen against the background of yellow-brown subsoil into which it had been dug. No evidence of occupation other than the burned bone was found in the feature. It is remotely possible that the feature was used by Woodland period hunters, but there is no artifactual evidence to support this. We suspect, therefore, that the C-14 sample was in some way contaminated.

Four Otter Creek type projectile points (Plate I, Fig. 1-4) were recovered. Two of these were ground on the base and in the notches, a third additionally ground on the tangs, while the fourth was ground on the base, in one notch and one tang. One complete point blank (Fig. 8) was square based and 5 sections of point blanks were found, along with 10 bases (Fig. 11) and 9 tips of large quarry blades probably broken in the preparation of Otter Creek points. In addition, we unearthered 7 retouched flake knives, 4 utilized flakes, a single oval flint pebble hammerstone (Fig. d), and a narrow oval knife (Fig. 7) which was thinned along all edges.

Of the 42 above-listed artifacts, only two are of material foreign to the immediate area; one point and the point blank are of quartzite. The remainder of those artifacts were fashioned from Fort Ann flint which outcrops at a large quarry just 1 mi. south of the site. This undoubtedly accounts for the large percentage of point blanks and quarry blades.

In addition to the artifacts of siliceous material we found six interesting artifacts of local slate. These are described below.

1. A gray-green slate scraper (81mm x 61mm), roughly rectangular in outline (Fig. 13). The scraping edge was 47mm long and 7mm thick, being finely flaked and having a straight, smoothed edge. The upper surface has two diagonally crossed grooves worn across almost the entire breadth while one edge has been slightly worn. In experimenting with slate and flint pieces, the senior author found that the grooves may well have been made in grinding



The Parrish Site collection.

The Parrish Site collection.

down the outer edges of the tangs of Otter Creek points. He also found that deer bone, such as might have been used in making bone awls, made no marks on the slate. In further experiments, we found that the worn outer edges of the slate might have been created in smoothing the incurvate bases and/or notches of the Otter Creek points.

2. A gray-green slate scraper (72 mm x 72 mm), roughly semi-lunar in outline (Fig. 14). The scraping edge is straight for 40 mm, then is fashioned outward at a 90 degree angle for another 7 mm. The entire edge is finely chipped and worn. Possibly this object was used to smooth and square-off the edges of wood pieces. All additional edges show slight wear and the underside exhibits 10 short parallel scratches. As on the specimen described above, this wear and grooving might have resulted from grinding portions of Otter Creek points.
3. A large (91 mm x 99 mm) semi-lunar, purple slate piece with a finely chipped edge (9 mm thick) along the front (Fig. 12). The heavy wear along the entire vertical face of the steep, chipped edge seems to rule out the possibility that this tool was used entirely or if at all as a hide scraper. Experiments with flint blanks with prepared notches similar to those of Otter Creek points showed that the slate scraping edge would fit easily in the notch of a point and would, with little effort, smooth the chipped flint edge. The underside shows a single groove worn approximately one-third of the way across the piece.
4. A roughly rectangular (56 mm x 66 mm) gray, slate scraper with a 47mm long straight, chipped and worn scraping edge 25 mm thick (Fig. 10). No scratches or grooves are evident on this piece.
5. A triangular (52 mm long x 42 mm wide) gray, slate piece (Fig. 9). The edges show wear, possibly as a result of grinding points. A single scratch, approximately one-half the length of the slate, is evident.
6. A roughly triangular (54 mm long x 46 mm wide) slate abrader showing numerous crisscrossing scratches on either side (Fig. 5). Two edges show wear.

In conclusion, we believe that the Parrish site was a small, temporary campsite, chosen primarily because of the proximity to the flint outcrops. This is readily evidenced by the large proportion of quarry blades and point blanks of the local flint, exhibiting various stages in the production of Otter Creek points. Although we were disappointed by the recency of the C-14 date, the possible discovery of the point-grinding tools (the various slate pieces described above), gave us some satisfaction. Meanwhile, the effort goes on to pin the elusive Vergennes Phase to a time chart.

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VARIOUS EXPLANATIONS

With this number of The Bulletin, inaugurating a new fiscal and publication year, a new schedule of dues goes into effect for the membership of the New York State Archeological Association. The increase was voted at the annual meeting April 24--26 at which was present probably the most broadly representative attendance of any meeting within the past five years. Since the increase in dues goes entirely to the state treasury and since it was voted after a plea by the editor of The Bulletin in behalf of an increase in the budgetary allowance for the publication of The Bulletin, the editor feels constrained to offer an explanation.

The per page cost of printing The Bulletin in its present format has risen since the transfer from Moxon to Braun-Brumfield from about $10 per page to about $13.35 per page. The appropriation for The Bulletin at that time was $1000 per year for three issues and we had hoped to print 96 pages, with $40 left for mailing and contingent expenses. But slowly or quickly the costs have risen and we have never been able to meet this goal. A little on-the-cuff with arithmetic will show that this past year's three issues of 72 pages cost, for printing, about $960. It should be clear that to keep within the budget of $1000 we would have to accept a continuous erosion of the amount of material published, at a time when the amount of worthy material awaiting publication is on the rise. Because the editor has followed a fiscally conservative policy no deficits have been incurred, but the question that confronts us is how well we can discharge our functions and achieve our objects as the sole organization devoted to the archaeology and prehistory of New York State in its entirety without increasing our reporting, and immediate reporting, of the work being done.

The NYSAA engages in two activities which justify its existence, the annual meeting at which a program of significant reports is presented, and the publication of The Bulletin, which is the permanent record of our archaeological research. If either of these activities languishes the NYSAA loses its effectiveness and fails its obligation to recover and preserve as much as possible of the remaining prehistory of the state. It has been said again and again, but still not often enough, that excavation and recovery of evidence, even though done with meticulous care and professionalism, is a major mischief unless and until that excavation and recovery has entered, through publication, into the literature; the more thoroughly a site is excavated the more thoroughly it is destroyed. Without publication there is no such thing as archaeology; it is only strip-mining. Without a Bulletin, as a journal of archaeological research, there is no NYSAA; it might as well call itself The New York State Astrological Association.

This, in essence, was the argument advanced by the editor for an increase in Bulletin allowance to the membership meeting of the Long Island Annual Meeting. He did not ask for a specific amount and the membership itself set the figure of $1500, which constitutes a percentage increase off-setting the inflation in costs over the past four years. This increase, in turn, dictated the amount of rise in dues. The membership total is about 500; thus an average increase of $1 per capita will balance the budget. At the present page cost, for a press run of 1000 copies, this should allow an annual output of about 104 pages, a total that will probably not be reached because there is almost certain to be a cost rise during the year. But we may be able to attain a volume of 96 pages, or three issues averaging 32 pages, though the issues may not work out just that way.

The kind of material The Bulletin has been receiving over the years has changed imperceptibly but steadily, as any reader of it during the past decade can verify by reviewing his back numbers. The quality of submissions has gained by at least one order of magnitude and the submissions are lengthening, with more technical documentation-tables, graphs etc. They are, moreover, wider-ranging in scope, as befits the growing awareness of the effects of geology-ecology on aboriginal habit. The Bulletin is pleased to be attracting such contributions, but some of them pose a problem. We are in receipt of two manuscripts,

one from Mrs. Eleanor Lopez, widow of the late Julius Lopez whose work in the New York City area can not be duplicated, and one from Joseph Granger, a pupil of Dr. Marian White, both of which are wholly devoted to New York archaeology, but both of which are of monograph length. It would be easy to reject these manuscripts as too long; all of the state society journals we know of would do that, however regretfully. But rejection might very well mean oblivion for them, since they are of strictly New York central interest. In the editor's opinion both deserve decent publication which The Bulletin alone seems the only New York medium with any chance of providing. Researches and Transactions is already partially committed to a manuscript by Dr. Peter Pratt but printing costs rise almost as fast as publication funds can be set aside for it and the prospects for any other publication are dim for the next five years at least.

Consistent with an attitude already expressed that archaeological work is valueless until published, the editor feels that it is incumbent on him to hold these manuscripts until some way can be found to publish them. One promising arrangement suggests itself, that The Bulletin makes a page allowance for part of the monograph length manuscript and the author finance the other part at the going page rate. The advantage to the NYSAA membership is that it would be getting every five or six issues a monograph on New York state archaeology, something it has not received for several years and cannot look forward to receiving for several more. The advantage to the author, often a student or a salaried teacher who cannot afford to lay out $1200 to $1500, and cannot command that much in grant or other assistance, may be able to come up with a half share or, possibly less. The policy looks good in statement; when spelled out in dollars and cents for the author, and page allowance for the Bulletin, the decision is not so simple. How many pages can The Bulletin allow without slight to its obligation to print shorter pieces with reasonable immediacy? Out of a yearly volume of 72 pages it could allow, probably, no more than 20; but this would be of no help at all, since most monograph-length papers will run 60 to 70 pages, even in the Bulletin which prints 900 words to the page, because of figures and illustrations. But a volume of 104 pages gives us some space to move around in, and the printing of a monograph-length paper becomes a talking possibility. A 50 page allowance is thinkable.

The editor is going to try to print a monograph-length paper, probably the Granger paper, the shorter of the two, within the next three or four issues, before costs again force us to begin cutting back on size, because it is apparent that the monograph-length piece is being squeezed out of the literature by cost escalation. Larger, more ambitious works are absorbing publication funds on the one hand, while the cost of private publication is well beyond what the author himself can bear. But the monograph, with its documentation and technical data, has long been the very marrow of archaeological reporting. The thorough reporting of a site of any complexity and extent requires monograph-length or its puissance is lost. It is the feeling of the editor that The Bulletin, if it is to maintain its standards as an archaeological journal, must meet the needs of the times, avoiding a rigidity which would limit its usefulness to New York archaeology and its interest to the NYSAA membership.

When the notice of the increase in dues reaches the membership there is likely to be some quick calculation and more than one will come up with the answer that $4 going to the state treasury for 3 issues of The Bulletin means almost $1.50 per issue. But $3,based on the present 500 membership, not the full $4, goes toward printing The Bulletin, making the cost $1 per copy, not excessive for a journal which does not carry advertising. The editor wishes to emphasize that all of this contribution is for cost of printing. There are no payments to authors, of course, nor for editing which, by any current salary standard, would cost at least $150 per issue. The editor receives no reimbursement of any kind, not for postage, which has amounted to a tidy sum for the 11 years he has been editor, nor for stationary or other supplies. Nor does the editor even use NYSAA official stationary in his correspondence. The only charge put upon NYSAA membership for The

Bulletin is for printing by Braun -Brumfield, and for distribution.

This brings up the question of whether the printing costs are too high, which brings up, in turn the reasons for the format and page layout. We cannot emphasize too strongly that we believe we are getting from Braun - Brumfield, using the present layout, the most attractive and economical publication in the field. There has been some inquiry in the past why we continue to use a layout no more "magazine" looking then in the days when The Bulletin was little more than a newsletter. The answers are involved.

The page size is what it is for two reasons; the better reproduction of photographs, drawings and tables, and the best use of space for text. The Bulletin page takes 3 pages of normal typescript of 300 words per page because only half as much space is devoted to margins as would have to be given to a "handbook" format of approximately half the size. This is part of the reason that text is set full-page, rather than in columns, but only part. The cost of setting The Bulletin in two columns-and setting is by far the greatest printing cost--would approximately double.

The regular text is set in 12 point type. It could be set in 10 point, the next smaller size, but this would give so large a page an unattractive denseness, and the saving would be in paper only, a small cost item. Paper is saved in the ways mentioned above, by using the large page and printing full-page, and by running articles directly one after the other, rather than beginning each article at the top of the page. We can afford 12 point type to attain legibility.

The text is set on an IBM machine which has three sizes of type, 12 point, 10 point and 8 point, with an italic face for the 12 point and the 10 point. As long as we stay within these sizes and faces we are getting the most economical job of setting on the market. To go beyond this to relieve the monotony of the page, for heads and subheads would be costly, to no important purpose. We try to vary the text where appropriate, to give it some liveliness, but we have to work within what we have.

We have striven for liveliness and freshness of appearance by changing the color of the covers, which costs nothing, and by running and illustration on the cover, which is a saving when the illustration is one that would ordinarily be included in the text of a published piece. This is not always so, of course, and when we receive a special cover illustration, as Kraft's for the March Bulletin or Gwyneth Gillette's for the Perch Lake mounds, we are only too happy to use it. Such contributions are pluses and they don't cost anything either.

There is not much likelihood that there can be much change in The Bulletin layout for sometime, since all changes from now on will be disproportionately costly, and for appearance only. The problem of cost is basically a problem of membership. If it totaled 750 instead of 500, The Bulletin's budget of $1500 would cost each member $2 instead of $3. The membership has been growing steadily, but it is far from catching up with Massachusetts's 1000 plus, or Virginia's 1000 plus. NYSAA is a relatively small society trying to sustain a program and a publication worthy of a very large state. For $1 per member per year it can be done.

Louis A. Brennan

NYSAA Annual Meeting—1970

The Place

Alfred Dart
Program Chairman

Long Island Chapter President and Chief Cook Harrison Case

Dr. Ralph Solecki shows flint chipping technique with soft hammer

Retiring President Charle Hayes III. Left, President Elect Michael Bipton

Ronald Wyatt
Banquet Speaker

Full House