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Proceedings = 2nd] 1971
of the
Middle Atlantic
Archeology^{ical} Conference

Edited by

Charles W. McNett Jr.

William M. Gardner



Held at

(The Catholic University of America, 1970)

The American University, 1971

Elizabeth A. Moore

*Presented to the
1st Conference on
the Archaeology of
the Eastern United States*

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EDITOR'S INTRODUCTION

The Middle Atlantic Archeology Conference originated in discussions held among a number of archeologists specializing in the area who were attending the Eastern States Archeological Federation meetings held in Morgantown, West Virginia, in November, 1969. William M. Gardner of The Catholic University of America was informally designated the program chairman and local arrangements committee for the first annual conference to be held at The Catholic University in the spring of 1970. He and Charles W. McNett, Jr., of The American University jointly planned the first program, a copy of which appears below along with a list of participants.

The first conference was recorded on tape and has been transcribed. It is not reproduced here because most of the discussion was highly tentative and centered around familiarizing the participants with work going on in the region, as well as discussions of how the conference should be organized. As such, much of it is now out of date. There was one formal paper presented by W. Fred Kinsey, III, which has since been published in the Pennsylvania Archaeologist. Primary conclusions reached at that first meeting and in mail discussions thereafter were that the program ought to consist of about equal amounts of formal papers and informal discussions among the participants, as well as a continuation of research plan announcements. It was decided that the second conference would be held in the spring of 1971 at The American University with McNett as organizer. A program and list of participants is also reproduced below. The formal papers presented in this volume are the result of that conference. It was decided that taping and transcribing comments at the second conference would be too expensive, given the conference's limited resources, and they are omitted.

The third conference is scheduled for the University of Delaware in the spring of 1972. Ronald A. Thomas, Delaware State Archeologist, is in charge of local arrangements.

This volume is made possible by the \$2.00 registration fees paid by the participants of the two conferences. In addition, the Department of Anthropology of The American University provided a typist to prepare the final multilith masters. Art work was by Charles E. Hunter of The American University and Victor Carbone of The Catholic University.

Washington, D.C.
June 30, 1971

PROGRAM FOR THE 1ST MIDDLE ATLANTIC ARCHEOLOGY CONFERENCE

The Catholic University of America
Washington D. C.
April 17 and 18, 1970

Friday, April 17

Morning Sessions:

Geography of the Middle Atlantic	Kinsey, chairman
Physiographic Zones	Gardner
Ecological Zones	McNett
Lower Hudson Geography	Brennan
New Jersey Geography	Marchiando
Pennsylvania Geography	Kent
Delaware Geography	Thomas
Potomac Geography	Gardner
Carolina Geography	Ferguson
Carolina Geography	Packard

Afternoon Sessions:

Cultural Sequences in the Middle Atlantic	Bastian, chairman
New York	Brennan
New Jersey	Marchiando
New Jersey	Kraft
Pennsylvania	Kent
Delaware	Thomas
North Carolina	Ferguson
North Carolina	Packard
Maryland	Bastian
Virginia	Johnson
Potomac	Gardner and McNett

Saturday, April 18

Morning Sessions:

Research Plans	Marchiando, chairman
New York	Brennan
New Jersey	Marchiando
Delaware	Thomas

Maryland
Maryland
Potomac
Maryland
Virginia

Cresthull
Bastian
McNett
Schuyler
Johnson

Planning for second meeting followed.

FIRST MIDDLE ATLANTIC
ARCHEOLOGICAL CONFERENCE: 1970

PARTICIPANTS

Harvard Ayers
Appalachian State University

Tyler Bastian
Johns Hopkins University

Louis A. Brennan
Ossining, New York

Victor A. Carbone
The Catholic University

John L. Cotter
National Park Service

Paul Cresthull
Abingdon, Maryland

Leland Ferguson
University of North Carolina

Franklin Folsom
Roosevelt, New Jersey

William Gardner
The Catholic University

Steve Gluckman
The Catholic University

James I. Gross
University of Maryland

R. G. Handsman
The American University

Deborah Harrison
The Catholic University

Cecil L. Harvey
The American University

D. Michael Hull
Lancaster, Pennsylvania

Charles E. Hunter
Franklin and Marshall College

Arthur F. Johnson
Alexandria, Virginia

Elmer A. Jones
North East, Maryland

Barry C. Kent
William Penn Museum

W. Fred Kinsey
Franklin and Marshall College

Herbert C. Kraft
Seton Hall University

Clifford Lefferts
Dover, Delaware

Ellis McDowell
University of Maryland

John McGuinness
Dover, Delaware

Charles W. McNett, Jr.
The American University

Pat Marchiando
New Jersey State Museum

Thomas Mayr
Davidsonville, Maryland

Vance P. Packard
Penn State Museum

Suzanne Rappoport
The American University

George M. Reynolds
Elkton, Maryland

Jack R. Rudy
National Park Service

Robert S. Schuyler
University of Maryland

Harold C. Simmons
Briarcliff College

Ira F. Smith III
William Penn Memorial Museum

George E. Stuart
University of North Carolina

Ronald A. Thomas
Delaware Archeology Board

Melburn D. Thurman
University of Maryland

PROGRAM FOR THE 2ND MIDDLE ATLANTIC ARCHEOLOGY CONFERENCE

The American University
Washington, D. C.
March 19 and 20, 1971

Friday, March 19

- 9:00-9:30 a.m. Registration--Room 11, Hurst Hall
- 9:30-12:00 Shell Middens and Settlement Patterns--Thomas, Chairman
Mayr and Cresthull--An Early Archaic Site
Brennan--Implications of C-14 Dates from Montrose Point, N. Y.
McNett and Gardner--Shell Middens of the Potomac
Coastal Plain
MacCord--Late Woodland Settlement Patterns in Virginia
Discussion
- 12:00-1:00 Lunch provided by the Dean of Graduate Studies and
Research
- 1:00-2:45 Early Pottery--Kinsey, Chairman
Kraft--Early Pottery of the Northeast
Smith--Early Pottery of the Susquehanna
Gardner and McNett--Early Pottery of the Potomac River
Discussion
- 2:45-3:00 Coffee Break
- 3:00-4:30 Typology--Gardner, Chairman
Thurman--Some Remarks on Typology
Discussion
- 5:00- Cocktails, you're on your own for dinner.

Saturday, March 20

- 9:30-12:00 Workshop on Settlement and Subsistence Patterns--
Bastian, Chairman
Floor Contributions and Discussion
- 12:00-1:00 Lunch, you're on your own again.
- 1:00-3:00 Research Plans, state by state
General Discussion and Planning

SECOND MIDDLE ATLANTIC
ARCHEOLOGICAL CONFERENCE: 1971

PARTICIPANTS

Harvard Ayers
Appalachian State University

Galen Baker
University of North Carolina

Tyler Bastian
Johns Hopkins University

Louis A. Brennan
Ossining, New York

N. Brice
Annapolis, Maryland

Victor A. Carbone
The Catholic University

R. Cox
Baltimore, Maryland

Paul Cresthull
Abingdon, Maryland

Sarah Derr
University of Delaware

Toni Doilney
The American University

John Eddins
The American University

William M. Gardner
The Catholic University

Mary Anna Goewert
The Catholic University

Jeff Graybill
Franklin and Marshall College

D. Griffith
University of Delaware

James I. Gross
University of Maryland

Nancy Hand
University of Maryland

Deborah Harrison
The Catholic University

Elmer A. Jones
North East, Maryland

W. Fred Kinsey
Franklin and Marshall College

Herbert C. Kraft
Seton Hall University

Clifford Lefferts
Dover, Delaware

Carol Lewis
University of Delaware

Howard MacCord
Virginia State Library

Ellis E. McDowell
University of Maryland

Charles W. McNett, Jr.
The American University

Dorothy Martinek
Silver Spring, Maryland

Thomas Mayr
Davidsonville, Maryland

Munro Meyersburg
The Catholic University

Glenda Miller
The Catholic University

Mr. and Mrs. John P. O'Hehir
Kensington, Maryland

Vance P. Packard
Penn State Museum

George M. Reynolds
Elkton, Maryland

Jack R. Rudy
National Park Service

Robert S. Schuyler
University of Maryland

Harold C. Simmons
Briarcliff College

Ira F. Smith III
William Penn Memorial Museum

Deana Steiner
University of Maryland

Ronald A. Thomas
Delaware Archeology Board

Melburn D. Thurman
University of Maryland

Joan Walker
The Catholic University

Nancy Warren
University of Delaware

THE IMPLICATIONS OF TWO NEW C-14 DATES
FROM MONTROSE POINT, LOWER HUDSON, N.Y.

by

Louis A. Brennan
Metropolitan Chapter
Archaeological Society of New York

Though it may seem to many in this audience that I have been reporting for at least the past ten years on the same site from the Lower Hudson, the fact is that, with a great deal of assistance, I have excavated more sites in this vicinity in the past two decades than many of my listeners are years old.

The seeming monotony of it all is owing to our involvement in digging the same hackneyed kind of site, riverbank middens of oyster shell. But it should by no means be thought that when you've dug one oyster midden you've dug them all. Despite the uniformity of the shell deposit context, each site is peculiar in one respect or another and has its unique contribution to make to the prehistory of the Shattemuc, which is the Algonkian name, meaning "river that flows both ways," for the Lower Hudson. Excavation of at least a dozen substantial sites, most of them oyster shell middens, has given us a picture of a quite complex Archaic during which at least three cultural traditions, apparently contemporaneous, resorted to the banks of the Hudson to camp and collect oysters for food. We can even say that southern and northern facies of the Archaic met at an interface in the Lower Hudson and were there joined by an eastern or coastal Archaic, at least by Middle Archaic times. The prehistory of the Lower Hudson is far from a matter of simple cultural sequences and replacements.

Let me briefly recapitulate our work up to the present:

In the decade 1950-60 we labored diligently at the Van Cortlandt site, the Winterich site, the several Crawbuckie loci, the Parham Ridge site, the Oscawana site, the Woolcott and Dogan Bluff sites on Montrose Point, the Hanotak Rock Shelter and several smaller sites, accumulating a great deal of material and data but finding no clues by which we could synthesize it all. No work having ever been done in the Lower Hudson, there were no references for guidance, not only in archaeology but in geology or oyster ecology. Carlyle Smith's "The Archaeology of Coastal New York" (1950) for the metropolitan and Long Island area immediately south of us, with its unacceptable 2000-year chronology, was useless. Ritchie's work on the Mid-Hudson "An Introduction to Hudson Valley Prehistory" (1958) was related by him to his prior work on Lamoka Lake, Brewerton and other central New York sites and in that form was deemed by us to be inapplicable to the Lower Hudson because there was implicit in it a premise known to be no longer valid.

This premise, which was standard doctrine at the time the New York work was done, was that the Archaic pattern, like the Paleo-hunter before it, had entered America as a direct migrant from Asia; therefore the movement of population into the present United States had

been from north to south and the cultures Ritchie discovered in the 1930's and 40's were earlier than and presumably parent to cultures of related aspect to the south, including the Lower Hudson. But this view became seriously undermined during the 50's, as site after site of early Archaic age, on a time level with the Paleo-hunter period, was reported in the southeast and it was no longer tenable after the publication of Coe's "The Formative Cultures of the Carolina Piedmont" (Coe 1964) and DeJarnette's "Stanfield-Worley Bluff Shelter Excavations" (DeJarnette, Cambron and Kurjack 1962) both of which defined Archaic parent cultures at least 10,000 years old. It was clear by 1960 that there had been an early Holocene Archaic population across the southern United States and that the movement of its peoples had been in the direction of glacial front retreat, that is, from south to north, in later Holocene times.

Casting about for our own solutions we conceived the notion that the heaps of shell that we had noted in several places along the Hudson as being of some depth, might be stratified, and in 1960 we began to dig one of these, at the Kettle Rock locus on Croton Point. The most clearly defined stratum of this badly eroded midden was the lower one, of quite large shell which caused us to give it the name GO (for giant oyster) horizon. Though it contained no projectile points or other diagnostic artifacts, the cultural evidence of stone chips, manos, charcoal and split animal bones was abundant. Charcoal scattered throughout this stratum was collected and dated 5863 plus or minus 200 years (Y-1315).

Though it had been a strongly held opinion that the collection of marine shell fish for food had not been a practice before the Woodland period and the use of ceramics, the Croton Point midden established the practice as Middle Archaic beyond question. Our excavations there did not, however, discover who these oyster users were, and we moved on to another shell midden site, at Twombly Landing on the west side of the Hudson in the New Jersey section of Palisades Park, directly opposite Yonkers, New York.

This site was located on a bluff 100 ft. above the present water level and it yielded a great deal of material, most of it pertaining to the stemmed point Taconic tradition. Charcoal from a hearth near which was found a Taconic point was dated 4750 plus or minus 120 years (Y-1761) and 4725 plus or minus 80 years (GX-0762). The evidence of Twombly Landing was, therefore, that the stemmed point Taconic tradition was contemporary with the upriver Vosburg tradition, dated 4480 plus or minus 300 years (M-287) at the Bannerman site (Ritchie 1958) and 4730 plus or minus 80 years (Y-1535) at the Sylvan Lake Rock Shelter (Funk 1966). Although the dated hearth was not the earliest occupation at Twombly, which we estimated at 5000 years ago, there was no sign of a GO horizon occurrence.

Our search for another GO horizon deposit led us to Montrose Point, about four miles upriver from Croton Point, where it appeared to be present in an erosion cut-bank. This was confirmed by a C-14 date on shell of 5650 plus 200 years (L-1038-E), obtained from Lamont Laboratory through the good offices of Dr. Walter E. Newman of the Queens College geology department. We began digging this site in the spring of 1968

and we still cannot define the culture of the G0 horizon people, but in May, 1970, on the same afternoon, we came upon two associations that seemed worth the fund expenditure for C-14 dates by reason of the specific artifacts that would be temporally placed.

The first of these was a side-notched red shale point which, if seen isolated in a collection, would be called Brewerton side-notched. It was lying beneath the shell deposit on the original soil surface, with a lanceolate lens of red slate, probably a knife, and the outline of a hearth from which nearly all charcoal had been leached away. Shell taken from immediately above the association was dated at 5155 plus or minus 120 years (GX-1918).

The second association was a cluster of three square stemmed, triangular bladed points that may or may not relate to the Taconic tradition. They were found near the contact line of shell midden with the original soil surface and were within the still-preserved humus of that surface on which a shell heap had been deposited. This associated shell yielded a date of 5075 plus or minus 160 years (GX-1919).

But these two associations provided more chronological information than the time placement of two point types. Only 80 years apart in time, they were only 22 feet apart in space, and the area between them, which was a continuous midden, had been a camp site where there had been several stop-overs by peoples making various styles of projectile points. Bracketed in time and space by the two dated associations were an Otter Creek or Big Sandy point, a large and a small Dalton-like point, two Vosburg points, a Taconic point and a series of points that we shall, for the moment, call Beekman triangles since they are, in the main, similar to triangles so named by Funk who found them in the Vosburg stratum at Sylvan Lake Rock Shelter where they date, as noted above, at 4730 years. [Kinsey has recently (Kinsey 1971) reported an age of 5580 years for a Vosburg occurrence of his Faucett site on the Upper Delaware River.]

This impressive concurrence of six dates, done by three different laboratories on both shell and charcoal over a period of seven years, should banish from the literature for all time any doubts about the use of marine shell fish and, specifically, oysters as a food staple with the consequent accumulation of shell middens during Archaic times. How so illogical a belief as that a gathering people would not have known about and harvested mollusks ever became an *idée fixe* in the literature exceeds the explicable. As a matter of fact by far the greater bulk of oyster shell laid down in aboriginally deposited middens in the Lower Hudson date during the Archaic, since oyster production petered out here, on the archeological evidence, at about ceramic times. All signs point to an equally heavy accumulation of middens before the dates of the upper limit of 6063 years for Croton Point and the upper limit 5850 years for Montrose Point, since these middens have been truncated by erosion, as sea level rose from the 40 feet below present level that it was 6000 years ago. Both Croton Point and Montrose Point had to have been vastly larger middens than the remnants we have excavated and it is not beyond hope that we will find earlier middens, though probably not the earliest, which are now undoubtedly underwater or washed away.

The Dogan Point locus on Montrose Point is an expanse of oyster shell, much of it badly weathered, of at least an acre in extent, of varying depths, lying on a hillside that rises from about 8 ft. to about 40 ft. above present water level. It is only one of several accumulations along the mile long shoreline of Montrose Point. What we call Dogan Point is a slight extrusion from the shoreline about 35 ft. long and 25 ft. wide. That it is a point at all is due to quite recent -- the last century or so -- wave cutting of the eastern flank. This flank was, not too many centuries ago, a continuation of the hillside slope down to the shore of a shallow inlet now about 25 acres in extent but once much narrower and probably deeper. It is obvious that in this inlet lay the oyster beds from which came the shell of the Dogan Point midden.

At the time the G0 horizon shell was deposited, the level of the Lower Hudson was 40 ft. below present level, as we know from C-14 dates taken from peat deposits across the river called Ring and Salisbury Meadows (Newman 1967). The direction of midden accumulation would naturally be from the shoreline inland, from lower to higher elevations. Thus the 5650 year old G0 horizon shell at Dogan Point (and the G0 horizon at Croton Point as well) lies 40 ft. higher than the water whence the shell was taken, and the inference is that all the area between water level and the elevation where the G0 shell was deposited was already covered by midden. This midden must have been at least three acres in extent, and were all the shell ever deposited there in whole condition at one time, there must have been peaks in it up to ten feet in height.

That the direction of midden accumulation was actually from the shore inland is indicated by the three dates we have. The 5650 date comes from west trench 1, the eastern most trench nearest the inlet, and square 4 north, that is, inland and uphill by 20 ft. from the baseline at the tip of Dogan Point. The 5155 date comes from west trench 2, square 9 north or 45 ft. from the baseline. The 5075 date comes from west trench 3, square 13 north, or 65 ft. from the baseline.

Our excavation to date has uncovered, substantially, the area of the Point and up the hillside to about 75 ft. north of the baseline. It divides into two sections. Section 1 consists of a depression or sag between the rock outcrop which forms the end of Dogan Point and a terrace-like rise beginning about 35 ft. from the baseline. In this sag the shell is 3 to 4 ft. in depth and the lower 30 in. of it is G0 horizon. Section 1 is about 45 ft. wide in west trench 1 and 35 ft. wide in west trench 4, the terrace running diagonally across the Point.

The G0 horizon occurs only in Section 1. It is marked by a weathered surface infiltrated by humus which provided a ground level for later campers. On this surface, 22 in. below present surface, there occurred a Taconic stemmed point for which the dating at Twombly Landing was 4750 years. Within two feet of it, at precisely the same level, was found a triangular point identified by Funk, who was present when it was found, as a Beekman point of the type he had found in the Vosburg level at Sylvan Lake Rock Shelter. Thus the contemporaneity of Taconics, Vosburgs and Beekmans is manifest.

Likewise on this G0 horizon surface and at 22 in. below present surface was found a point that, had it come from North Carolina, would be called a Kirk side-notched. It is not serrated, as most Kirk blade edges are, but the blade has been reduced by rechipping as though for sharpening, like many Kirk specimens, creating barb-like shoulders.

Above this group were found pinch-stem (Normanskill-like) Taconics, an unidentified new industry using an exotic speckled flint and based on pentagonaloid forms, a fragmentary Perkiomen and, on top, a series of the Twombly side-notched points which we found at Twombly Landing in association with Vinette 1 pottery but which at Dogan Point were associated only with steatite sherds.

In summary, Section 1, above the G0 horizon with its restricted area and thin shell build-up, gives us a picture of small group, short term camping over hundreds of years, with very little loss of artifacts at the camp locus and not a great deal of industrial or other activity. The same small area, perhaps six feet in diameter, was used over and over as the location of the camp fires of successive camping, laid either on the surface or in a slight depression and not defined by a stone hearth.

There was a similar camping locus in Section 2, in an area roughly 15 ft. by 20 ft., beginning at square 12 north, or 60 ft. from the baseline. This area was, in the original topography, nearly level, and is in a slight cove, protected from the prevailing northwest wind by a low spur of hillside. Open to the south, it is a surprisingly comfortable niche in the hillside. By covering our work to prevent freezing we were able to dig in this niche two weeks in December, one in January and three in February, of the severe 1969-70 winter. In this camping locus was found the collection of divergent types already mentioned, the Otter Creek-Big Sandy, the Vosburgs, the Daltons, the Taconic and, most importantly, the series of a dozen tentatively typed Beekman triangles.

The triangles were at the contact line of midden and original surface or low in the midden and apparently relate to a camping association consisting of a pit hearth dug into the subsoil between two large stones, a cobble metate (a similar one was found in Section 1) with a mano nearby, and considerable waste and core material of a quartzite industry, though none of the triangles were of quartzite. The charcoal in the hearth had been almost entirely consumed by tree roots and the remainder was not sufficient for dating. The dated cluster of square-stemmed points was on the inland periphery of this triangle point-makers' camp site, representing a later but not much later camp site.

The red shale side-notched dated point, which we will tentatively call Montrose side-notched and which I relate to that ancient tradition of side-notched points found at the bottom of Modoc Rock Shelter (Fowler 1959), of Stanfield-Worley Rock Shelter (De Jarnette 1962), of Graham Cave (Logan 1952) and of the Raddatz Rock Shelter (Wittry 1959) occurred at the boundary between Sections 1 and 2. The shell deposit was here about 30 in. deep and the point, the lanceolate slate knife and the shadow of a hearth were under it, on the original

ground surface. The likelihood immediately suggests itself that the campers who dropped the point were the depositors of the GO midden shell, the dated locus of which is only 25 ft. away, at the same level. But there has intervened between the dated-pointed-locus and the dated GO locus an anomaly in the shell that destroys the stratigraphic continuity. In west trench 2, square 5 north, there is a depression or sink hole which for centuries has acted as a catch basin for run-off water from the hillside. The pooled water sank into the shell at this point and then percolated eastward, toward the cut bank, dissolving the shell into grist for a width of about two feet and erasing any chance of reading the stratigraphic indicators.

It is the opinion of the author that the Montrose side-notched point association does not pertain to the GO horizon. We have never found a projectile point within or in assured relation to the GO horizon. It has yet to be proved that the GO people made projectile points. Further, shale and slate is never found in the scant chippage, always of good flint, that shows up in the GO middens, but they do show up in the later middens of the Taconic-Vosburg-Beekman period. From the data we now have the hiatus of 500 years between the GO horizon and the later Taconic-Vosburg-Beekman era, seems to have been a reality. During that time oysters probably did not grow in the Lower Hudson. It seems to the author that the Montrose side-notched point either pertains to the Taconic-Vosburg-Beekman period of oyster production and midden deposit, or represents a period not related to the middens at all, prior to midden deposit of any era, and of early Archaic age.

Whatever the age of the Montrose side-notched association, the point styles of proved 5100 year age at the Dogan Point midden are so diverse as to raise the question of why such variety in the same vicinity at the same time. There are two answers, one specific and local, the other of origins and the movement of peoples.

In the first place the banks of the Shattemuc is where we would expect to find evidences of every band, tribe or tradition living anywhere within many miles. Thrusting, as it did, its abundant marine food resources into a forest environment, it provided a reliable larder in times when there was deficiency in the woodlands, by reason of blights, bad seasonal weather or cyclic scarcity. Even today, without oysters, Haverstraw Bay is one of the finest fish-producing bodies of water in the East (Doyle 1968).

But this leads directly to the question of why there were at least three traditions of projectile points, the stemmed tradition, the notched-blade tradition and the unhafted triangular tradition, presumably representing three different originations, in the vicinity of the Shattemuc. Knowledge acquired within the past decade or so about environmental and geographic-climatic changes during the Holocene in the Northeast provide us with the likely answers.

At the height of the last Wisconsin advance, the Valdres, at about 11,600 years ago, the Northeast quadrant, as far south as Virginia and the Ohio River, was in tundra, taiga and boreal forest. The evidence from the Dutchess Quarry Cave, Orange County, New York

(Funk, Walters and Ehlers 1965), the Debert site in Nova Scotia (Byers 1969) and the Holcombe Beach site, Michigan (Fitting 1966) shows that the occupants of the Northeast at this time, and for sometime thereafter, were the fluted point making Paleo-hunters and that their principal game was the caribou.

About 11,000 years ago the Valdres began to melt, rather rapidly, and the Arctic and sub-arctic vegetational zone followed it northward in its retreat. There then moved into the territory the meridional environment of deciduous trees and a southern fauna, the principal meat animal of which was the Virginia deer. The switch-over from a Canadian to a Carolinian environment occurred in Centre County, Pennsylvania, at about the latitude of the Lower Hudson, about 10,000 years ago or somewhat later, on evidence presented by John Guilday (1967). Analyzing the bone collection from the New Paris No. 4 pit, which had been a natural animal trap, Guilday found that it consisted of caribou and a Canadian fauna with an age of 11,250 plus or minus 1000 years (Y-727). But in the nearby Hosterman's Pit, a similar animal trap, dated 9240 plus or minus 1000 years (M-1291), the faunal assemblage was southern, including the Virginia deer, indicating that a meridional environment had reached Centre County at that time. Associated with this southern forest environment and fauna was undoubtedly early Archaic man whose presence 10,000 years ago in Carolina has been proved by Coe (1964) and for as far north as West Virginia by Broyles (1966). From this direction there must have come into the Lower Hudson the notched blade tradition, both in the original styles such as MacCorkles (Brennan 1970) and the Kirk-like, Otter Creek-Big Sandy-like and Dalton-like points of this report, along with others not mentioned herein, and in the variations on these themes we tend to call Laurentian.*

But what happened to the fluted point caribou hunters, when the environment of the Northeast changed from boreal to meridional forest? There is no reason at all to believe that these competent hunters vanished or were made obsolete by a change in game from caribou to deer. We know that in the west the Clovis fluted point mammoth hunters begat the Folsom fluted point hunters of Taylor's bison and out of the Paleo-hunter tradition there evolved the Plano tradition. We have, however, given little or no thought to what became of the makers of the Eastern tradition of shankless fluted lanceolate points. That they continued in existence and continued to make shankless points, with the plane form of these evolving from lanceolate to quasi-pentagonal to triangular, like the Beekmans, is the most reasonable explanation of the several varieties of triangles we find in the lower Hudson in epi-Paleo-hunter, that is, Archaic times.

But if this sweeping climatic-vegetational change explains alike the entrance into the Northeast of the Meridional Archaic and the persistence therein of the epi-Paleo-hunter, what explains the presence of the Taconic or stemmed point-makers? The answer apparently lies in the rise in sea level that was a concomitant of the melting of the final Wisconsin. The Taconic people must have been living along the coast,

* The New York State Archeological Association Bulletin for July, 1971, carries the report of the discovery on Staten Island of the whole spectrum of Coe's Carolinian projectile point types with dates ranging from 7300 B.P. to 9400 B.P.

congregating at river mouths, where oysters grow in abundance, and other sea produce, land game and vegetational resources could be had. As the rising sea level encroached farther and farther inland these coastal dwellers were pushed ahead of it, into estuarial zones like the Lower Hudson. Since we do not find stemmed (or any other type) points in the 5600 year old G0 horizon, but do find them in the middens of 500 years later it would seem that the Taconic people did not venture this far inland until about 5100 years ago, although what is now the Lower Hudson had been oyster-producing long before, certainly during the G0 period. Even though a sharp rise in sea level at about 5100 years ago probably had something to do with it, the advance of the Taconic people up the valley must have been a population movement by an expanding people, since they held ascendancy in the Lower Hudson for at least the next millenium and continued to push farther up this and other coastal river valleys.

In summarizing it should be pointed out that the emphasis here is not on tracing projectile point relationships but on the climatic change that made inevitable the cultural movements that distributed them. That Paleo-hunters making fluted points lived in this area during the last stage of the Pleistocene and the early Holocene has been archeologically demonstrated. That they left descendants who remained in the area despite the change from one kind of ground cover and fauna to another, changing the shape of their projectile points slightly through time, is not less than highly probable. That the Meridional-Archaic hunters and gatherers drifted northward with the deciduous forest environment to which they were adapted and reached this latitude by 9000 years ago is implicit in the very concept of the Archaic. That the Taconic people moved in from the coast may never be susceptible to absolute proof, since their primal home is now under many fathoms of sea, but their presence in the Lower Hudson some 5000 years ago can have no other explanation than they came from the east, compelled to retreat before a rising water level.

The three traditions, then, that we see as present in the Lower Hudson at 5100 years ago, on the evidence of the two dates reported here, are the Meridional Archaic of notched blades, the Epi-Paleo-hunter tradition of unhafted triangulars and para-triangulars, and the Coastal Archaic Taconic tradition of stemmed points.

ADDENDUM

Extensive excavation of Iroquois sites in central and western New York have demonstrated that the projectile point type used there in Protohistoric times was the small, narrow isosceles triangle called the Madison (Ritchie 1961) after the name applied to this form in the Mississippian of the Midwest and late prehistoric cultures of the south. As a result there has been an uncritical tendency to type categorically all small, narrow isosceles triangles as Madison, or at least Late Woodland, and to use them as chronological index artifacts. Having been guilty of this kind of impetuous typology myself, I can only say that it inevitably effects serious misinterpretations of excavated data.

It can be readily admitted that some Iroquois, and particularly Huron, arrow points do approach in semblance the small, narrow isosceles triangles of the Lower Hudson shell middens (though they no longer look

alike to me) without the least danger of compromising the Archaic age of the Shattemuc triangles. On four extensive sites of our area where these have been found in some numbers there has not been the slightest hint of Woodland, to say nothing of Protohistoric, material. These sites are Parham Ridge (Brennan 1962), Winterich (Brennan 1964), Hanotak Rock Shelter (Brennan ms) and Dogan Point, at which latter site the C-14 data for a Middle Archaic age has been presented in this report. All sites where these triangles have been found have had mainly Archaic components. The triangles are invariably present at shell midden sites which, to repeat, are at least 90 per cent of Archaic age.

There are several discernible variations on the triangular theme in the Lower Hudson material and, since we are uncertain about what variations have typological-chronological value and which are contemporaneous variations within the same type, it would be premature to begin a nomenclature. But there is no reason why the whole series sequence of small, narrow isosceles triangles, para-triangles and penta-triangles should not be designated the Shattemuc tradition.

We construe the Beekman variation rather more narrowly than did Funk in his description. In our series it is a ground, straight based isosceles triangle so precisely made that the whole blank may have been ground into shape before the final chipping of the blade edges. Para (meaning "more than") triangles are those with excurvative blade edges approaching the lanceolate. The penta (meaning five sided) triangles verge evanescently on five-sidedness and some are actually five-sided. The series also includes simple, true triangles, some with straight, some with yoke bases.

At a time we believe to have been Late Archaic, perhaps 4200 B.P., the Shattemuc tradition veered away from the isosceles triangle toward the equilateral, generally larger and heavier, though small ones were made. On some sites, particularly Winterich and Crawbuckie, (Winterich is purely Archaic, Crawbuckie mainly so) there are nearly equilateral triangles as large as the much later Owasco triangles. This change in proportions marks the beginning of what we call the Bear Mountain tradition. But the mixture of features, straight and yoke bases, straight and excurvate sides, continues. Owasco and Levanna triangles probably had this ancestry and it may be useful to explore whether Jacks Reef pentagonals and Cony-Fox Creek lanceolates did not strike off from it. No argument will be raised here against a Mississippian derivation for Madison and other Late Woodland triangles, but it should be remembered that there was a triangle-making tradition at least 4500 years old in the Northeast to which they may plausibly be referred.

The dating of the cluster of three square-stemmed points at 5075 B.P. has complicated the stemmed point tradition, hinting at the possibility that it is the coalescence of two traditions unrelated in origin. This writer recently suggested (Brennan 1970) an evolutionary sequence for the stemmed point Taconic tradition that began with Phase 1 knobby stems and evolved into Phase 2 square stems and thence into Phase 3 pinched or expanding stems, with fishtail points a possible Phase 4. It was also suggested that styles of earlier phases continued to be made after the advent of a later phase. Thus knobby stems would

have persisted into the square stem phase and both of these would have continued to be made as minor styles during the predominately Phase 3 era.

The dated cluster of square stemmed points at Dogan Point does not help this hypothesis, though it does not destroy it. Falling into the Phase 2 type of that hypothesis, they are, at 5075 B.P. older by 225 years than the Phase 1 knobby stem with a stop date forward at Twombly Landing at 4750 B.P. The persistence clause mentioned above would cover this situation if we could find Phase 1 points in, say, the GO midden of 5650 B.P. But so far we have not found them. Even so the Twombly point may be as old as 5000 years.

A further detail of note is the fact that while two of the cluster have straight bases, the third has a spur or toe-out at one corner of the base and probably had one at the other. Ten such points were found at Twombly Landing, where they were named Excelsior toed stems. This kind of basal treatment is most un-Taconic-like, as we know the Taconic, and we must consider the possibility that the toe is an obsolescent feature which harks back to a non-Taconic ancestor.

Nevertheless it is hard not to see all these stemmed, predominately narrow-bladed points as being somehow within the same tradition. Many variations on the theme repeat themselves on sites falling within the same time-cultural continuum not only in the Lower Hudson but farther afield. Particularly striking is the correspondence we find in the variations in our Lower Hudson stemmed points with the variations in stemmed points at Kinsey's Kent-Hally site on Bare Island in the lower Susquehanna (Kinsey 1959) and those at the Accokeek Creek site on the Potomac in Maryland (Stephenson and Ferguson 1963).

Kinsey has called this tradition the Piedmont, probably a better designation than the Taconic that I first gave it, now that it is being identified all along the Atlantic seaboard. Its regional prevalence beginning at least during the Middle Archaic gives it cardinal importance in the Atlantic Seaboard Culture Province.

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SHELL MIDDENS OF THE POTOMAC COASTAL PLAIN

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INTRODUCTION

The two initial purposes of the Potomac River Archeology Survey, supported by National Science Foundation Grants GS 2568 and GS 3020, were to locate as many sites in the Potomac drainage as possible and to establish a cultural chronology for the area. We have now located nearly 1000 sites from a combination of records at the Smithsonian Institution, the National Park Service, and the files of the state archeologists in Maryland and Virginia. This has been supplemented by published sources, our own surface surveys and the extremely valuable assistance of interested members of the archeological societies in Maryland and Virginia. We have a number of radiocarbon dates which make it seem likely that the second objective is also being achieved, and we plan to conduct excavations this coming summer which should fill in the gaps in our current chronology. Therefore, although we do not pretend that the above two objectives have been entirely achieved, we are currently entering a second stage in our program to understand the archeology of the Potomac.

We are beginning to ask distributional and other anthropological questions of our data. This paper is concerned with a number of these queries relating to the distribution of artifacts associated with, and ecological factors involved in, the utilization of Ostrea virginica as a basic means of subsistence in the Coastal Plain. Our emphasis will be upon shell fields and mounds in Maryland, since the bulk of our work to date has been in that state, but we do not mean to slight the importance of the Virginia shore and will refer to it where we have data.

The upper boundary of the Coastal Plain of the Potomac is located at the fall line near Washington, D. C., while our primary area of interest is limited by the distribution of the oyster, which formerly reached Nanjemoy Creek where shell middens occur (Reynolds 1889:252) and which today reaches no farther north than the Port Tobacco River.

During the Pleistocene, the Potomac was a much narrower and longer river and was a tributary of the Susquehanna River. The rise in sea level at the end of the Pleistocene not only submerged the Continental Shelf but also drowned the Potomac Valley, producing the broad river which we know today, as well as the numerous tidal estuaries which provide ideal growing conditions for the oyster. The area is underlain by sedimentary deposits of Cretaceous or more recent age and is characterized by gently rolling plains which slope gradually toward the ocean. Erosion from these uplands has created extensive lowlands of a swampy character extending out into the Potomac for as much as a mile. Where

the river bends around Mathias Point, however, the full flow of water turns eastward and hits the Maryland shore when the channel turns south. The result is that here there are steep perpendicular bluffs often 200 or more feet high which drop directly to the river. These are cut by a number of estuaries, however.

Thus, we see that there are three essential microenvironments to the Coastal Plain--the uplands, the lowlands, and the river proper. The uplands undoubtedly bore a mixed deciduous-southern pine forest at the time of contact and contained a full quota of Eastern Woodlands fauna (Paradiso 1969). Of especial importance, as we shall see, were deer. In the less swampy sections, the low lying land was excellent for agricultural purposes, while the more swampy sections contained migratory waterfowl and the oyster and hard clam in the estuaries. Deer occurred throughout the lowland. The Potomac proper held fish and the Chesapeake blue crab, both of which occurred in the estuaries as well. Of particular importance were probably shad and herring, both of which occur in the spring in plentiful supply during their migratory runs up river. In summary, the situation was not a great deal different from what we would expect in any coastal area in the East.

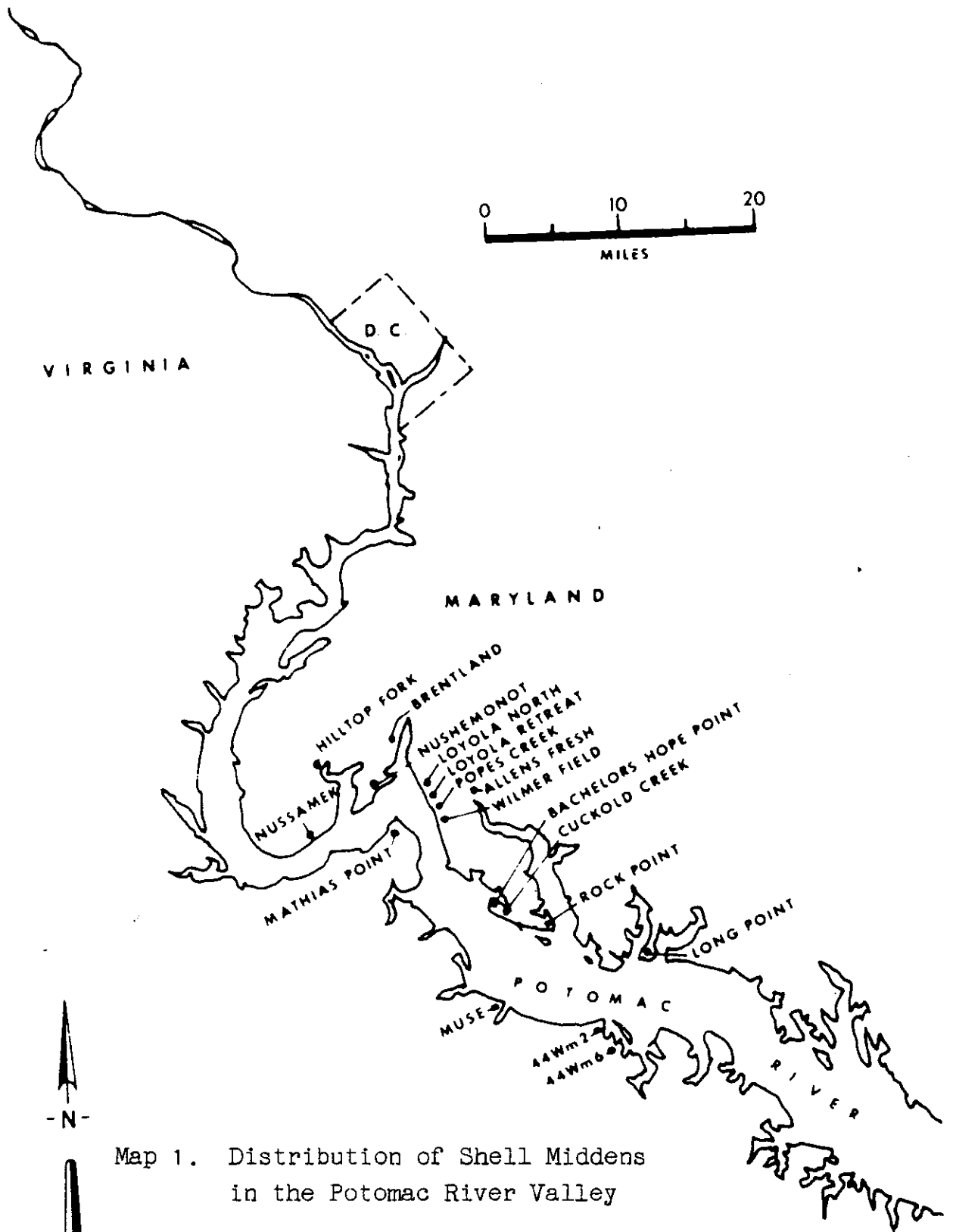
ARCHEOLOGICAL HISTORY

Reynolds, concentrating on the Maryland shore (1884; 1889), surveyed the lower Potomac for shell middens. We have located the sites he lists on our own maps. This data was supplemented by the Charles County soil map of 1922, and the researches of Graham, including his maps which are on file at the Smithsonian Institution. Sites located from these sources are shown on Map 1, if a collection of artifacts from them was available. In addition, there is the work of Holmes (1903; 1907) on the midden at Popes Creek, and the surveys of Reginald Looker, Joseph Hickey and Pat Linskey, and others in the nearby Zekiah Swamp area. We are also engaged in a survey of the archeology of the Swan Point area on property owned by U.S. Steel. The sites there occur as shell fields and our limited testing indicates some stratification of the cultural remains. Finally, we have excavated for part of a field season at the Loyola Retreat site near Popes Creek.

Gardner was first led to the latter site by Turkey Tayac, who claims to be the last of the Piscataways, and who was born not far from it. Students from a field school at The American and Catholic Universities dug there during the summer of 1970, about five weeks under the direction of Charles E. Hunter and later Stephen J. Gluckman. The site was stratified, and we thus have some chronological control over the occupations of most of the shell middens for which we have artifactual data.

CHRONOLOGY

We report elsewhere (Gardner and McNett 1971) in full on the early pottery of the Potomac and the Carbon 14 dates associated with it. Here, I will only summarize the chronological periods and their diagnostic artifacts.



Map 1. Distribution of Shell Middens
in the Potomac River Valley

There is a Paleo-Indian occupation in the area, the best evidence of which is a fluted point of Harper's Ferry quartzite (USNM #382705) found by Howard MacCord in the Zekiah Swamp area. There is also sporadic evidence of an Early-Middle Archaic period marked by bifurcated base, serrated quartz points and an occasional corner notched point identified by Jeffre Coe (pers. comm.) as similar to Palmer Corner-notched. However, the first firm evidence of the Archaic is to be found in the side-notched and straight stemmed quartzite and quartz points which are so common in the Potomac region. We have found these in a stratified context at the Ruppert Island site (McNett, Gardner, and McDowell 1971) where they are definitely prepottery. However, they may possibly occur with pottery as well. Only further excavation, which we plan this summer, will solve this problem. The earliest pottery from the Coastal Plain is a coarse sand and grit tempered ware which is highly friable and usually cordmarked. It is similar to Stony Creek and Accokeek ware (Evans 1955; Stephenson 1963: 96-100) and dates to about 750 B.C. in the Piedmont and presumably also in the Coastal Plain. This ware is followed by the distinctive Popes Creek ware at some sites. Popes Creek pottery (Holmes 1903; Stephenson 1963) is thick and made with the same paste as described above. It is, however, always net marked, many sherds are distinctively scored on the interior, and the necks may show linear finger smoothing on the exterior. The date on this ware is about 400 B.C. Next we find a thinner, hard, shell-tempered ware similar to Meckley (Stephenson 1963: 103-9) and Chickahominy ware (Evans 1955) which may be plain, corded or fabric marked. Our dates from Loyola Retreat place this ware at about 800 A.D. It overlaps in time the Potomac Creek ware of Schmitt (1965) and the Moyaone Ware of Stephenson (1963) which can be as late as contact times. The latter is a very compact ware tempered with fine sand; the former is the coarse but compact sand tempered ware called Potomac Creek by Schmitt (1965). With these various diagnostic artifacts serving as a chronological control, we are ready to survey the distribution of shell middens in the Potomac.

DISTRIBUTION

There are a total of 70 shell middens located on our maps in Charles and St. Marys Counties, Maryland, and King George and Westmoreland Counties, Virginia. Of these, we have had access to collections from 18 which were located either at the Smithsonian Institution, in reports by the Archeological Society of Virginia, in landowner collections, or by our own survey.

Preceramic

Wilmer's Field--This is a thin shell field which yielded no pottery. The points are square stemmed and of quartzite.

Allens Fresh--This shell field (Reynolds 1889: 256) is located at the head of the Wicomico River where it meets the Zekiah Swamp. No pottery was in the Smithsonian collection, and the points ranged from Archaic to triangulars and Piscataway types. This is obviously not exclusively an Archaic site but may have been a hunting camp for many groups. It is interesting that few, if any, sherds have been found on any Zekiah Swamp site.

Muse Site - This shell field is located in Westmoreland County, Virginia, and yielded a Susquehanna Broadsphear point and two quartzite points, one of which is square stemmed.

Long Site - This site, in Maryland across the river from Curriomen Bay, was collected by Graham. Points range from contracting and square stemmed quartz and quartzite to one triangular. Again, this seems unlikely to have been an Archaic period midden, and Reynolds (1889) does not report it.

Curriomen Bay - (a) This site (44Wm2) is reported to have yielded a "Halifax" point of quartz. We do not know whether it is a shell field or a closely packed shell heap.

Mathias Point - This is another shell field (44Kg11). The landowner has found a number of artifacts in his garden on the edge of the shell deposit, including three points of quartzite which are similar in shape to the Guilford type of Coe (1964), and one contracting stemmed point. This is almost certainly not an Archaic site since Reynolds (1889: 252-3) reported pottery from "a small fishing camp north of the deposit." We have not seen any pottery from the site, however.

Popes Creek Ware

Popes Creek - This site, a thick shell heap, is reported by Holmes (1907). The Smithsonian collections contained 303 sherds of Popes Creek ware, 8 shell tempered, 4 quartz tempered, 1 Stony Creek like, 1 Potomac Creek, and 2 miscellaneous sherds. Points are quartz and quartzite sidenotched and square stemmed, with some triangulars, Piscataways, and bifurcated base, serrated quartz types. It is located on an eatuary which cuts the high bluffs mentioned before.

Brentland - This site is located on the western bank of the Port Tobacco River. It contained 11 sherds of Popes Creek netmarked. Reynolds (1889: 252) describes the deposits as "small;" Thus, we presume it is a shell field.

Loyola Retreat - The pottery from this site is discussed above. The only point associated with Popes Creek pottery was a crude chert sidenotched point, while a quartzite square stem was found below the shells.

Hilltop Fork - This site is located near the head of Nanjemoy Creek and contains what may be an intermediate ware between Popes Creek and the later wares--it is shell and sand tempered and net marked. This is also a "small" deposit as described by Reynolds (1889: 252).

Late Wares

Nussamek - This is another of Reynolds' "small" deposits and is to the west of the mouth of Nanjemoy Creek. Artifacts are sparse; only one shell tempered sherd and two stemmed points, one of quartz and one of quartzite, were reported.

Nushemonot-- Another "small" deposit to the east of the mouth of Naniemoy Creek, this contained the coarse tempered Potomac Creek ware as well as some shell tempered sherds. Points were square stemmed, contracting stemmed, and triangular.

Loyola Retreat North-- This site (18CH61) is a small shell field located on a narrow ravine which cuts the bluffs just to the north of the Loyola Retreat site. We tested it in the summer of 1970, and wares were shell tempered and Potomac Creek sand tempered.

Bachelors Hope Point--This is a shell field on the northern tip of Swan Point Neck. Tests reveal only shell tempered pottery.

Cuckold Creek--Another shell field further up Cuckold Creek, it contains shell tempered and Potomac Creek wares.

Rock Point--This site at the mouth of the Wicomico River contains shell tempered and Potomac Creek wares as well as a few Stony Creek like sherds. Points are contracting stemmed quartzite, square stemmed rhyolite, side-notched rhyolite and quartz triangular.

Curriomen Bay (b)--This site contains shell tempered and Potomac Creek wares, while points seem to be square and contracting stemmed quartz and quartzite with three of quartzite said to be like Guilford.

Washington's Birthplace--This shell field contains square stemmed and sidenotched quartz and quartzite, contracting stemmed, triangular, and bifurcated base, serrated points. The pottery all pertains to Potomac Creek wares.

In summary, we see that preceramic sites, if any we have reported are truly preceramic, seem to be located on shell fields, both atop bluffs and in the lowlands. The Stony Creek like ware occurs in similar locations and may be associated either with shell fields or heaps, as the Popes Creek ware apparently always in association with relatively thin shell deposits. This is clearly seen at Loyola Retreat, where Archaic artifacts occur prior to the shell deposition, and a Stony Creek like ware with closely packed shells intermixed with some dark soil. The shells are typically small, but large quantities of them were collected. The Popes Creek ware is associated with strata which have little or no brown soil in the shells, while the shells increase in size and the consequent number of shells per matrix unit decreases. Finally, the later wares are associated with small numbers of small shells mixed in a great deal of soil.

Throughout the Loyola Retreat midden, bones seem to be primarily deer and bird, with fish and crabs rare even in the floated samples. Although our analysis is incomplete, it appears that there is little change through time in the utilization of these resources, except perhaps for varying proportions of bird and deer. No floral remains have been identified at any level.

ECOLOGICAL MODEL

One way in which we can interpret these data is through the description of cultures as systems. Flannery (1968) has done just this by describing the ecosystem of the food-collectors and early food producers of Mexico. We will attempt to apply a somewhat similar systems model to the archeological remains of the Potomac in an admittedly preliminary effort at describing the ecosystem of the Coastal Plain. Our ultimate aim, of course, is to get at the causes behind the cultural changes which took place in the area.

Coe and Flannery (1964: 650) point out that cultures rarely adapt to whole environmental zones but rather to microenvironments within them. Flannery (1968: 67) then goes on to show that, in fact, "'adaptation' may not even be to the 'micro-environments' within a zone, but rather to a small series of plant and animal genera whose ranges cross-cut several environments." Utilization of these genera may be viewed as a system which is subject to two controls--seasonality and scheduling. The former is the result of "the nature of the wild resources themselves;" the latter "was a cultural activity which resolved conflict between procurement systems" (Flannery 1968: 74).

What we propose to do is to view oyster collecting as a procurement system which was utilized to varying degrees by cultures through time and relate it in so far as possible to the other procurement systems which these cultures practiced. Throughout, we will be concerned with the effects of both seasonality and scheduling.

PROCUREMENT SYSTEMS

Flannery (1968: 68) has discussed both positive and negative feedback in procurement systems. The former amplified deviations from the system while the latter tends to promote equilibrium. Thus, an unwise choice in scheduling would result in a negative feedback in that the new choice is not likely to be made again, and the old scheduling would be retained. On the other hand, a satisfactory result of scheduling might lead to that choice being made repeatedly. Rescheduling would be the result.

Scheduling considerations would seem to underlie the relative unimportance or even absence of shellfish collecting in preceramic periods. Equally apparent from the data is the fact that shellfish collecting was highly important to the first pottery using people of the area and that significant rescheduling had taken place. We would like to suggest as a hypothesis that the association of the pottery with the increased importance of shellfish is not fortuitous. Rather, we would see a positive feedback network in operation. Oysters are extremely difficult to open without steel knives. Possible means include smashing the shell with a rock, roasting them in hearths, stone boiling in hide lined pits, or steaming them open in containers. The shells at Loyola Retreat are neither broken nor chalky from roasting, so we presume that the last method was used there. While preceramic people might have used either of the first three methods, most of the juice would have been lost and/or more time would have been required per

unit of food. Thus, in the absence of an oyster knife, the fourth method seems technologically most efficient. On the other hand, pottery as a device would seem to be relatively inefficient for people who were not sedentary for at least part of the year. Thus, the use of pottery increases the value of oysters. Sedentary oyster collection makes pottery more feasible. More use of pottery means more oysters, more oysters mean more sedentary living, etc. This network would lead to the scheduling of oyster collection at the expense of other procurement systems as well as the adoption of pottery.

There are several lines of evidence as to the seasonality of oyster collection. In the first place, the lack of crab remains is significant. Crabs are not available in the winter when they bury themselves in the river bottom and must be dredged out. On the other hand, there would seem to be little scheduling conflict between gathering oysters and trapping crabs in the summer. We, therefore, propose that oyster collection was seasonal in the fall and winter. Subsidiary evidence for this hypothesis is the number of deer antlers that occurred at Popes Creek and our own observation that the deer bones from Loyola Retreat seem to be mature individuals. The bird bones may indicate fall waterfowling. It seems possible to us that the men engaged in hunting and waterfowling at Loyola Retreat and the nearby Zekiah swamp, while the women collected oysters, and that this activity took place in the fall and winter. The latter season, of course, is when food is least available and, consequently, when oyster collecting is most useful.

We do not have the specific data on other types of sites occupied by the people responsible for the Stony Creek like ware. But it is quite clear that they had a wide range of other types of sites all up and down the Potomac. It is also apparent that the oyster was even more important to the people responsible for the Popes Creek ware. We suspect that their scheduling gave more importance to the oyster because the oysters from their levels at the site are larger and would have produced more food for less work. This may be the result of more favorable conditions for the oyster, but rescheduling evidently did take place. This increased importance of the oyster should be reflected in a decreased number of other types of sites for this culture, and in fact this does obtain.

We can distinguish at least two other types of sites in addition to the shell heaps. The first of these is a series of sites located where the river narrows at the head of the Coastal Plain on up to the Piedmont. We suggest that this is the ideal place to locate fish weirs or large gill nets to harvest the plentiful spring runs of shad and herring. Waterfowling in the nearby marshes could also be undertaken. The second type of site is located on estuaries near Fort Washington. We have no direct evidence of the connection of Popes Creek ware and ecological factors here other than the fact that Ferguson (1963) reports large numbers of freshwater clams associated with later occupations at Accokeek Creek. There is a distinct possibility that these were summer shell fishing camps. We believe these clams must be dug, not a pleasant prospect at any season but the summer.

We have no direct evidence that agriculture had been introduced by the time marked by the shell tempered pottery. There is suggestive evidence, however, that something had replaced the importance of the oyster since this pottery is associated with the much less dense strata containing fewer and smaller oysters at the top of the Loyola Retreat shell heap. It is also the typical pottery of most of the shell fields, such as Swan Point, where it occurs with Potomac Creek ware, at least in its later stages. Flannery has shown that the introduction of agriculture leads to the rescheduling of competing activities, especially during the summer. Moreover, agriculture typically requires the culture to be sedentary for that part of the year, and as it increases in importance, fewer other procurement systems are utilized.

We suggest the following system for these cultures. They were sedentary in the summer until crops were harvested. Then, as Flannery (1968:82) points out, deer hunting assumes primary importance. Moreover, deer are "edge" animals whose numbers are likely to be increased by more extensive clearing for cultivation. The more fields, the more favorable the environment for the deer (Paradiso 1969: 4). As a result, there would be less and less time to spend in fall and winter shellfish collection. Here, again, we have positive feedback. Spring waterfowling and fishing, on the other hand, would probably remain important since they would not conflict with any other procurement system. Thus we suggest that the shell fields such as those at Swan Point or the freshwater clam remains at areas like Piscataway are the result of use of the shell fish resources close to the agricultural villages of these people and that they were used only sporadically as time could be spared from crop growing, deer hunting, and probably fishing and waterfowling.

CONCLUSIONS

We submit that we have shown that Flannery's model can be applied to the data from the Potomac Coastal Plain with a fair degree of fit. However, most of what we have said must be taken to be hypotheses to be tested and no more. We intend to test them this summer with a program of excavation to seek evidence to support or refute these hypotheses. Even if every hypothesis is refuted by this work, we feel that the course of Middle Atlantic archeology will have been advanced far more than if we had followed convention and ended this paper before the section on ecological models.

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Abstract of

LATE WOODLAND PALISADED VILLAGES IN VIRGINIA

by

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Virginia State Library

John White, artist with the 1585 Roanoke Colony, illustrated two types of Indian villages in the area of Roanoke Island and Albemarle Sound, N. C. The two distinct village patterns indicate culture in transition from an open, dispersed village or cluster of huts along the waterfront to a compact, enclosed village, usually circular. Captain John Smith does not report palisaded villages in the area he explored in 1607-8, but archeological evidence has been found that two of the villages he saw were, in fact, palisaded. These were the sites of Katawomeck in Stafford County, Virginia and Moyaone in Prince George County, Maryland. It is possible that other sites in the Coastal Plain area were similarly palisaded, but evidence has not yet come to light.

For the Piedmont area, we have no descriptions for the early contact years, although we do have references to fortified towns during the later Historic Period. Archeological evidence of a palisaded village was found at the Gaston Site on the Roanoke River, excavated by J. L. Coe in 1962, and at the Hand Site on Nottoway River, excavated in 1965-66 by G. P. Smith. Also, two palisaded village sites have been found on the Potomac River between the Falls and the Blue Ridge. These are the Hughes Site (shell-tempered pottery) and the Selden Island Site (crushed quartz-tempered pottery), both in Montgomery County, Maryland. Again it is likely that other such sites exist but have not yet been found. In the valley of the upper Dan River's major tributary, the Smith River in Henry County, Virginia, three sites have been dug which show definite evidence of circular, fortified village patterns. These are the Belmont, Stockton and Koehler Sites, dug by R. P. Gravely, Jr., in the past six years. No palisade postmolds were found at any of these sites, but the circle of midden was enclosed by a shallow ditch, lacking postmolds, which probably represents excavations for earth to make a low embankment in which posts were set. Subsequent plowing and erosion have levelled the embankments and destroyed and postmolds which might have been there. At all of these sites, the pottery is that of the Dan River Series.

West of the Blue Ridge, in the Shenandoah Valley, two palisaded village sites have been tested. These are the Miley and the Quicksburg Sites, both in Shenandoah County. Both have shell-tempered pottery, and both seem to be the latest sites in the area, probably dating to around 1600 A.D.

Southwest of the Shenandoah Valley, there appear to be a number of sites which had been palisaded, as shown by the circular midden. Many of these sites are found in the valleys of the New River and the streams which flow into the Tennessee River. Two sites in Southwestern Virginia have been dug and found to have been palisaded. One of these was the Shannon Site on the North Fork of the Roanoke River in Montgomery County, Virginia. This site proved to be oval, with

dimensions of 320' by 210'. Two gates were found, one made by overlapping segments of the wall, and one like a funnel. Within the palisade were found numerous circular house patterns, ranging from 12' to 24' in diameter. Eighteen of the houses were uncovered, although others were not explored. The site contained numerous refuse-filled storage pits, and 100 human burials were found. With one exception, an extended interment, the burials were all flexed, and most were oriented with the heads to the east. Projectile points were isosceles triangles, there was a well-developed bone tool industry, and the pottery was predominantly the limestone-tempered ware of the Radford Series. Lesser amounts were found of the sand-tempered Dan River Series and shell-tempered New River Series.

On Wolf Creek, a tributary of the New River, in Bland County, Virginia, a similar but smaller site was dug. This was the Brown Johnson Site, and it was completely stripped and mapped. Thirteen house patterns were found, of which eleven could have been in use simultaneously. The houses ranged from 15' to 25' in diameter, and they were in a circle, enclosed by a circular palisade, 140' in diameter. Two gates were found, each made by overlapping segments of the palisade, and each was guarded by a gate house structure. One gatehouse seems to have had a watch-tower extending upward from its roof. Fourteen burials were found, but only a limited number of pits and extremely small quantities of debris. This evidence points to a brief occupation at the site, possibly as little as four years. Points were isosceles triangles, and the pottery was entirely of the limestone-tempered Radford Series. Two other sites, Lurich and Snidow, on New River in Giles County have been tested, and segments of a palisade were found.

From the evidence obtained in the excavation of approximately eighty sites in Virginia, it appears that palisaded villages developed during the final decades of the Late Woodland Period, extending into the Historic Period. No evidence has been found in Virginia to show that earlier cultures lived in compact groups, either with or without palisades. It seems likely that the earlier peoples lived in scattered houses strung along small streams or on the banks of estuaries, with separate garden areas, trapping areas, and so on. Fairly late in the prehistory of the area, some condition arose which necessitated the banding together of many families and the occasional palisading of the village. What threat may have developed is not known at this time. It may have been the growing power of the Iroquois Five Nations, or it may have resulted from European incursions along the coast and into the interior of the Southeast. Perhaps the turbulence caused by DeSoto's march through the Southeast was felt as far north as the Potomac Valley. Much additional research is needed to clarify these points. As time and resources permit, we in Virginia plan to test additional sites which promise to yield the evidence we need.

THE EARLIEST CERAMICS IN THE NORTHEASTERN SECTOR
OF THE MIDDLE ATLANTIC STATES AREA

by

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Like many another archeologist in the Northeast, I had been under the impression that steatite or other stone bowls of the Archaic period were the logical prototypes for the pottery vessels in the eastern United States (Willey 1966: 258). I was disabused of this notion at the 1970 meeting of the E.S.A.F. when Ripley Bullen of the Florida State Museum made it clear that in the Southeast, at least, the reverse situation probably prevailed. There the earliest steatite vessels are predated by Stallings Island Plain, now radiocarbon dated as early as 2500 B.C. \pm 135 years and 2515 B.C. \pm 95 years; Orange Plain, dating from 1625 \pm 120 years, and Wheeler fiber-tempered wares of somewhat comparable dates (Ford 1969: 28, 29, 167; Willey 1966: 256-7).

James Ford (1969: 97) and Ripley Bullen (1959: 43-53) believe that the earliest steatite vessels in the southeast make their appearance about 1200 B.C. and suggest that in shape these vessels may be copies of the earlier ceramic forms rather than the reverse. This attitude contrasts with the traditional belief with respect to the precedence of stone bowl use in the Northeastern and Middle Atlantic States. Joffre Coe, for example, cites the appearance of steatite bowl fragments in the Savannah River phase in North Carolina, for which he has a radiocarbon date of 2000 B.C. (Coe 1964: 119). The fact that the steatite fragments were located in the ceramic bearing zone, however, leaves some questions concerning the actual predeposition of the stone bowls at the Gaston site. Coe himself concludes that the stone sherds were brought upward from a lower stratum by aboriginal disturbance (op. cit. 112-3). Much farther north, at the Wapanucket #6 Site in Massachusetts, James Griffin (1964: 231) and Maurice Robbins (1959) have stated that stone bowl fragments were found in a Late Archaic context. In New York state, William A. Ritchie presents evidence for the use of steatite bowls during his Frost Island phase of the Transitional Period which is radiocarbon dated at 1250 B.C. \pm 100 years (Ritchie 1969: 159-62). Another early date for stone bowl use was derived from the Miller Field site in northwestern New Jersey where steatite bowl fragments with chisel marked exteriors were found associated with a Perkiomen broadspear component dated at 1720 B.C. \pm 120 years. The same site also produced steatite bowls with smooth exteriors in the same context with Orient fishtail points and related artifacts dated at 1220 B.C. \pm 120 years (Kraft 1970: 108-110).

Steatite bowls and fragments of bowls have been found in many other areas of the Northeast, but it would be tedious to enumerate them all. At the Abbott Farm site, for example, Dorothy Cross found seventeen sherds from about eight stone vessels. Other steatite bowls, or parts thereof, were found at Indian Head, Munsell and other southern New Jersey sites. Cross states that on the Abbott Farm site steatite bowls make their first appearance in the Early Woodland period which she dates from

A.D. 100 to 350 (Cross 1956: 174). Not only are these dates too recent in light of currently accepted chronology, but the stratigraphic and associative data for these steatite sherds also leaves something to be desired.

Of purely academic interest is a reference to steatite vessels written by Peter Kalm in his Travels into North America in which it is stated that soapstone vessels were used by the New Jersey Indians in historic times. However, such bowls were not in use when Peter Kalm visited the New Jersey colony in 1747. Moreover, the credibility of this account is questioned by scholars.

When and how quartzite, sandstone and limestone vessels fit into the picture is not yet clearly established. Such stone vessels are rarely encountered in our area and there are no dates for them so far as I know. My personal bias favors a Late Archaic provenience. One carved sandstone bowl now in the collection of Seton Hall University Museum was found at Bound Brook, N.J., in association with Bare Island-like points.

To return to the question of the steatite bowl - pottery priorities, we reiterate that James Ford and Ripley Bullen are undoubtedly correct in their assertions that pottery predates steatite bowls in the Southeastern United States. However, in the Middle Atlantic and lower Northeastern States, the reverse situation does seem to prevail. Here, the earliest ceramics were apparently patterned after the steatite bowl (Witthoft 1953: 25; Ritchie 1969: 157). Indeed, the straight sided, flat-bottomed, lugged, steatite or grit tempered ceramic vessels today called by such names as Marcey Creek Plain, Seldon Island, and Ware Plain are often found in contexts that also produce steatite vessels of somewhat similar form.

Marcey Creek Plain was defined by Carl Manson (1948: 223-6) following excavations at the Marcey Creek site on the right bank of the Potomac River in Arlington County, Virginia. Marcey Creek Plain vessels are modeled from clay having an admixture of large amounts of steatite temper, presumably derived from crushed steatite bowl sherds. This temper may constitute from 30% - 80% of the paste. The vessels have configurations like those of steatite bowls. Marcey Creek Plain vessels appear to have been constructed by modeling and almost all of them have smooth or plain surfaces. Nearly all of the vessels show mat impressions on their flat bases, and most of them have lugs or nodes on their sides; normally two to four; rarely one or none. Many of the Marcey Creek Plain vessels also have a thickened "heel" at the juncture of side wall and base.

Marcey Creek Plain vessels appear to be concentrated in the Virginia Tidewater region of the Lower Potomac and Rappahannock Rivers. They are well represented in the Delaware, Maryland and southern New Jersey area, but are rare in northern New Jersey and New York State. At the East Towanda Fair Ground in Bradford County, Pennsylvania steatite sherds and Marcey Creek Plain sherds were found in the lowest levels, with Vinette I pot sherds in the higher zone (McCann 1962: 53-5). John Witthoft believes that Marcey Creek Plain ware is an intrinsic part of the Susquehanna Soapstone Culture (Witthoft 1953: 12).

At the Koens-Crispin site, Abbot Farm site and other archaeological areas of southern New Jersey, Marcey Creek Plain (which Dorothy Cross called Koens-Crispin Plain) has been found in some abundance. Cross states that such pottery gradually diminishes as one goes north until it practically disappears in the Millstone River Drainage area (Cross 1956: 175). This statement now needs to be revised in light of recent evidence from the Miller Field site in northwestern New Jersey. On this site Marcey Creek Plain pottery was found in an area that also yielded an Orient fishtail component that radiocarbon dated at 1220 B.C. \pm 120 years (Kraft 1970: 117).

A rather startling announcement concerning steatite tempered pottery came during the 1970 E.S.A.F. pottery symposium when Howard Sargent (Franklin Pearce College) reported that a Marcey Creek-like steatite tempered pottery had been found in New Hampshire. Unfortunately, the samples were not very diagnostic and may have represented a vessel of proper temper and paste but of different shape.

Seldon Island pottery was identified by Richard G. Slattery in 1946. The type site is located on Seldon Island, Montgomery County, Maryland. Seldon Island pottery is similar to Marcey Creek Plains in all respects except surface treatment. It is a steatite tempered pottery with a fabric or cord-impressed exterior.

Ware Plain pottery is another early type of flat-bottomed vessel having close affinities with both Marcey Creek Plain and Seldon Island pottery. Ware Plain pottery was first identified by Catherine McCann (1950: 316). This unfortunately ambiguous term (ambiguous in the sense that we also refer to pottery as a ware) derives from the Ware site in Salem County, New Jersey which McCann excavated in 1947-8. Ware Plain pottery may be either smoothed or fabric impressed, but it differs from Marcey Creek Plain and Seldon Island pottery in that it has a grit, sand, or limestone temper in place of steatite. In every other respect, however, Ware Plain pottery has the same straight sides, lugs, flat base and heels.

Ware Plain pottery is common not only throughout southern New Jersey and into Virginia (Howard A. MacCord, Sr., personal correspondence), but it is also the only representative of such flat-bottomed vessel forms in Staten Island and Long Island where it is associated with the Orient fishtail tradition. Having examined such pottery in private collections and in the collections of the Archaeological Museum in Southold, Long Island, the American Museum of Natural History, and the Staten Island Museum, I am fairly convinced that Ware Plain pottery predates Vinette I pottery in these areas.

Excellent examples of Ware Plain pottery have been found in the Millstone River drainage system in central New Jersey; some fragments were also found at the Miller Field Site (Kraft 1970: 118-9). To the best of my knowledge no flat-bottom pots of any type have, however, been discovered in New England to date (Fowler 1959: 19).

Fayette Thick pottery, first discovered in Fayette County, Kentucky has some of the same attributes as the aforementioned and is sometimes cited as having possible affinities with early wares in the

east (Cross 1956: 132). This pottery type is generally barrel shaped and lugged. It is very thick with usually plain surfaces, although some examples are basket or fabric-impressed.

A variety which is cordmarked and which has a heel at the juncture of sides and base is called Half Moon cordmarked. The temper used in both the Fayette Thick and Half-moon Cordmarked Wares is crushed granite, clay, or large grit. Fayette Thick has been dated to 290 B.C. \pm 150 years at the Cresap Mound in West Virginia.

In Pennsylvania, the earliest pottery following steatite tempered wares appears to be Juniata Thick Cordmarked. This has been found at the Sheep Rock Shelter (Michaels and Smith 1967: 456, 468-70). This pottery is tempered with course limestone, chert, shale or dolomite. It is described as being coil constructed and paddled. Juniata Thick cordmarked has vertical sides, a nearly flat bottom and is cordmarked on both the interior and exterior in a manner comparable to the cord-impressions on Vinette I.

Vinette I pottery was once thought to be the earliest pottery in the Northeast. It is a thick ware with large particles of quartz or pulverized crystalline rock temper. These vessels have straight sides, a conoidal base, and no lugs. The vessels are coil constructed and are cordmarked in various directions on the exterior; generally vertically or diagonally. The interiors usually bear horizontal cordmarkings part way down the wall. Ritchie believes that the "want of any suitable stone substitute for the steatite pot may have hastened the adoption of the Vinette I ware which was being introduced into the New York area not later than 1000 B.C." (Ritchie 1969: 163). However, it is important to emphasize that the Vinette I pottery vessel is not a copy of any known steatite or stone vessel.

Vinette I pottery was found associated with, and overlying steatite vessel sherds at the O'Neil 2 site of the Frost Island Phase in New York State. There it was dated at 1250 B.C. \pm 100 years (Ritchie 1969: xxxi). This pottery presumably grew in importance and soon dominated the succeeding Meadowood Phase.

Vinette I pottery has been reported from the top of Level 3 at Ellsworth Falls, Maine where it has been Carbon 14 dated at 1400 B.C. (Byers 1959: 244). If this later data is still acceptable, then Vinette I would have made its appearance in the far north at a time as early as or earlier than in New York State.

Recently, Ritchie discovered Vinette I pottery at Martha's Vineyard. At the Howland Site it was found in Stratum 2 where it is estimated to have a date of 400 B.C. Lagoon, Rossville and Steubenville (Fox Creek) points were associated with this ware (Ritchie 1969a: 200). At the Peterson site it was dated at 360 B.C. \pm 100 years; again associated with Rossville and Lagoon points. At the Vincent site, the Vinette I pottery was dated at 100 B.C. \pm 100 years (ibid: 180, 195).

James Fitting reports a Vinette I style of pottery from Michigan where it is also known as Marion Thick and Schultz Thick. He assigns it a date of 560 B.C. \pm 100 years (Fitting 1970: 91).

In New Jersey Vinette I is sparsely present in various parts of the northern sector of the state. On the Abbott Farm site Cross refers to it as Thick Interior Cord Marked pottery. Vinette I pottery has also been found on Staten Island and on Long Island.

CONCLUSION

Stone bowls, especially steatite bowls, almost certainly predate the earliest ceramics in the Middle Atlantic and Northeastern States. How the idea of ceramic technology got to these areas, whether by contact or stimulus diffusion from the south as some have suggested, or from the northwest as others would have it, is still a moot point. Marcey Creek Plain, a steatite tempered pottery, is generally regarded as the earliest ceramic in the area. Its form and temper suggest a close genetic relationship to the steatite bowl. Seldon Island and Ware Plain pottery types appear to have evolved out of Marcey Creek Plain, differing only in temper and surface treatment. Whether these latter wares have also been influenced by Vinette I as some have suggested is a moot question not yet satisfactorily answered. Stylistically, at least, there is no comparability between the lugged, flat-bottomed Marcey Creek Plain, Seldon Island and Ware Plain vessels, and Vinette I.

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Abstract of
EARLY POTTERY OF THE LOWER SUSQUEHANNA VALLEY

by

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The information presented in this paper was abstracted from a larger study, conducted several years ago, in which the author attempted to gather and evaluate all of the, at that time, currently available information pertaining to the Early and Middle Woodland cultures of the Susquehanna Drainage of Pennsylvania.

Various kinds of sites and artifacts, from private and institutional collections, were examined. Using this data, sites were categorized as to type; partial lithic tool kits were developed; external Adena- and Hopewell-like influences were examined; inter- and intra-regional culture contact was studied resulting in the formulation of various "spheres of cultural influence;" and a tentative ceramic chronology was established. Pottery was of critical importance because it was the one major category of artifact that could be selected from private collections with some degree of temporal assurance.

Throughout the Early and Middle Woodland periods, the Susquehanna Valley appears to have been within the spheres of influence of three different culture areas--one to the north, one to the west-southwest, and one to the south. Most of the time, however, the Valley was marginal to developments taking place at the centers of all three of these areas.

The Lower Susquehanna, bounded to the west by the Blue Ridge Mountains (South Mountain) and to the north by the foothills of the Appalachian Mountain Section of the Ridge and Valley Province, during both the Early and Middle Woodland periods, was primarily within a southern sphere of influence, or, stated another way, within the northern limits of the Middle Atlantic Culture Province.

Fourteen distinct pottery types (and numerous varieties) are described for the Lower Susquehanna. Less than half of these types have been discussed in the literature from surrounding states; four have been described for the first time, but because of the small sample size have received no type names. The names for three new types have been suggested--Bare Island Cordmarked, Susquehanna Net or Fabric Impressed, and Susquehanna Cordmarked. The remaining types are most like those described and named in the literature. On the basis of currently available chronological data, both from the Lower Susquehanna Valley and from surrounding areas, and upon typological and morphological comparisons, the following sequence, beginning with what is considered to be the earliest pottery in the area, is suggested. It must be remarked, however, that there is considerable temporal overlapping in types, and that the arrangement of those types that have been indented below is only approximate.

Marcey Creek Plain (2 varieties)
 Seldon Island Cord Marked
 Mica Schist-tempered Pottery (3 varieties)
 Gneiss-tempered Pottery (3 varieties)
 Vinette 1
 Bare Island Cordmarked
 Pope's Creek Net Impressed
 Susquehanna Net or Fabric Impressed
 Accokeek Cord Marked
 Susquehanna Cordmarked
 Advanced Interior-Exterior Cordmarked
 Advanced Mica Schist-tempered, Exterior Cordmarked
 Mockley Net Impressed
 Woodland Cordmarked

A time-space model was set up and alluded to in discussing the significance of these types in the Lower Susquehanna. It was suggested that the first pottery in the area--essentially steatite-tempered--was introduced from further south in the Middle Atlantic Culture Province; that local populations utilizing available resources made reasonably accurate copies of these types; that at a later date, a grit-tempered, interior-exterior cordmarked tradition (Vinette 1) intruded into the Lower Susquehanna from the north, combined with local varieties and southern types, to create strange combinations such as Bare Island Cordmarked (steatite-tempered, interior-exterior cordmarked); that by the latter part of the Early Woodland period or the beginning of the Middle Woodland period, the first significant net-impressed influence (Pope's Creek Net Impressed) entered from the south; that during the Middle Woodland there were various short-lived developments (i.e. Susquehanna Net or Fabric Impressed), while other local types evolved from all that went before; that a major sand-tempered tradition (Accokeek Cord Marked) came into the Valley from the south during Middle Woodland times, merging once again with a lingering northern interior-exterior cordmarked tradition, resulting in various hybrid types; and, finally, that a weak shell-tempered tradition arrived from the east or south during the waning phases of the Middle Woodland period.

Marcey Creek Plain, Vinette 1, Susquehanna Net or Fabric Impressed, and Woodland Cordmarked are the only pottery types that have a significant distribution in any other part of the drainage beyond the Lower Susquehanna.

EARLY POTTERY IN THE POTOMAC

by

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INTRODUCTION

The purpose of this paper is to discuss the distribution and significance of early pottery along the Potomac Piedmont and Coastal Plain. This will be accomplished first by a discussion of two sites which represent the earliest appearance of pottery in each of these physiographic zones. In this section we briefly describe the types of pottery found and discuss their chronological placement. In addition we will consider the interrelationships existing between the early ceramics of the Coastal Plain and Piedmont and the origins of our local wares and more generally the relations of all this to the fiber tempered areas of the southeast. The last section will be devoted to a discussion of the significance of the introduction of pottery to the prehistoric social systems of the Potomac.

GENERAL SETTING

The Potomac drainage system is divisible into four broad physiographic zones, the Mountain, Ridge and Valley, Piedmont and Coastal Plain. Although the entire drainage is part of our overall research project, to date the bulk of our work has been in these latter two zones. For purposes of analysis and distribution studies, we have found it convenient and practical to divide the Piedmont and Coastal Plain into a third area, the Piedmont-Coastal Plain transition. This is not an altogether meaningless division since the ecological setting within this zone is in many respects quite distinct from either of the two zones it borders. In addition there is good evidence that throughout much of Potomac prehistory, at least from the Late Archaic on, that each of these zones represent small scale culture areas or style zones.

THE MONOCACY SITE

The Monocacy site is located in the upper Piedmont at the junction of the Monocacy and Potomac Rivers. Excavations here, conducted off and on over the past four years, went down to around 11.5 feet below the surface. Eight zones were uncovered. These zones are as follows:

- | | |
|---------|--|
| ZONE I | Surface to 1.0 feet. The zone consisted of humus and at least two distinct historic occupations, Civil War and Historic (see also Ayers, 1967). |
| ZONE II | From 1.0 to 2.5 feet. Evidence of human occupation was lacking. The soil build-up is apparently the result of frequent (?) flood deposition. No humus represented. |

- ZONE III Approximately 2.5 to 3.9 feet. The zone was clearly marked by dark stained soil. The entire occupation was prehistoric with the artifact complex dominated by quartz tempered pottery and triangular projectile points. Quartz was the dominant lithic material. The terminal C-14 date for this zone was A.D. 1665 \pm 90. The beginning date was A.D. 1235 \pm 90.
- ZONE IV From 3.9 to 7.0 feet. Evidence of human occupation was again absent. The yellow silt, similar to that in Zone II, indicates another period of flood deposition.
- Zone V Ranged in depth from 7.0 to 8.2 feet. A C-14 date from the upper part of this zone gives a terminal date of 545 B.C. \pm 95. The lower part dates to 950 B.C. \pm 95. This latter date is associated with steatite tempered pottery.
- ZONE VI From 8.2 to 9.0 feet. Another sterile zone marked by flood deposition.
- ZONE VII From 9 to 10.0 feet. An occupation zone marked by dark stained soil and rhyolite chipping waste. Diagnostic artifacts were lacking.
- ZONE VIII From 10 feet to gravel. Sterile flood deposition. Coring below the gravel revealed no further evidence of occupation.

Zone V is of particular importance to this paper. The initial occupation in this level began before 1000 B.C. The artifacts from the earliest component are dominated by diagnostics of the Susquehanna Soapstone Tradition, i.e., Susquehanna Broadspears and steatite vessels. Immediately above this and in some areas mixed with it is steatite tempered pottery. Slightly above the steatite tempered pottery but showing considerable overlap is a friable sand and grit tempered pottery. At the top of this zone and clearly separated are a few quartz tempered potsherds. The favored lithic material throughout this level is rhyolite. Side-notched projectile point forms dominate. There seems to be little continuity in point styles between the Susquehanna tradition and the ceramic using horizons.

ZONE I - HISTORIC - CIVIL WAR AND C & O CANAL		
ZONE II - STERILE - FLOOD DEPOSITION		
ZONE III - PREHISTORIC	DOMINATED BY CRUSHED QUARTZ TEMPERED POTTERY	A.D. 1665
	TRIANGULAR PROJECTILE POINTS SHELL AND LIMESTONE TEMPERED POTTERY AS MINORITY WARES CORNER NOTCHED POINTS RARE QUARTZ DOMINANT LITHIC MATERIAL	A.D. 1250
ZONE IV - STERILE - FLOOD DEPOSITION		
ZONE V - PREHISTORIC	QUARTZ TEMPERED POTTERY IN UPPER PORTION (RARE)	545 B.C.
	SAND & BRIT TEMPERED CORDMARKED POTTERY STEATITE TEMPERED CORDMARKED STEATITE TEMPERED PLAIN POTTERY STEATITE VESSELS SIDE NOTCHED POINT FORMS SUSQUEHANNA BROADSPEARS RHYOLITE DOMINANT LITHIC MATERIAL	950. B.C.
ZONE VI - STERILE - FLOOD DEPOSITION		
ZONE VII - PREHISTORIC - ARCHAIC (?)	ONLY RHYOLITE FLAKES	
ZONE VIII - STERILE - FLOOD DEPOSITION		
GRAVEL		

MONOCACY SITE

The steatite tempered pottery occurs in two basic forms. The first of these, commonly referred to as Marcey Creek Plain, has flat bases and smoothed or plain exterior and interior surfaces. The bases however often contain net, fabric or mat impressions.

The other variant has cordmarked exteriors and conoidal bases. This is known in the literature as Selden Island Cordmarked. The lack of association between cordmarked surfaces and flat bases seems to hold true throughout the steatite tempered pottery from the Potomac Piedmont.

The friable sand and grit tempered pottery is always cordmarked and the bases are conoidal. This pottery is most like the type Stony Creek.

THE LOYOLA SITE

The Loyola site is a shell midden located in the Coastal Plain on the Maryland shore of the Potomac between Port Tobacco and Popes Creek. Excavations at this site went down to depths varying from 4 to almost 7 feet. There were four basic zones at the site represented by different soil colors. Shell was tightly packed throughout the entire occupation.

There were also four basic cultural zones. Going from latest to earliest the upper part of the occupation contained a compact sand and grit tempered pottery with either smooth surfaces or cord-wrapped stick stamp decoration. This is similar to Potomac Creek ware. Immediately below this was a shell tempered pottery with cord-marked or partially smoothed surfaces. These ceramics are identical in most respects to Mockley ware. A radio-carbon date on this material from the Loyola site is 815 A.D. The third cultural zone consists entirely of a thick, friable sand and grit tempered ware, commonly referred to as Popes Creek ware. The exterior surfaces of the sherds from Loyola are all net impressed. The interior surfaces are frequently combed or otherwise scored. A C-14 date is 480 B.C., which was taken from the mid-point of the Popes Creek occupation. The final and earliest cultural zone contains friable sand and grit tempered cord-marked pottery in most respects identical to the material from Zone V of the Monocacy site. The principal difference is the Coastal Plain pottery is sandier. This seems to hold true throughout and is most likely representative of the properties of the local clays.

HISTORY OF EARLY POTOMAC POTTERY

Steatite tempered pottery on the Potomac apparently develops out of one or two Late Archaic steatite bowl using components. The most logical ancestor is the Susquehanna Soapstone tradition which is confined in distribution for the most part to the Upper Piedmont. The association of steatite tempered pottery and components of the Susquehanna tradition is quite close--almost everywhere broadspears and soapstone bowls are found, steatite tempered pottery is also found. Elements of stylistic continuity include the similarities in vessel shape between the stone and ceramic vessels, and the preference for rhyolite.

ZONE I - MUCH DARK LOAMY SOIL
CRUSHED AND WHOLE
SMALL SHELLS

COMPACT SAND TEMPERED -
POTOMAC CREEK-LIKE
SHELL TEMPERED -
MOCKLEY WARE - LIKE

A.D. 815

ZONE II - PURE WHOLE SHELL

POPE'S CREEK
NET MARKED

490 B.C.

ZONE III - WHOLE SHELL WITH
A LITTLE BROWN SOIL

POPE'S CREEK
NET MARKED

ZONE IV - WHOLE SHELL AND
MODERATE AMOUNTS
OF BLACK SOIL

SAND AND GRIT TEMPERED
CORDMARKED

STERILE CLAY

LOYOLA RETREAT SITE

Unquestionable continuity in projectile point styles cannot be demonstrated at present.

Another possible Transitional period ancestor is a local variant of the Savannah River Archaic. This possibility results from the association in the Piedmont-Coastal Plain transition zone of steatite tempered pottery with straight stemmed quartz and quartzite projectile points and soapstone bowls. Examples of this can be seen in the collections from Marcey Creek and Selden Island.

In both of these cases mixing of earlier and later components is a problem. However the distribution studies indicate that Susquehanna tradition artifacts are largely lacking in the Piedmont-Coastal Plain transition but steatite tempered pottery is fairly abundant.

The upshot of this is that we have two possible candidates in the Archaic out of which pottery could have developed. Whichever proves to be the real parent, it seems reasonably clear the idea of ceramics is the result of diffusion from the Southeast.

Before turning to a consideration of this, we would like to present a condensed version of our hypothesized developments for the Potomac.

FIRST--around 1300 B.C. Archaic groups using stone bowls settle in two areas of the Potomac. In the upper Piedmont this is the Susquehanna tradition. In the Coastal Plain-Piedmont transition this is a variant of the Savannah River Archaic.

SECOND--Around 1000 B.C. the concept of ceramics appears. The first pottery vessels are direct copies of soapstone bowls. They have plain exterior and interior surfaces and flat bases.

THIRD--the concept of pottery making spreads rapidly northward along the distribution of Susquehanna tradition groups. Somewhere in the northeast, possibly New York, three things occurred. These are the substitution of grit or crushed rock as tempering, vessel shapes become cylindrical with conoidal bases, and cordmarked surfaces appear.

FOURTH--between 1000 and 750 B.C. pottery related to the developments in the northeast appears in the Potomac Coastal Plain. The local version of this is the friable sand and grit tempered cord-marked pottery at Loyola.

FIFTH--shortly thereafter this type of pottery appears in the Piedmont. Steatite tempered pottery shifts from the plain surface, flat base form to cordmarked vessels with conoidal bases.

SIXTH--the subsequent drift is decreasing popularity of steatite tempered pottery and increasing popularity of sand and grit tempered ceramics. Even while the steatite tempered ware continues to be made less and less steatite and more and more sand and grit is used in the paste.

SEVEN--the sand and grit tempered pottery develops before 500 B.C. into crushed quartz tempered pottery.

Returning to the ultimate origins of pottery we see the concepts arising out of events taking place in the southeast. Between 1500-1300 B.C. fiber tempered pottery moves west into the Lower Mississippi and northwest into Alabama. This represents some form of direct contact, perhaps migration. Much of this pottery is decorated and we can perhaps use this to account for the appearance of decoration in the Midwest after 750 B.C.

The spread of these ideas to the north was apparently along the distribution of the Savannah River Archaic. What the mechanism was we have no idea, but it was apparently at best an indirect stimulus.

From the Potomac the movement is northward along the Susquehanna tradition distribution and then ultimately east and west of the Piedmont. Finally we see as mentioned the concepts of conoidal base vessels and cordmarking moving south along the coast.

SIGNIFICANCE OF POTTERY

In our chronological reckonings, pottery is one of the major criteria for delineating the Archaic from the Early Woodland period. Pottery, however, is not the only criteria with burial mounds and other earthworks also being used as delineating diagnostics (see for instance Willey 1966: 267 and Ritchie, 1969: 179). In much of the Middle Atlantic, however, burial mounds or even elaborate burial ceremonialism never appears or appears relatively late. Even in areas where burial mounds occur it is difficult to directly relate any particular site or early pottery component with specific burial practices. The assumption is made however that there is some correlation and undoubtedly there is, but since burial areas are generally removed from the village, the correlation is by no means close. Accordingly, as long as we saddle ourselves with the Woodland framework, we are inclined to agree with Sears (1948) and feel the major difference from the point of view of chronological placement is the addition of pottery (here we would exclude the fiber tempered areas since they did not figure into the original definition of what the Woodland period is).

Aside from its chronological implications pottery in archeological sites, along with other evidence, is usually taken to indicate in a broad sense greater residential stability. This would certainly seem to be true in areas where the developmental sequence moves chronologically from pre-pottery to pottery using horizons. On the other hand there are a number of archeologists who have taken the position that the addition of pottery to the inventories of prehistoric eastern North American Indian groups had little overall effect on their lifeways. Among these are Sears (1948) who feels that the eastern Archaic is little more than Woodland without pottery. Willey and Phillips (1958: 119) turn this around and note that, "Early Woodland is merely Archaic with pottery." Admittedly these people are talking more about the chronological implications and are probably warning us that there is considerable stylistic continuity from Archaic into Woodland despite the fact the names change. On the other hand, Willey and Phillips use this statement to justify their contention that, "The incorporation of pottery--did not bring about any changes from a developmental point of view" (ibid: 118).

The reasoning behind this statement stems from the fact that during the Archaic many people had turned to the use of stone bowls and that pottery represents little more than a translation of the function of stone bowls to a different medium. As far as Willey and Phillips are concerned the systemic changes leading to greater residential stability had already taken place and pottery really represents nothing new in the lifeways of the people involved. With reservations which will be discussed shortly and as long as we keep in mind we are talking about areas where stone bowls were the precursors of pottery, we will accept their position.

However, it must be kept in mind that not all of the areas of the Eastern United States went through a stone bowl using stage. There are numerous places east and west of the Piedmont where steatite was not available and the people pursued their lives without benefit of the advantages bestowed by stone bowls. In these cases it would seem to us that pottery when it was introduced played the role stone bowls did elsewhere and can indeed be viewed as an indicator of significant changes.

In discussing change we are taking the cultural ecological viewpoint that the introduction of a new technological item into a viable social system of necessity leads to a readjustment of the system. The degree of change which results from the introduction of new traits is dependent on many factors including the importance of the newly introduced items to the group's exploitative system. Agriculture for instance would require a fundamental structural reorientation, the ramifications of which would be felt throughout the system.

On the other hand, there are newly introduced items which have lesser ramifications for the structural network which comprise the system. These items range in degree of importance as catalysts and if we follow the cultural ecologists far enough, the items which will result in the most extensive changes are those that are related most directly to the group's subsistence or exploitative base.

Along the Potomac Piedmont and Coastal Plain we apparently have examples of both types of change and we feel that pottery can be viewed as a harbinger of these changes. For instance, in the Piedmont, as we have seen, there were Archaic groups using stone bowls. These people as Willey and Phillips have noted, had already undergone the major systemic changes brought about by the addition of food processing vessels which were relatively permanent and difficult to transport. Viewed from the perspective of gross cultural changes as these authors have done, the incorporation of ceramics would have had little significant effect in terms of evolutionary development. However, if we shift our perspective and look at this from the point of view of lesser changes as described above, it can be demonstrated that the shift from steatite to clay must have had important ramifications for the structure of the group's systems.

For instance, the use of steatite as a raw material requires several things. First and foremost is the procurement. This could be handled in a variety of ways such as participation in a trade network,

settlement in an area where steatite is readily available, or long, frequent trips to quarries. In the Potomac Piedmont this seems to have been solved by a combination of the latter two alternatives. Shifting to pottery takes away the necessity for both of these. In terms of extraction, manufacturing and transportation from the quarry, the use of steatite vessels is laborious and requires considerable expenditure of time. On the other hand clay suitable for manufacturing earthenware is probably readily available throughout the riverine environment. Accordingly the use of pottery requires less time and labor, time and labor which could be directed into other aspects of life. As a further labor and time saving mechanism many more ceramic vessels can be made at any one time with greater ease. Admittedly the pottery vessels would be less durable but ease of manufacture probably compensated for this.

Going even further the extraction of raw materials for pottery requires a different environmental perspective than is dictated by the use of steatite. In essence this involves a shift in the extractive components of the system. With this shift there is no longer any need to make the journey to the quarries and engage in the tasks which took place there. Related to this is the question of which members of the group participated in the quarrying and manufacture of stone bowls. The assumption with pottery, based on ethnographic analogy, is that women did this type of work. Can we assume the same thing with steatite vessels? Perhaps, but it must be remembered that often the quarries are long distances away and steatite whether in finished vessels or as raw blocks is heavy. Carving bowls is also hard work. It would seem more likely that men were somehow involved in this operation either as principals or co-participants. In either role they could have combined trips to the quarry with hunting expeditions. At any rate, if men were involved and we have a shift with the introduction of pottery to complete responsibility on the women's part, this would make a significant difference in social roles and concomitant behavior patterns. Even if no men were involved, the differences which would result in the activities of women should also be highly important. Finally it has been demonstrated time and time again that almost any artifact utilized by a group has symbolic value and this value is attached in various ways to the rest of the system. It cannot be assumed that pottery had the same symbolic value as steatite vessels particularly if the fabricating process involves different actors.

Turning our attention to the Coastal Plain we have a situation in which pottery appears without stone bowl antecedents. We would expect on this basis, if the position we have adopted has any validity, to see major adaptive changes. As it turns out, this seems to be the case. In our companion paper in these proceedings, we have already elaborated on this to some degree. This can be demonstrated by what is apparently a major shift in subsistence and settlement pattern.

For instance, according to our distribution studies, little emphasis was placed on oyster procurement prior to the introduction of pottery. To be sure there are probably some shell fields which were laid down by non-ceramic using peoples and elsewhere pre-ceramic shell middens are common, but in the lower Potomac oyster harvesting and processing does not seem to become a major part of the subsistence cycle until the beginning of pottery. Prior to this the indigenous

Archaic groups apparently shifted seasonally from the river's edge to the interior woodlands and swamps. It is fairly obvious they were hunting away from the river with multiple resource exploitation taking place along the river. In both cases, while some of the sites are extensive, there is very little depth of occupation suggesting at best transitory settlement.

With the advent of pottery and the Woodland period we find the beginning of the large shell middens as typified by the Loyola and Popes Creek sites. It is possible this could be explained on the basis of a fortuitous coincidence between the appearance of pottery and changes in the Potomac leading to a sudden radiation of the oyster population. It is also possible that the appearance of pottery is related to a sudden influx of people into this area who were oriented to this type of adaptation. These we feel are both unlikely explanations. It remains, of course, for us to demonstrate either the continuity of Archaic stylistic forms into the Early Woodland and/or that oysters were available in quantities prior to the introduction of pottery.

Until then, however, an equally good explanation and one which fits all the available observations is that intensive oyster exploitation was made possible only by the appearance of a container in which the oysters could be boiled or steamed to facilitate extraction of the meat. Based on our analysis of the remains from Loyola and Holmes' comments on Popes Creek breaking the shells open to get at the meat was rare. Stone tools which would allow the people to shuck the oyster and equally as rare. Boiling or steaming thereby killing the oyster and making separation of the valves easy seems to have been the method employed, and this was made possible by pottery. Such activity also results in less loss of juices thereby resulting in increased nutritive value.

Intensive utilization of the lower Potomac's oyster resources by these early pottery using groups does by no means indicate these people achieved maximum residential stability. It does, however, at the minimum indicate that in their seasonal rounds they were able to spend more time in favorable riverine environments than heretofore possible. The woodlands and swamps continue to be exploited but apparently far less intensively. In addition there is evidence to suggest that these areas were exploited only by a portion of the settlement, namely the males since by and large pottery is absent from these zones. This would indicate that the shell middens are base camps where the females, young, infirmed and aged remained.

The reverberations of such a dramatic shift in subsistence orientation must have been felt throughout the social system. We are only beginning to investigate this area. In general, however, it can be predicted that there were shifts in the roles and related behavior of the groups' members. If, as is likely, females were responsible for the oyster harvesting and processing, we would expect that the importance of their roles increased as the importance of oysters in the diet increased. This would be similar to what is usually described as the result of agriculture. Conversely with a decrease in the importance of hunting, the role of the male must have shifted. Also related to

this would be the importance of pottery as the major component of oyster processing and the association of women with pottery.

More specifically we certainly seem to have, if not a new perspective on the environment, then a reorientation. This apparently can be documented and tested through archeological investigation. It is tempting to see a decrease in the amount of equipment related to hunting and an increase in the items related to multiple exploitation of the resources of the riverine environment. This seems to be the case in the shell middens, but this may reflect the loci of different activities. Further upriver we have the appearance of early pottery in areas which are environmentally suited for the exploitation of fish and mussels. This may indicate a simple transfer technique of riverine exploitation into different microzones by an expanding population.

In summary we feel that we have demonstrated that pottery cannot be viewed as a simple addition to the technological inventory which had little or no effect on the systems involved. Granted, many of the inferences we have made remain to be tested. On the other hand, a number are derived from empirical observations. The important point is that by focusing on these problems, we can derive testable models from which predictions can be made. We are also the first to admit that the idea that new technology leads to structural change is not necessarily a new concept. Anthropologists concerned with cultural change have long been aware that the introduction of new items of technology brings about new adaptations. Archeologists on the other hand, while cognizant of this fact, tend to be concerned not with the changes which were wrought, unless they are changes that lead from one evolutionary stage to another. On the contrary they tend to view the introduction of new artifacts or stylistic elements solely as points on which to hang chronological developments.

We do not deny the necessity of chronology, only that too great a concern with it obscures what we feel should be the more important aims of archeology, namely reconstruction of past social systems and cultural process. To say, for instance, that the appearance of the drill marks the beginning of the Archaic or the appearance of dentate stamped pottery signals the Middle Woodland is not sufficient. We must ask what this means in terms of the peoples involved and in terms of culture process. This is not a task which is beyond the archeologist, but in many respects it is a task which is open only to the archeologist.

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SOME REMARKS ON TYPOLOGY

by

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There has been a great deal of argument in archeology about the meaning of artifact types. Put simply there are two poles of thought. Some workers argue that types are units that exist in nature; others that types are arbitrarily established or designed by archeologists. The first of these positions is exemplified by Albert Spaulding, the second by James Ford in their classic debate on typology (Ford 1954a, 1954b, 1954c; Spaulding 1953a, 1953b, 1954a, 1954b). Spaulding's (1953a) seminal paper was even entitled "Statistical Technique for the Discovery of Artifact Types" (italics added).

There are a large number of permutations of these two positions. By "natural types" some workers mean no more than Kaplan (1964:50-1) who defined a "natural grouping" as "one which allows the discovery of many more, and more important, resemblances than those originally recognized," as apart from an "artificial" grouping which "we cannot do more with. . . than we first intended." On the other hand, some workers treat "natural types" as if they were the "atoms" or the basic indivisible units of empirical study. These workers variously place the locus of type meaning in the minds, societies, or cultures of the makers. Deetz (1967:45-52), for example, argues that artifacts represent the mental templates of their makers.

There are intermediate positions between the "natural" and "arbitrary" poles. Rouse (1960), for example, argued that modes are not arbitrary, but that types formed from modes are arbitrary.

Unfortunately most archeologists have shown little concern for the meaning of their taxonomic statements. This is easily seen in the willingness of many archeologists to gloss over the differences. Chang (1967:87) largely missed the real differences between Ford and Spaulding. Willy and Phillips (1958:13), while recognizing that archeologists argue about the meaning of types, went on to write that "there is happily, a general working agreement among archeologists about what constitutes an artifact type." In these words they seem to feel that while archeologists might have philosophic differences and go through different sets of operations because of these philosophic differences, the end result of the different approaches is essentially the recognition of the same classes and types.

There can be no doubt that Willy and Phillips are wrong. The nature of our types is determined by the operations we perform in establishing the types. The operations of type establishment are the operations by which we standardize our data. John Dewey (1938) among others, observed that in fact "the whole burden of inductive-deductive inquiry is actually borne by the operations through which we standardize our data."

A little thought will show the obviousness of this point. All things in the world are like all other things, just as all things are unlike all other things. Things are like or unlike in terms of definitions. For instance, sexual criteria differentiate a man from a woman, but both are alike in being human. The problem of the typologist is to group similarities and differences in ways which will allow him to learn more than he already knows.

The purpose of archeological typology is not merely to give archeologists something to do, nor is it to provide pigeon holes for collectors to fill. Typologies are the basic tools which archeologists use to increase our knowledge of the past. The nature of our typologies determines the kind of things we can learn about the past, or perhaps it would be better put to say our answers can only be in the terms with which our questions are phrased.

The logical basis for learning from types more than is already known is the form of inductive argument known as analogy. In arguing from an analogy one argues that the greater the number of similarities two objects or units share, the greater the probability that a new attribute recognized on one will be found on the other. In the same way that similarities are established from heterogeneity, apparently homogenous groups can be divided by the recognition of systematic difference. In this way the recognition of likenesses and differences encourages us to look for other systematically articulated likenesses and differences.

For example, Prufer and Baby (1963:57-61) plotted the length of fluted Paleo-Indian projectile points in Ohio. They then compared the cumulative frequency graph of lengths of these points with the cumulative frequency graphs for Mason's Delaware Valley material and for Mason's Michigan material. They found the graphs of the Delaware Valley material to be very similar to the Michigan material, but very different from the Ohio material. Statistical tests of the metric variation showed this variation to be highly significant statistically.

Recently I have plotted the length of 88 complete points of the 105 which are well illustrated by McCary in his survey of Virginia fluted points. I have also converted the measures of 149 Indiana fluted points given by Dorwin in six tenths of inches into metric units, and graphed the cumulative frequencies of these points on the same charts with the Michigan, Delaware Valley, and Ohio material. The differences recognized by Prufer and Baby were more marked with these additional data. One type of frequency graph was represented by the Delaware Valley, Virginian and Michigan material, and a second type of frequency graph was represented by the Indiana and Ohio material. The metrical difference between members of the same type are statistically insignificant, but very significant between the two types.

By making large numbers of comparisons of a similar kind, using other types of classes of artifacts, style zones could be established for the entire eastern U. S. The procedure for the recognition of these style zones would be analogous to the procedure used by

Wissler (but not Kroeber) in his establishment of cultural areas of North America, or by the dialectic geographers' use of bundles of isogloses. Style zones are called so here because this rather neutral name carries with it none of the suspect cultural dynamics usually associated with culture areas.

We would expect these stylistic differences to correlate with cultural differences. If we could type the huge corpus of material already in our hands we could probably differentiate style zones at a microlevel which would give us the data for intelligent thinking in relation to regional or micro-regional research projects.

Unfortunately only the tip of the iceberg, so to speak, has been typed. We would probably learn more about significant social variation from a wide ranging typing of artifacts from collections (farmers as well as museum) than we are going to get from many more years of random excavation.

Gross morphology of points is not enough for typing, as Bordes has frequently pointed out from a technological point of view. The more attributes we include the less likely that the types we establish will contain material which is culturally heterogeneous. Hence in regions such as the Mid-Atlantic area where little is known of types, Spaulding's approach of cluster analysis is the best beginning.

In the eastern United States the example of the point types named "Steubenville Lanceolate" and "Steubenville Stemmed" is instructive. Mayer-Oakes in 1955 established these point types on the basis of material excavated from the site of East Steubenville, West Virginia in 1938. Mayer-Oakes felt that typologically the Steubenville points were Paleo-Indian, and pointed to similarities to the Scottsbluff point. In 1959 Dragoo challenged Mayer-Oakes' conclusions, pointing out that the Steubenville projectiles had been found associated with grooved axes and crescent hammerstones, and were also similar in morphology to points known from late levels at stratified rock shelters. Dragoo, however, did not describe the points either, and in fact used the same illustrations previously used by Mayer-Oakes.

The first adequate description of the points was made in 1963 by Stephenson in his report on the Accokeek Creek site. One of the attributes Stephenson mentioned as not being present on Steubenville Lanceolate points was ground basal and lateral edges. Prufer and Baby, however, have referred to some points which have been labelled Steubenville Lanceolate which have basal and lateral grinding. These have been found in contexts where grooved axes were lacking. There seems little doubt that more than one type has been included within both "Steubenville Lanceolate" and "Steubenville Stemmed" points.

We must constantly examine our artifact types to see if the typologies make the most useful distinctions. For example, let us suppose that silver trowels are sometimes included in the foundation deposits of important buildings in the United States. In every way, except for the silver plate, these are identical to trowels used in

actual building construction. Were excavations carried out in the United States we would recognize the silver trowel as a type apart from the building trowels because of the high degree of association of each of the trowel types with a particular context. This could easily be demonstrated by a two by two table in which silver trowels and non-silver trowels are ordered against corner-stone deposit find spots and non-corner stone find spots. The degree to which we can demonstrate non-random association of types with find spots is the degree to which we can have confidence in our type definitions.

This view of artifact typology is a radical one, although much the same thing has been put forth by Binford (1965). It is based on the postulate that artifacts and features such as pits (which are inferred artifacts) are cultural symbols in terms of which social interaction takes place. It is theoretically possible that two societies have exactly the same cultural inventory, and yet have completely different patterns of social interaction. Hence, it is argued that neither a social unit nor an artifact type is a valid typological category in anthropology. The archeologist cannot of course directly observe the social group with which he is dealing, but the nature of its articulation with any given artifact type can be inferred from spatial distribution of the artifacts. Hence artifact types should be formulated on the bases of these spatial relations together with the traditional formal criteria.

In short it has been argued in this paper that: 1) while everywhere the series of operations which establish artifact types is of extreme importance in areas such as the Mid-Atlantic regions these operations are crucial. In areas where little is known, the clustering of large numbers of attributes when defining types gives wide scope to analogical argument from the formulated types, by which we can learn more (If types are arbitrary it would seem that our ability to learn by analogy would be of limited nature.); 2) after we define types in this manner we must seek to prove or disprove the usefulness of the types; 3) our basic archeological unit would not be simply clusters of formally defined artifact types, but "activity types" which are formally defined artifacts and the associated cultural and social matrix. In other words, our analysis should begin with formal artifact types, but as we learn more these should be replaced by "activity types."

Taxonomy beyond the "activity type" is fraught with grave problems. It is not the identity of the "activity types," but rather the manner in which the activity types are associated which should be of crucial concern to the taxonomist in formulating cultural or systems types. Systems theory seems the most promising approach to these problems, although there is still no systems model totally satisfactory for anthropology.

A necessary step in our progress would seem to be a reformulation of artifact types in terms of "activity types" which could then be considered in terms of systems models.

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