

**Phase III Archaeological Data Recovery at the Smithsonian Pier Site  
(18AN284/285), Smithsonian Environmental Research Center,  
Anne Arundel County, Maryland**

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## ***Abstract***

The Smithsonian Environmental Research Center proposes construction of an education building and associated amenities at its facility in Edgewater, Anne Arundel County, Maryland (Maryland Archeological Research Unit 7). Henry Wright conducted limited excavations in the area of proposed construction, testing a Woodland shell midden and reporting the results in the 1960s. Phase II site evaluation of the Smithsonian Pier Site (18AN284/285), conducted in January of 1995, revealed evidence of intact oyster shell midden over some 1800m<sup>2</sup>, surrounded by plowed midden. Twenty 2m by 1m units and two 1m by 1m units were excavated into intact portions of the shell midden as part of a Phase III data recovery, revealing Middle Woodland (Selby Bay phase) and Late Woodland (Little Round Bay phase) oyster shell deposits of varying thickness (<0.20m) on top of the preoccupation A-horizon. Late Woodland material, represented largely by Rappahannock cord marked and incised pottery, occurs primarily in the plowed portions of the midden, with Middle Woodland Mockley cord marked and net-impressed pottery occurring in the intact portions of the midden.

Flotation analysis yielded little well-preserved organic matter, but pollen samples from the A- and B-horizons produced arboreal and non-arboreal pollen. These include some poorly preserved maize and legume pollen grains, as well as other species consistent with forests and forest clearings. Faunal analysis revealed limited exploitation of terrestrial species (principally deer and turtle) with little use of aquatic birds, pelagic fish, or molluscs other than oyster. Oyster shell analysis indicates a mesohaline environment, a hard, sandy substrate, and harvesting practices that did not adversely affect the oysters' reproductive cycle. Parasitic worms infected many of the oysters, but outright predation by boring sponges and drumfish appears to have had a negligible effect on the population, posing little competition for human predators. Research results support current models of Middle and Late Woodland special task sites supporting larger, inland settlements; but not necessarily models of increasing resource diversity.

This research, performed in compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended), was conducted under an antiquities permit granted by the Smithsonian Institution under the provisions of the Archeological Resources Protection Act of 1979, and in partial compliance with a memorandum of agreement between the Smithsonian Institution and the Maryland Historical Trust (19 June 1995). This investigation recovered those data for which the site is deemed eligible, under Criterion D, for inclusion into the National Register of Historic Places.

### *Acknowledgements*

Gretchen Seielstad, in addition to helping with the fieldwork, identified plant species occurring on and around the site. The authors take this opportunity to acknowledge Gretchen's assistance in Smithsonian's environmental research and educational programs, and in local archaeological studies. Justine Woodward McKnight conducted the ethnobotanical analysis. Technicians Tim Steelman (Smithsonian Institution), and Matt Croson and Tara Tetrault Goodyear (James G. Gibb, Archaeological Consultant) conducted most of the extractive and basic cataloguing procedures. We appreciate their contribution to this work and we thank Elizabeth J. Cole and Gary D. Shaffer, both of the Maryland Historical Trust's Office of Archeology, for their advice and patience.

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## ***Introduction***

The Smithsonian Institution, a trust instrumentality of the federal government, proposes construction of an education building, parking area, and trail head at its Environmental Research Center in Edgewater, Maryland. Previous archaeological studies (Wright 1968, 1969; Ballweber 1990) identified prehistoric cultural remains near the proposed location of the education building (18AN284/285). In partial compliance with the National Historic Preservation Act of 1966 (as amended), the Smithsonian Institution commissioned an archaeological evaluation study of the Smithsonian Pier site. Phase II site examination by Weiskotten and Gibb (1995) demonstrated the survival of intact oyster shell midden containing preserved mammalian, avian, and piscine faunal remains, as well as pottery (primarily Middle Woodland Mockley and Late Woodland Rappahannock) and some lithic debitage. The investigators recommended a determination of eligibility for inclusion into the National Register of Historic Places for the Smithsonian Pier site; viz., the site retains sufficient horizontal and vertical integrity, and information potential, to meet criterion (d) for inclusion into the National Register.

A variety of design, legal, and environmental issues precludes re-siting the proposed education building. In consultation with the Advisory Council on Historic Preservation and the Maryland Historical Trust, and in partial fulfillment of a Memorandum of Agreement dated 19 June 1995, the Smithsonian Institution commissioned, and participated in, a Phase III archaeological data recovery, the methods and results of which this document reports.

This report consists of eight sections, in addition to this introduction and supporting documentation:

- 1) Project Area and Environmental Background
- 2) Culture History
- 3) Research Design and Methodology
- 4) Stratigraphic Analysis
- 5) Midden Composition
- 6) Midden Components
- 7) Summary, Interpretations, and Recommendations

All of the work described herein was conducted in accordance with the *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). The Smithsonian Environmental Research Center granted an antiquities permit under the provisions of the Archeological Resources Protection Act of 1979 .



## *Chapter 1 Project Location and Environment*

### **Project Location**

The study area lies within the Western Shore subdivision of the Coastal Plain physiographic province. It is located at the end of the Dock Road, south of Contees Wharf Road, in Anne Arundel County, Maryland (Maryland Archeological Research Unit 7; Figures 1 and 2). The study area is bounded on the north by Dock Road, on the east by the Rhode River, and on the west and south by the proposed limit of disturbance for construction of the Education Building and facilities (Figure 3).

### **Environmental Setting**

Native Americans chose habitation sites, in part, on the availability of natural resources. Topography, soil conditions, access to water, and availability of food, raw materials for shelter, and fuel were all important factors in choosing a site. Site locations and functions can be predicted on the basis of environmental factors, with different prehistoric and historic activities requiring different settings. We must consider these factors in planning archaeological fieldwork and in interpreting the results of field and laboratory analyses. The following brief description describes the environmental variables that probably played a direct role in Native American site selection.

Maryland Archeological Research Unit 7, in which the study area is located, consists of the eastern two-thirds of Anne Arundel County, extending eastward from the Patuxent River drainage to the Chesapeake Bay. Low rolling uplands, with rivers and marshes, and many slow moving and heavily silted tidal streams that flow into the Bay characterize the region. Elevations range up to 30m above sea level.

The study area is relatively level, sloping up gently to the west and terminating at the base of a 10m high terrace. It is on a broad low terrace along the shore, and near the mouth, of the Rhode River. Sellman Creek lies 0.5 km to the north and Muddy Creek is 0.5 km to the south. The Rhode River is a tributary of the Chesapeake Bay. Silt load in the Rhode River has been high due to a number of factors, including historic period deforestation, agriculture, and residential and commercial development. A study conducted by the Smithsonian Environmental Research Center (Yu and Oldfield 1989), however, demonstrates that cliff erosion—a product of rising sea levels—has made the greatest contribution to near shore sedimentation.<sup>1</sup> The water is brackish and there are no fresh water sources nearby, except seasonal or intermittent streams in shallow ravines to the north and south of the study area. Siltation and radical changes wrought upon the hydrology of the area by recent development have destroyed active streams, although natural reforestation along the Rhode River is occurring as local agriculture declines. The Rhode River provides a wide range of food resources, including: fish, shellfish, waterfowl, leafy plants, tubers, and terrestrial and marine mammals and reptiles. The nearby Chesapeake Bay and its tributaries also serve as a natural corridor for transportation, communication, and trade.

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<sup>1</sup> See also Marcus and Kearney (1991) regarding calculation of sediment budgets in the neighboring South River and the relative contributions of surface runoff and shoreline erosion to recent sedimentation in the estuary.

Figure 1-1. Maryland Archeological Research Unit map.

Figure 1–2. U.S.G.S. Topographic map, South River, Maryland, Quadrangle (1974).

Figure 1-3. Project area map.

Unconsolidated Cretaceous silts, sands, clays, and poorly sorted gravels comprise the local soils. Quartz and quartzite cobbles and pebbles occur in streambeds and along the shoreline. Prehistoric peoples used these naturally occurring materials, as well as lithic materials exotic to the region, in tool manufacture. The soils are well drained loamy soils with fine sand of the Marr–Westphalia–Sassafras association, subject to severe erosion, particularly on slopes. These well drained soils attracted prehistoric and historic peoples. Large quantities of oyster shell contribute to excellent preservation of organic matter by neutralizing destructive soil acids. Inspection of exposed surfaces and tree throws reveals evidence of intact and redeposited shell midden throughout the study area.

Although cleared and under cultivation in the middle of the 17th century and later, two phases of secondary forest growth now cover the project area. Large (50cm+ DBH<sup>2</sup>) tulip poplar and sweet gum cover most of the study area, with smaller (up to 30cm DBH) locust, sweet gum, oak, elm, and tulip poplar covering much of the western portion of the study area. Ground cover is heavy throughout, consisting of honeysuckle, wild grape, poison ivy, greenbriers, and other low shrubs and climbing vines; much of it recently cleared, presumably by land surveyors.

The surrounding waters of the Chesapeake Bay and its tributaries influence the climate of eastern Anne Arundel County. Westerly winds bring in most of the weather formations, and evaporation from the widespread and shallow water courses creates high humidity. Precipitation and length of growing season have been relatively stable over the past three millennia.

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<sup>2</sup>Diameter at breast height.

## *Chapter 2. Culture History*

### **Prehistoric**

The prehistory of the Middle Atlantic Coastal Plain province has been extensively researched by Custer (1984), Steponaitis (1978, 1983, 1986), Wanser (1982), Wright (1973), and many other scholars. Dent (1995) synthesized the prehistory of the Chesapeake Bay region and we rely heavily upon his work in this section. We also address hypotheses proposed by Steponaitis (1986) and Bernstein (1993) regarding coastal Native Americans' increasing sedentism and resource diversification throughout prehistory. The emphasis placed on the Middle and Late Woodland periods in this section corresponds to the materials actually recovered from the site. We provide only a brief sketch of the historic period since the data recovery concerns the prehistoric component of the site. We found no historically significant components at the Smithsonian Pier site other than the Middle/Late Woodland shell midden. The Historic subsection provides sufficient background for understanding the recent cultural transformations of the prehistoric deposits.

### **PALEOINDIAN STAGE**

During the latter part of the last glacial period, known as the Wisconsin (terminating around 14,000 B.C.), thick sheets of ice buried most of northern North America. The vast amounts of water contained in these continental glaciers lowered ocean levels by as much as 130m, exposing broad expanses of the now submerged continental shelf for many kilometers beyond the present shorelines. The glaciers did not flow as far south as present day Maryland (the edge of the Laurentide ice sheet lying some 350km to the north), and the Chesapeake Bay of today existed only as the valley through which flowed the ancestral Susquehanna River. Boreal forests dominated by spruce and pine covered the area, giving way to mixed forests with glacial recession.

Glacial recession 11,000 years ago (c.9000 B.C.) raised the sea level, inundating the ancestral Susquehanna Valley. The rising waters flooded the lower portion of the Susquehanna 9,000 ago (c.7000 B.C.), sea water transgressing the valley as far north as present-day Annapolis by 3,000 B.C.. By 1,000 B.C., the Chesapeake Bay reached its present limits and modern climactic and biotic regimes began to develop to their present state. Oysters and a variety of benthic and pelagic fishes occupied newly created niches in what is now one of the richest estuarine environments in North America. Oak and hickory forests covered the region, and swamps, marshes, and streams formed in the hinterland and along the coasts (Carbone 1976, Lippson 1973, Schubel 1981).

Rich aquatic and terrestrial resources attracted Native Americans to the coastal environment. Prior to the formation of the Chesapeake Bay (c. 3000 B.C.), people occupied a broad range of upland and lowland settings, invariably close to a water source. Data from other parts of the region, and from North America as a whole, suggest intensive hunting of large mammalian game along the edge of the receding spruce-fir forests. Data on plant collecting and processing, unfortunately, are poor; but whether this situation arises out of differential preservation or Paleoindian choice remains unresolved.

Paleoindian tools, dating between 13,000 and 7,500 B.C., are rare in Anne Arundel County. Generally, collectors and professional archaeologists find them in redeposited contexts, often associated with multi-component sites in floodplains (Brown 1979). The Maryland State Highway Administration recently excavated a Paleoindian component at the stratified Higgins site in the interior of Anne Arundel County (Ebright 1992). The site is located along a small drainage that appears to have shifted its course

and overflowed its banks many times, alluvium covering the Paleoindian component. The Higgins site is exceptional in its preservation of Paleoindian and Early Archaic components. Such sites have not been found in the vicinity of the study area (Wright 1968; Ballweber 1990).

#### ARCHAIC STAGE

Dent (1995) defines the latter part of the Archaic Stage as a period of cultural intensification and diversification as represented by more varied projectile point styles and more varied adaptations to the environment. He hypothesizes a radical change in the relationship between human communities and the environments they occupied: Paleoindian and Early/Middle Archaic peoples “accommodated” nature, adapting to changes imposed from without, while Late Archaic communities and their successors “appropriated” nature, adapting their surroundings to social strategies and radically altering their environments (cf., Martin’s [1966] and Edwards’ [1966] hypotheses regarding the role of Paleoindians in the mammalian extinctions of the terminal Pleistocene). Dent’s hypothesis grows out of the debates between processualists and post-processualists, drawing on the strengths of ecological analysis from the former and the concern for human agency expressed by the latter. The theoretical issues need not detain us. The critical point: environmental changes are less evident for the past three millennia than for the previous seven or more, yet the pace of cultural change—as expressed through material cultural richness—greatly accelerated since the middle of the Late Archaic (ca. 2200 B.C.).

#### *Early/Middle Archaic*

There are no Early or Middle Archaic period sites (7,500 to 6,000 B.C. and 6,000 to 4,000 B.C.) recorded within the immediate vicinity of the project area, although there are sites of this period in Maryland. Some researchers feel that Early and Middle Archaic peoples abandoned coastal locations in favor of Piedmont locations (Kavanagh 1982:50), but this may be based on the lack of study of sites submerged by rising sea levels. Dent has proposed fission–fusion settlement models (1995:171–172, 177), but there is little regional data to support them. Flotation data from several sites around the Chesapeake Bay reveal some exploitation of nuts, tubers, and some starchy seeds (Dent 1995:172–173); but the degree to which Early/Middle Archaic peoples relied on plants cannot be determined with the data at hand.

#### *Late Archaic*

By the Late Archaic period (4,000 to 1,000 B.C.), primarily deciduous forests surrounded the Chesapeake Bay. The rich plant and animal life provided a wide array of foods and raw materials. Expanding Late Archaic communities took advantage of this great abundance, as evidenced by increases in both the number and size of Late Archaic sites over those of previous periods. The Smithsonian Environmental Research Center would have been near the head of the Chesapeake at this time, and Late Archaic peoples could have exploited the shallow waters and spreading tidal inlets for crabs, oysters, and anadromous fishes. Bernstein (1993), however, suggests that sea level stability promoted the natural development of tidal marshes, and such marshes are necessary for the development of stable molluscan and crustacean populations. Sea level stabilized toward the latter part of the Late Archaic period, both in the Chesapeake Bay and in the Narragansett Bay on which Bernstein focuses.

At the end of the period the deciduous forests were widespread and less diverse, thereby decreasing the heterogeneity and richness of terrestrial resources. With the encroachment of brackish water into inland bays and waterways, and the stabilization of sea level during this period, such estuarine species as shellfish became better established, and more importantly, accessible to human occupants of the area. The dominance of deciduous forests and the stabilization of sea level may have encouraged a settlement shift from interior wetlands to riverine and estuarine environments. Estuaries provided numerous locations for habitation where resources were close, plentiful, and diverse. Local Native American groups during the Late Archaic developed more complex technologies (e.g., canoes, fish weirs, and nets), and adopted a more sedentary lifestyle. It is during the Late Archaic that we see the first well developed manifestation of large, not-quite-year-round, base camps along the Bay and its major tributaries, with associated seasonal camps and resource collecting sites in the interior. Communities congregated at base camps at certain times of the year (fusion), separating, or fissioning, into smaller groups to more effectively exploit resources at other times of the year.

Dent(1995:185ff) distinguishes between narrow blade projectile point groups and broad blade groups, the former preceding, and possibly supplanted by, the latter. Broad blade groups appear to have enjoyed a richer, more diverse diet, but this observation may grow out of the substantially richer database for the latter part of the Late Archaic. Alternatively, the archaeological record may reflect a richer environment attendant on the maturation of the Chesapeake Bay. Anadromous fishes, for example, were not available at or immediately below the fall line in Maryland prior to the full expansion of the Bay.

The expanding waters of the Chesapeake Bay and its tributary rivers, creeks, marshes, and swamps provided an extensive network for travel and communication. Overland travel became more difficult as the shoreline became deeply etched by downcutting interior streams and inundated tidal creeks. The waterways also served as a food source. Exotic materials on Late Archaic period sites, such as rhyolite, argillite, steatite, and cherts and jaspers from Pennsylvania and Maryland's Great Valley, indicate extensive trade networks and/or travel.

## WOODLAND STAGE

Although there may have been some occupation of the SERC property during the Late Archaic, it was during the subsequent Woodland Stage that the area was most intensively occupied. Archaeologists divide the Woodland Stage (c. 1000 B.C to A.D. 1600) into three periods: Early, Middle, and Late, each characterized by distinctive settlement and subsistence patterns, ceramic styles, and projectile point types. While Late Archaic peoples may have experimented with pottery making, the appearance of ceramics marks the Woodland Stage.

### *Early Woodland*

Archaeologists characterise the Early Woodland period in the Middle Atlantic Region, between 1000 B.C. and 300 B.C., as a continuation of many of the cultural traditions and subsistence and settlement patterns established during the Late Archaic. Exchange networks declined resulting in the recovery of fewer exotic materials from sites of this period relative to those of earlier periods. Indigenous peoples procured shellfish, migratory waterfowl, anadromous fish, and other marine and estuarine species from the maturing Bay and its tributaries. The present vegetation patterns of the region, with tulip poplar and sweet gum in the lowlands and oak, hickory, chestnut, and pine found in the uplands, were established by this time. Early Woodland peoples made extensive use of



these resources. Archaeologists often find underground storage facilities, grinding tools, and faunal remains on Early Woodland sites (e.g., Gardner 1982).

Pottery styles define both phases of the Early Woodland period: Marcey Creek (1000–750 B.C.) and Accokeek (750–300 B.C.). Marcey Creek ceramics are molded (as opposed to coiled) and they are tempered with crushed steatite. Marcey Creek pot forms imitate steatite vessel forms of the terminal Late Archaic, lacking decoration and bearing lug handles. Marcey Creek ceramics occur on sites throughout the Delaware and Susquehanna river valleys and in the Coastal Plain and Piedmont provinces of Maryland and Virginia, with some occurring in New York State. Selden Island wares occur in association with Marcey Creek ceramics. They have thinner walls, steatite tempering, and cord marking on exterior surfaces. Projectile points of this phase include the Holmes/Bare Island, Claggett, Dry Brook, and Orient Fishtail points, all of which made their first appearance in the terminal Late Archaic.

The Accokeek phase is named for a pottery type identified at the Accokeek site in Prince George's County, Maryland (Steponaitis and Ferguson 1963). Accokeek vessels are small and conoidal, tempered with sand or crushed quartz, with cord marked exterior surfaces. The rims often are smoothed. Accokeek ceramics occur in association with Calvert projectile points.

Wright (1973), Custer (1984), Steponaitis (1986), and Dent (1995) postulate a continuation of Late Archaic settlement and subsistence patterns into the Early Woodland. Local populations formed macrobands and occupied semi-sedentary base camps during certain seasons. At other times of the year, they split into microbands and occupied short-term task specific and seasonal camps. With the development of food preservation techniques, such as underground storage, larger populations could be supported in smaller areas. Food storage reduced the need for seasonal migration. It also required a degree of sedentism in order to maintain access to, and control over, stored foods. Population growth probably occurred at this time. Base camps appear in the Chesapeake Bay along the major river drainages, and several extensive surveys, conducted along the Severn, South, and Patuxent rivers, have identified numerous Early Woodland sites. In his survey of the Severn River, Wright (1968, 1969) identified eight sites with Marcey Creek components. Steponaitis (1978) found three Marcey Creek components along the South River, and ten within the Patuxent River drainage (Steponaitis 1980, 1983). Both Wright and Steponaitis found the majority of the Marcey Creek sites in the upper reaches of the rivers, with a few sites next to estuaries. All of these sites are shell middens. This pattern indicates a riverine orientation for sites of the Marcey Creek phase.

The Accokeek phase sites represent a shift from the established Late Archaic–Marcey Creek period sites. Steponaitis (1983) identifies three trends:

1. a greater number of Accokeek sites than Marcey Creek, suggesting population growth;
2. an increase in the amount of artifacts found on Accokeek sites, indicating longer occupations, and;
3. more intensive oyster utilization, and exploitation of a broad range of terrestrial and aquatic resources. Intensive gathering in rich ecozones supported a shift toward increased sedentism and population growth.

A shift in trade networks also is seen with the acquisition of exotic materials and tools: chert from New York, Canada, Indiana, and Tennessee; copper from the Great Lakes

region; and Adena or Adena-like goods similar to those found in Ohio. The latter examples are found almost exclusively at mortuary sites, indicating a complex Adena-like mortuary practice.

### *Middle Woodland*

The Middle Woodland period in the Middle Atlantic region also is marked by changes in subsistence and settlement patterns. Archaeologists divide the period into two phases: Popes Creek (300 B.C.–A.D.200) and Selby Bay (A.D.200–800), each characterized by distinctive ceramics and projectile point types.

Popes Creek Net Impressed ceramics are friable, with a medium to coarse sand temper comprising 50% to 70% of the paste. The vessels are coil constructed, in the form of wide-mouthed jars, with conical or semi-conical bases and thick walls. Interiors are scraped and exterior finishes are net impressed. Rims are decorated with incised horizontal lines, often with finger smoothed and incised chevron patterns. Popes Creek ceramics rarely are cord marked. Wright (1973) identified a local variant that he has named Smallwood ware, but the only significant difference is the presence of some shell and quartz tempering in a sandy paste. Rossville and Piscataway contracting stem projectile points occur in deposits with Popes Creek ceramics. They occur on sites from southern New England to the Chesapeake Bay. The Popes Creek tool assemblage also includes bone awls, knives, grinding stones, mortars, axes, choppers, and hammer stones of local lithic material.

The Selby Bay phase follows the Popes Creek phase, represented by Mockley Cord-marked and Net Impressed pottery, and exotic lithic materials. Mockley ceramics are tempered with coarse crushed shell, comprising about 20% to 30% of the paste. The vessels are coil constructed, medium to large in size, with rounded or semi-conical bases and moderately to thickly potted walls. Vessels from the beginning of the period are predominantly cord-marked. Cord marking appears to have been supplanted by net impressed treatments, both plain and crumpled, by A.D. 700–900. Potters smoothed surfaces just below the rim often leaving the rest of the pot undecorated. They commonly decorated the smoothed necks with incised cross-hatching, diamonds, chevrons, or parallel lines, and—occasionally—punctates. Mockley pottery appears on sites from the western coastal plain of Virginia to the Delaware River. On Maryland's Western Shore they occur in association with Selby Bay bifaces—made from non-local rhyolite, argillite, and jasper—and elliptical two-holed gorgets, hematite squares, grinding stones, bifacially retouched flakes, and worked bone. Gardner, et alia (1988), also recovered several Piscataway points from a pit at 18CV272 that also contained Mockley sherds. The chronological placement of Piscataway points, however, is still a point of contention among scholars in the region (e.g., Ebright 1992:38; Reeve 1992a).

The Popes Creek phase may represent local development, with an intensification of the subsistence patterns established during the Accokeek phase of the Early Woodland. Large semipermanent macroband sites were located along the upper portions of major river drainages, with associated satellite procurement stations located in strategic spots near the base camps.

There is some discontinuity between the lithic assemblages of the Popes Creek and Selby Bay phases. Popes Creek tools generally were made from locally available quartz and quartzite. Selby Bay phase lithic assemblages are entirely different, dominated as they are by exotic materials: rhyolite from western Maryland, argillite and

cherts/jaspers from Pennsylvania, and cherts from New York.<sup>3</sup> Luckenbach, et alia (1987), suggest that there was a greater affinity of Selby Bay phase peoples with populations to the north, if not migration into the Maryland Coastal Plain Province from the north. Custer (1986) suggests that this settlement pattern reorganization may have culminated in the establishment of small chiefdoms by the Late Woodland period. Jacks Reef projectile points appear in the late Middle Woodland associated with Mockley pottery, but are made primarily of locally–available quartz rather than exotic rhyolites and argillite. (Indeed, Jack’s Reef pentagonal points bear a strong resemblance to heavily reworked Selby Phase lanceolate points.)

In her study of settlement patterning in the Patuxent River drainage, Steponaitis (1986) remarked on the decline in component and projectile point densities during the Middle Woodland, both measures increasing rapidly during the Late Woodland. She also noted the appearance of Middle and Late Woodland components yielding lower than expected richness values for the artifact assemblages. Steponaitis (1986:286) identifies four dramatic changes occurring during the Middle Woodland period:

1. marked differentiation between the use of coastal and interior zones;
2. increased segregation of activities between these zones;
3. appearance of large, special purpose sites; and
4. dramatic rise in site artifact density.

She regards these developments as an important shift from Late Archaic/Early Woodland practices to reliance on task specific camps supporting larger, more sedentary settlements. Steponaitis also poses an hypothesis to account for these observations and the widespread use of exotic lithic materials on Middle Woodland sites: interregional alliances and exchange created demand for intensified production, requiring increased storage for short–term accumulation and decreased mobility coupled with increased reliance on task specific camps to produce surpluses (Steponaitis 1986: 284). In this hypothesis we can see aspects of Dent’s (1995) “appropriation” model.

#### *Late Woodland*

The appearance of the first true signs of horticulture in the Middle Atlantic region mark the beginning of the Late Woodland Period (c. A.D. 800). The period ends with sustained European contact in the 17th century (after A.D. 1600). Maize horticulture was widely and rapidly adopted throughout the northeastern United States at this time and may have been introduced by cultures to the west of the Chesapeake Bay region.<sup>4</sup> (Herbert [1991] identified the earliest evidence of maize in Southern Maryland at the Thomas Point site [18ST570] with a corrected radiocarbon date of A.D. 880.) Hart and Sidell (1997), however, report evidence of pre–maize horticulture east of the Allegheny Mountains in north central Pennsylvania during the Late Archaic and Early Woodland periods, and complex plant collecting and cultivation strategies are well known for states

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<sup>3</sup>Ballweber (1994) provides the following material percentages for the nearby Selby Bay phase Luce Creek site: 92.9% rhyolite; 6.2% jasper; 0.6% quartz; 0.3% quartzite; and 0.3% chert (n=340). Stewart (1984) reports a marked increase in the percentage of rhyolite in lithic assemblages that are 80 to 100+ miles from sources in Western Maryland.

<sup>4</sup> The reasons for this widespread adoption of maize remain elusive, although Johnson and Speedy (1992) suggest population replacement of Mockley pottery peoples in the Upper James Estuary based on their proportional analysis of z- and s-twists on the cordage with which Middle and Late Woodland pots were impressed.

further west (e.g., Cowan 1997; Fritz 1997). The environment remained essentially the same since the end of the Pleistocene, and local peoples continued gathering plants, hunting, fishing, and oystering. By the time of European contact in the Chesapeake Bay region, aborigines relied less on estuarine resources than did their immediate precursors. Horticultural villages on floodplains were the primary occupation sites of the native inhabitants, at least according to the reports of European observers.

Archaeologists divide the Late Woodland into two phases: Little Round Bay (A.D. 800–1250) and Sullivans Cove (A.D. 1250–c.1600).

Little Round Bay Phase ceramics include incised and fabric impressed wares of the Rappahannock series. Both are shell tempered. The vessels are coil constructed, with smooth interiors and rough exteriors. Potting tends to be thinner, and the temper smaller and finer, than the earlier Selby Bay vessels. Rappahannock ceramics include wide-mouthed jars with rounded or semi-conoidal bases.

Griffith (1980) defined eight varieties of Rappahannock Incised. Motifs include horizontal bands, zigzags, and squares or triangles, occasionally filled in with incised lines. Generally, the more complex geometric forms occurred during the period between A.D. 900 and A.D. 1300. Fabric impressions on Rappahannock wares typically are clear and not over stamped. Some vessels have pseudo-cord impressed patterns at the rim. Projectile points associated with the Rappahannock ceramic types include Jacks Reef points—found throughout Maryland, Delaware, Virginia, Pennsylvania, New York, Ohio, Michigan, and Ontario—and Levanna points—found throughout Maryland, Virginia, Delaware, Pennsylvania, New Jersey, New York, Ontario, and into New England. Other Late Woodland artifacts include bone awls, obtuse angle pipes, grinding stones, and pitted stones.

Sullivans Cove pottery is thinly potted with light, crushed shell tempering. Vessels have conoidal bases and constricted necks. Body sherds are partially cord marked and smoothed. Rim exteriors are decorated with cord wrapped stick impressions, and horizontal lines and herringbone patterns. Rappahannock Incised ceramics with less complex motifs also are found with Sullivans Cove pottery, as is the Rappahannock Herringbone motif. The small triangular Madison projectile point, found throughout the northeastern United States, typically is the only projectile point found on Sullivans Cove phase sites. The small size of the Madison point indicates that Late Woodland peoples replaced the throwing spear, which required a larger and heavier point, with the bow and arrow. Sullivans Cove assemblages also include grinding stones, convex-edged end scrapers, knives, and other stone tools. It was during the Sullivans Cove period that horticulture is associated with a shift to fully sedentary village life in locations away from the shores of the Chesapeake. As noted above, however, task specific sites continued to support the villages (e.g., Steponaitis 1986).

Custer (1984) suggests that vast changes occurred in the settlement and subsistence patterns of the Late Woodland. Prior to A.D. 1000, settlement and subsistence patterns centered around intensive gathering and hunting with some use of cultigens. Groups followed seasonal rounds, moving from base camp to base camp, with occasional forays to task specific sites to procure shellfish, waterfowl, and other resources. Wright (1973) suggests that the Little Round Bay phase occupations centered around base camps at the estuarine/transition zones, with frequent use of numerous nearby procurement camps. Wright interpreted the Obrecht site, near the head of the Severn River, as a base camp for the Purcell site on the Magothy River and the Oakridge site on the Patapsco River. The two smaller sites served as resource procurement sites. Obrecht, a large oyster

shell midden measuring 180m in length, produced materials from the Middle Woodland and Late Woodland periods. Wright interprets the broad array of faunal remains and cooking features at the Obrecht site as evidence of a large macroband base camp. The Purcell site is a small oyster shell midden site, measuring at least 25m in length, with a similar broad array of faunal remains. Wright suggests that it is a microband base camp, probably occupied in the fall. The Elkridge site is on the estuarine portion of the Patapsco River, at the confluence of three major tributaries. It is well placed for the exploitation of spring runs of spawning fish. Development has destroyed a number of smaller sites near Elkridge which could have served as microband procurement sites. Procurement sites were selected for ease of access to seasonally available foods.

Increased reliance on cultigens lessened, but did not eliminate, the need for satellite camps, and this shift is reflected in the archaeological record. The functions of base camps changed as they became village sites, devoted to the production, storage, and protection of food. The need for crop land also required a shift away from coastal areas to fertile floodplains (a pattern Bernstein [1993] hypothesizes for coastal New England as well). Horticulture in the Bay region became important some time after A.D. 1000, probably during the Sullivans Cove phase. Larger villages of this period were surrounded by smaller villages, camps, and isolated household sites or clusters. Sullivans Cove phase peoples still used sites previously used for oystering, waterfowling, fishing, and hunting, but not as intensively.

### **Historic**

Spanish explorers and French privateers may have come in direct contact with Chesapeake aborigines as early as the first half of the 16th century, but it was not until the establishment of the Virginia (1607) and Maryland (1634) colonies that sustained direct contact occurred. The native inhabitants had long abandoned their semi-sedentary camps along the bay for more settled, horticultural villages further inland. Native Americans still hunted, fished, trapped, and traveled along the shore, but they built more permanent settlements further inland. Raids by the Susquehannocks from the upper Susquehanna River also may account for the movement inland, local groups seeking less exposed sites for protection. Europeans traded with inland tribes at the head of the bay and in the Susquehanna River, sailing past the sites on the Chesapeake shores.

Europeans settled Anne Arundel County in the late 1640s and 1650s, first along the lower reaches of the major rivers such as the Rhode River, and into the interior in the late 17th and 18th centuries. Augustine Hermann's 1673 map of Maryland (Figure 2-1) shows many plantations in the vicinity of the project area, mainly along the major river courses.

Ballweber's 1990 report identified a number of sites associated with the historic use and occupation of the property, but the project area appears not to have been occupied during historic times other than as a farm lot. Plantations of the region generally consisted of 50 to 250 acres with tobacco as the major crop. Wheat, corn, and soy have risen in importance in recent years. Slaves cultivated and harvested the crops, and the plantations typically contained an assortment of structures including the plantation house, slave quarters, and an array of outbuildings. Farm tenantry, already common as early as the late 17th century, became the principal form of land tenure after the Civil War.

The study area is part of the "Java Farm," patented in the 17th century. The land, with a large brick house and ancillary farm and slave structures, was owned by several absentee owners in the 18th century. John Contee acquired the plantation c.1819, but did not live on the premises. His wife seems to have lived there for a time after his death. Her

two sons later divided the farm. Charles Contee took possession of 360 acres, including the land south of Contee's Wharf Road, and encompassing the study area. In 1860 tobacco remained the predominant crop, Contee growing the largest crop in the Rhode River watershed. Almost all of the arable land of the Java Farm was in cultivation at that time. An 1862 United States Coastal Survey map, the resolution too poor to reproduce for this report, also shows the study area under cultivation.

By the early 1870s, the Java Farm was rented and the property began to decline for want of proper cultivation and upkeep. The farm was sold in 1882 and operated by a manager. In 1890, the study area was still in cultivation. Two early 20th century milk bottles from the "Java Farm" dairy are in the collections of the Smithsonian Environmental Research Center. These two bottles represent an attempt to adapt the farm to the local market, specifically the production of fluid milk for the expanding markets of Annapolis and the United States Naval Academy. The Smithsonian Institution acquired the derelict farm in 1965.

Dock Road, which leads from Contee's Wharf Road to the site of the proposed Education Building, does not appear on any known historic map. Several maps show evidence of its course, but it is as a fence line, field border, or possibly a shallow ravine. The dock and Dock Road were built in the 1930s. The fields in this area were abandoned some time in the early 1940s, although it is clear from examination of the standing woods that it was abandoned in two stages. The section along the road and extending 70m south and west is about 50 years old. Colonizing species of smaller diameter occur further west.

Figure 2–1. Herrman’s map of Maryland and Virginia, detail (1673).

## Previous Investigations

There have been a number of archaeological studies of the area around the Rhode and West Rivers. Ballweber (1990:35–36) describes these reports in her survey report of the Contees Wharf area. Notable among these reports is the work of Henry Wright (1968, 1969) who first identified the Smithsonian Pier site and the Smithsonian Pier West site; 18AN284 and 18AN285, respectively. Ballweber's more intensive Phase I survey in 1990 found that the two sites are parts of a single site. Weiskotten and Gibb's (1995) Phase II study confirms Ballweber's observation, and we refer to the entire site as the Smithsonian Pier site (18AN284), generally omitting reference to the second site number. A cursory examination of the surrounding area indicates that similar shell deposits are to be found at least as far north as Contee's Wharf. Distinguishing individual sites, or loci within, will require a far more intensive survey of wider scope than has been conducted to date.

Wright (1968) identified 19 prehistoric sites in the immediate vicinity of the project area. The Java History Trail, an outdoor interpretative exhibit recently opened to the public, crosses three of these sites (18AN284, 18AN285 and 18AN286). Wright later excavated a portion of 18AN285, recovering oyster shell, bone, some lithic material, and aboriginal pottery (Wright 1969). Ballweber (1990) identified similar materials.

Weiskotten and Gibb (1995) excavated 89 shovel tests on a 10m grid in the area of proposed construction. They delineated the northern, western, and eastern boundaries of the shell midden. The southeastern boundary is outside of the area of potential effects, but apparently follows the current shoreline of the Rhode River, 30m beyond the sample grid. The plowed portion of the shell midden covers an oval area 50m by 60m, or more. The intact portion of the shell midden is somewhat smaller, about 40m in length, but mirrors the boundary of the plowed midden. A piece of soapstone, some animal bone, very few flakes and fire-cracked rock, and prehistoric pottery were recovered from the shovel tests. Most of the prehistoric artifacts occur within the shell midden. There is some evidence of patterning within the shell midden, fire-cracked rock occurring to the south, pottery and flaked stone to the north. Evidence of an occupation area north of the shell midden consists of three quartz flakes in the plowzone.

Stratigraphic excavation of three 2m by 1m units confirmed the results of the shovel testing. Portions of the midden, with preserved faunal remains and artifacts, survive beneath the plowzone. Faunal remains include deer, turtle, bird, soft shell clam, terrestrial snails, and oyster. Large samples of cultural material were recovered from the excavation units, particularly from intact portions of the midden. Few lithic materials were recovered (25 flakes), and most of these are quartz and rhyolite flakes from late stages of reduction. The excavation units yielded large quantities of Mockley cord marked, net-impressed, and crumpled net-impressed pottery (141 sherds), and lesser numbers of Rappahannock fabric impressed and incised pottery (36 sherds). Many of the conjoinable sherds have been mended.

Based on their Phase II site examination, Weiskotten and Gibb (1995) determined that the prehistoric component of the Smithsonian Pier site retains sufficient integrity to yield potentially important data on the prehistory of coastal Maryland, particularly in terms of the transition from Middle Woodland (Selby Bay phase) to Late Woodland (Little Round Bay phase) subsistence, settlement, and trade patterns (Criterion D). They recommended data recovery to preserve those data for which the Smithsonian Pier site is considered eligible for inclusion into the National Register of Historic Places. The historic component, consisting of 10 small brick fragments, a wire nail, a small white



paste earthenware sherd, and a 1944 Mercury Head dime, does not meet any of the eligibility criteria for the National Register.

The remainder of this report describes the methods, findings, interpretations, and recommendations of the Phase III data recovery at the Smithsonian Pier site.

### *Chapter 3. Research Design and Methodology*

#### **Research Design**

The principal purpose of a Phase III data recovery is “to retrieve and analyze the maximum amount of information from an archaeological property necessary to address important research topics” (Shaffer and Cole 1994:27). Objectives include:

1. description of the site and those qualities that make it eligible for the National and Maryland registers of historic places;
2. maximum retrieval of data relevant to current research problems;
3. testing of current hypotheses and posing new hypotheses based on new data or new insights; and
4. conveying findings to non-archaeologists through publication, news media coverage, site tours, exhibits, and school programming, to name the more common approaches.

Realizing each of these goals requires a thorough understanding of the historical context of the site (and, by extension, some knowledge of the period during which it was occupied) and a commitment to sharing archaeological findings with the public.

The Smithsonian Environmental Research Center, in consultation with Weiskotten and Gibb (1995) and the Maryland Historical Trust, prepared a scope of work to accomplish the goals set out by Shaffer and Cole (1994) and to meet the specific guidelines of Section 106 of the National Historic Preservation Act of 1966, as amended. This scope of work was undertaken in partial compliance with a memorandum of agreement dated 19 June 1995.

#### **STAGE 1. BACKGROUND**

Although most of the background research necessary to place the Smithsonian Pier site was undertaken during the Phase II site examination and reported in Weiskotten and Gibb (1995), additional research was required to better interpret the Phase III data. The sections above reflect much of that research, particularly in reviews of the works of Steponaitis (1986), Dent (1995), and Bernstein (1993): additional material appears in the appropriate analytical sections below.

#### **STAGE 2. FIELDWORK**

Eighteen 2 by 1m units, including the Phase II units, were required to sample intact oyster midden within the area defined by Weiskotten and Gibb (1995; see also Appendix I) to: 1) sample artifact and ecofact assemblages; and 2) to identify cultural features. Given the data redundancy apparent in the field, and subsequently borne out in the analyses below, only an additional four units (6m<sup>2</sup>) were excavated, and three were used to define a possible feature around Unit 9. All units, except three of the supplemental units, were laid out in advance with a measuring tape and transit, each placed at or—to avoid large trees—near the northwest corner (i.e., the datum) of a 10m<sup>2</sup> unit within the area of intact midden (Figures 3-1 and 3-2). Each unit was excavated stratigraphically at least 10cm into the B-horizon. Since surviving remnants of the shell midden and the buried A-horizon rarely exceeded 10cm in depth, we did not excavate strata in arbitrary levels. The spoil was screened through ¼ in. (6mm) mesh for artifacts and the stratigraphy

Figure 3–1. Limits of intact oyster shell midden (Weiskotten and Gibb 1995).

Figure 3-2. Unit placement within intact oyster shell midden.

documented. All oyster shell above 2cm in length was collected and weighed in the field, a sample of at least 40 upper and lower valves retained for detailed analysis and permanent curation. All artifacts and non-oyster mollusc shells were collected and bagged by unit. Fieldwork was undertaken between 01 and 29 June 1995.

Two-liter soil flotation samples were collected from each intact stratum for each unit; i.e., for the shell midden (Stratum 2B) and the buried A-horizon (Stratum 2C). In addition to the techniques and samples specified in the scope of work, the principals collected pollen column samples from each of three units. Samples were collected from below intact shell midden in 2cm increments through the buried A-horizon to 10cm into the B-horizon. The three units were selected on the basis of thick, intact shell midden and well-defined A-horizons. One column sample has been processed at The Johns Hopkins University and analyzed by Dr. Grace Brush. SERC curates the remaining two column samples. Since no cultural features were encountered, radiocarbon samples were not collected, larger pieces of charcoal appearing only sporadically in the shell midden and buried A-horizons; i.e., we could not distinguish between natural sedimentary charcoal and culturally derived charcoal, nor could we identify sealed deposits within the multicomponent deposits.

The excavation units were established on the grid system, but were placed in such a manner as to avoid trees and large roots, and to exclude adjacent shovel test sites. The northwest corner is the reference point for each excavation unit. Soil color and texture, artifact content, depth of stratum, soil anomalies and features, plan and profile views were recorded on pre-printed cardstock provenience cards. Elevations were measured relative to a nearby U.S.G.S. benchmark.

### STAGE 3. LABORATORY WORK

The purposes of this stage are to identify and analyze artifact and ecofact collections and to prepare those materials for curation, as per *The Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). Historic and prehistoric artifacts were washed, dried, and labeled with the site number (18AN284) and lot number. Lot numbers begin with 63, picking up where the Phase II catalogue ended. Oyster shells are not labeled. Conjoinable fragments have been mended with Acryloid B-72. Artifacts and oyster shell are packaged in resealable archival quality polyurethane bags. Provenience information is marked on the bag exteriors with permanent ink. An acid-free label with provenience information is included in each bag. Flotation materials are contained in small glass vials.

All flotation and oyster shell samples were processed at SERC by Smithsonian technician Timothy Steelman. He sorted, counted, and weighed all of the recovered organic material (subsequently identified and catalogued by Justine Woodward McKnight) and measured samples of oyster shell from each of the intact midden strata, recording size, number of growth rings, and the frequency of parasite scarring.

The Smithsonian Environmental Research Center curates all of the artifacts, botanical and faunal specimens, drawings, photographic negatives, and field notes, making its collections available for scholarly research and museum exhibition.

### STAGE 4. ANALYSIS AND REPORT PREPARATION

All recovered artifacts are catalogued on spreadsheets, by unit and stratum (Appendix III), as are macroflora (Appendix IV), general fauna (Appendix V), and molluscan data (Appendix VI). We recapitulate some of the Phase II findings in the following chapter, proceeding then with a summary of the Phase III fieldwork results,

stratigraphic analysis, and various artifact, faunal, and botanical analyses. Since no intact features were found and charcoal appeared only sporadically mixed throughout the plowzone, midden, and buried A-horizon deposits, no samples have been submitted for radiocarbon analysis: the results of one or more radiocarbon assays would be sufficiently equivocal, given the nature of the deposits, that the expense involved is unwarranted.

#### STAGE 5. PUBLIC EDUCATION AND INFORMATION

Largely through SERC's Education Department, A. Mark Haddon, Director, the principals conducted an outreach program in conjunction with the archaeological fieldwork. A representative of Maryland's principal Native American community was notified of impending fieldwork and invited to comment and visit (Appendix II.3). Project archaeologists and SERC's director of education led four school groups, two family groups, and two visiting professional groups through the site during the three week excavation, explaining why the work was undertaken, sampling, and preliminary results (Appendix II.2). News releases were issued to several local newspapers, resulting in a well written piece in *The Capital* (Cody 1995; Appendix II.1). The principals presented preliminary results at the annual Middle Atlantic Archeological Conference in Ocean City, Maryland (Gibb and Hines 1996) and at the Annual Anne Arundel Conference on Archaeology (Gibb 1995). We anticipate preparation of a summary article for *Maryland Archeology*.

## *Chapter 4. Stratigraphic Analysis*

### **Shovel Testing Data**

Henry Wright (1968) identified two archaeological sites, 18AN284 and 18AN285, in the area currently occupied by SERC's education trailer and wet lab. Ballweber (1990:49) states that they probably are loci within a single site. She estimated the area of the shell midden at 2.0 acres (about 8,000m<sup>2</sup>). Deposits in the vicinity of the existing education trailer and wet lab have been extensively disturbed by construction.<sup>5</sup>

In January of 1995, Weiskotten and Gibb (1995) shovel tested the study area to determine the size, configuration, location, and content of the site. Eighty-nine shovel tests were excavated on the 10m grid, each unit approximately 1m southwest of a grid point, although placement was altered in some cases to avoid trees. Six soils were encountered:

1. humus, with little or no cultural material (Stratum 1);
2. recent construction fill, with little or no cultural material (Stratum 1A);
3. deep colluvium that had been plowed and contains little prehistoric or historic cultural material (Stratum 1B);
4. plowed soil with varying amounts of crushed and whole oyster shell and some prehistoric and historic cultural material (Stratum 2A);
5. intact oyster shell midden consisting of whole and some crushed oyster shell and prehistoric cultural material (Stratum 2B); and
6. Pleistocene sediment, wholly lacking in cultural material, except some prehistoric artifacts at its interface with overlying shell midden or buried A-horizon soils (Stratum 3).

We have since designated the dark sandy loam at the base of intact shell deposits as an intact buried A-horizon (Stratum 2C); the topsoil that developed prior to human occupation of the site. Figures 4-1 through 4-4 depict the distribution of the principal strata. The histograms provide an abstract view of the depths and extent of these soils.

#### *N160 Transect*

A thin layer of humus occurs across the N160 line (Figure 4-2). The underlying plowzone is a very dark brown (10YR3/3) to very dark grayish brown (10YR3/2) fine sandy loam, with the crushed oyster shell content highest towards the east end of the transect. From E170 to E190 the plowed shell midden gives way to intact shell midden. The intact midden consists of a dense lens of oyster shells, 10cm to 15cm in thickness, with very dark brown (10YR3/3) very fine silty loam, underlain in places by the same soil, albeit nearly devoid of shell and compacted. Underlying the shell midden, buried A-horizon, and plowzone is a dark yellowish brown (10YR4/4) fine sandy loam mottled with very dark brown (10YR3/3) sandy loam, devoid of cultural material.

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<sup>5</sup> Our examination of the area indicates that the shell deposits were in a single continuous deposit (or perhaps two very close clusters), with thicker, highly localized deposits. We estimate that the shell midden once covered approximately 15,000m<sup>2</sup>, with 6,500m<sup>2</sup> having been destroyed by facilities construction in 1994.

Figure 4-1. Transect sectional view of the Smithsonian Pier site.  
(Refer to Figures 4-2 through 4-4)



Figure 4–2. Schematic profile of Smithsonian Pier site, N160 Transect.  
(N.B. Stratum designations)

Figure 4–3. Schematic profile of Smithsonian Pier site, Northeast–Southwest Transect.  
(N.B. Stratum designations)

Figure 4-4. Schematic profile of Smithsonian Pier site, Northwest–Southeast Transect.  
(N.B. Stratum designations)

#### *Northeast–Southwest Transect*

A thin layer of humus occurs along a line extending from N120/E160 to N160/E200 (see Figure 4–3). Near the education trailer it covers a layer of recent construction fill, but otherwise it lies directly on top of plowed soil. The plowzone is a very dark brown (10YR3/3) to very dark grayish brown (10YR3/2) sandy loam with the crushed oyster shell content highest towards the east end of the transect; viz., closest to the water's edge. The plowed shell midden extends along the full length of the transect. Intact midden underlies the plowzone from N160/E160 to N160/E200. It consists of a dense lens of oyster shells, 10cm to 15cm in thickness, with very dark brown (10YR3/3) very fine sandy loam. Underlying the plowzone, shell midden, and a barely discernible buried A–horizon, is a dark yellowish brown (10YR4/4) fine sandy loam B–horizon mottled with very dark brown (10YR3/3) sandy loam, devoid of cultural material.

#### *Northwest–Southeast Transect*

A thin layer of humus occurs along the line from N120/E140 to N200/E110 (Figure 4–4). The underlying plowzone is deep, very dark brown (10YR3/3) to very dark grayish brown (10YR3/2) sandy silt loam colluvium, derived from the hill to the west. The paucity of oyster shell in the soil also suggests that a shell midden never developed in the area between N150/E160 and N200/E110. Farmers could plow deeper in the absence of shell. Plowed and intact oyster shell midden extend along the line from N140/E170 to N120/E190. The intact midden consists of a dense lens of oyster shells 5cm to 10 cm in thickness, with very dark brown (10YR3/3) sandy silt loam. Underlying the shell midden is a barely discernible buried A–horizon (see above), and the overlying plowzone is a dark yellowish brown (10YR4/4) fine sandy loam mottled with very dark brown (10YR3/3) sandy loam.

Shovel tests indicate that archaeological deposits cover approximately 4,000m<sup>2</sup> within the project bounds, based on the recovery of at least 500g of shell from individual shovel tests. Examination of the shovel test data and soil profiles reveals that approximately 80% of the spatial extent of the midden is intact. One small portion of intact midden, lacking associated cultural material, occurs around Shovel Test N190/E180. The remaining portions cover the southeastern third of the study area, and contain cultural materials dating to the Middle and Late Woodland periods.

Rather than a continuous sheet of oyster shell, leveled by the plow, the surviving midden appears to be a series of dense shell 'islands' blurred through plowing. The irregular patchwork is a product of depositional processes (i.e., the ways in which Middle and Late Woodland peoples discarded the shell on an irregular surface) and post–depositional process (sp., plowing). Ballweber reported similar findings but was unable to test the entire extent of the deposit. She found that 40m from the river bank as much as 20cm of intact shell midden lay preserved between the plowzone and sterile subsoil.

Nearly 55kg of oyster shell were recovered from the Phase II shovel tests. Figure 3–1 in the previous chapter illustrates the distribution of oyster shell, measured in terms of grams per unit.<sup>6</sup> Contours were generated with a computerized contouring program, each contour representing 500g of oyster shell. The highest values approximate the extent of the intact shell midden, approximately 4,000m<sup>2</sup>.

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<sup>6</sup>Since the entire area had been plowed, shell weights from all strata were combined for each shovel test.

Shovel testing also recovered historic and prehistoric artifacts such as brick (10 pieces, all under 10g), one wire nail, white paste earthenware (one very small fragment that fell through the screen), fire-cracked rock (4 pieces), bone (7 pieces), pottery (26 sherds), steatite fragments (5 pieces), a polished stone, and two rhyolite and six quartz flakes. Prehistoric artifacts recovered from the shell deposits generally were better preserved than those recovered from the plowzone. Most artifacts in the shovel tests were single finds, but two shovel tests unearthed interesting assemblages of artifacts indicating intact midden with potential for yielding additional archaeological data. Several well-preserved shell tempered pot sherds were recovered from a 16cm thick intact shell midden in Shovel Test N150E170. Five of the sherds from this shovel test are Rappahannock Incised and four are Rappahannock Fabric Impressed. The remainder are of indeterminate type. Shovel Test N150/E210 disclosed no intact shell midden, but yielded a large fragment (10cm in length) of very grainy steatite and a piece of Mockley Crumpled Net Impressed pottery. No other diagnostic prehistoric artifacts were found in shovel testing.

Figure 4–5 illustrates the spatial distribution of historic material. Most of that material occurs near the road edge, but clusters also occur west of, and above, the shell midden. Given a relatively close sampling interval of 10m (33 ft.), the recovery of historic material is low. There is little evidence of significant historic activity within the study area, and we attribute these few finds to activities at Contees Wharf, just north of the study area.

Prehistoric activity is much more pronounced than historic activity at the Smithsonian Pier site. The shell midden is clearly of prehistoric origin. Pottery was the most common artifact recovered from the shovel test pits, but bone, fire-cracked rock, and flaked stone also were recovered. Hand plotting of their distributions suggest some spatial structure to the site (Figure 4–6). Pottery clusters in the northern portion of the shell midden, fire-cracked rock in the southern portion. Three flakes were recovered from units outside, and on the edge, of the shell midden. These three flakes raise the possibility of an occupation area adjacent to the midden. Bone distributions appear insignificant since bone occurs almost solely in association with high oyster shell concentrations, reflecting differential preservation rather than patterned deposition. Although bone occurs in much lower frequencies than does oyster shell, it seems to have little value in defining spatial structure at the Smithsonian Pier site. Steatite was recovered from only one shovel test unit.

Figure 4–5. Distribution of historic artifacts at the Smithsonian Pier site  
(Source: Weiskotten and Gibb 1995).

Figure 4–6. Distribution of bone, fire–cracked rock, flaked stone, pottery, and steatite.  
(Source: Weiskotten and Gibb 1995).

### **Excavation Units Data**

The Phase II stratigraphic and spatial analyses defined the horizontal and vertical limits of the Smithsonian Pier site’s shell midden, suggesting some evidence of spatial structure to the site and clearly establishing the integrity of much of the shell midden. Three Phase II units, each measuring 1m by 2m, were excavated in different parts of the

site to recover data on deposit integrity and to collect a larger sample of artifacts with which we could date the site. Seventeen additional 2 by 1m units and two 1 by 1m units were excavated as part of the Phase III data recovery, yielding a total of 22 units covering 42m<sup>2</sup>. Shovel testing outside of the midden yielded little cultural material, hence we confined our data recovery to the intact shell midden as defined in Figure 3–1. (We will return to the implications of this strategy in the last chapter.) All 22 test unit locations, therefore, are within the plowed and intact portions of the shell midden.

In this section, we examine stratigraphic and spatial data from the excavation units to characterize the structure of the shell midden and to determine whether components and activity areas can be defined.

### SHELL MIDDEN STRUCTURE

Ballweber’s (1990) observations and Weiskotten and Gibb’s (1995) results clearly indicate that the Smithsonian Pier shell midden consists of several thousand square meters of discontinuous deposit. This subsection explores the structure of the midden in greater detail with the aid of shell and artifact distribution maps. The structure of the midden determines the kinds of data we are likely to recover and the directions in which we can take further analyses.

Table 4–1 provides stratigraphic summaries. For ease of description, we group the units into two categories: those revealing intact shell midden (>3cm layer of continuous shell extending across the unit; i.e., a significant portion of Stratum 2B survives) and those characterized only by plowed shell midden (Stratum 2A). Sixteen of 22 units (73%) exposed intact shell midden of varying thicknesses, two of those lacking a discernible buried A–horizon (Stratum 2C). Half of the six remaining units exposed only thin (<4cm) remnants of discontinuous oyster shell midden.

The stratigraphic sequence across the project area varied only in the presence or absence of intact shell midden and the absolute thicknesses of each of the strata, summarized statistically in Table 4–1 and illustrated in Figures 4–7 through 4–10.

Table 4–1. Summary of strata.

Unit Group	Descriptive Statistic	Humus (Stratum 1)	Plowzone (Stratum 2A)	Shell Midden (Stratum 2B)	Buried A–horizon (Stratum 2C)	Units
Intact Midden n=16	Median	6cm	16cm	9cm	10cm (n=17)	1, 2, 5, 8, 9, 11,
	Mean	6cm	16cm	7cm	8cm (n=17)	12, 13, 14, 15, 16,
	Std. Dev.	3cm	3cm	4cm	6cm (n=17)	17, 18, 20, 21, 22
Non–intact Midden n=6	Median	6cm	19cm	N/A	6.5cm (n=4)	3, 4, 6, 7, 10, 19
	Mean	5cm	20cm	N/A	6cm (n=4)	
	Std. Dev.	2cm	5cm	N/A	5cm (n=4)	



Figure 4–7. Unit 3 revealing plowed shell midden.

Figure 4–8. Unit 3 revealing plowed shell midden.  
Humus (1), Plowzone (2), and Subsoil (3).

Figure 4–9. Unit 1 revealing intact shell midden.

Figure 4–10. Unit 1 revealing intact shell midden.  
Humus (1), Plowzone (2), Shell Midden (3), and Subsoil (4).

Not surprisingly, the depths of the humus for midden and non-midden units alike vary little, with identical—or nearly identical—mean and median values and standard deviations of less than 51% of the mean. Tree throws—still clearly visible on the surface, although long ago filled with sediment—and other minor topographic variations probably account for the limited variability in humus thickness. Lacking significant quantities of cultural material, and that material resulting from recent disturbances (viz., the last 40 to 50 years, the last time the land was cleared and plowed), the humus lacks analytical value.

Plowzone thickness tends to be greater among the non-midden units than the midden units by about 25%. Again, this should come as no surprise, farmers plowing deeper in areas of thin or non-existent shell midden with horse-drawn or early motorized plows. With standard deviations of approximately 25% of their respective means, plowzone depths appear to be relatively uniform within the categories of midden and non-midden units. Differences within and between the two categories, however, should have little effect on the results of our spatial analyses since the presence of intact shell midden—not the depth of the plowzone—appears to influence the quantity of material recovered from the overlying plowzone. Shovel test results from the Phase II site examination support this observation, relatively little cultural material having been recovered beyond the limits of intact shell midden. These findings further support our interpretation of the shell midden as a trash disposal area that may or may not overlie an earlier domestic space, but was not itself the locus of discrete activities (see also Mathis 1993).

Rouse (1997) suggests that questions of prehistoric occupation and historic mining of shell middens can be tested by means of shell fragmentation indices. One simply sifts entire deposits, or samples, through nested quarter and half inch (0.65 to 1.3cm) mesh screens, weighing the resulting material, and calculating the following index value:

$$F=(x/y), \text{ where}$$

x=weight of material retained by the 0.5 inch mesh,

y=weight of material retained by the 0.25 inch mesh, and

F=the fragmentation rate, ranging from zero to an indefinite value determined by the total weight of shell per stratum.

The index values can be compared for deposits *within* (not between) sites to determine areas of greater and lesser disturbance. Application of the formula assumes no significant differential fragmentation arising from excavation damage. Unfortunately, we had not considered this approach at the time the field study occurred and the samples retained from the deposits are unsuitable for such an analysis since they consist of whole, or nearly whole, oyster valves. Our assessment of shell midden integrity for each unit, therefore, is impressionistic and based on observations of midden compactness, degree of fragmentation, and shell orientation. Thickness of a shell deposit also played an important role in our determinations, with discontinuous deposits of less than 3cm in thickness regarded as disturbed and as a trace of a more substantial midden that succumbed to the plow. Among the midden units—that is to say, those units revealing intact oyster shell layers—midden thickness averages less than 10cm. In several cases, localized deposits extended further into the underlying soils, in each instance a product of bioturbation; sp., the uprooting of trees and subsequent slumping of overlying materials, the semi-circular

to circular deposits of interbedded shells and silts consistent with those explored by the first author and described by Reeve (1992b).

The distribution of shell weights across the site also provides some insight into midden structure. Excavators recovered from the screens all oyster shell measuring 2cm or greater in any one dimension, placing the shells in buckets for on-site weighing. Excavators then recorded the total weight of shell, in pounds, for each stratum on the appropriate provenience card. The weights appear in the artifact catalogue (except for Phase II Units, 1, 2, and 3). Contour maps, generated with Golden Software's Surfer® for Windows Program, Version 6.0, illustrate the distributions of oyster shell, by weight, across the project area for the plowzone (Stratum 2A; Figure 4-11) and shell midden (Stratum 2B; Figure 4-12). Yields from the humus (Stratum 1), buried A-horizon (Stratum 2C), and B-horizon (Stratum 3) were too small to warrant spatial analysis.

Figure 4-11 depicts the highest oyster shell weights in the northern (above N155) and southeastern (N120-140/E185-210) portions of the site. High concentrations of oyster shell in the plowzone, however, need not indicate the survival of intact shell midden; quite the reverse, in fact, if one examines Figure 4-12. Here the concentration rises fairly consistently with the rise of the land to the west, with the exceptions of Units 12 and 13 along the N140 line (see also Figures 3-1 and 4-2 through 4-4). Units closer to the Rhode River to the east and south produced lower yields of shell. The relationship between quantity of oyster shell (a measure of midden integrity) and elevation cannot be proven for lack of sufficiently fine-grained topographic data across the site, but we suspect the two are highly correlated. Figure 4-13 depicts the distribution of intact midden depths for the 19 systematic sample units, the individual unit values representing mean depths. The contours projecting northward in the northwest quadrant of the sample grid are spurious, a product of the kriging algorithm and edge-effect. Overall, the contours support the argument for decreasing midden integrity and increased plow disturbance to the east and southeast.

Colluvium earlier in the 20th century formed along the base of the upper terrace, providing a protective buffer on top of the midden. Survey beyond the proposed limits of disturbance to the west, outside of the current project area, may yet reveal intact shell midden; midden not easily betrayed by surface shell due to the thick mantle of colluvium. Alternatively, the midden may never have extended as far west as the base of the hill, raising the possibility of preserved living sites in that area.

As noted, the general distribution of oyster weights across the project area is not perfectly regular, lower values occurring along the N140 line in Units 12 and 13. Both units exposed shell midden, but the shell deposits were less dense than noted among many of the other shell midden units. Indeed, field director Tara D. Pettit noted for Unit 12 that "the intact midden appears thickest at the southern end of the unit," and her planview sketch on the provenience card indicates little shell in the northern third of the unit. Pettit's fieldnotes for Unit 13, on the other hand, indicate a compact—if in places thin—deposit of shell, most of the pottery recovered from the thinner portions of the deposit.

Figure 4–11. Distribution of oyster shell weights, plowzone.  
(N.B., measured in kilograms)

Figure 4–12. Distribution of oyster shell weights, shell midden.  
(N.B., measured in kilograms)

Figure 4–13. Average depth of intact shell midden.  
(N.B., measured in centimeters)

Figure 4–14 depicts the distribution of pottery sherds recovered from the plowzone stratum of all units. Consisting of Mockley and Rappahannock types, and numerous sherds of indeterminate affiliation, the map tells little about the nature of Middle or Late Woodland occupation of the site. It does, however, reveal something about the condition of the shell midden when compared to the distribution of all pottery from the intact shell midden: pottery frequencies are much higher in the plowzone in the east half of the project area, a finding consistent with our interpretation of shell weight distributions in the plowzone; viz., plowing moved more of the shells and sherds from midden into the plowzone in the eastern portion of the project area. Figure 4–15 reveals a more complex distribution within the intact shell midden, but we might infer that the plow has caused less damage in the northwest corner of the project area than elsewhere, Unit 8 producing the fewest plowzone sherds and the most shell midden sherds.

The thickness of the underlying A–horizon varies considerably beneath the intact shell deposits (the standard deviation equalling 75% of the mean), but even more so in units lacking intact shell midden (the standard deviation nearly equal to the mean, and the soil horizon generally destroyed through plowing). Differential compression and plowing undoubtedly account for much of the variability. The buried A–horizon represents an unplowed forest duff that predates intensive shellfish processing at the site. The dark brown (10YR3/3) silt loam differs slightly from the underlying dark yellowish brown (10YR4/4) silt loam B–horizon in terms of color and texture, soil development prior to human occupation and subsequent percolation of organic material giving the A–horizon a darker color and finer texture than its parent material. Stratum 2C yielded few temporally diagnostic pottery sherds and those few were either Mockley or indeterminate shell tempered wares, suggesting no significant occupation of the site prior to intensive shellfish gathering and processing (see below). Later Rappahannock wares were not recovered from Stratum 2C. No ‘pre–shell’ features were identified below the buried A–horizon and the few artifacts and whole shell recovered probably derive from the initial use of the midden area as a trash dump. The reader should keep in mind, however, that this project was designed to sample the shell midden for cultural materials and organic residues of cultural activity; it does not explicitly address the identification, sampling, and analysis of non–shell midden deposits, whether below or around the extant midden. Shell midden sampling reduces the likelihood of recovering information on aboriginal architecture and non–disposal activities predating, and associated with, the deposition of oyster shell (Mathis 1993).

In sum, the oyster shell midden at the Smithsonian Pier site covers approximately 15,000 m<sup>2</sup>, much of it damaged by construction and intensive plowing. The 4,000 m<sup>2</sup> of shell midden within the project area varies in thickness, as does the underlying buried A–horizon, and appears to be discontinuous across the project area. Plowing not only truncated the middens but spread shell over a greater area, furthering the illusion of a single, horizontally definable shell midden. The midden might be characterized best as a series of discrete and overlapping piles of oyster shell and other prehistoric debris truncated and smeared largely through plowing and possibly through historic period shell quarrying. On the largely Selby Bay phase Rose Haven site (18AN279), Peck reported six concentrations of oyster shells on the plowed surface, each nearly circular and measuring 4m to 7m in diameter. Deposits at the Smithsonian Pier site may have similar.



Figure 4–14. Distribution of pottery sherds, plowzone.

Figure 4–15. Distribution of pottery sherds, shell midden.

The hackly surface of the middens, prior to historic period leveling and recent soil deposition, would have proven a difficult place upon which to conduct the day to day affairs of domestic life. The piles of oyster shell and other animal carcasses would have attracted a wide range of vermin, undermining effective processing, preservation, and storage of foodstuffs (e.g., Dickens 1985:49–50; Ward 1985; 87ff; Moeller 1991). The shell midden probably served one principal purpose—the disposal of trash—greatly limiting our ability to archaeologically explore architectural variability and other aspects of prehistoric lifeways. Most of the subsequent analyses appearing in this report, therefore, focus on the recovery and analysis of environmental data from the rejectage of food processing. Spatial analyses, where used, attempt to identify deposits—particularly within the intact midden and buried A–horizon—attributable to specific cultural–historical periods, thereby refining the temporal dimension of the human–environmental dialectic.

## *Chapter 5. Midden Composition*

### **Introduction**

The preceding chapter treats the integrity and spatial dimension of the Smithsonian Pier site; viz., the shell midden's condition and horizontal and vertical delineation. The analyses in that chapter suggest that the Smithsonian Pier site—like virtually all shell midden sites—should be regarded as a series of spatially discrete and overlapping middens created by a succession of occupations. While prehistoric salvaging of bone, shell, and other materials undoubtedly contributed to some mixing and spreading, historic period plowing and, possibly, shell quarrying greatly truncated the deposits. Moreover, colluvium from upslope to the west may have shielded shell midden and non-shell midden deposits in the western half of the project area, and beyond, from the plow. In this chapter, we examine the evidence for a succession of groups visiting the site from the early Middle Woodland Popes Creek phase through the early Late Woodland Little Round Bay phase, and summarize the general nature of the assemblage and composition of the midden. We define and analyze the components in Chapter 6.

### **Artifact Recovery and Analysis**

Chapter 2 summarizes the culture history of the Middle Chesapeake Basin, identifying archaeological cultures, subsistence and settlement patterns, and diagnostic artifacts. Chief among the latter are pottery types, defined on the bases of temper and design, and lithic material preferences which, during the Selby Bay phase, tended strongly towards the use of metarhyolites conveyed from the Great Valley of Maryland, Pennsylvania, and Virginia. Temporally and functionally diagnostic stone tool types supplement these data, but contribute little by themselves due to the paucity of stone tools (n=12) recovered during both phases of archaeological study. This section summarizes the types of artifacts recovered and their relative frequencies, providing the basis for the following chapter's discussion of component definition.

### **POTTERY**

Pottery was the most common artifact recovered from the project area, followed by flaked stone, fire-cracked rock, and steatite. Pottery types identified for the principal strata include: four sherds of Popes Creek, at least one of which is net impressed; 679 Mockley sherds bearing both cord and net impressions; 85 Rappahannock sherds with cord impressions and incised decorations (Figure 5-1); and 650 indeterminate shell tempered sherds; for a total of 1,418 pottery sherds (Table 5-1).

The pottery types recovered from the Smithsonian Pier site are consistent with those recovered throughout the region and described in Chapter 2. The Popes Creek Net Impressed ceramics have a fine sand temper. The sherds appear to be from coil constructed vessels, at least one of which had a conical base, and another small sherd bears net impressions. The Mockley net, crumpled net, and cord impressed ceramics are tempered with coarse crushed oyster shell, comprising about 20% to 30% of the paste (Figures 5-2 and 5-3). Most of the shell burned during pot firing, exhibiting various shades of gray and delamination. Some of the Mockley sherds have lost most or all of their shell temper, probably due to leaching in the more acidic soils lacking large quantities of shell. The vessels are coil constructed with moderately to thickly potted walls. The well-preserved vessel fragment recovered from Unit 2 appears to have been a very large, wide-mouthed pot. The Rappahannock ceramics bear cord and fabric impressions as well as, in a few cases, inscribed herringbone designs (Figure 5-4; see

also Figure 5–1). Like the Mockley vessels, the Rappahannock material is highly fragmented and vessel forms remain undetermined. The vessels are coil constructed, with smooth interiors and rough exteriors. The sherds are thinner, and the oyster shell temper smaller and finer, than the earlier Mockley wares. Approximately 87.5% of the identifiable sherds from Strata 2A and 2B are Mockley and 12.5% are Rappahannock, Popes Creek constituting a negligible portion of the assemblage. Most of the sherds, regardless of type, are too small and fragmentary to permit reliable vesselization of the assemblage; although it is apparent that both jars and bowls are represented among the rim and body sherds of the Mockley and Rappahannock subassemblages.

Table 5–1. Pottery types recovered from the principal strata.

Stratum	Popes Creek	Mockley	Rappahannock	Indeterminate Shell Tempered	Stratum Totals
1	0	12	0	0	12
2A	4	255	39	271	569
2B	0	353	46	286	685
2C	0	55	0	76	131
3	0	4	0	17	21
Type totals	4	679	85	650	1,418

Of 30 mends, 24 comprise portions of a single Mockley Net Impressed pot, the sherds found in place in the shell midden exposed by Unit 2. Some of the other breaks subsequently mended probably occurred during excavation or in the laboratory. Small areal samples (2 by 1m units), intensively plowed contexts, the generally poorly-fired, crumbly nature of the pottery, and the act of recovering pottery from the tenacious shell midden all militated against successful mending and the use of mends to evaluate deposit integrity. Since the stratigraphic evidence detailed in the previous chapter addresses the issue of integrity, we need not use the pottery data in this regard.

Pottery data does inform directly on the issues of componency and intensity/duration of occupation. Mockley wares dominate the assemblage, supporting Weiskotten and Gibb’s (1995) initial assessment of the Smithsonian Pier site: it is a Selby Bay phase site with negligible earlier occupation and little later occupation. Chapter 6 explores these issues at greater length.

One fragment of soapstone, or steatite—in addition to the five pieces recovered from a Phase II shovel test (N150 E210, Lot #33)—was also recovered from the plowzone in Unit 10 (Lot #79). Soapstone vessels occur primarily in Late Archaic deposits, but this material might have been used by Woodland Stage peoples as well, quarrying the material themselves in present-day Cecil and Montgomery counties, or receiving it through trade or gift exchange. The fragment recovered from the plowzone in Unit 10 is too small to determine the form of the vessel, although a shallow bowl or trough seems likely. No grinding stones were recovered from any of the units.

Figure 5–1. Rappahannock incised pottery.

Figure 5–2. Mockley cord impressed pottery.

Figure 5–3. Mockley net impressed pottery.

Figure 5–4. Rappahannock incised pottery.  
 (see also Figure 5–1)

#### FLAKED STONE

Relatively little flaked stone was recovered from the excavation units; 274 flakes and stone tools (n=12), of which all of the tools and 227 (83%) of the flakes derive from the principal strata. Quartz and rhyolite dominate the flaked stone assemblage (Table 5–2).

Table 5–2. Summary of lithic materials from principal strata.

Principal Strata	Quartzite	Jasper/Chert	Quartz	Rhyolite	Indeterminate	Row Totals
1 Humus	0 (0%)	0 (0%)	1 (25%)	3 (75%)	0 (0%)	4 (100%)
2A Plowzone	2 (2%)	0 (0%)	54 (46%)	60 (51%)	2 (2%)	118 (100%)
2B Shell Midden	0 (0%)	3 (4%)	32 (48%)	32 (48%)	0 (0%)	67 (100%)
2C Buried A–horizon	1 (3%)	5 (13%)	20 (53%)	11 (29%)	1 (3%)	38 (100%)
Column Totals (%)	3 (1%)	8 (4%)	107 (47%)	106 (47%)	3 (1%)	227 (100%)
Sitewide	5 (2%)	11 (4%)	137 (50%)	118 (43%)	3 (1%)	274 (100%)

Figure 5–5, a broken line graph, illustrates the lithic distribution types for the plowzone (Stratum 2A), shell midden (Stratum 2B), and buried A–horizon (Stratum 2C).



Figure 5–5. Percentage distributions of lithic materials by stratum.

Figure 5–5 indicates nearly identical distributions for the various lithic types in the plowzone and the shell midden. Quartz and rhyolite dominate the lithic assemblage for both strata in roughly equal proportions. Stratum 2C yielded a lower percentage of rhyolite (29%, as opposed to ~50%) and a higher percentage of cherts and jaspers (13%, as opposed to <5%). We attribute this difference to sampling error (n=38 from 15 units). Although rhyolite constitutes nearly 50% of the lithic assemblage from the principal strata, that percentage is low compared to the 92.9% (n=340) reported by Ballweber (1994) for the nearby Luce Creek site (18AN143), a single component Selby Bay phase shell midden. The difference could be attributed to the Popes Creek and Little Round Bay phase occupations in evidence at the site, both phases defined in part by their preferences—or primary utilization—of quartz, and to a lesser extent, cherts. Steponaitis (1986) reports rhyolite as constituting nearly 30% of the lithic materials on Middle Woodland sites in the Patuxent River drainage, but 77% of the Middle Woodland points. The reader should remember, however, that many if not all of the sites in her sample are multicomponent and she lumps Popes Creek and Selby Bay phase material; a necessary practice given the small size of her surface collections. The much higher percentage of Middle Woodland points made from rhyolite suggests that Selby Bay phase usage of rhyolite was higher than the undifferentiated lithic material indicates.

Peck (1977), in his report on the Rose Haven site (18AN279), describes a site similar in many respects to the Smithsonian Pier site; a series of shell middens yielding Popes Creek, Mockley, and Rappahannock pottery. Mockley dominates the ceramic assemblage as does rhyolite in the lithic assemblage (49.7%). Also recovered, in descending order: quartz (30.3%), quartzite (9.4), chert/jasper (7.5), and argillite (3.1).

Ballweber's (1994) results from the Luce Creek analysis do not correspond with the general 'fall-off' model of lithic type distribution, with real and proportional declines in the presence of lithic types with distance from their sources. Stewart's (1984)

observation that rhyolite increases proportionately in assemblages 80 to more than 100 miles from sources in Western Maryland suggests that this material was particularly important in the structuring of intergroup relations during the Selby Bay phase (see also Steponaitis 1986). Neither the Smithsonian Pier nor the Rose Haven assemblages, therefore, are exceptional. The Luce Creek assemblage, however, produced an inordinate amount of rhyolite suggesting a sampling problem. (Ballweber might have sampled actual living areas, while the work at Rose Haven and the Smithsonian Pier site focused on contexts of secondary discard; viz., trash piles). Alternatively, the Luce Creek site may have occupied a unique position in the rhyolite exchange network. And, of course, we should not overlook the obvious in that Luce Creek appears to be a single component site; hence the very high percentage of rhyolite in the lithic assemblage may reflect actual usage during the Selby Bay phase. Steponaitis' (1986) finding that 77% of the Middle Woodland projectile points found in the Patuxent River drainage support the latter hypothesis.

Temporally and functionally diagnostic stone tools, unfortunately, contribute little to the analysis of lithic material preferences. Only 12 stone tools were recovered, and all are fragmentary and unidentified (Figure 5–6).

Four bifacially worked rhyolite tools (Figure 5–6a, c–e) include: a mid– and tip section of a large biface (e); a stem from a projectile point or hafted biface (d); and two side–notched projectile points (a,c). One point (Figure 5–6a) has been shattered, possibly through burning. The second point (c) was heavily reworked. Both approximate Peck's (1977: 43–45) description of Selby Bay side–notched points, Variety 3 (see also Steponaitis 1986). The quartz tools include: four bifaces (f, g, and i; one too small for illustration); two point fragments, a mid–section (h) and a tip (too small for illustration); and a shattered corner–notched point. Based on roughly equal percentages of rhyolite and quartz flakes in the plowzone and shell midden, we might expect a similar distribution in material types among the tools. Two factors preclude such a simple comparison: the sample of stone tools is too small to be statistically significant (i.e., they probably are not representative of the tools used at the site), and the site's occupants may have guarded rhyolite—a non–local resource—much more stringently than they would have conserved locally available quartz. A comparison of quartz and rhyolite flake types recovered from the excavations demonstrates the differential use and conservation of quartz and rhyolite.

Table 5–3 summarizes the distributions of early and late stages of waste flakes for the plowzone, shell midden, and buried A–horizon; excluding the few quartzite, chert/jasper, and indeterminate metamorphic flakes. Early stages of lithic reduction are represented by primary and secondary cortical and decortication flakes, platform preparation flakes, cortical shatter, and tertiary flakes. Late stage flakes include biface thinning and retouch flakes. The quartz and rhyolite subassemblages clearly differ, with the quartz flakes more or less equally divided between early and late stages of lithic reduction in Strata 2A and 2B. The preponderance of late stage quartz flakes in Stratum 2C can be attributed to the small sample size, 17 flakes from the 15 units in which a buried A–horizon was detected. All of the rhyolite flakes represent biface thinning and tool maintenance. Given the non–local nature of rhyolite—its probable conveyance from the source in the form of blanks, and material conservation practices—this pattern conforms to our expectations.

Table 5–3. Flake distributions by stage of reduction and material.

Stratum	Quartz, Early	Quartz, Late	Quartz, Total	Rhyolite, Early	Rhyolite, Late	Rhyolite, Total	Totals	Sample Size
2A (%)	25 (53%)	22 (47%)	47 (100%)	0 (0%)	59 (100%)	59 (100%)	106	n=19 units
2B (%)	17 (57%)	12 (43%)	29 (100%)	0 (0%)	33 (100%)	33 (100%)	62	n=17 units
2C (%)	3 (18%)	14 (82%)	17 (100%)	0 (0%)	11 (100%)	11 (100%)	28	n=15 units
Type totals	45 (48%)	48 (52%)	93 (100%)	0 (0%)	103 (100%)	103 (100%)	198	

The paucity of lithic tools and waste flakes has some implications for the identification of activities characterizing the Woodland occupations of the Smithsonian Pier site. The ceramic assemblage exceeds the lithic assemblage by a factor of seven. Oyster shells, of course, dwarf the entire artifact assemblage and the rest of the ecofact assemblage (bones, floral material). Scrapers, perforators, and other specialized stone tools are wholly lacking. Generalized ‘knives’ are few (at least seven and as many as nine), as are projectile points (three to five). No bone tools were recovered. The few tools that were recovered, and the small number of early and late stage waste flakes, suggests that stone tools were needed. There is little evidence, however, for the extensive use of specialized stone tools, reflecting: 1) a specialized activity (oyster harvesting and processing) requiring only a few general utility tools; and/or 2) the use of tools constructed of wood, hides, and other ephemeral materials. To what extent these patterns of specialization and limited tool use can be applied to the entire Popes Creek–Little Round Bay phase continuum at the Smithsonian Pier site awaits further analysis in the next chapter.

Figure 5–6. Functionally diagnostic stone tools and clay pipe bowl fragment.  
Rhyolite side-notched projectile points (a, c) and biface fragments (d, e); quartz corner-notched projectile point (b) and biface fragments (f–i); terra cotta tobacco pipe, punctate design, micaceous clay (j).

## FIRE CRACKED ROCK

Fire-cracked rock recovered from the Smithsonian Pier site consists of locally available quartz and granitic pebbles generally exhibiting sharp, irregular edges and discoloration from intense heat. We saved all fire-cracked from the excavations, a total of 3.121kg, apportioned among the principal strata as follows: plowzone (817g), shell midden (1,594g), buried A-horizon (682g), and the buried A-horizon/subsoil interface, or E-horizon (28g). Fire-cracked rock derives from thermally shocked pebbles, the stones shattering upon exposure to high, prolonged heat or rapid cooling after heating. Where fire-cracked rock appears in a hearth, covered in charcoal and ashes, the mending pieces abutting one another, extreme heat probably caused the breakage. That is not the case at the Smithsonian Pier site: excavators recovered isolated fire-cracked rock from the shell midden and underlying A-horizon in association with other artifacts. These fire-cracked rocks may represent rejectage, thermally fractured ‘pot boilers’ no longer suitable for heating the contents of clay pots and steatite bowls. The question remains, of course, what was in the pots into which Native Americans placed heated rocks? Oysters? Grains such as maize? Acorns, hickory nuts? Although we offer no solutions to this problem, we discuss the alternatives in the following two sections. The spatial distribution and possible temporal associations of the fire-cracked rock are discussed in the next chapter.

## FAUNAL MATERIAL

Bone comprises the largest class of ecofacts recovered from the Smithsonian Pier site, next to oyster shells. Generally well-preserved if highly fragmented, 65% of the bone (612 out of 944 pieces from the principal strata) derives from the shell midden, with 30% (n=286) and 5% (n=46) recovered from the plowzone and buried A-horizon, respectively (Table 5-4). The shell midden protects bone from acid leaching more so than the lower pH buried A-horizon. Etching of bone in the plowzone may be greatly underestimated, acidic soils, plowing, and bioturbation destroying most of the more delicate bone fragments. Irrespective of stratum, few of the bones have been burned to the point of carbonization or calcification. The percentage transformations of the raw data (0 to 3.5%) indicate little burning of bone, less perhaps than one might expect with intensive roasting of meats.

Table 5-4. Summary of altered faunal material by stratum.

Stratum	Carbonized	Calcined	Weathered/Etched	Unmodified	Stratum Total.
2A	10 (3%)	2 (0.5%)	18 (6%)	256 (91.5%)	18 (100%)
2B	13 (2%)	1 (0.001%)	65 (11%)	525 (87%)	18 (100%)
2C	0 (0%)	0 (0%)	5 (11%)	41 (89%)	46
Type Totals	23 (2%)	3 (0.5%)	88 (9%)	830 (88%)	944 (99.5%)

Overall, bone recovery from the Smithsonian Pier site was low, with an average of less than 50 bone fragments—most quite small—per unit. The majority were recovered from the plowzone and shell midden. Fragmentation greatly hindered identification of bones to species, but 14% to 30% of the assemblage, by stratum, could be identified to order; ~15% for the most productive strata, Strata 2A and 2B. Surprisingly, no blue claw crab remains (*Callinectes sapidus*) were recovered from the screens, and only two or three fragments turned up in the flotation material (addressed

below). Hard clam (*Mercenaria mercenaria*) and whelk (*Busycon* sp.) are wholly lacking and soft shell clam (*Mya arenaria*) fragments are few. Deer (*Odocoileus virginianus*) turned out to be the most commonly identified species, and undoubtedly supplied the highest proportion of the meat represented by the bones, particularly if most of the indeterminate large mammal remains prove to be deer. Bird and fish remains are few and largely unidentifiable as to species; although at least eight black drum fish (*Pogonius cromis*) bones were recovered from the dry-screen and another black drum tooth and four scales from one or more indeterminate fish were recovered from flotation samples.

Oyster shells (*Crassostrea virginica*), of course, far outnumber the bones and probably represent the largest dietary contribution. The small, highly fragmented, bone assemblage precludes quantified comparisons. Growth ring analysis indicates that the site occupants harvested oysters during both the warmer and cooler parts of the year, determined by the relative distance of the last growth ring from the most recent winter or spawn check. The growth rings also point to a normal distribution of the age at death, with a mean age at harvest of 5.7 years; an average that exceeds that for modern oyster harvests by almost 100%.<sup>7</sup>

The paucity of stone tools and near absence of burned bone, and the lack of grooved netsinkers and shell and bone hooks, suggests that the succession of site occupants used the Smithsonian Pier site primarily to harvest and process oysters; not to hunt or fish.

Table 5–5. Summary of identified faunal material by stratum.

Stratum	Turtle spp.	Deer	Bird spp.	Fish spp.	Small Mammal	Large Mammal	Indeter. Mammal	Indeter. spp.	Stratum Totals
2A	36 (13%)	31 (11%)	9 (3%)	1 (0.5%)	15 (5%)	112 (39%)	43 (15%)	39 (14%)	286 (100%)
2B	70 (11%)	121 (20%)	42 (7%)	22 (4%)	12 (2%)	204 (33%)	41 (7%)	100 (16%)	612 (100%)
2C	8 (17%)	6 (13%)	1 (2%)	0 (0%)	0 (0%)	8 (17%)	9 (20%)	14 (30%)	46 (99%)
Totals	114 (12%)	158 (17%)	52 (6%)	23 (2%)	27 (3%)	324 (34%)	93 (10%)	153 (16%)	944 (100%)

The distribution of deer skeletal elements (Table 5–6) suggests that deer were hunted and butchered at the Smithsonian Pier site and environs:

Table 5–6. Deer skeletal element distributions

Stratum	Cranial/Dental	Axial	Appendage	Pedal/Caudal	Totals (Identifiable)
2A	0	5	10	16	31
2B	16	43	39	28	116
2C	1	0	0	3	4
Element Totals	17	48	49	47	151

Since the material is too fragmentary and the units too small and dispersed to warrant minimum element counts, Table 5–6 should be interpreted in terms of presence or absence of particular element groups. Aside from axial (e.g., vertebrae, scapulae, ilia, and ribs) and appendage (femur, humeri, radii, and ulnae) elements, pedal and cranial elements were recovered. The latter include an antler tine, a number of teeth, and an

<sup>7</sup> Results on season of death uncorrected for modern population variability. Age at death determined by number of winter annuli for a particular individual.

occipital condyle. Cranial and pedal elements, in particular, suggest butchering at the site rather than at the kill location. The small assemblage of broken projectile points and cutting tools is consistent with the faunal evidence of limited hunting and on-site butchering.

## BOTANICAL MATERIAL

In an effort to determine whether or not the Smithsonian Pier site occupants—and, as above, we treat them for the moment as a whole—harvested and ate plants, we collected a dispersed two liter soil sample from each intact stratum (i.e., shell midden, buried A-horizon, and features) within each of the systematically placed 19 sample units. Smithsonian technician Tim Steelman sorted each sample into heavy and light fractions through simple flotation and consulting ethnobotanist Justine Woodward McKnight (1997) catalogued the resulting materials. Continuous column samples, each 5cm in thickness and roughly 10 by 10cm, were taken from three units (8, 9, and 17), beginning at the top of the buried A-horizon and extending at least 10cm into the subsoil. Pollen was extracted from one of the samples (Unit 8) at The Johns Hopkins University and identified and catalogued by Grace S. Brush (Brush 1995).<sup>8</sup> We reproduce the substance of the McKnight and Brush reports in this section.

### *Macrobotanicals*

McKnight examined all charcoal specimens under low magnification (10X to 30X), recording general categories of plant material (i.e., seed, wood, nutshell, and rind fragments). She identified botanical remains to the genus level in most cases, to the family level when limited diagnostic morphology survived, and to the species level only when the assignment could be made with a high degree of confidence, using standard published texts (Martin and Barkely 1961; Panshin and deZeeuw 1970; and Schopmeyer 1974) and a modern reference collection.

One hundred liters of soil from 50 separate strata yielded 14.3g of charcoal. Table 5–7 catalogues the identified material. Wood charcoal constitutes the most abundant class of material, present in 48 of the 50 samples. Identified wood species include: white and red oaks (*Quercus* sp.); hickory (*Carya* spp.); birch (*Betula* sp.); American chestnut (*Castanea dentata*); maple (*Acer* sp.); Eastern cedar (*Juniperus virginiana*); and representatives of the southern pine group (*Pinus* spp.). Identified nuts from 25 of the 50 samples include: thin- and thick-shelled hickory (*Carya* spp.) and black walnut (*Juglans nigra*). Seeds were recovered from five of the 50 samples, identifiable species including: sunflower (*Helianthus annuus*), and representatives of the goosefoot (CHENOPODIACEAE) and legume (LEGUMINOSEAE) families. The samples also yielded unidentifiable husk or rindlike materials, possibly the remains of squashes (*Cucurbita* spp.; five samples), and amorphous charcoal lacking any diagnostic features (33 of the 50 samples).

All of the identified arboreal and non-arboreal species are consistent with current forest patterns in the area (Brown and Brown 1972; Eyre 1980). The seed remains represent wild and possible cultivated species, walnut, hickory, and sunflower informing on prehistoric plant utilization, the specifics of which appear in the next chapter. The paucity of carbonized plant food remains suggest the use of a limited number of plants during the late summer and autumn, and then on a small scale, relative to oyster

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<sup>8</sup> The Smithsonian Environmental Research Center curates the remaining two samples from Units 9 and 17, along with the rest of the collection of artifacts and ecofacts.

harvesting. Extraction of oil from hickory nuts might account for the presence of some clay pots and fire-cracked rock on the site (e.g., Stafford 1991).

#### *Microbotanical Remains*

Microbotanical remains consist of pollen, spores, and rhizomes, extracted from 12 samples taken from a single column in the southwest corner of Unit 8. Extraction involved a standard palynological treatment of successive hydrochloric acid and hydrofluoric acid baths, followed by acetylosis using a combination of sulfuric acid and acetic anhydride. Although pollen is present in all of the samples, it is poorly preserved and not abundant. All pollen within two 0.1 aliquots were counted, the values of which appear in Table 5–8. Question marks indicate uncertain identifications due to poor preservation. Fourteen spores from sample 133 (Unit 8, Stratum 3, 0–5cm into the subsoil) were identified as *Selaginella*, but might belong to *Lycopodium*.

Brush (1995) offers no interpretations of these data, citing small samples and poor preservation; however, some of the results are suggestive and, based as they are on a relatively new technique (in archeology) for sampling pollen, we discuss them at some length.

We used a sampling strategy advocated by Gerald Kelso (Kelso 1993; see also Kelso and Harrington 1989) for recovering palynological and phytological materials from archeological sites. This technique recognizes the role of percolation in moving pollen through the soil column, particularly downward into otherwise ‘culturally sterile’ subsoils. Ideally, the procedure recovers sufficient pollen to generate statistically valid frequency histograms, allowing the analyst to distinguish periods of high deposition for individual genera and species from the ‘noise’ created by percolation. In some cases, particularly shell middens where pollen preserves poorly, pollen may survive through percolation into the lower pH clay subsoil. This method, of course, is expensive since numerous samples must be collected and processed for a single locus. Opting for this approach presented funding problems since palynological analysis was not included in the scope of work or budget. (Unexpended funds for radiocarbon analysis covered the cost of this unplanned expense.) Nonetheless, Kelso’s (1993) approach requires palynologists to examine larger than conventional samples; large samples which require considerably more resources to adequately process and analyze. The results even from our small samples are sufficiently intriguing to warrant use of this sampling technique on other prehistoric sites throughout the region.

We collected the samples, measuring 5 by 10 by 10cm, through the buried A-horizon and 10cm into the subsoil. Samples were not drawn from the humus and plowzone, for obvious reasons of non-integrity and rapid percolation, or from the shell midden: pollen preserves very poorly in, and it moves too freely through, the porous, alkaline environment of a shell midden.



Table 5–7. Carbonized plant remains, presence (\*)/absence (McKnight 1997).

Table 5–8. Catalogue of identifiable pollen (Brush 1995).

Brush identified 8 arboreal taxa, including mimosa, cypress, hickory, walnut, mulberry, pine, oak, and elm. Four of the species appear among the carbonized macrobotanical remains identified by McKnight (see above), indicating local procurement of woods and nuts: hickory, walnut, oak, and pine. Recovered non–arboreal pollen species include: amaranth, several berries, plantains, grasses, one legume, and between two and four maize (*Zea* sp.) pollen grains. All of the maize pollen grain occurred in the subsoil: three in the upper 5cm and one between 20 and 25cm into the subsoil. The one bean pollen grain (LEGUMINOSAE) was recovered from 5 to 10cm into the subsoil. Amaranths, the most common pollen identified, occur throughout the soil column. Other genera appearing sporadically, with values of one to five, include various mosses, grasses, and weeds; plants consistent with open, periodically abandoned habitations areas.

### **Summary**

This chapter briefly summarizes the principal types of data recovered from the Smithsonian Pier site along with some of the methods employed in collecting those data. We have not tried to analyze and interpret the data in this section, only giving the reader some idea of the nature of the dataset. Intelligent analysis of this material requires that we first try to separate the principal occupations. That accomplished, we can analyze and begin to interpret the data in terms of settlement and subsistence practices, the natural environment, and the dialectical relationship between the two.

The principal artifact classes include: aboriginal pottery, flaked stone, and fire–cracked rock. These derive primarily from the plowzone and intact shell midden. Principal ecofact classes include: terrestrial, avian, and marine faunal remains, macrobotanical material recovered through flotation, and pollen. The plowzone and intact shell midden yielded the best samples of bone and shell. Flotation materials were collected only from intact strata (viz., the shell midden and buried A–horizon) and the pollen was collected in continuous column samples from the A–horizon and underlying B–horizon. Chapter 6 analyzes and interprets these materials by stratum and component, and examines the few possible subterranean features encountered in the excavation units.

## *Chapter 6. Midden Components*

### **Introduction**

The possibility of stratigraphically distinguishing the predominantly Selby Bay phase deposits of the Middle Woodland period from those of the succeeding Little Round Bay phase and the preceding Popes Creek phase always appeared remote, most of the intact shell deposits rarely greater than 10cm in thickness, and usually less. Removing oyster shells in arbitrary levels of 5cm with a three-pronged cultivator (the tool of choice for oyster shell midden excavations) would prove very difficult and the results equivocal: shell middens simply did not form in an orderly, laminar manner. In most cases, aborigines probably discarded the shells, and other debris, in piles, with the latest material resting on top of the piles and extending downward to the base, in the manner of a hand-dipped taper: cutting off the top of the candle reveals a series of concentric rings, each representing one dipping episode. With shell middens, those rings become blurred through years of plowing. Our best chance at delineating components, particularly those of the Selby Bay and Little Round Bay phases, is to try and isolate them spatially, rather than stratigraphically. That is to say, we test the hypothesis that Native American groups representing all prehistoric periods occupied the project area uniformly. If we reject the null hypothesis, then we can begin to spatially isolate one or more phases of occupation for purposes of cultural and ecological analysis.

We employ contour mapping, an exploratory data analysis technique, to characterize portions of the project area as Middle or Late Woodland; not dismissing earlier or later contributions to the deposits but attributing most of the accumulations to one phase or the other. That allows us to move from site-wide patterns in the distribution of ecofacts to phase-specific subsistence patterns.

### **Component Definition**

The following contour maps illustrate the distributions of pottery types and lithic materials, allowing us to test hypothesis of uniform distributions for each of the three occupations: Popes Creek, Selby Bay, and Little Round Bay. Before initiating such a discussion, however, it seems appropriate that we address some of the limitations of these maps and the caveats one must keep in mind while analyzing spatial distributions.

Surfer® for Windows V.6.0, like any statistical package, uses one or more algorithms to transform, summarize, and interpolate or extrapolate data.<sup>9</sup> As long as there are a sufficient number of values from a minimum number of points, the application always produces results. The analyst uses his or her knowledge of statistics and experience in archaeological data recovery and cataloguing to determine whether the results are meaningful and useful. To a great extent, the lead author of this report exercised his judgment both in determining which data to map and which maps to reproduce for this report. For example, datasets consisting of 19 records with values of one, two, or three were not mapped: statistically, the results would be meaningless, particularly given a two-percent sample of the project area surface with units placed approximately 10m apart. Also, maps depicting a series of contour lines encompassing a single unit are of dubious value. The shell midden in a particular unit, for example, could yield 100 pottery sherds while other units may yield only a few, or none at all. The resulting contour map would add little or nothing to the discussion since the distribution

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<sup>9</sup> Kriging worked best for the Smithsonian Pier sampling distributions, interpolating from nodal, or near-nodal, values.

could be stated briefly: “All of the specimens [or, Z%] of Artifact X appear in Unit Y.” We have omitted such maps for the sake of brevity and to avoid misinterpretations.

Our sampling strategy involved the systematic excavation of 19 units on a 10m grid, each measuring 2 by 1m, including the three excavated as part of the Phase II site examination. One additional 2 by 1m unit (# 20) and two 1 by 1m units (#s 21 and 22) were excavated around Unit 9 to investigate a possible feature. For purposes of spatial analysis and the definition of site-wide patterns, we use only the systematically-placed units. Results from the judgmentally-placed units appear in the discussion about the possible feature. As noted in previous chapters, each of the principal strata occur site-wide and form the bases of the following analyses. Localized strata generally include only remnant shell midden in otherwise plowed deposits. We discuss these at the end of this chapter.

Figures 6-1, 6-2, and 6-3 illustrate the distributions of Mockley pottery and rhyolite, the latter the well-documented lithic material of choice for Middle Woodland makers of Mockley pottery (e.g., Stewart 1984). Mockley sherds recovered from the plowzone concentrate in the northeast corner of the site, particularly in Unit 7 (see Figure 6-1). Not surprisingly, only a remnant of the shell midden survives in Unit 7, the plow tearing the 85 Mockley sherds (as well as the two Rappahannock, two possible Popes Creek, and 32 indeterminate shell tempered sherds) out of their original context (the piles of trash created by the prehistoric inhabitants; Figure 6-4).

In contrast, the highest concentrations of Mockley pottery in the intact shell midden occurs in the northwestern and southwestern corners of the sample grid (see Figure 6-2). The latter concentration actually reflects the recovery of a large net-impressed Mockley sherd broken into numerous, mendable pieces (see Figure 5-2); nonetheless, this largely intact sherd indicates little disturbance of a Selby Bay phase shell deposit. The concentration in the northwestern corner of the sample grid radiates out from Unit 8, encompassing Units 6, 9, and 13. (Remember, pollen samples were taken from Units 8, 9, and 17, although only those from Unit 8 have been processed and catalogued as of this writing.) Rhyolite similarly occurs in high concentrations in the shell midden of Unit 8 (see Figure 6-3). Units 2 and 8, and those units in close proximity (6, 9, 12, 16, and 18) probably represent one or more Selby Bay components with little contribution from the previous and succeeding phases. Rappahannock pottery occurs primarily in Unit 14, and to a lesser extent in the adjacent Units 17 and 10, in the plowzone (Figure 6-5), and in the intact shell midden of Unit 1. Unit 1's Stratum 2B produced 35 Rappahannock pottery sherds, including those with incised geometric designs (see Figure 5-4). Thirteen Mockley and 74 indeterminate sherds also were recovered from this unit, indicating a mixed assemblage of dubious analytic value.

Figure 6-1. Distribution of Mockley pottery, plowzone.

Figure 6-2. Distribution of Mockley pottery, shell midden.

Figure 6-3. Distribution of rhyolite, shell midden.



Figure 6–4. South and west profiles of Unit 7.

Clearly, the distributions of Selby Bay and Little Round Bay phase materials are not uniform: we can distinguish an area occupied by the former from that of the latter. The reader should consider, however, that Rappahannock and Mockley pottery occur across the entire site: the occupations are not mutually exclusive, as is clearly the case in the shell midden exposed in Unit 1, but they are distinct enough to allow some characterization of each. We also should not lose sight of the fact that Popes Creek pottery occurs on the site in at least two units (Units 7 and 19), and possibly three (Unit 18). The proximity of Units 7 and 19, in particular, suggests a Popes Creek phase occupation in the northeast corner of the sample grid. With only three definite Popes Creek sherds, and one possible sherd of the type, in three units, there is little evidence for a significant early Middle Woodland period occupation within the project area. Six steatite fragments (five from Shovel Test N150 E210, Stratum 2A, and one from Unit 10, Stratum 2A) could be associated with the Popes Creek pottery or with a Late Archaic/Early Woodland component hinted at by the recovery of several stemmed and notched points from our excavation units (see Figure 5–6).<sup>10</sup> We take these considerations into account in analyzing and interpreting the material from the units in the northeast corner of the sample grid.

Based on the distributions of pottery types, we offer the following allocation of units to components (Table 6–1). Table 6–2 summarizes the apportionment in terms of the numbers of Selby Bay phase, Little Round Bay phase, mixed, and indeterminate deposits. We have already established that Popes Creek materials occur only in the plowzone in and around Units 7 and 19, and possibly Unit 18, in direct stratigraphic association with later materials. Three of the 22 units lack intact shell midden. Three plowzone units (8, 11, and 15) and two shell midden units (4 and 5) produced only a few sherds that could not be identified with confidence, hence we describe them as ‘Indeterminate’ under the heading ‘Phase.’

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<sup>10</sup> Lot #s 74, 98, and 140 (?) for the Popes Creek pottery, 33 and 79 for the steatite. All derive from the plowzone.

Figure 6-5. Distribution of Rappahannock pottery, plowzone.

Table 6–1. Allocation of units to components.

Table 6–2. Summary of component allocation by stratum.

Component	Plowzone (Stratum 2A)	Shell Midden (Stratum 2B)
Selby Bay	8 units	14 units
Little Round Bay	1 unit	0 units
Mixed	10 units	3 units
Indeterminate	3 units	2 units
Not Present	0 units	3 units

Mixed plowzone components comprise nearly one-half of the plowzone units, a finding consistent with Weiskotten and Gibb’s (1995) observation that plowing mixed the later Rappahannock pottery with Mockley material. Despite the results of contour mapping, suggesting plowzone concentrations of Rappahannock pottery in units 14 and 17 (see Figure 6–5), and shell midden concentrations of Rappahannock pottery in Units 1 and 9 (Figure 6–6), unmixed Rappahannock pottery occurs only in the plowzone of Unit 2; and then represented only by three sherds. Unmixed Mockley material, significantly, occurs in eight plowzone units and 14 shell midden deposits. On the basis of presence–absence pottery data, we conclude that Popes Creek and Little Round Bay phase materials occur in mixed deposits that preclude detailed cultural and ecological analysis. Fourteen intact shell midden units contain what appear to be intact Selby Bay phase deposits, probably dating between A.D. 200 and 800. None of the intact shell deposits or possible features produced sufficient charcoal in a well–defined context (i.e., a hearth or pit feature) to warrant radiocarbon analysis.

Materials from the intact shell midden exposed in the following units comprises the dataset analyzed in the section on phase–specific patterns below: 2, 7, 8, 10, 12–18, and 20–22.

### Site–Wide Patterns

Most of the artifacts and ecofacts recovered from the Smithsonian Pier site cannot be attributed, by themselves, to any one period or phase of occupation. Nonetheless their distributions may prove instructive. Bone and fire–cracked rock distributions are particularly important, pointing as they might to meat and vegetable processing; albeit once removed through discard away from the actual processing site. Flaked stone distributions also might point to discrete disposal of waste flakes in direct association with the debris of other specialized activities. We examine these broader patterns in this section before returning to the cultural and ecological analyses of the Selby Bay phase intact shell midden deposits.

Figure 6-6. Distribution of Rappahannock pottery, shell midden.

## BONE DISTRIBUTIONS

Bone is distributed across the site irregularly in each stratum, with standard deviations that approach or exceed the means (Table 6–3):

Table 6–3. Bone distributions, principal strata.

Stratum	Min/Max	Mean	Stand. Dev.
2A	0/46	14.4	12.0
2B	0/199	32.0	48.2
2C	0/16	2.4	4.5

Bone attains its highest densities in the shell midden (an alkaline, undisturbed deposit) and its lowest densities in the more acidic, thin, buried A–horizon. Although probably neutral in pH, the plowzone soils provide a poor refuge for bone; subjected as they were to the plow and continuing to undergo physical alteration through bioturbation and freeze–thaw action.

Figures 6–7 and 6–8 illustrate the distribution of bone in the shell midden and buried A–horizon. The contour maps clearly indicate two areas of high bone concentration: the shell midden in the western half (Units 1, 2, 8, 11, and 16) and the buried A–horizon in the northwestern (Unit 8) and southeastern (Units 14 and 17) quadrants of the project area. Since all of the identifiable pottery recovered from the buried A–horizon appears to be Mockley—ten of the 16 buried A–horizon units yielded Mockley pottery, only Unit 7 yielding a significant number (32)—we regard all of these faunal remains as debris from the Selby Bay component. The shell midden concentrations of bone emanating from Units 2 and 8 are associated with high concentrations of Mockley pottery (see Figure 6–2). The shell midden strata of Units 1 and 11 contain Rappahannock and Mockley pottery, rendering any detailed analysis and interpretation of those units equivocal.

Excavators made no note of clusters of in situ bone, leading us to the conclusion that the bone, like the oyster shell and other debris, represents secondary deposition; viz., aborigines discarded waste bone away from the point at which they created it. Concentrations of bone represented in the contour maps, therefore, do not represent butchering areas and primary discard. Butchering occurred elsewhere, probably off of the shell midden.

## FIRE–CRACKED ROCK DISTRIBUTIONS

Fire–cracked rock also appeared scattered throughout the plowzone, shell midden, and buried A–horizon, lacking any suggestion of clustering and primary deposition. Stafford (1991) suggests that fire–cracked rock was produced as a byproduct of hickory nut processing, the heated rocks shattering in pots filled with cold water and hickory nuts, the fragments discarded after the hickory oils were skimmed off. Stuart A. Reeve (pers. comm., 1990) hypothesizes the use of heated stone pavements, producing large quantities of fire–cracked rock, in the preparation of root crops. Alternatively, cooking of a variety of stew–like meals in low–fired clay pots could easily account for the appearance of large numbers of fire–cracked rock on an archeological site. The data from the Smithsonian Pier site contribute little to this discussion, although we broach the issue again in the next section in the context of phase–specific patterns.

Figure 6–7. Distribution of bone, shell midden.

Figure 6–8. Distribution of bone, buried A–horizon.



Figure 6-9. Distribution of fire-cracked rock by weight (grams), plowzone.

Figure 6-10. Distribution of fire-cracked rock by weight (grams), shell midden.

Figure 6-11. Distribution of fire-cracked rock by weight (grams), buried A-horizon.

Figures 6–9 through 6–11 depict the distributions of fire–cracked, by weight in grams, for the plowzone, shell midden, and buried A–horizon. Plowzone concentrations in Units 3 and 4 (see Figure 6–9), when compared to the low values returned for the intact shell midden (see Figure 6–10), represent destroyed shell midden; an interpretation supported by the profile drawings for both units (see Figures 4–7 and 4–8; Figure 6–12).

Figure 6–12. Profile view of Unit 4.

Fire–cracked rock concentrations in the intact shell midden occur in the west half of the project area, and are particularly marked in the southwestern corner of the sample grid (see Figure 6–10). The concentration in the southwestern corner occurs in the buried A–horizon as well, albeit more diffuse and paling in comparison to that of the northeastern quadrant; specifically Units 6 and 7 (see Figure 6–11). The buried A–horizon of Unit 7, as noted above, yielded a relatively large assemblage of Mockley pottery, 32 sherds.

Although shell midden did not escape the plow in Unit 6, a buried A–horizon did survive below the plowzone (Figure 6–13). Field director Tara Pettit noted: “small possible daub fragments appear—less than 6 were seen” (Pettit’s provenience card comments, dated June 5, 1995). Could these bits of burned clay, clearly different from fired pottery in terms of their lack of temper and highly oxidized (reddened) state, represent part of a puddled hearth beyond the limits of Unit 6 or destroyed through human and other natural forces? Might they represent leavings from periodic hearth cleaning? If these pieces are burned daub, they are too small and insufficiently distinguishable from pottery to admit analysis. They do, however, raise the spectre of cooking features on site, features not uncovered by 22 excavation units exposing 42m<sup>2</sup> of the project area’s subsoil surface. We return to the fire–cracked rock question in the section below on phase–specific patterns.

Figure 6–13. Profile view of Unit 6.

#### FLAKED STONE DISTRIBUTIONS

Figures 6–14 through 6–16 illustrate the distributions of flaked stone in the plowzone, shell midden, and buried–A horizon, respectively. The highest concentrations appear on the north side of the project area for both the plowzone and the buried A–horizon. Shell midden lithics occur primarily in Units 18 (in the southwest) and 8; the latter concentration corresponding to that of rhyolite flakes illustrated in Figure 6–3. Plowzone lithics are difficult to interpret with confidence, representing as they do two or more components mixed through plowing. The shell midden exposed in Units 8 and 18 both consist of Selby Bay materials (see Table 6–1), however, they differ in the ratio of rhyolite to quartz/quartzite: 17:2 for Unit 8 and 3:21 for Unit 18 (89% and 13% rhyolite, respectively). The low representation of rhyolite in Unit 18 does not conform to expectations, the result of an inadequate sample size, more complex assemblage than the ceramic assemblage suggests, or a combination of both factors.

The distribution of flaked stone in the buried A–horizon (depicted in Figure 6–16) bears a close similarity to the distribution of fire–cracked rock in that stratum. Curiously enough, these concentrations do not coincide with the highest concentrations of oyster shell in the buried A–horizon, which lie to the southwest around Units 8 and 13 (Figure 6–17). These contrasting distributions suggest a Selby Bay phase occupation apart from the shell midden; viz., a possible occupation area preceding intensive oyster shell discard in the northwest quadrant of the sample grid. Again, we address this point at greater length in the next section.

Figure 6-14. Distribution of flaked stone, plowzone.

Figure 6–15. Distribution of flaked stone, shell midden.

Figure 6-16. Distribution of flaked stone, buried A-horizon.



Figure 6-17. Distribution of oyster shell by weight (kg), buried A-horizon.

## OYSTER SHELL PATTERNS

Several of the above contour maps illustrate the distribution of oyster shells, by weight (kilograms), for each of the principal strata. Recognizing the potentially valuable information that these mollusc shells might retain for both archaeological and environmental research beyond simple spatial distributions, we recorded various types of data from oyster shell samples from each of the principal strata and those that could be features. The analyses are based on techniques described at length in Kent's (1988) *Making Dead Oysters Talk*, although we have taken the simpler approach to sampling in retaining and examining 20 to 40 intact, or nearly intact, left and right oyster valves for each stratum. These small samples contribute to the various combined samples used in the following analyses; viz., the larger combined samples used in the analyses were drawn more or less uniformly from across the study area. Appendix VI summarizes observations recorded on 650 oyster valves representing the shell midden and buried A-horizon for each of the units in which they were identified, as well as from submidden features. Smithsonian technician Tim Steelman recorded: the valve (left or right); six linear measurements; the number of winter annuli (an estimate of age); the season at death, based on the of growth since the last winter check measured as a percentage of the last full year of growth; percentage of valve exterior covered by small and large sponge (*Cliona* sp.) borings; numbers of interior polychete worm (*Polydora* sp.) scars; the presence of bryozoans, barnacles, and boring clams; and the presence of shell decomposition. We address sitewide patterns in this section.

### *Seasonality and Demographics*

Kent (1988) recommends a variety of techniques for examining and recording growth lines on oyster shell hinges. We have adopted the simple expedient of isolating the last clusters of growth lines and noting whether they represent winter growth or spawn checks, classifying each valve as a Summer or Winter—warm or cold weather—kill. The results are not corrected for population variability; however, given the high average age of the individuals, which minimizes the variability arising from rapid growth rates in the first two years of life (Steponaitis and Herbert 1995), the effect of that variability may be minimal. Calculated on a sample of 339 sufficiently intact valves for the shell midden, we estimate a roughly 50/50 split between warm and cold weather kills. Fifty-eight intact valves from the buried A-horizon return a value of 55% warm weather kills. Statistically, the samples are identical ( $X^2=0.777$ ,  $\alpha=0.05$ , d.f.=1, c.v.=3.841). We examine the question of whether this broad seasonal pattern holds for individual components in the next chapter.

If the various occupants of the Smithsonian Pier site harvested oysters over an extended season—or periodically over several seasons—they appear not to have over-harvested. The broken line graph in Figure 6-18 demonstrates a roughly normal distribution for the age at harvest for 286 valves from the shell midden with modes of 5 and 6 growth lines. The buried A-horizon's sample of only 44 intact valves has a single mode at four growth lines, with secondary peaks of 5 and 6. Scattered over six categories (three to eight growth lines), the sample may be non-representative. If it is representative, viz., if the first Selby Bay phase occupants of the Smithsonian Pier site harvested younger oysters, we could hypothesize a cultural preference for smaller, younger oysters, or human

Figure 6–18. Growth line distributions for oyster shells, Strata 2B and 2C.

predation as the oysters first established themselves on this portion of the Rhode River. Both samples, however, exceed the average for oysters currently harvested from the Chesapeake Bay, some fraction over two years, as opposed to four to seven years.

Human communities appear not to have competed intensively with other species for oysters. Our faunal analysis suggests that these people harvested black drum (several teeth and some post-cranial elements), a finfish preying upon oysters, but they did not harvest them intensively. Since drum were harvested, but few drum remains have been recovered from the site, we suggest that the aborigines caught them infrequently and drum were not common in the shallows of the Rhode River; a condition that persists to the present. No bryozoans or barnacles were found adhering to the oyster shells (although barnacle fragments were recovered from two-liter flotation samples from nine shell midden units and the buried A-horizon of Unit 14), and only three boring clams appear on shells from the shell midden strata of Units 4, 9, and 15. Polychetes, parasitic worms that reside within bivalves, left identifying scars on the interior surfaces of left and right valves. One or more scars appear on 278 (68%) of 410 shell midden valves and 38 (48%) of 79 buried A-horizon valves. These distributions differ significantly ( $X^2=11.25$ ,  $\alpha=0.05$ , d.f.=1, c.v.=3.841), with polychete infestations lower than expected for the buried A-horizon sample. The lower than expected frequencies could indicate a slightly lower salinity for the Rhode River during the early years of the Selby Bay phase (ca. A.D. 200–500). This pattern becomes particularly interesting considering the generally younger oysters harvested during the initial occupation of the site (see above).

Sponge infestations also appear on the valve exteriors. Fifty-three percent of the shell midden valves (218 of 410), and 42% of the buried A-horizon shells (33 of 79), exhibit sponge scarring. Sponges are much more in evidence on the later shell midden valves, but chi-square analysis indicates no statistically significant difference ( $X^2=3.447$ ,  $\alpha=0.05$ , d.f.=1, c.v.=3.841).

### **Phase-Specific Patterns**

Up to this point, we have examined each of the major stratigraphic units as a whole, largely disregarding the multicomponent nature of the site. This approach can be justified on the bases of:

1. an apparent continued occupation of the site from the Selby Bay phase into the Little Round Bay phase with little significant contribution of materials from earlier and later occupations; and
2. the largely ecological focus of the analyses addresses a period during which the regional environment had already matured through climactic stabilization, forest succession, and marine transgression.

Given the overall stabilization of the environment and the maturing of the Chesapeake Basin ecosystem, differences between the ecofact assemblages of the Selby Bay and Little Round Bay phases should be attributable to differences in their respective settlement and subsistence practices. Those differences provide insights into the cultural-historical development of the region and the dialectical relationship that existed between aboriginal peoples and their environment.

Unfortunately, the data recovered from the Smithsonian Pier site do not admit detailed comparisons of the Selby Bay and Little Round Bay phases of occupation: only Selby Bay phase materials occur in the buried A-horizon, and the intact shell midden contains either mixed assemblages or, based on the presence/absence of ceramic types, Selby Bay phase materials only (see Table 6–1). Nonetheless, the Smithsonian Pier data

may prove useful in comparisons with contemporary and non-contemporary assemblages from elsewhere in the Middle Chesapeake Basin. The following analyses employ data from the shell midden deposits containing only Mockley and unattributed shell tempered pottery; viz., Stratum 2B for Units 2, 7, 8, 10, 12–22. We omit the remaining units either because they lack pottery attributable to a particular phase or because they yielded both Mockley and Rappahannock pottery. The lack of Rappahannock or earlier pottery, of course, does not insure against multicomponency that would undermine the value of the following analyses; however, there appear not to be any options other than dismissing the possibility of undertaking a phase-specific analysis. Unwilling to do so, we cite our observations above, viz., Rappahannock pottery clusters only in the shell middens of Units 1 and 11 (both eliminated from this analysis) and in the plowzones of Units 14 and 17 (see Figures 6–5 and 6–6). Analyses of the above-cited units should yield defensible patterns and support several hypotheses regarding the nature of the Rhode River/Middle Chesapeake environment between roughly A.D. 200 and 800 and the settlement and subsistence strategies of the Selby Bay phase inhabitants.

Table 6–4 summarizes the Stratum 2B artifact data for those units yielding only Selby Bay phase pottery. The pottery is far from uniformly distributed, with high concentrations (>20 sherds) occurring in 5 of the 11 units, the yields seemingly uncorrelated with the thickness of the shell midden. Lithic values similarly appear not to correlate with shell midden thickness, although the non-normal distribution and large number of zero values precludes actual calculation of a rank or product moment correlation coefficient. Fire-cracked rock also occurred in three concentrations: Units 2, 16, and 18. We detected no evidence of in situ burning (e.g., high concentrations of charcoal, thermal alteration of the soil, greater than expected burned oyster shells). The non-uniform distributions and lack of correlation between lithics, pottery, fire-cracked rock, and depth of shell midden suggest differential discard of trash. This is not to suggest—and we have made this point in previous sections—that the various artifacts recovered represent primary deposition; i.e., the occupants of the Smithsonian Pier site probably discarded debris away from where they created it. We can hypothesize, however, that differential secondary discard represents discretely defined activity areas elsewhere on the site where people periodically collected and removed trash from the principal living areas. Those principal living areas probably lie beyond the original limits of the shell midden and may survive outside of the project area, beyond the scope of this project.

Table 6-4. Artifact data for Selby Bay phase units, Stratum 2B.

Unit	Chert <sup>11</sup>	Quartz, early	Quartz, late	Quartz, shatter	Quartz, biface	Total Quartz	Rhyolite, late	Rhyolite, biface	Total Rhyolite	Total Lithics	Mockley Pottery	Shell Tempered Pottery <sup>12</sup>	Total Pottery	Fire-cracked Rock (g)
2	0	0	0	0	0	0	0	0	0	0	114 <sup>13</sup>	17	131	400
7	0	0	0	0	0	0	0	0	0	0	7	0	7	0
8	0	0	1	1	0	2	17	0	17	19	43	58	101	0
10	0	1	1	0	0	2	0	0	0	2	12	2	14	28
12	0	0	0	0	0	0	0	0	0	0	4	1	5	0
13	0	0	0	0	1	1	0	0	0	1	21	0	21	0
14	0	2	2	0	0	4	3	1	3	7	40	40	80	0
15	0	0	0	0	0	0	0	0	0	0	10	0	10	0
16	0	0	0	0	0	0	0	0	0	0	7	4	11	510
17	0	0	0	0	0	0	0	1	1	1	52	1	53	0
18	2	11	7	1	0	19	3	0	3	24	12	0	12	227
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	6	1	7	0
21	0	0	0	0	0	0	0	1	1	1	6	2	8	0
22	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Totals	2	15	11	2	1	28	23	3	25	55	335	126	461	1165

<sup>11</sup> Includes jaspers, all of the flakes representing late stages of lithic reduction; sp., tertiary, biface thinning, and retouch flakes. This distinction between early stage (decortication, primary, and platform preparation flakes) and late stage lithics follows throughout the categories, although the category of 'early stage' appears in the table only if one or more flakes for that category have been recovered.

<sup>12</sup> Shell tempered pottery defying attribution due to fragmentation and acid leaching. Most, if not all, probably are Mockley cord impressed or net impressed.

<sup>13</sup> Most of these sherds represent a single pot, comprising a large crushed sherd of Mockley Crumpled Net.

Analysis of the faunal remains from the same group of 11 units (n=454) reveals little difference from the aggregate shell midden units. Deer (48 pieces) continues to dominate the identifiable non-molluscan faunal assemblage, followed by turtle (54 pieces) and one or more species of birds (29 fragments). Unidentified medium to large mammalian remains (153) and unidentified bone (138 pieces) constitute the largest portions of the overall faunal assemblage, most of the former probably consisting of indeterminate deer post-cranial elements. Deer remains include virtually all cranial and post-cranial elements, albeit fragmentary, only femorae missing from the list of identifiable elements; probably a function of small sample size and fragmentation. Maxillae and mandibular fragments lack molar series that would have permitted precise aging of individuals and determinations of season of death. Overall element sizes, mature teeth, and fused epiphyseal sutures indicate 72% of the deer remains represent adults, the remaining 28% subadults. Twenty-two fish remains, including two black drum teeth and six scales, appeared exclusively in the shell midden of Unit 8 (one fish bone was recovered from the plowzone in Unit 15 and a possible shell feature in Unit 21). The concentration of fish remains in one unit suggests a single event and not regular harvesting and eating of fish. Turtle remains consist principally of carapace and plastron fragments, although several limb bone fragments and vertebrae also have been identified from five of the 11 units. Two illial fragments indicate a minimum of two individuals, but that value probably underestimates the number in the assemblage, given the number and distance between the units.

Oysters, of course, comprise the largest portion of the shell midden faunal assemblage. Twenty to 40 valves were retained from each unit: a total of 313 valves, 188 left, or lower, valves, 119 right, and six indeterminate. The distribution of growth rings for this sample approximates a normal distribution (n=225) and indicates that most of the oysters were harvested at 5 to 6 years of age (Figure 6-19), a finding consistent with that of the entire shell midden sample (see previous section). The distribution of growth rings for Unit 8 only, depicted on the same graph, suggests harvesting at four to five years of age, but the sample is too small (n=17) to draw any conclusions.

Figure 6–19. Oyster shell growth rings, Selby Bay phase shell midden.

Fifty–seven percent (151 of 266) of the valves recovered from the Selby Bay phase deposits appear to have been harvested during the warmer months. This percentage agrees well with those computed for Strata 2B and 2C sitewide (see above). If the Selby Bay phase people were primarily responsible for the creation of the Smithsonian Pier site’s shell midden, and that seems to be the case, then the similarities are as expected. Similarly, bryozoans and barnacles are absent, and only one boring clam specimen was recovered (Unit 15). Forty–six percent of the valves lack evidence of *Cliona* sp. infestation (143 of 313), and 35% lack evidence of polychete scarring (109 of 313). The corresponding values of 47% and 32% were returned on the overall Stratum 2B sample.

The results from the phase–specific analysis suggests either that the intact shell midden consists primarily of Selby Bay phase material, or that there was little environmental or cultural change from the late Middle Woodland to the early Late Middle Woodland. Selby Bay phase groups occupied the site for extended periods spanning cold and warm months, or periodically over the same period. They hunted, fished, and gathered hickory nuts, but harvesting and processing oysters appears to have been the principal reason for occupying the site. Although small and highly fragmentary, the faunal assemblage for the shell midden as a whole, and for the Selby Bay phase units alone, suggests opportunistic hunting, trapping, and butchering on or near the shell midden. Pottery sherds, mostly unmendable, may be related to the processing of these various foods for use on site, or for transportation to other inland sites, possibly to sedentary base camps. Tool kits are poorly represented by 11 broken and extensively resharpened bifaces (see Figure 5–6). Small sample size precludes an examination of lithic tool assemblage richness and heterogeneity, statistically, but the presence of only six projectile points, five generalized bifaces, and the total absence of bone tools indicates little diversity in the range of activities on site during either the Selby Bay or Little Round Bay phases. Roughly 50% of the lithic assemblage consists of imported rhyolite in the form of lithic waste and discarded worn and broken tools. Limited quartz tool manufacture occurred on site, presumably using locally available pebbles. Whether these activities took place in or around structures, we now turn our attention.



## Subsurface Features

Twenty-two excavation units, covering 42m<sup>2</sup>, exposed four features. Each feature, except for 14/2B1-4, consists of a more-or-less well-defined cluster or pocket of oyster shells extending below intact shell midden or plowzone, and comprised of one or more strata of soil and oyster shell fragments: Feature 14/2B1-2 lacks significant numbers of oyster shell. The features occur in the following units: 14, 15, 16, and Units 9, 20, 21, and 22; the latter four exposing a single large feature. We describe below each feature, the designations indicating unit number and stratum or strata.

### FEATURE 14/2B1-4

Located in the northwest corner of Unit 14, this feature appeared directly below the plowzone as a void in the underlying shell midden, its shape roughly that of 90° of arc of a circle with a radius of 0.80m, centered at the northwest corner of the unit (Figure 6-20). The void, defined as a lack of oyster shell relative to the surrounding intact midden, consisted of a very dark brown (10YR3/2) silt loam (identical to the matrix of the intact midden) with 36 shell-tempered pottery sherds, 15 of which are clearly identifiable as Mockley. Neither fire-cracked rock nor flaked stone were recovered. The eight bone fragments recovered include a deer metapodium and ischium, two turtle carapace fragments, and four indeterminate mammal bones. No plant remains were identified.

Stratum 2B1, only 5cm in thickness, overlaid a similar deposit (2B2), not as well defined horizontally and slightly mottled with a dark yellowish brown (10YR4/4) silt loam. Again, shell-tempered pottery constituted the sole artifact class represented in the deposit, five of the 12 sherds clearly Mockley in temper and surface treatment. Ecofacts, other than oyster shell, include one fragment of soft shell clam (*Mya arenaria*) and an unidentifiable carbonized seed fragment. This 7cm deposit was separated from an irregularly shaped oyster shell layer (2B4) by 2cm of yellowish brown silt (10YR4/4) silt, mottled with very dark grayish brown (10YR3/2) silt loam (2B3), containing a single small Mockley sherd and an unidentifiable carbonized seed fragment. Stratum 2B4 proved highly varied in depth, between 10 and 20cm, extending through the buried A-horizon and into the B-horizon. Eleven of the 21 shell-tempered pottery sherds are Mockley. Twenty-one soft shell clam fragments (*M. arenaria*) were recovered from the 81kg of oyster shell. No carbonized plant remains were identified.

The interlayering of yellowish brown silt loam (Stratum 2B3, identical but for its more extensive mottling to the natural B-horizon), irregularity of the bottom of the stratum (similar to a root ball with projecting roots), and large number of terrestrial snail shells, suggest that this is a natural feature, the product of an overturned tree. Oyster shells torn up with the roots probably settled back into the hollow first, followed by the subsoil—that adhered more tenaciously to the roots—and darker A-horizon material washed off of the root ball and in from the surrounding midden. During this process, occurring over a period from several months to several years, a microenvironment suitable for terrestrial snail colonization developed, providing a cool, moist, organic setting in which they thrived. The number of oyster valves exhibiting degradation in the sample for Stratum 2B4 (11 of 25, or 44%) greatly exceeds the percentage of degraded valves from Stratum 2B sitewide (84 of 314, or 27%), indicating greater decomposition through weathering; however, chi-square analysis does not support such an hypothesis, the samples are statistically identical ( $X^2=3.41$ , d.f.=1,  $\alpha=0.05$ , c.v.=3.841). Feature 14/2B1-4 is very similar to shell-filled Selby Bay phase deposits excavated by the J.

Patterson Park & Museum, Maryland Historical Trust, at the Patuxent Point site (18CV271; Reeve 1992b). Those excavations remain unreported.

Figure 6–20. Successive planviews of Feature 14/2B1–4.

#### FEATURE 15/2B1–2

This feature appeared at the base of the intact shell midden as a subrectangular patch, measuring 0.3m wide and in excess of 0.75m in length, comprised of some oyster shell and very dark grayish brown (10YR3/2) silt loam mottled with some very dark brown (10YR3/2) silt loam (Figure 6–21). Stratum 2B1 is basin shaped, 22cm thick at its center and devoid of artifacts, although carbonized hickory nutshell (*Carya* sp.) and an indeterminate husk or rind were recovered through flotation.

Stratum 2B2, underlying Stratum 2B1, also consisted of very dark grayish brown (10YR3/2) silt loam mottled with some very dark brown (10YR3/2) silt loam, but was virtually devoid of shell. It is roughly conical in section and measures 49cm at its deepest point, 25cm in diameter at its interface with Stratum 2B1 and 8cm at its very bottom. Although the best candidate at the site for a postmold, irregularities in the sides of the feature and its overall form suggested the in place deterioration of a tap root of a conifer, with minimal slumping and some accumulation of material in the larger root ball above (Stratum 2B1).

Figure 6–21. Planview and profile of Feature 15/2B1–2.

#### FEATURE 16/2B1

This very shallow (10cm), basin-shaped feature appeared at the base of the intact shell midden in the southwest corner of Unit 16 (Figure 6–22). The black (10YR2/1) silt loam with very few oyster shell fragments appears to have been a small natural depression in the surrounding buried A-horizon where lighter organic materials were redeposited early in the occupation of the site. No diagnostic artifacts were recovered from this

Figure 6–22. Planview and profile of Feature 16/2B1.

feature, only a quartz and a chert or jasper flake. Carbonized black walnut (*Juglans nigra*) and hickory (*Carya* sp.) nutshell fragments, as well as an unidentified carbonized seed fragment, were recovered through flotation.

#### FEATURE 9/2B1–2

Initially discovered in Unit 9, and exposed through the excavation of judgmentally placed Units 20 ( a 2 by 1m unit), and 21 and 22 (1 by 1m units), Feature 9/2B1–2 is the largest and most complex feature encountered at the Smithsonian Pier site. Although lensed (Figure 6–23), like Feature 14/2B1–2, it was irregular in outline and in topography (Figure 6–24). The superposition of very dark brown (10YR2/2) silt loam and oyster shell over dark brown (10YR3/3) silt loam and dense oyster shell could have derived from midden material jerked up from the ground by an overturned mature tree, the denser shell–laden material initially falling from the root ball in a clump, the more leached and lower shell density material more slowly eroding from among the roots and redepositing on top of the denser material. Only 20% of the shell from both strata exhibit deterioration, indicating rapid filling. This feature does extend into the B–horizon, and it is surprising that none of the brown (10YR4/3) silt loam of Stratum 2C was redeposited above or below Strata 2B1 and 2B2.

Both Strata 2B1 and 2B2 yielded artifacts and ecofacts, but in very small numbers. Eleven shell–tempered pottery sherds were recovered from Stratum 2B1, all of which are Mockley. Stratum 2B2 yielded seven shell–tempered sherds, all of which are Mockley, as well as one rhyolite flake. Both strata yielded minute quantities of hickory (*Carya* sp.) nutshell fragments.

Figure 6–23. Planview of Feature 9/2B1–2.

Figure 6–24. Profiles of Feature 9/2B1–2.

The lead author assisted in the excavation of features similar to Feature 9/2B1–2 in profile, although more regular in outline, at the Patuxent Point site in Calvert County, Maryland. Reeve (1992a) reports radiocarbon dates for two of these Selby Bay phase features (2104L and 2608H–J), which he interprets as “Middle Woodland domestic middens deposited within treefall holes” (Reeve 1992b:3). A more extensive report documenting these features and their contents has not appeared. Given the irregular shape and section of Feature 9/2B1–2, we regard it as a natural feature containing redeposited midden, the product of an overturned tree in a mature forest.

Artifacts recovered from the buried A–horizon consist entirely of Mockley pottery, indeterminate shell–tempered pottery, and a few lithics and fire–cracked rocks. We did not encounter any cultural features in this stratum, or below. We conclude that the site was first *intensively* occupied by Selby Bay phase peoples (the four Popes Creek sherds notwithstanding), but the project area rapidly became a place for discarding refuse. Evidence for domestic space (*viz.*, postmold patterns representing dwellings and other structures, storage pits, and hearths) remains elusive and may exist beyond the limits of the shell midden. We caution the reader, however, that the research methodology was designed to sample intact midden and not to identify domestic spaces: An aligned two–percent sample of the project area surface could easily miss such evidence.

## *Chapter 7. Summary, Interpretations, and Recommendations*

### **Summary**

Data recovery at the Smithsonian Pier site consisted of the stratigraphic excavation of 22 units, 20 of which measured 2 by 1m, the remaining two measuring 1 by 1m. Nineteen of the units represent an aligned systematic sample, the units placed in the northwest corner of each 10 by 10m grid square within the project area, shifted one to two meters in some cases to avoid extant trees and obvious tree throws. The remaining three units were excavated around Unit 9 to explore the extent, depth, and contents of a possible feature.

The excavation units revealed a fairly consistent stratigraphy throughout the project area, hence the use of sitewide strata designations. Stratum 1 is a humic layer developed over the past 30 to 50 years during the establishment of the current mature forest cover. This layer typically yielded few prehistoric or historic artifacts, and those few probably derived from natural disturbances such as overturning trees and rodent activity. Stratum 2A is a plowzone and, like the humus, appears in all of the units. This stratum probably was created early in the historic occupation of the site (second half of the 17th century) and continued to develop into the early 20th century, at which time the land was devoted to pasturage and preserved from the destructive effects of mechanized plowing. Cultural materials recovered from Stratum 2A include Middle Woodland (Pope's Creek and Selby Bay phases) and Late Woodland (Little Round Bay phase) pottery and stone tools, intermixed with some 19th and 20th century artifacts, with Selby Bay phase Mockley pottery dominating the assemblage of temporally diagnostic artifacts.

Stratum 2B is the shell midden, comprised primarily of oyster valves, and varying considerably in its state of preservation, absent in some units and minimally represented in others. Stratum 2B yielded most of the inorganic and organic cultural materials recovered from the site, but did not exhibit any defineable cultural features. Wherever identified at the Smithsonian Pier site, the shell midden appears to be intact, limited disturbances arising from bioturbation and, presumably, the effects of aboriginal scavenging and trampling. We found few ceramic mends within each unit suggesting secondary deposition (discard away from the point of use) rather than primary deposition and activity areas. The clustering of certain classes of artifacts (e.g., fish remains in Unit 8) does suggest, however, that the surviving intact deposits represent relatively unmixed trash. The deposits represent well-defined activities occurring elsewhere on the site, albeit probably apart from the shell midden. Most of the surviving shell midden appears to be of Selby Bay phase vintage, with the earlier Popes Creek and later Little Round Bay phase materials occurring in the plowzone. The midden might be characterized best as a series of discrete and overlapping piles of oyster shell and other prehistoric debris truncated and smeared largely through plowing and possibly through historic period shell quarrying.

The buried A-horizon (Stratum 2C) underlying the shell midden contains relatively few cultural materials, the temporally diagnostic objects consisting solely of Mockley pottery. Evidence of structures, hearths, and other domestic features predating significant shell midden formation may survive in the project area, however, the sampling design was planned around recovery of representative samples of refuse, not the broad exposure necessary for uncovering postmold patterns or other, less frequently occurring features. Such features may survive beyond the current limits of the shell midden.



Although several features intruding through the A–horizon were noted, all appear to be products of bioturbation and, where they incorporate any temporally diagnostic material at all, contain only Selby Bay phase pottery. These features do not necessarily predate the subsequent Little Round Bay phase occupation: Rappahannock pottery is sufficiently infrequent on the site, and clustered, that it simply may not have been redeposited in these features. Most of the features, however, appear to have formed while the midden accreted material, only Feature 14/2B1–2 occurring at the shell midden–plowzone interface.

Oyster shell analysis—including the identification and quantification of parasites—indicates a stable, mature marine environment. The mesohalic waters discouraged many predators, allowing the oysters to proliferate and provide a reliable source of food for the area’s human inhabitants. Despite long–term seasonal occupation, or repeated visits, by Selby Bay and Little Round Bay phase peoples, the ages at death for the oysters followed more or less normal distributions, with average ages between five and six years.

Faunal analysis suggests opportunistic hunting and fishing, deer and turtles the principal prey, with some indeterminate bird species and black drumfish also exploited. Analysis of the deer elements indicates nearby kills, the entire carcass returned to the site for butchery. Projectile points and generalized bifaces reflect hunting, but no fishing artifacts (e.g., bone or shell fishing hooks, netsinkers) were recovered. The small, limited tool assemblage and the relative scarcity of bone, suggests limited concern with hunting and fishing and a focus on shellfishing and shellfish processing. Significantly, crab remains are virtually absent.

Floral analysis also revealed little interest on the part of the prehistoric inhabitants in plant gathering or horticulture at the Smithsonian Pier site. Although hickory nutshell fragments were recovered through flotation, they are very few in number and small in size, piling in comparison with Ballweber’s (1994) findings at the Luce Creek site. The presence of weed pollen points to the periodic occupation of the site. The recovery of maize (*Zea* sp.) and legume (*Leguminosae*) pollen from the B–horizon, on the other hand, are more difficult to interpret. Did they derive from Middle Woodland or Late Woodland gardening, or are they products of historic farming? Clearly, much larger samples of extracted pollen will have to be analyzed before we can begin to draw the kinds of conclusions that Kelso (1993) and Kelso and Harrington (1989) have drawn for historic period sites.

### **Interpretations**

Analyses of oyster shell and other faunal materials indicate little cultural or environmental change during the course of the shell midden’s formation, although this may be due to the dominance of Selby Bay phase materials, strongly biasing the samples and overshadowing the Little Round Bay phase occupation. While it may seem obvious that aborigines visited the Rhode River to harvest oysters, our data suggest that they did so to the near exclusion of all other resources; collecting hickory nuts and walnuts, fishing, and hunting in an irregular, opportunistic manner. They appear to have been wholly uninterested in crabs, a popular delicacy in the Chesapeake Basin during the 20th century. The recovery of several small crab claw fragments from the flotation material, and the recovery of delicate terrestrial snail shells from both the dry screens and the fine mesh flotation screens, clearly indicates that the crab exoskeletons should have preserved in the midden; hence we attribute their absence to cultural subsistence patterns. Crab appears to have been absent from the Selby Bay phase features at the Otter II (18CV272;

Gardner, et al. [1988]) and Rose Haven (18AN279; Peck [1977]) sites. Gardner, et al. (1988) did recover 19 fragments of razor clam (*Tagelus plebeius*) shell and one of soft shell clam (*Mya arenaria*), both fairly fragile, from Feature 4 at the Otter II site: preservation appears not to be the issue. Despite this concentration on oysters, the prehistoric occupants of the Smithsonian Pier site appear not to have overharvested. Whether this pattern reflects a certain fundamental ethos, or simply population controls exerted elsewhere in the cultural system remains to be determined. The relative lack of non-human competitors (e.g., black drum, and other predatory fish and molluscs), and the uncertain effects of sponges (*Cliona* spp.) on oyster growth and reproduction, may have permitted fairly intensive harvesting without adversely affecting the oyster population's reproduction or structure.

The ubiquity of pottery and dearth of stone tools, coupled with the relative infrequent occurrence of terrestrial, avian, and piscine faunal remains, and the lack of significant deposits of charred nuts and seeds, clearly supports the interpretation of the Smithsonian Pier site as an oyster processing site. We do not have direct evidence of how these people prepared oysters or what they did with them in terms of preservation and storage. The bivalves may have been shucked with the aid of heat and wooden tools, the meat dried or cooked and stored in pots for transport to inland sites.

The Smithsonian Pier site cannot be used to identify and interpret the full range of Selby Bay phase settlement and subsistence practices, much less general trends in prehistoric strategies. It does provide data, however, that contribute to our understanding of these larger research issues. For example, Dent's (1995) dichotomy between accommodative and appropriative strategies cannot be supported by data from the Smithsonian Pier site. The oyster shell analysis suggests use, but not overuse, of this marine resource; a strategy that may have been practical (accommodative) or ethical (appropriative), and that may have been possible largely due to the relative lack of non-human species preying on the oysters. Indeed, it is difficult to see from the perspective of this particular site how the exploitation of oysters could have been anything but accommodative *and* appropriative. The Smithsonian Pier site represents one special task site within a larger constellation of sites, using without over-exploiting resources in an effort to maintain certain social relations within and between groups.

Data from the Smithsonian Pier site do not support Steponaitis' (1986: 284) hypothesis that interregional alliances and exchange (exemplified by rhyolite constituting around 50% of the lithic assemblage) created a demand for intensified production. They appear not to have intensively harvested oysters, as can be seen from the age at harvest data, nor have we uncovered any evidence of short term storage, other than the remnants of clay pots. Whether the Selby Bay occupants, and their successors, used clay pots to store oyster prior to shipping, or used above- or below-ground storage structures at the site cannot be determined with the data at hand. The latter might be tested through excavations beyond the shell midden.

The Smithsonian Pier data neither support nor refute Bernstein's (1993) generalized model of increasing resource diversification for the coast of the Eastern United States. The Selby Bay phase occupants seemed little interested in the range of edible plants and animals available along the Rhode River, largely ignoring migratory fowl, fish, crustacea, most small mammals, and nut-bearing trees. Clearly, the low frequency of non-oyster biotic remains cannot be attributed to poor preservation, but must represent some larger strategy for food procurement, the missing elements of which probably survive at contemporary sites along the coast or further inland.

Our data point to some variability among coastal Selby Bay phase sites. Ballweber (1994) reports rhyolite frequencies for the Luce Creek site (18AN143) far in excess of those that we report for the Smithsonian Pier site: 92% as opposed to ~50%. Moreover, Ballweber recovered 272 pieces of flaked stone from seven excavation units covering 10m<sup>2</sup>, this in contrast to the 198 pieces of flaked stone we recovered from 22 units covering 42m<sup>2</sup>. (Peck [1977], on the other hand, reports 805 pieces of flaked stone from the predominantly Selby Bay phase Rose Haven site [18AN279], 49.7% of which are rhyolite.) In other respects, Ballweber's results are comparable to ours: high frequencies of sponge and mud worm infestations; the absence of barnacles, boring clams, and oyster drills; low recovery of highly fragmented faunal material (deer, with some fish); and limited recovery of floral material, although hickory nuts are far better represented in the Luce Creek assemblage, and Ballweber identified nine acorn nutshells in the uppermost level of her Unit 7. Deer bones included cranial, axial, pedal, and appendage elements, and fish bones were very scarce at Luce Creek. Analysis of oyster growth rings for the Luce Creek sample pointed to warm season collecting, but could not exclude winter exploitation. Ballweber (1994) does not provide age at death data for the oysters.

Ballweber (1994) did submit a charcoal sample for analysis, Beta Analytic returning a date of 210 ± 80 B.C., the date not in keeping with the generally accepted range of A.D. 200–800 for the Selby Bay phase and at odds with a sample that Henry Wright (1973) submitted for the Luce Creek site: A.D. 580 ± 120. Both charcoal samples derive from the general shell midden deposit, hence we cannot distinguish between sedimentary carbon (i.e., charcoal from cultural or natural phenomena that may or may not have been contemporary with shell midden formation) and charcoal deriving from Selby Bay phase activities. We did not collect charcoal for radiocarbon analysis from the Smithsonian Pier site midden, nor did we identify any sealed deposits from which reliable samples might have been collected.

### **Recommendations**

Construction of the Education Building and parking lot began soon after the completion of fieldwork, destroying most of the cultural deposits within the project area. Additional cultural deposits—possibly including aboriginal living sites—may survive outside of the project area; particularly to the south where surface shell points to additional preserved shell midden. Occupation areas may survive on the higher ground to the west. Only additional testing will determine the extent and nature of these deposits. The Smithsonian Institution takes its stewardship responsibilities seriously, and every effort will be made to avoid disturbance to these areas or to take proper steps in keeping with the Section 106 process to identify and preserve historically significant cultural deposits around the Education Building.

The new Education Building will also house the collections for the Smithsonian Pier site. The three archival records boxes with the artifacts, faunal, and floral specimens will be stored in a specially designed fire resistant, secure closet, admittance limited to the Director of Education and the Center's senior staff. Some objects have been removed temporarily for use in the Education Building's exhibit, with entries made on the electronic catalogue and 'artifact removed' slips placed in the appropriate bags.

Based on the data recovery program reported herein, and the ongoing exhibit program at the Smithsonian Environmental Research Center that uses the data and collections for educational purposes, we recommend no further work be undertaken in connection with this project.

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*Appendix I: Scope of Work*

*Appendix II: Public Outreach*

**1. News Coverage**

## **2. Public Education Events Summary**

The following groups visited the Smithsonian Pier site during excavations. Many visitors were able to discuss findings directly with the principal investigators and the field crew. SERC personnel recorded the visits with color prints, slides, and videotape, copies of which are available from SERC's Education Department. The excavation also afforded volunteer opportunities, of which seven individuals took advantage, contributing approximately 16 person days of labor.

June 6th

Lakewood Elementary School, 4th Grade  
50 students

June 7th

West Frederick Middle School, 6th Grade  
25 students

June 9th

Visiting family group  
2 adults, 2 children

June 13th

National Association of Environmental Professionals  
45 participants

June 19th

Teacher Workshop  
16 Teachers

June 21st

Anne Arundel County Summer Program  
2 adults, 10 children

June 26th

Visiting family group  
3 adults, 7 children

June 27th

Gallaudet University  
4 instructors, 14 students

### **3. Notification of Native American Community**

Mervin Savoy  
Piscataway Recognition Project  
P.O. Box 1484  
La Plata, Maryland 20646

June 12, 1995

Dear Mervin,

I was very happy to talk to you the other day and report that SERC is in the process of recovering artifacts from the prehistoric site located on the old Java Farm property. Jim Gibb is the archaeologist in charge of the dig and has already discovered sections of pottery which show various clay designs. Feel free to visit SERC at any time in the near future to see the site and excavations. Please contact Jim Gibb directly, (410) 257-9377, to arrange a meeting with him since the pottery sections are presently in his possession. The new Environmental Science Education Center will have an exhibit about the prehistoric Rhode River site and show the artifacts that were recovered. If I can be of any help to you concerning these matters, please feel free to contact me at anytime. Hope to see you soon.

Sincerely,

A. Mark Haddon  
Education Director, SERC

*Appendix III: Artifact Catalogue*

*Appendix IV: Botanical Catalogue*

*Appendix V: Faunal Catalogue*



*Appendix VI: Oyster Catalogue*

## ***Appendix VII: Principal Investigator's Credentials***

James G. Gibb, Ph.D  
2554 Carrollton Road  
Annapolis, Maryland 21403  
(410) 263-1102

### **Education**

1994 Ph.D. in Anthropology, Binghamton University  
1985 M.A. in Anthropology, Binghamton University  
1978 B.A. in Anthropology, State University of New York at Stony Brook

### **Continuing Education**

1996 University of Nevada Cultural Resource Management Program: Assessing the Archaeological significance of Historical Sites.  
1994+ Washington Ceramic Seminar: Master Class in Antique Ceramics.

### **Professional Experience**

Twenty-one years of archaeological field and laboratory experience in six eastern states and Arizona, on sites ranging in age from early prehistoric to late 19th century.  
Fourteen years of supervisory experience and eight years as Principal Investigator in Sole Proprietorship consulting firm.

### **Select Publications**

1996 *The Archaeology of Wealth: Consumer Behavior in English America*. Plenum Press, New York. (in press).  
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