NATIONAL CAPITAL AREA ARCHEOLOGICAL OVERVIEW AND SURVEY PLAN

Barbara J. Little

U. S. Department of the Interior
National Park Service
National Capital Area

1995

Occasional Report Series of the Regional Archeology Program
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Front cover graphic: Plan of excavations at Park Building 40 (46JF88), Harpers Ferry National Historical Park, delineated by J. Ravenhorst 1992.

NATIONAL CAPITAL AREA
ARCHEOLOGICAL OVERVIEW AND SURVEY PLAN

Barbara J. Little

for the
SYSTEMWIDE ARCHEOLOGICAL INVENTORY PROGRAM
NATIONAL PARK SERVICE
NATIONAL CAPITAL AREA

Occasional Report No. 13
U.S. Department of the Interior
National Park Service
National Capital Area
Archeology Program
Washington, D.C.

1995

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ACKNOWLEDGMENTS

Review from outside the National Park Service was graciously provided by State Historic Preservation Offices and several individual archeologists. I wish to thank Randy Turner (Virginia SHPO), Beth Cole (Maryland SHPO), Nancy Kassner (DC HPO) and Pat Trader (West Virginia SHPO) for their comments and support. I thank Russ Handsman (Anthropology Department, University of Rhode Island) for his review and comments. I am particularly grateful to Jeffrey Hantman of the Anthropology Department at the University of Virginia and to Carol Ebright of the Maryland State Highways Administration Archeology Group for their extensive, insightful, and tactful comments, especially on those sections dealing with prehistory.

Review within the National Park Service was provided by several individuals. The Cultural Resource Specialists in each park within the National Capital Area were provided an opportunity to review the first draft. Thanks to Marcia Keener and Mike Shaver (of Prince William Forest Park), Bob Grumet (of the National Register Programs Office in Philadelphia), and Michele Aubry (WASO Division of Anthropology) for taking the time to read the first draft.

Cari YoungRavenhorst (Harpers Ferry NHP) pulled together several resources about historic artifacts for me. John Ravenhorst (Harpers Ferry NHP) designed the cover. Figures I.1 and I.2 were done by the GIS Services of the National Capital Area System Support Office. Marian Creveling provided Table III.2.

I would like to thank Regional Archeologist Stephen R. Potter for his initiative in getting this plan and its implementation underway, for his support, comments and suggestions, insight into regional archeology needs, and, most of all, for more than 15 years of high quality research in this region. Without his recent book, <u>Commoners, Tribute, and Chiefs; The Development of Algonquian Culture in the Potomac Valley</u>, writing the regional overview of this plan would have been a truly daunting task.

As in everything I do, I am grateful for the help and support of Paul A. Shackel (Harpers Ferry NHP). He took the time to read and comment on the first draft - and the second - and to offer lots of good advice on both content and layout.

Thanks are also due to all the archeologists in the mid-Atlantic whose work is drawn upon here. I hope that they find this plan useful.

And, not least, thanks to all the folks at the Regional Office (now the System Support Office) and in the Parks who helped make working on this plan a real pleasure.

HOW TO USE THIS PLAN

This plan is designed to address the needs of park managers who are charged with stewardship of cultural resources. The overview section of the plan is primarily designed for archeologists but it should also be useful to other cultural resource specialists, to natural resource specialists with an interest in how people used and were affected by the natural environment, and interpreters who wish to convey some of the rich complexity of American heritage to park visitors.

Park Managers:
It is recommended that Park Managers read the Management Summary and the sections other than the following technical portions: Section II, which is the Regional Overview, the final part of Section I on the physical environment and the part on Survey Coverage and Methods in Section IV. Park Managers may also be interested in reading the Abstract of the Regional Overview to get a sense of the kind of information available. They may then choose which technical sections interest them.

CRM specialists:
This plan should serve as a reference and information base; it is meant to be a flexible tool. It should help in assessing each park's cultural resources and in placing work that has been done into context in addition to identifying what further work needs to be done. It is recommended that CRM specialists begin with the Management Summary, Abstract of the Regional Overview, and the part of Section III pertaining to the relevant park.

Archeologists:
This plan should serve as a reference document and research tool for contracted or in-house archeologists and for archeologists outside of the NPS. Section II, the Regional Overview, the final part of Section I on the physical environment, and the part on Survey Coverage and Methods in Section IV are particularly important.

Interpreters:
This plan should serve as a reference and information base; it is meant to be a flexible tool. It is recommended that Interpreters read the Abstract of the Regional Overview as well as the part of Section III pertaining to the relevant park and then use the Table of Contents to find parts of interest in the text for further information.

Law Enforcement Rangers:
In conjunction with the enforcement of the Archeological Resources Protection Act (ARPA), Law Enforcement Rangers may wish to become familiar with the survey plan and with the archeological resources of each park. It is recommended that Law Enforcement Rangers read the Management Summary and the Abstract of the Regional Overview as well as the section of Park III pertaining to the relevant park.

MANAGEMENT SUMMARY

The Table of Contents shows the structure of this plan. The Management Summary highlights some of the major points aside from the Regional Overview (Part II). An abstract of the Regional Overview is provided in the following section.

Background

The Systemwide Archeological Inventory Program (SAIP), also known as the National Archeological Survey Initiative (NASI), was established in response to the identification of a material weakness in the Park Archeology Program, servicewide. The weakness stems from the fact that there is inadequate knowledge of archeological site location and therefore inadequate ability to protect and preserve these cultural resources.

The overall goal and objectives of SAIP are as follows (NPS 1992:2):

GOAL: Conduct systematic, scientific research to locate, evaluate, and document archeological resources on National Park System lands.

OBJECTIVES:

1. Determine the nature and extent of archeological resources in park areas.

2. Record and evaluate those resources, including nominating eligible properties for listing in the National Register of Historic Places.

3. Recommend appropriate strategies for conserving, protecting, preserving *in situ*, managing, and interpreting those resources.

Documents to be produced include Archeological Overview and Assessments, and Archeological Identification and Evaluation Studies. These documents, including an archeological base map, will provide information needed by park managers, planners, interpreters, law enforcement officers and other specialists to effectively carry out their responsibilities for the protection and interpretation of archeological resources.

The survey and inventory will partially fulfill certain requirements of the National Historic Preservation Act, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), the Archeological Resources Protection Act, and NPS-28, Cultural Resource Management Guideline.

National Capital Area Parks

The National Capital Area, formerly the National Capital Region (NCR), of the National Park Service encompasses Washington, D.C. and environs within the drainage basin of the Potomac River (Fig.1). From the Occoquan River in Prince William County, Virginia to the source of the Potomac in Cumberland, Maryland to the mighty confluence of the Shenandoah and Potomac in Harpers Ferry, West Virginia, the parks in this region contain rich and diverse cultural and natural resources. Archeology within the region has provided far-ranging insight into human lives, from the earliest human immigration to the area 11-12,000 years ago, to the devastation of Native American displacement, to the wreckage of the Civil War, to industrial development.

Figure 1 (page 2) shows the National Capital Area and Table I.3 (page 14) provides a summary of park lands in the Area.

Figure 2 (page 25) shows the Potomac River Basin and the major physiographic divisions. Table I.5 shows the locations of parks or portions of parks in major physiographic regions.

Archeology

> While archaeology may in a sense be the past-tense of anthropology, it is not the past-tense of anthropology alone.
>
> Renfrew 1982:4

> On a map of the sciences, archaeology would be a border state between the natural and social sciences. It is like a social science in that the objects of interest are people, human culture and artifacts created under the influence of ideas and social norms . . . archaeology is also like a natural science in that its focus in on the *material* remains of people in the past and on their relation with the natural environment.
>
> Kosso 1991:621

In the United States archeology is considered part of the broader discipline of anthropology, literally the study of humans. As anthropology developed in this country in academic and museum settings through the 19th and 20th centuries, all of its sub-specialties were closely tied to the study of native American peoples. Ethnography and ethnology were concerned with documenting and comparing contemporary, living societies; anthropological linguists recorded native languages; biological anthropologists studied and compared physical characteristics of peoples; archeologists investigated the tangible remains -- the artifacts and architecture -- of past societies.

Anthropology as a profession has, of course, expanded to study far more than native peoples and archeology is concerned with much more than objects. What Lord Renfrew meant by the first remark quoted above is that because archeology is concerned with the remains of what has gone before, it is relevant to a whole range of fields, since many fields of study have tangible remains that may inform about the past. Such fields include architectural history, cultural landscape studies, and history. The link among all the remains studied by archeologists is an interest in past human activity.

Archeology as a study has the advantage of time depth and a breadth of data for comparisons. The material remains which survive for archeological study are varied, yet they obviously cannot represent the whole of a living culture. Even though the material remains are partial remains they are not inconsequential, but are the remains of human action and intention. Archeology relies to a great extent on insights and methods developed in the natural sciences. The formation, preservation, and degradation of archaeological sites and their contents are only understood by applying geology, soil science, hydrology, chemistry, and the like.

What I have attempted to do here is to present a productive and interesting structure for an archeological plan that may serve for the next few decades. I have assessed the trends in the discipline and have organized this discussion for general usefulness. In addressing each topic I often describe the approach of some major work(s) not necessarily confined to regional concerns in order to provide a context for thinking about archeological data in the Potomac Basin. Not all of the theoretical positions or approaches I mention have been used in the mid-Atlantic and I wish to suggest that they may be applied. I do not, however, seek to develop a critique of mid-Atlantic archeology, as that would be an effort far outside of the scope of this plan.

A Note on Time Notation

Conventional time notation of years as B.C. or A.D. is abandoned here in favor of the theologically neutral BCE (Before Current Era), which is equivalent to B.C., and CE (Current Era), which is equivalent to A.D. Dates are often given as BP (Before Present). For archeologists, "present" is defined as 1950 CE. Usually I have simply added 2000 years to a BCE designation for an approximate date BP.

Status of Archeological Inventory

For most parks in the National Capital Area the status and adequacy of archeology is poor. One park and some sections of others have a formal Overview and Assessment. Site forms are incomplete. The only historical base maps for archeological resources or surveys for the region as a whole was created in 1963 and therefore is missing not only many known sites, but also whole park units.

There is locational information in paper files for all recorded sites in the National Capital Area, although it is clear that many sites known on park land have not been recorded with the appropriate state or district repository. In most cases site locations are marked on USGS maps. There is not yet a coherent GIS data base of archeological sites in the region. Setting up such a data base, with appropriate security measures to protect locational information, should be a priority of each park.

Table III.1 (page 201) summarizes data for the status of inventory and documentation for each park.

Of the approximately 78,000 acres in the National Capital Area parks, about 6% has been inventoried at a sufficient level of intensity that further systematic inventory is not necessary (given current standards). Approximately another 11% has been inventoried by less than full-coverage and requires further inventory to meet current standards.

A brief synopsis for each park is provided. Sample issues for archeological research also are noted. Tables III.3 (page 213) through III.15 (page 259) provide a chronological listing of archeological work in each park.

Project Needs

For each survey and inventory project the following, at a minimum, should be accomplished. These are detailed as Requirement #3 of SAIP (NPS 1992:6):

1) Consulting and coordinating projects with appropriate NPS and non-NPS projects;

2) Preparing or revising Archeological Overview and Assessments;

3) Preparing research designs for field studies;

4) Undertaking other appropriate studies and activities that are essential to successfully plan and implement archeological inventories; for example, consulting or conducting geomorphological studies; creation and maintenance of GIS and relational data bases, including survey boundaries and intensity and non-site artifact finds as well as site locations; and special studies such as pollen and phytolith

analysis, which contribute valuable information to historic cultural landscape studies;

5) Preparing interim and final archeological reports;

6) Recording site locational data on Historical Base Maps;

7) Entering data about archeological resources into the NPS's computerized archeological site data base (ASMIS);

8) Cataloging archeological objects and specimens into the NPS's National Catalog of Museum Objects using the Automated National Catalog System (ANCS);

9) Stabilizing and preparing archeological collections for storage;

10) Preparing National Register of Historic Places nominations for eligible archeological resources (individual sites, Multiple Property Listings, Archeological Districts);

11) Making the projects' results available to park managers, planners, interpreters, and other appropriate NPS specialists; and

12) Making the project's results available to the professional community and to the public, as appropriate.

There are only a few formal Overview and Assessment documents for parks or sections of parks within the National Capital Area (see Table III.1). This plan is designed to serve as an archeological overview of the entire National Capital Area. It provides an overview of history and prehistory within the Potomac Basin (excluding the Shenandoah River Valley). It also provides data on site predictive models and predicted site locations. However, it does not provide the level of detail required at the park level. For example, this plan's overview does not provide historic maps of park areas or details about landforms which are essential for predicting and testing site locations.

Archeological inventory projects traditionally have focused on single park units and, for the most part, projects proposed in this plan do so as well. No projects involving parks outside of the National Capital Area are proposed in this draft of the SAIP plan. While it would be possible to plan such projects, the anticipated difficulties in scheduling funding and sharing resources outweighed the advantages. It remains possible to design such projects if logistical problems can be addressed.

Archeological evaluation projects and National Register nominations often will cover just one site. However, in many cases it would be advantageous to complete a Multiple Property Listing nomination for a particular category of sites within a park or throughout parks within a cluster. With a Multiple Property Listing in place, several individual nominations may be prepared and placed in context. One advantage to such an approach is that, because the multiple listing compiles relevant information and explains the significance of many properties, it is readily adaptable to interpretive needs. For example, portions of Multiple Property Listings may be modified into pamphlets or brochures for the visiting public. Such documents also provide park interpreters with ready access to information about their park and neighboring parks.

When archeological survey and inventory has been completed for particular park units, it may be reasonable to prepare nominations of archeological districts. Of course, it is often appropriate to prepare individual nominations for sites which have been evaluated and determined eligible.

ABSTRACT OF THE REGIONAL OVERVIEW

Physical Environment of the National Capital Area

Figure I.1 (page 2) shows the National Capital Area and Table I.3 (page 14) provides a summary of park lands in the Area.

Figure I.2 (page 25) shows the Potomac River Basin and the major physiographic divisions. Table I.5 (page 26) shows the locations of parks or portions of parks in major physiographic regions.

There are three sharply defined physiographic zones in the eastern United States paralleling the Atlantic shore from New England almost to the Gulf of Mexico. These are the Coastal Plain, Piedmont Plateau, and the Appalachian Province. The latter has three divisions: 1) the Blue Ridge district; 2) the Greater Appalachian Valley including the Great Valley (Hagerstown Valley in Maryland and Shenandoah Valley in Virginia) and the Allegheny ridges; and 3) the Allegheny Plateau.

Climatic conditions and even the physical characteristics of the land have changed over the past 12,000 years, presenting inhabitants with variable conditions. Each physiographic region exhibits some difference not only in topography but also in available food resources and raw materials such as stone and clay.

Two sections on physical environment follow a brief discussion of available resources. The first is a brief discussion of environmental parameters and constraints before present conditions. The second is a more detailed, geographic description of the physiographic provinces within the Potomac Basin. It is provided here not only because such information is sometimes difficult to find, but also because it provides the interpretive staff in each park an idea of that park's natural setting in relation to other parks in the region. Because there has been traffic for thousands of years between these areas, it also provides some sense of the different circumstances people confronted prehistorically and historically.

Archeology

The introduction to the regional overview provides some comments on the discipline of archeology to orient both archeologists and non-archeologists to the concepts that underlie the overview in this plan. A glance at the Table of Contents will reveal the structure of this overview.

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In the United States archeology is considered part of the broader discipline of anthropology, literally the study of humans. As anthropology developed in this country in academic and museum settings through the 19th and 20th centuries, all of its sub-specialties were closely tied to the study of native American peoples. Ethnography and ethnology were concerned with documenting and comparing contemporary, living societies; anthropological linguists recorded native languages; biological anthropologists studied and compared physical characteristics of peoples; archeologists investigated the tangible remains -- the artifacts and architecture -- of past societies.

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It is commonly accepted that the three main goals of archeology are 1) the establishment of cultural chronological sequences; 2) the elucidation of past lifeways; and 3) explanation of processes of cultural change, such as the development of food producing economies from hunting-gathering ones and the historical development of industrialism. These goals are pursued within the basic frameworks of space, time, and the formal attributes of artifacts and the built environment.

What I have attempted to do here is to present a productive and interesting structure for an archeological plan that may serve for the next few decades. I have assessed the trends in the discipline and have organized this discussion for general usefulness. In addressing each topic I often describe the approach of some major work(s) not necessarily confined to regional concerns in order to provide a context for thinking about archeological data in the Potomac Basin. Not all of the theoretical positions or approaches I mention have been used in the mid-Atlantic and I wish to suggest that they may be applied. I do not, however, seek to develop a critique of mid-Atlantic archeology, as that would be an effort far outside of the scope of this plan.

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Archeological Logic

Archeologists rely quite heavily upon the use of analogy in many ways. Analogies may be made between the past and ethnographic, historical, and current descriptions or models. They may be quite specific, focusing on the function of a particular artifact, or more general, concerning social strategies for dealing with scarce resources.

Ethnographic analogy must be used with extreme caution, especially since there are no ethnographically known societies for the vast majority of human history. However, there is little else with which one may begin to ask questions of the prehistoric past. The discussion provides a general overview of the kinds of ideas drawn from ethnographic knowledge and applied in archeological reconstruction. I also include a caution about making simplistic assumptions about "simple" hunter-gatherers and "complex" food producers.

There is a long-standing bias in anthropology which associates a society's means of subsistence with its cultural complexity, assuming that complexity arrives with food production. However, an increasingly sophisticated understanding of human cultures leads to a rejection of an uncomplicated dichotomy between simple foragers and complex farmers. In the mid-Atlantic region, the variability of hunter-gatherer societies is an issue central to most of prehistory since hunting-gathering remained the principle subsistence strategy until the Late Woodland period. This variability and complexity of groups prior to the full-scale adoption of agriculture has yet to be adequately researched.

Chronology and Economy

Table II.2 (page 62) summarizes a few of the dates and time periods used by archeologists in the mid-Atlantic region for pre- and protohistoric periods.

Tables II.3, II.4, II.5, II.6 and II.7 provide some of the temporally diagnostic material culture styles recognized in the mid-Atlantic. Table II.3 (page 65) lists formal styles of stone points. Table II.4 (page 66) provides selected radiocarbon dates for those point types. Table II.5 (page 68) lists pre- and protohistoric pottery types.

Tables II.6 (page 72) and II.7 (page 76) provide material used to date historic sites; the first is a list by time period of common material and the latter is a schematic of the manufacturing ranges of some of the most frequently cited ceramic time markers.

One of the most intensely researched topics in North American prehistory is the earliest human occupation, the Paleoindian period. It is not simply time which veils the most ancient American lives; it is also the strangeness of attempting to understand completely new adaptations in an environment without any modern counterpart. Analogies are limited not only for ecological conditions but also for various components of behavior and culture such as economy, mobility, and social interaction.

One of most significant conceptual shifts in Quaternary studies is the relatively recent realization that Pleistocene biomes were not at all like those of the present. There was a very rapid reordering of vegetation across eastern North America about 10,000 years ago. By then, an essentially modern Holocene vegetation association had replaced the late glacial mosaic forests.

There are important implications for human adaptation that have come out of the refinement of environmental reconstruction. Many text-books and traditional archeology describe Paleoindians as "big-game hunters," assuming that mastodon and ancient bison remains which are associated with Paleoindian artifacts in the western United States must have been the preferred game in the east as well. Careful paleoenvironmental reconstruction at the Shawnee-Minisink site in the Delaware Valley indicates that by the time people occupied the area, the megafauna were already gone. Plant and fish remains at the site suggest that Paleoindians were generalized hunter-gatherers rather than big-game specialists.

The Archaic was characterized by generally modern (Holocene) climatic conditions, although that is not to say that the landscape suddenly looked like today's. There continued to be complex changes. The ancient Susquehannah River, ancestral to the Chesapeake Bay, began to be submerged by encroaching water about 10,000 years ago, but the infilling of the Bay was not complete until about 5,000 years ago. The formation of the Potomac basin then presented a slowly changing landscape to humans for thousands of years. The major environmental change was the infilling of the Chesapeake Bay and concomitant development of estuarine resources. The first known use of shellfish is dated to about 4,000 years ago.

The Archaic period was so-named in the 19th century to designate an outdated wandering way of life, a perception now itself outdated. The period covers a long time and traditionally includes hunter-gatherer lifeways during the Holocene. With a growing understanding of the complexity of both hunting-gathering lifeways and the development of agriculture, the definition of the period is more nebulous. The end of the Archaic is usually marked by the innovation of pottery, traditionally regarded as a Woodland period trait. General trends of the Archaic have been traditionally identified as population growth and greater dependence on food gathering relative to hunting as well as the absence of agriculture, ceramics, and settled village life. The definition of Archaic lifeways continues to be refined by modern archeologists.

There is some fascinating recent evidence for subsistence and material culture during the late Early Archaic and the Late Archaic at the Indian Creek V site near the Fall Line in Prince Georges County, Maryland. Very good plant preservation and careful analysis revealed an important botanical assemblage. Discovered were fruits, tubers, starchy seeds, nuts, shoots and leaves with seasonal availability in the spring, summer and fall. Tubers represented over 80% of the taxa, while there were very few nuts. Nearly all of the 37 charred plant species have documented ethnographic uses. Such plants were used to medicate and intoxicate, and for cordage, mats, baskets, decorative objects, dyes, and shelter.

The transition between the Archaic and the Woodland period, sometimes labeled as the Terminal Archaic (see Table II.2) or as the Transitional, correlated with environmental change as the Chesapeake Bay estuaries were formed and estuarine resources as well as anadromous fish became available.

This transitional period witnessed changes in every aspect of archeologically-visible culture: site size, density and number; technology, settlement, and subsistence. The major economic changes were marked by the diagnostics of Savannah River and Susquehanna broadspears, steatite bowls, and ceramics. A new, riverine focus appeared all along the eastern United States and there was also an increased subsistence focus on fishing and probably on drying and storing fish. Evidence for trade in steatite and other material indicates much broader regional interaction.

Throughout the eastern United States archeologists have observed general trends during the Late Archaic as people increasingly focused their energy on riverine, estuarine, or lacustrine settings and resources and developed more sedentary settlement systems. Changes in natural environment and population pressure have been the most commonly cited causes. A meaningful goal, though, is not simply to attribute changes in human strategies to external causes, but to address human choices and responses in the face of major changes: response to new resource availability with different organization of labor and production, storage and the distribution of surplus; responses to decreased mobility and demographic changes in terms of social authority and control.

Woodland period adaptations were achieved in a modern climate with relatively minor fluctuations. Microenvironments could, of course, vary between locales.

The characteristics of the Eastern Woodland period generally are identified as population increase, increased sedentism, manufacture and widespread use of pottery, domestication of native plants, adoption of imported domesticates, and the development of elaborate mortuary practices. The famous Adena and Hopewell interaction networks centered in Ohio and Illinois did not directly or greatly affect material culture of much of the mid-Atlantic, although trade networks penetrated the Appalachians and the Delmarva peninsula. In the mid-Atlantic, there was a seasonal hunting-gathering adaptation through the Middle Woodland at least, although there may have been some plant domestication as well. In the mid-Atlantic, as in other parts of the eastern United States, many of the characteristics of Woodland societies predated the development of agriculture.

Because they are the result of more sedentary populations, Woodland sites tend to be internally complex, containing storage pits, structure patterns, and burials. However, the Early Woodland is not well known and there is little excavated data from the Middle Woodland. Late Woodland sites are better documented.

A new kind of feature appeared during the Middle Woodland (and likely earlier) to alter the cultural landscape. Burial mounds were built in the Potomac Valley in Maryland and West Virginia and the Shenandoah Valley in Virginia. The following issues are connected with burial mounds: public symbolism; the social integration of communities and dispersed settlements; and territoriality. The appearance and disappearance of mounds also may have accompanied the rise and fall of early ranked social systems.

Territoriality, that is, the definition and control of an area by people, is a factor which became important in the mid-Atlantic during the Middle Woodland. For most of prehistory physiographic regions did not mark significant cultural boundaries, but during the Middle Woodland divergent cultural adaptations appeared in the Coastal Plain and Piedmont. The cultural boundary along the Fall Line between Algonquian speakers of the Coastal Plain and Siouan speakers of the Piedmont may have been initially defined much earlier in the Woodland, but it is certainly archeologically identifiable by 1000 years ago.

Subsistence during the later part of the Late Woodland among the Virginia Algonquians was based on the swidden farming of maize. Beans, squash, pumpkins, gourds, sunflower and tobacco were also grown. Corn contributed over half of the diet and was consumed by at least part of the population throughout the year. Maize is found throughout the mid-Atlantic by at least 1000 years ago and was used intensively by 700-800 years ago.

The most apparent and major change during the Late Woodland in the mid-Atlantic was the establishment of large villages with economies based on maize agriculture. It was during the latter part of this period that major changes in social and political organization occurred concurrently with this reliance on imported crops. Populations aggregated to form large, albeit often dispersed, villages as territorial and social boundaries became increasingly distinct and important. Evidence for intergroup and interregional hostility increased after 1400. The development and dynamics of chiefdoms and competition among them are some of the most compelling research issues for archeology.

Once archeological attention turns to historically documented periods, the whole tone of investigation changes in response to the often rich and always biased data that are available. Oddly, historical archeology tends to ask both more and less sophisticated questions than prehistory; this dual tendency is due, in part, to the difficult methodological issues of integrating, challenging, or confirming documentary data in addition to archeological data. Archeology of historic periods is neither easier nor superfluous, but it does require a somewhat different orientation and methodology than that of prehistory. Consequently, the section of the overview concerning the historical period is arranged differently from those preceding as it is assumed that the reader is familiar with the basic trends of the historic period.

The tobacco economy characterized 17th and early 18th-century European settlement in the Potomac Basin. The place of the English colonies within the world economic system was that of an economic periphery servicing the British economic core.

Tobacco and the trade and profit it engendered were major factors in the dispersion of plantations and people along the deep, navigable rivers of the Chesapeake drainage. The ease of water transportation made it possible for trade to take place at individual plantations and hampered the formation of towns and cities. Large plantations, however, served many of the functions of towns, including the location of crafts.

The variety and volume of domestic material at European American sites tends to increase through time, with relatively little found at 17th-century sites and more at 19th and 20th century sites. Even wealthy settlers in the early years of the colonies did not leave dense archeological deposits. The consumer revolution of the 18th century drastically changed the material world of the middle class and this transformation is clearly visible archeologically.

Previous Survey and Predictive Models

This section provides a chronological listing of some of the major professional survey within or adjacent to the Potomac Basin by physiographic region. Many small surveys, particularly those which have been undertaken for Section 106 compliance are not listed here. Work that has been undertaken in the units of the National Park Service within the National Capital Region is addressed in Part III of this plan: Status of Archeological Inventory.

Archeological sites can be anywhere; they often are found in unexpected places. Statistically, however, they are more likely to be in certain environmental settings than in others. It is this latter observation which fuels site predictive models. The former observation stands as a caution against overreliance on such models. Predictive site models rest on the assumption that there are fairly regular patterns of human settlement for any particular time period in a particular environment. These models begin with a hypothesized pattern drawn from known site locations and analogies with ethnographically-known societies. Confirmation is then sought through site survey.

A "red flag model" may be useful in the management of sites. For both land management and archeological needs, we need ways to identify sites which do not fall within predicted locations. The archeological value of such an approach is clear:

> Sites in anomalous settings by definition must be the result of behaviours that do not fit current models of why

> prehistoric inhabitants settled where they did. Under any definition, these sites must be significant, for they more than any others have the potential of telling us something about prehistory that was heretofore unknown [Altshul 1990:227-8].

With the understanding that predictive modeling should be approached with flexibility, I summarize some of the models that have been created from survey data for the different physiographic areas of the Potomac basin.

Tables II.11-II.14 summarize some of the predictive factors.

Archeological Issues

Throughout this overview, research topics in need of archeological study are identified. Traditional archeological interests in chronological control, subsistence, settlement pattern, and social organization need to be further addressed for nearly all periods throughout the Potomac Basin within frameworks of anthropological and historical questions. Economy is suggested as a comprehensive framework for forming and addressing questions for both the prehistoric and historical past. Specific research issues, of course, will be formulated for each particular project.

This section provides categories of issues and examples. Synopses of parks in Section III of the plan also include some examples of archeological issues.

INTRODUCTION

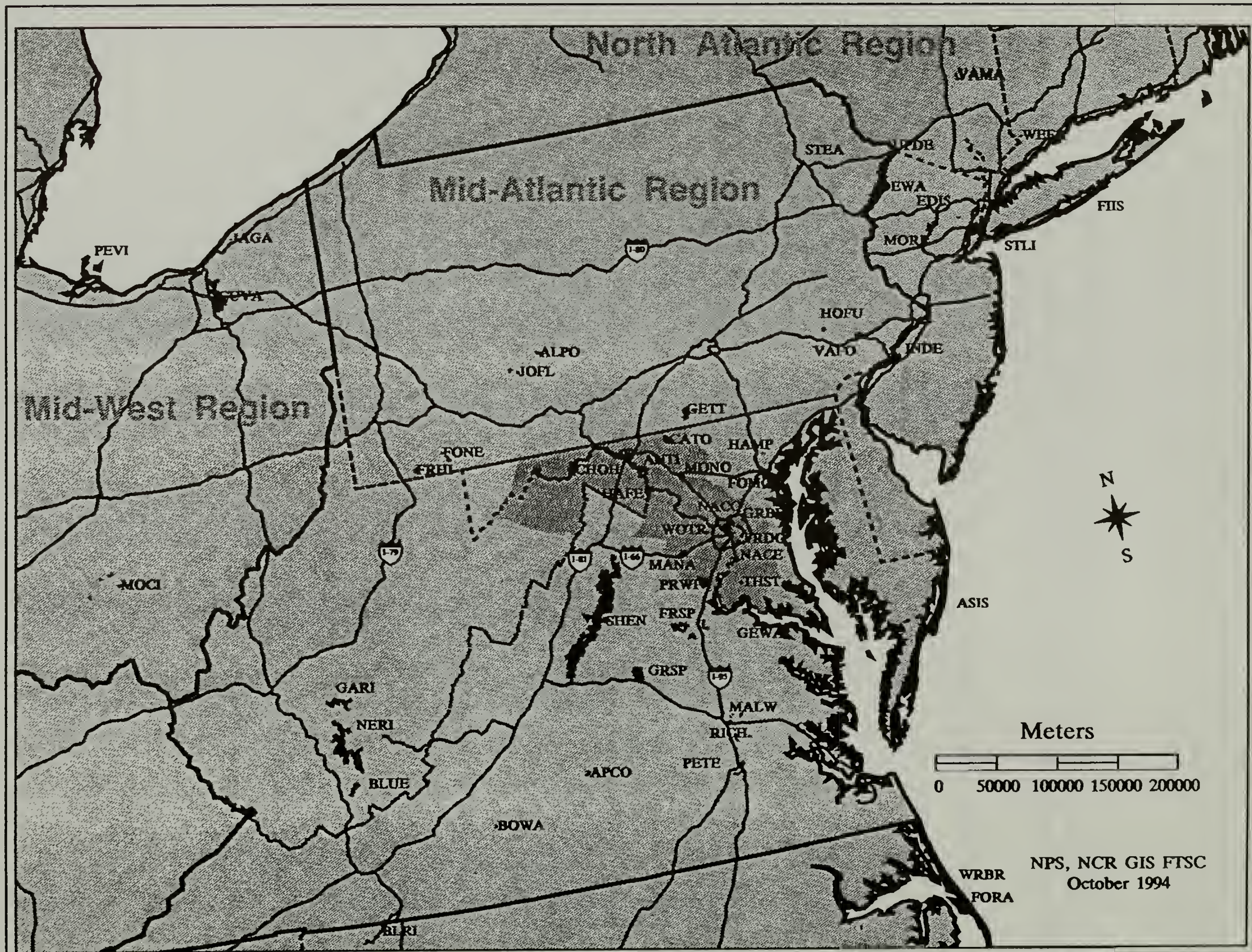

Fig.I.1. *National Capital Area (darkly shaded) of the National Park Service.*

INTRODUCTION

NATIONAL CAPITAL AREA

The National Capital Area (NCA), formerly the National Capital Region (NCR), of the National Park Service encompasses Washington, D.C. and environs within the drainage basin of the Potomac River (Fig. I.1). From the Occoquan River in Prince William County, Virginia to the source of the Potomac in Cumberland, Maryland to the mighty confluence of the Shenandoah and Potomac in Harpers Ferry, West Virginia, the parks in this region contain rich and diverse cultural and natural resources. Archeology within the region has provided far-ranging insight into human lives, from the earliest human immigration to the area 11-12,000 years ago, to the devastation of Native American displacement, to the wreckage of the Civil War, to industrial development.

Washington, D.C. is the city upon which the National Capital Area focuses. Within the immediate metropolitan area are the Virginia cities of Alexandria, Arlington, and Fairfax. The Metropolitan Statistical Area (MSA) of Washington, D.C. covers a much larger area, extending from Prince William and Stafford counties, Virginia to Frederick, Maryland (see Table I.1). Three other MSAs defined by census figures affect parks and visitation. These are Baltimore, Maryland; Hagerstown, Maryland; and Cumberland, Maryland/West Virginia. The following counties encircle or adjoin park lands: in Maryland: Anne Arundel, Charles, Montgomery, Prince Georges, Frederick, Washington, and Allegeny; in Virginia: Arlington, Fairfax, Prince William, and Loudoun counties and the city of Alexandria; and in West Virginia: Jefferson, Morgan, and Mineral.

Census figures from the past few decades reveal some important trends for the parks of the National Capital Area. Higher population, more visitation, and more visitor services all lead to higher impact on the resources and the increased need for good baseline data to inform management decisions about locating services and designing interpretation. Knowledge of the location and extent of archeological resources is an essential part of this baseline data.

Table I.1 summarizes population statistics for the four MSAs and central cities within the National Capital Area. Population growth has been particularly heavy in the metropolitan rings over the last few decades. Table I.2 summarizes recent demographic characteristics of the National Capital Area. Such information may help interpreters better understand their local audiences.

The purpose of this plan is to organize the state of our archeological knowledge of the region and to define strategies for identifying resources and discerning how they fit into our understandings of our heritage. The administrative background for its development is summarized below.

Table I.1. Population Statistics for National Capital Area.

	Washington DC-MD-VA	Hagerstown MD	Cumberland MD-WV	Baltimore MD
Metropolitan Statistical Area				
1990	3,923,574	121,393	101,643	2,382,172
Rank of 281 MSAs	7	231	259	18
Density (sq.mi.)	989.1	265	135	913
1990	3,250,921	113,086	107,782	2,199,497
Rank	8	228	242	15
1970	3,040,307	103,829	107,153	2,071,016
Rank	8	214	207	14
% change 1980-90	20.7	8.9	-5.7	8.3
% change 1970-80	6.9	8.9	0.6	913
% change 1960-70	37.1	13.8	0.6	14.8
Central Cities				
	Washington	Hagerstown	Cumberland	Baltimore
1990	606,900 (15.5% MSA)	35,445	23,706	736,014 (30.9% MSA)
Density (sq.mi.)	9,882.8	na	na	9108.0
1990	638,432	34,132	25,933	786,741
1970	756,668	35,862	29,724	905,787
% change 1980-90	-4.9	3.8	-8.6	-6.4
% change 1970-80	-15.6	-4.8	-12.8	-13.1

Table I.1. Population Statistics for National Capital Area.

	Washington DC-MD-VA	Hagerstown MD	Cumberland MD-WV	Baltimore MD
% change 1960-70	58.5	-2.2	-11.0	-3.5
density (sq.mi.) (1980)	10,396.2	3,792.4	3,241.6	9,735.7
Metropolitan Rings (MSA outside of central city or cities)				
	Outside DC, Frederick, MD and Arlington, VA			Outside Annapolis and Baltimore
1980	3,105,590	85,948	77,937	1,612,971
1980	2,431,804	78,954	81,849	1,381,016
1970	2,153,443	67,967	77,429	1,165,229
% change 1980-90	27.7	8.9	-4.8	16.8
% change 1980-90	12.5	16.2	5.7	16.8
% change 1960-70	58.5	24.6	5.9	34.8
density (sq.mi.) (1980)	881.9	177	110.3	640.2
Areas, in square miles				
1990 whole MSA	3,966.7	458.1	753.1	2,609.3
Central cities	DC: 61.4; Frederick, MD: 18.2; Arlington, VA: 25.9.	9.9	8.3	Baltimore: 80.8; Annapolis: 6.3

Table I.1. Population Statistics for National Capital Area.

	Washington DC-MD-VA	Hagerstown MD	Cumberland MD-WV	Baltimore MD
Per capita income, 1990 (based on resident population 7/1/88)				
	DC: 14,778 Frederick, MD: 12,874 Arlington, VA: 22,181 other: 18,292	city: 9,616 other: 11,035	city: 10,055 other: 9,267	cities: 10231 other: 15,362

Sources:
Bogue (1985); U. S. Bureau of the Census (1991).

Component counties for the Washington MSA are Washington, DC; Calvert, MD; Charles, MD; Frederick, MD; Montgomery, MD; Prince Georges, MD; Arlington, VA; Fairfax, VA; Loudoun, VA; Prince William, VA; Stafford, VA; Alexandria City, VA; Fairfax city, VA; Falls Church city, VA; Manassas city, VA; and Manassas Park city, VA.

The component county for the Hagerstown MSA is Washington, MD. Those for the Cumberland MSA are Allegeny, MD and Mineral, WV. Component counties in Maryland for the Baltimore MSA are Anne Arundel, Baltimore, Carroll, Harford, Howard, Queen Anne's, and Baltimore city.

Table I.2. Demographic Characteristics of National Capital Area, 1980 (1989).

	Washington DC-MD-VA	Hagerstown MD	Cumberland MD-WV	Baltimore MD
Metropolitan Statistical Area				
% black	27.9 (27.1)	4.2 (4.7)	2.0 (2.1)	25.6(26.1)
% Spanish	3.1 (3.4)	0.6 (0.7)	0.4 (0.4)	1.0 (1.1)
sex ratio[1]	93.3	99.0	81.8	93.4
% 0-14 yrs	21.3	20.8	[illegible]1.8	21.3
% 65+ yrs	7.5 (8.3)	11.9 (13.2)	14.5 (16.3)	10.1(11.1)
Central Cities[2]				
% black	69.7 (70.3)	5.7	3.4	54.8(57.5)
% Spanish	2.8	0.5	0.5	1.0
sex ratio	86.1	85.7	81.8	87.6
% 0-14 yrs	17.7	19.4	18.1	21.2
% 65+ yrs	11.6 (12.1)	16.1	20.4	12.8 (13.6)
Metropolitan Rings				
% black	16.5	[illegible].5	1.5	17.7
% Spanish	3.1	0.5	0.4	1.0
sex ratio	95.3	105.3	93.5	96.8
% 0-14 yrs	22.3	21.4	21.6	21.4
% 65+ yrs	6.5	10.1	12.6	8.6

Sources: Bogue (1985:719ff) Appendix Table 3: Demographic Characteristics of Standard Metropolitan Statistical Areas, Central Cities, and Metropolitan Rings: 1980.
U. S. Bureau of the Census (1991).

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[1] Sex ratio is expressed as the number of males per 100 females.

[2] Washington, D.C. only for the Washington MSA and Baltimore City only for the Baltimore MSA.

BACKGROUND OF THE SAIP PLAN FOR THE NATIONAL CAPITAL AREA

The Systemwide Archeological Inventory Program (SAIP), also known as the National Archeological Survey Initiative (NASI), was established in response to the identification of a material weakness in the Park Archeology Program, servicewide. The weakness stems from the fact that there is inadequate knowledge of archeological site location and therefore inadequate ability to protect and preserve these cultural resources. The weakness includes the following elements:

1. Destruction or unacceptable damage to significant archeological sites/structures from development, operations, resources management, visitor use, vandalism or natural/human disasters;

2. loss of significant and scientifically valuable artifacts due to development, operations, resources management, visitor use, vandalism or natural/human disasters;

3. loss of significant scientific knowledge due to destruction or damage to archeological properties; and

4. failure of park and regional programs development and execution to identify, prioritize, schedule and fund archeological inventory, evaluation and data recovery actions to prevent or mitigate the consequences of items 1 through 3, above.

The impact of this material weakness on Department operations is serious and long-term. The NPS is the lead Federal archeological preservation agency. Its program must be executed in conformance with the legislative and regulatory requirements for the preservation and management of archeological resources. Failure to do so results in the destruction and loss of significant scientific knowledge and damages the Department's creditability as the lead Federal Agency in the preservation, conservation and management of archeological resources.

The emphases of the inventory program include 1) a research orientation in keeping with the Vail Agenda (National Parks Foundation 1992); 2) a regional focus; that is, projects may involve several parks as well as projects within parks, and priorities are defined regionally rather than by the Washington Office; 3) the beginning of a process of restructuring archeology and bringing cultural resources to the level of natural resources in the parks in terms of training, funding, recognition, and professionalism.

The overall goal and objectives of SAIP are as follows (NPS 1992:2):

GOAL: Conduct systematic, scientific research to locate, evaluate, and document archeological resources on National Park System lands.

OBJECTIVES: 1. Determine the nature and extent of archeological resources in park areas.

2. Record and evaluate those resources, including nominating eligible properties for listing in the National Register of Historic Places.

3. Recommend appropriate strategies for conserving, protecting, preserving *in situ*, managing, and interpreting those resources.

Archeological survey and inventory of nearly all of the units within the National Capital Area is insufficient to ensure that archeological resources under NPS stewardship are conserved, protected, preserved *in situ* and managed for long-term scientific research and for appropriate public interpretation and education. Information about the location, characteristics and significance of the majority of archeological resources is lacking. This lack of information seriously impairs the ability of park managers, planners, interpreters, law enforcement officers and other specialists to carry out their responsibilities.

To meet the goal and objectives of SAIP, the following should be accomplished for each park unit:

1) overview and assessment of existing information, including literature and collections, on prehistoric and historic resources;

2) a field survey and Phase II test excavations to locate, identify, evaluate, and document archeological resources using the criteria of significance established by the National Register of Historic Places;

3) appropriate analysis of the data;

4) artifact processing, cataloging, stabilization, and curation;

5) updating and maintenance of appropriate records, including the Archeological Sites Management Information System (ASMIS) and a Geographic Information System (GIS) archeological data base;

6) report preparation; printing, and distribution;

7) public outreach and education.

Documents to be produced include Archeological Overview and Assessments, and Archeological Identification and Evaluation Studies. These documents, including an archeological base map, will provide information needed by park managers, planners, interpreters, law enforcement officers and other specialists to effectively carry out their responsibilities for the protection and interpretation of archeological resources.

The survey and inventory will partially fulfill certain requirements of the National Historic Preservation Act, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), the Archeological Resources Protection Act, and NPS-28, Cultural Resource Management Guideline.

The Systemwide program requirements and standards and the factors for priority ranking of projects are specified and explained in the SAIP document (NPS 1992). The requirements and standards are listed below. The priority ranking factors are discussed in section VI of this plan.

There are four systemwide requirements:

1. Archeological inventory activities are focused on areas within the National Park System.
2. Archeological inventory activities are focused on systematic research to locate, identify, evaluate, and document archeological resources.
3. As appropriate, the full sequence of necessary activities are planned, programmed, and undertaken in an archeological inventory project.
4. All appropriate and available NPS and non-NPS sources of funds, equipment, services, and personnel are used to undertake archeological inventories and to develop regionwide archeological survey plans.

There are ten systemwide standards:

1. Archeological inventory projects meet the requirements of the NPS's policies, guidelines, and standards.
2. Archeological inventory projects are conducted in accordance with a written, fully professional research design, approved by the regional office.
3. Archeological inventory projects are conducted using efficient and effective advanced technologies.
4. Archeological inventory projects are developed and implemented in cooperation with the appropriate State Historic Preservation Officers.
5. Archeological inventory projects are developed and implemented in consultation with appropriate Indian tribes and other contemporary native groups and ethnic populations.

6. Since evidence of past cultural systems extend beyond the boundaries of federally-owned or controlled lands and waters in National Park System area, whenever possible, archeological inventory projects collect and consider data from non-Federal lands and waters within park areas as well as from adjoining lands and waters.
7. Development and implementation of archeological inventory projects involve non-NPS archeologists and other specialists who have demonstrated competence in a particular culture, geographic region, park area, or advanced technology.
8. Data collected during archeological inventory projects are provided to park planners for incorporation, as appropriate, into park planning documents, and to park managers for resource managements, law enforcement, interpretation, maintenance, and other park operational purposes.
9. Archeological data collected during inventory projects are incorporated into Servicewide inventories, lists, catalogs, and databases.
10. The results of archeological inventory projects are made available, as appropriate, to the professional community and to the public.

For further information on the Systemwide Archeological Inventory Program, the reader is directed to the NPS document produced by the Anthropology Division, <u>Systemwide Archeological Inventory Program</u> (NPS 1992). Each park superintendent was provided with a copy of this document. Additional copies may be obtained from the Anthropology Division, National Park Service, P.O. 37127, Washington, DC 20013-7127.

I. DESCRIPTION OF PARK LANDS

NUMBER OF PARK AREAS

The park units within the National Capital Area total approximately 78,000 acres as of the end of 1993. These figures account for 8.9% of the parks systemwide and 0.1 of the acreage (NPS 1992).

PARK SIZE

Park units in the National Capital Area range in size from 0.29 acres of Ford's Theater National Historical Site to nearly 21,000 acres of the Chesapeake and Ohio Canal National Historical Park. Table I.3 lists the acreage for each park unit.

PARK TYPE AND ARCHEOLOGICAL VALUES IDENTIFIED IN ENABLING LEGISLATION

The types of NPS units in the National Capital Area are grouped as follows.

National Battlefield
- Antietam NB, MD - ANTI
- Monocacy National Battlefield, MD - ANTI (MONO)

National Battlefield Park
- Manassas National Battlefield Park, VA - MANA

National Cemetery
- Antietam National Cemetery, MD - ANTI (ANTC)
- Battleground National Cemetery, DC - NACC (BATT)

National Historic Site
- Clara Barton NHS, MD - GWMP (CBNHS)
- Frederick Douglass NHS, DC - NACE
- Ford's Theatre NHS, DC - NACC
- Pennsylvania Avenue NHS, DC - NACC
- Mary McLeod Bethune Council House NHS

National Historical Park
- C & O Canal NHP, MD/DC/WV - CHOH
- Harpers Ferry NHP, MD/VA;WV - HAFE

National Memorial
- Arlington House, R. E. Lee Memorial, VA - GWMP (ARHO)
- Francis Scott Key Memorial
- Franklin Delano Roosevelt Memorial Park - NACC
- Korean War Veterans Memorial - NACC
- Lyndon Baynes Johnson Memorial Grove, VA - GWMP

Lincoln Memorial, DC - NACC
Mary McLeod Bethune Memorial - NACC
National Law Enforcement Officers Memorial - NACC
Thomas Jefferson Memorial, DC - NACC
United States Navy Memorial - NACC
Vietnam Veterans Memorial, DC - NACC
Vietnam Woman's Memorial - NACC

National Monument
Washington Monument, DC - NACC

National Parkway
George Washington Memorial Parkway, DC/MD/VA - GWMP
Baltimore-Washington Parkway - NACE
Clara Barton Parkway - GWMP
Rock Creek Parkway - ROCR
Suitland Parkway - NACE

National Scenic Trail
Potomac Heritage National Scenic Trail

Park for the performing arts
Wolf Trap Farm Park, VA - WOTR

Park (other)
Catoctin Mountain Park, MD - CATO
Greenbelt Park, MD - CATO
Kahlil Gibran Memorial Garden
Theodore Roosevelt Island, DC - GWMP
National Mall, DC - NACC
Constitution Gardens, DC - NACC
National Capital Parks, DC - NACC
White House
Fort Washington Park, MD - NACE
Piscataway Park, MD - NACE
Prince William Forest Park - PRWI
Rock Creek Park, DC - ROCR

The enabling legislation for no park units in the National Capital Area mentions archeological values specifically. Some of the National Register listings for the parks list archeological values. Historic values are listed in the legislation for most of these park units (see Table III.1).

Table I.3. Description of Park Lands within the National Capital Area.

PARK	SIZE IN ACRES	PARK TYPE/ENABLING LEGISLATION	LOCATION/ JURISDICTION/ ACCESS	OWNERSHIP OF PARK LANDS	PHYSICAL ENVIRONMENT	NEIGHBORING LANDOWNERS
ANTI Antietam National Battlefield	3245 acre boundary (946 in fee; 865 private)	historic/ estb. 1890 to preserve battlefield	rural/ Washington Co, MD/easily accessible	865 ac. privately owned within 3245 acre boundary	Great Valley physiographic province	Sharpsburg, MD; private owners; memorial avenue from Sharpsburg to cemetery
ANTI (MONO) Monocacy National Battlefield	1659 acre boundary (600 in fee)	historic/estb. to preserve battlefield	suburban/ Frederick Co., MD/easily accessible	1000 acres privately owned within boundary	Piedmont	private owners
CATO Catoctin Mountain Park	5769 acres	recreation and buffer for Camp David/no enabling legislation: National Industrial Recovery Act	rural/ Frederick Co, Washington Co, MD/fairly easily accessible	no private lands within park	Blue Ridge physiographic province	Thurmont, Foxville, MD; Cunningham Falls State Park
GREE Greenbelt Park (was CATO, now NACE)	1176 acres	recreational/ no enabling legislation	suburban/Prince Georges Co, MD/easily accessible	no private lands within park	Atlantic Coastal Plain; primarily reforested tobacco farmland	private
Baltimore-Washington Parkway (was CATO, now NACE)	1400 acres	recreation/ parkway establishment	suburban/Anne Arundel, Prince Georges Co, MD/easily accessible	no private lands within park	Atlantic Coastal Plain (western edge)	private

Table I.3. Description of Park Lands within the National Capital Area.

PARK	SIZE IN ACRES	PARK TYPE/ENABLING LEGISLATION	LOCATION/ JURISDICTION/ ACCESS	OWNERSHIP OF PARK LANDS	PHYSICAL ENVIRONMENT	NEIGHBORING LANDOWNERS
CHOH Chesapeake and Ohio Canal National Historical Park	20,781 acres (13,000 fee, 1356 less than fee, 2640 private, 2527 public)	historical and recreational/ canal	urban, suburban and rural/ District of Columbia; Montgomery Co, Frederick Co, Washington Co, Allegeny Co, MD; Morgan Co, Mineral Co, WV/ generally accessible	>2600 acres private, >2500 acres public within park	Atlantic Coastal Plain, Piedmont Plateau, Blue Ridge, Ridge and Valley Province; mainly floodplain	Washington, DC; Brunswick, Williamsport, Cumberland MD; HAFE, ANTI, GWMP; Fort Frederick and Seneca State Park, Green Ridge State Forest, McKee-Beshers and Dierson Wildlife Management Areas
GWMP George Washington Memorial Parkway [includes all units]	7200 acres	historic and recreational/ parkway	urban/Fairfax Co, Arlington Co, VA; Alexandria, VA; Montgomery Co, MD/easily accessible	no private lands within park	Atlantic Coastal Plain, Piedmont Plateau	property bounded by well-developed neighborhoods and commercial centers
GWMP (ARHO) Arlington House	27.91 acres	historic/ Robert E. Lee memorial	urban/Arlington, VA	no private lands within park	Atlantic Coastal Plain	Arlington National Cemetery surrounds ARHO
GWMP (CBNHS) Clara Barton National Historical Site	1.09 acres plus 7.5 acre recreational	historic/ estb. NHL and NHS	suburban/ Montgomery Co, MD/easily accessible	no private lands within park	Fall Line between Coastal Plain and Piedmont	Glen Echo Park
GWMP Glen Echo Park	9.3 acres	cultural and recreation/no enabling legislation beyond Capper-Cramton Act	suburban/ Montgomery Co, MD/ easily accessible	no private lands within park	Fall Line between Coastal Plain and Piedmont	Clara Barton parkway, CBNHS, CHOH; U.S. COE Washington Aqueduct; Glen Echo, MD
GWMP (GRFA) Great Falls Park	800 acres	natural, cultural and recreational/ Capper-Cramton Act	urban/Fairfax Co, VA	no private lands within park	Fall Line between Coastal Plain and Piedmont	Fairfax County, VA; River Bend Park (Fairfax County Park Authority)

Table I.3. Description of Park Lands within the National Capital Area.

PARK	SIZE IN ACRES	PARK TYPE/ENABLING LEGISLATION	LOCATION/ JURISDICTION/ ACCESS	OWNERSHIP OF PARK LANDS	PHYSICAL ENVIRONMENT	NEIGHBORING LANDOWNERS
GWMP (TRI) Theodore Roosevelt Island	88.5 acres	natural, historic/ memorial to TR	urban/ Washington, DC	no private lands within park	Fall Line between Coastal Plain and Piedmont	Washington, DC
HAFE Harpers Ferry National Historical Park	2505 acres authorized boundary	historic/historical events at or near Harpers Ferry	rural/Jefferson Co, WV; Loudoun Co, VA; Washington Co, MD/from easily accessible to relatively remote	NPS owns 2300 acres; Baltimore & Ohio Railroad owns right-of-way within park	Blue Ridge and Short Hill Mountains; confluence of Shenandoah and Potomac rivers	Harpers Ferry, Bolivar, WV; B&O Railroad
MANA Manassas National Battlefield Park	5100 acres	historic/preserve battlefield	suburban/Prince William Co, Fairfax, Co, VA	FHWA and VDOT own highways within park	Piedmont upland	private; Conway Robinson State Forest; Sudley Plantation (Fairfax County Parks and Recreation Department); Bull Run Regional Park (Northern Virginia Regional Park Authority); Prince William County Park Authority: several community sites; Isaac Walton Park
NACC more than 300 park units (all units)	6,467.85 acres	historic	urban/ Washington, DC	no private lands within park	Coastal Plain	primarily other federal agencies, including DOD; Washington, DC; private land ownership

Table I.3. Description of Park Lands within the National Capital Area.

PARK	SIZE IN ACRES	PARK TYPE/ENABLING LEGISLATION	LOCATION/ JURISDICTION/ ACCESS	OWNERSHIP OF PARK LANDS	PHYSICAL ENVIRONMENT	NEIGHBORING LANDOWNERS
NACC: National Mall Lincoln Memorial Jefferson Memorial Vietnam Veterans Memorial Washington Monument Ford's Theater Historic Site Constitution Gardens Pennsylvania Avenue National Historic Sites East and West Potomac Parks 150 various park reservations						
NACE all units	>5000 acres	historic and recreation/ 1790 Federal City; Capper-Cramton Act	urban; suburban; Washington, DC; Prince Georges, Co., Charles Co., MD	varies with individual park units - much of land owned in fee	Coastal Plain	private; Washington, DC;
NACE: Anacostia Park (1200 acres) Capitol Hill Parks (27 acres) Fort Circle Parks (>400 acres) Fort Washington Park (341 acres) Frederick Douglass NHS (8.08 acres) Harmony Hall (65.71 acres) Kenilworth Park and Aquatic Gardens (500 acres) Oxon Cove and Oxon Hill Farm (485.2 acres) Oxon Run Parkway (100 acres) Piscataway Park (4216.53 -- 1464.56 in fee; 2421.02 in scenic easement) Sewall-Belmont House Suitland Parkway (587.79 acres)						
PRWI Prince William Forest Park	>17,000 acres	recreation/ National Industrial Recovery Act	suburban, rural/ Prince William County, VA/accessible to remote	no private lands within park	Coastal Plain, Piedmont	Quantico Marine Base; Quantico National Cemetery; Helwig County Park, Locust Shade park (Prince William County park lands)

Table I.3. Description of Park Lands within the National Capital Area.

PARK	SIZE IN ACRES	PARK TYPE/ENABLING LEGISLATION	LOCATION/ JURISDICTION/ ACCESS	OWNERSHIP OF PARK LANDS	PHYSICAL ENVIRONMENT	NEIGHBORING LANDOWNERS
ROCR Rock Creek Park	1754 acres	recreation/estb 1890	urban/accessible	no private lands within park	Coastal Plain and Piedmont	Washington, DC; private land
WOTR Wolf Trap Farm Park	130.28 acres (117.89 in fee; 12.39 scenic easement)	cultural/for performing arts	suburban/ accessible	scenic easement lands within boundary	Piedmont	private land
WHSE White House and President's Park	approx. 85	home and office of U.S. President; Lafayette Park is "People's Park"	urban	no private lands within NPS-administered land	Coastal Plain	Washington, DC and other federal lands, buildings; private land

PARK LOCATIONS AND ACCESSIBILITY

Many of the park units within the National Capital Area are in an urban or suburban setting and most are easily accessible by public roads. There are some areas of a few parks, such as Prince William Forest Park and the C&O Canal NHP, which are remote. Location and accessibility is summarized in Table I.3.

LAND OWNERSHIP AND NEIGHBORING PUBLIC LANDHOLDINGS

Land Ownership is summarized in Table I.3 as are neighboring public landholdings.

There are numerous lands held by federal, state, and local government entities other than NPS within the National Capital Area. Table I.4 summarizes the state-owned land. There are also many federally-owned parcels of land. Some large parcels are outside the area but are close enough to be of archeological interest. For example, the George Washington National Forest of over one million acres is located in the Blue Ridge of Virginia and West Virginia. Both the Shenandoah National Park and the Mason Neck National Wildlife Refuge are located in the Virginia Blue Ridge.

Near the George Washington Memorial Parkway is Fort Myer and Arlington National Cemetery, Washington National Airport, the Dalecarlia Reservoir (Corps of Engineers), the University of the District of Columbia, Potomac Overlook Regional Park, Alexandria Four Mile Run Park, and other parks in Alexandria and Arlington County, Virginia.

Near Rock Creek Park is the National Zoo, the Walter Reed Medical Center, the U. S. Naval Observatory, and the Naval Security Station as well as Maryland Rock Creek Park.

National Capital Parks - Central and National Capital Parks - East are near many other parcels of publically owned land, including that owned by the city of Washington. Near Anacostia Park are Maryland Anacostia River Park, Fort Lincoln New Town, the National Arboretum, and the Washington Navy Yard. Also near NPS land are the U.S. Capitol and grounds, the U.S. Naval Station. Bolling AFB, Naval Research Lab, St. Elizabeth's Hospital, Fort McNair on the Washington Channel and numerous federal buildings along the National Mall.

Table I.4. State-owned Land within or near the National Capital Area.

Location	Facility	Acreage
MARYLAND		
Anne Arundel	Globe Com WMA	207
	Jonas Green SP	6
	Buckingham SF	152
	Patapsco Valley SP	992
	Patuxent River NRMA	286
	Patuxent River NH	50
	Sandy Point SP	786
	Severn Run NEA	1759
Charles	Cedarville SF	2706
	Chapel Point SP	828
	Doncaster SF	1516
	Hughsville Pond FMA	3
	Mattawoman NEA	2504
	Myrtle Grove WMA	831
	Patuxent River NRMA	1331
	Purse SP	149
	Smallwood SP	629
	Zekiah Swamp NEA	443
Prince Georges	Belt Woods NEA	109
	Bowen WMA	313
	Cedarville SF	992
	Cheltenham WMA	10
	Merkle NRMA	1565
	Rosaryville SP	990
	Patuxent River NRMA	1969
Montgomery	Dierrsen WMA	40
	Islands of the Potomac WMA	483
	Matthew Henson SP	100
	McKee Beshers WMA	1971
	Monocacy NRMA	5
	Patuxent River SP	3179
	Seneca Creek SP	6290
	Strider WMA	267

Table I.4. State-owned Land within or near the National Capital Area.

Location	Facility	Acreage
Frederick	Brunswick Pond FMA	5
	Cunningham Falls SP	4961
	Frank Bentz Pond FMA	4
	Gambrill SP	1138
	Gathland SP	23
	Greenbrier SP	23
	Heater's Island WMA	194
	Islands of the Potomac WMA	29
	Lewistown FMA	24
	Monocacy NRMA	1988
	South Mountain SP	2421
	Urbana Lake FMA	60
	Washington Monument SP	33
Washington	A. M. Powell Hatchery FMA	66
	Brownsville Pond FMA	4
	Fort Frederick SP	852
	Fort Tonoloway SP	26
	Gathland SP	117
	Greenbrier SP	1290
	Green Ridge SF	0
	Indian Springs WMA	6363
	Islands of the Potomac WMA	6
	Round Top NH	137
	Sideling Hill WMA	2066
	South Mountain SP	6474
	Washington Monument SP	109
Allegany	Belle Grove WMA	356
	Billmeyer WMA	708
	Dans Mountain SP	481
	Dans Mountain WMA	8803
	Evitts Creek Pond FMA	6
	Green Ridge SF	39,347
	Islands of the Potomac WMA	80
	Rocky Gap SP	3025
	Savage River SF	230
	Sideling Hill WMA	950
	Warrior Mountain WMA	4315
	Wills Mountain SP	52
VIRGINIA		
Coastal Plain	Grist Mill Historical Park	acreages not available
	Mason Neck SP	
	Leesylvania SP	
	Caledon Natural Area	

Table I.4. State-owned Land within or near the National Capital Area.

Location	Facility	Acreage
Piedmont	Conway-Robinson SF Sky Meadows SP Lake Anna SP	400 not available not available
WEST VIRGINIA		
EASTERN GATEWAY REGION	Counties: Jefferson, Berkeley, Morgan, Mineral, Hampshire	
	Edwards Run WMA Fort Mill Ridge WMA Nathaniel Mountain WMA Shannondale Springs WMA Short Mountain WMA Sleepy Creek WMA Springfield WMA Widmeyer WMA Berkeley Springs SP Cacapon Resort SP	397 217 8875 623 8005 22,928 9459 422 4 6115

SP=State Park; SF=State Forest; NEA=Natural Environmental Area; NRMA=Natural Resource Management Area; WMA=Wildlife Management Area; FMA=Fish Management Area; NH=Natural Heritage Area. Acreages for land managed by Maryland's Department of Natural Resources are current as of August 1, 1993. Only acreage actually acquired is listed.

Compiled from Goodmuth et al. (1993); Virginia Department of Forestry (1994); Virginia Department of Conservation and Recreation (1994); West Virginia Division of Natural Resources (1992); West Virginia Division of Tourism and Parks (1993).

NATURE OF THE PHYSICAL ENVIRONMENT

> It is water, not politics, that unifies portions of Pennsylvania, West Virginia, Virginia, Maryland, and all of the District of Columbia.
>
> ICPRB 1986:3

The Potomac River, with a network of over 100 tributaries, is the principal waterway that drains 14,670 square miles. The basin of "The Nation's River" includes mountains, ridges, and highlands to form a natural drainage area. The Potomac basin is small compared with some others in the United States, but it is nearly unique in terms of its variability as it traverses five distinctive physiographic districts, starting as a trickle in West Virginia, traveling 383 miles to meet the Chesapeake Bay where its mouth is 10 miles wide (ICPRB 1986). This section of the plan is devoted to a brief description of the land which the Potomac drains and upon which the basin's inhabitants, from the earliest scattered bands to the current four million individuals, have lived their lives.

There are three sharply defined physiographic zones in the eastern United States paralleling the Atlantic shore from New England almost to the Gulf of Mexico. These are the Coastal Plain, Piedmont Plateau, and the Appalachian Province. The latter has three divisions: 1) the Blue Ridge district; 2) the Greater Appalachian Valley including the Great Valley (Hagerstown Valley in Maryland and Shenandoah Valley in Virginia) and the Allegheny ridges; and 3) the Allegheny Plateau (Vokes and Edwards 1974).

Figure I.2 shows the boundaries of these zones within the Potomac basin. Table I.5 shows the locations of parks or portions of parks in major physiographic regions.

Climatic conditions and even the physical characteristics of the land have changed over the past 12,000 years, presenting inhabitants with variable conditions. Each physiographic region exhibits some difference not only in topography but also in available food resources and raw materials such as stone and clay. For example, the Coastal Plain estuaries provided abundant fish, shellfish, and migratory birds before extensive environmental degradation affected those populations. Until tobacco cultivation and soil runoff began to silt up the rivers and streams, water transportation provided a means of considerable mobility on the Coastal Plain. The Fall Line which separates the higher Piedmont from the Coastal Plain has been an important location for exploiting anadromous fish runs. Among the many important stone resources available in the Piedmont and along the Fall Line is steatite. This material was carved into vessels and crushed for temper for the earliest ceramics in the region. The Blue Ridge, the Ridges and Valleys, and the Plateau of the Appalachian province contain much greater topographic relief and higher elevations than the Piedmont and Coastal Plain. The stone resource rhyolite, important in prehistoric mid-Atlantic trading networks, is found in the Blue Ridge. Coal deposits and natural gas fields in the Allegheny Plateau spurred intensive settlement during the 19th century.

Different resources available in different locations spur people to invent various ways of obtaining the materials they need or want. The boundaries of physiographic provinces or other aspects of the natural landscape may or may not act as social barriers. Migration, seasonal movement, trade, and hostility may flow back and forth, defined by history and cultural circumstance. For example, the Fall Line did not act as a cultural boundary until Woodland times.

Understanding human action within the context of the natural and social environment is an important goal of archeology. Therefore it is critical to archeological analysis and the public interpretation of its findings that both natural and cultural resources be considered.

Two sections follow. The first is a brief discussion of environmental parameters and constraints before modern conditions. The second is a more detailed, geographic description of the physiographic provinces within the Potomac Basin. It is provided here not only because such information is sometimes difficult to find, but also because it provides the interpretive staff in each park an idea of that park's natural setting in relation to other parks in the region. Because there has been traffic for thousands of years between these areas, it also provides some sense of the different circumstances people confronted prehistorically and historically.

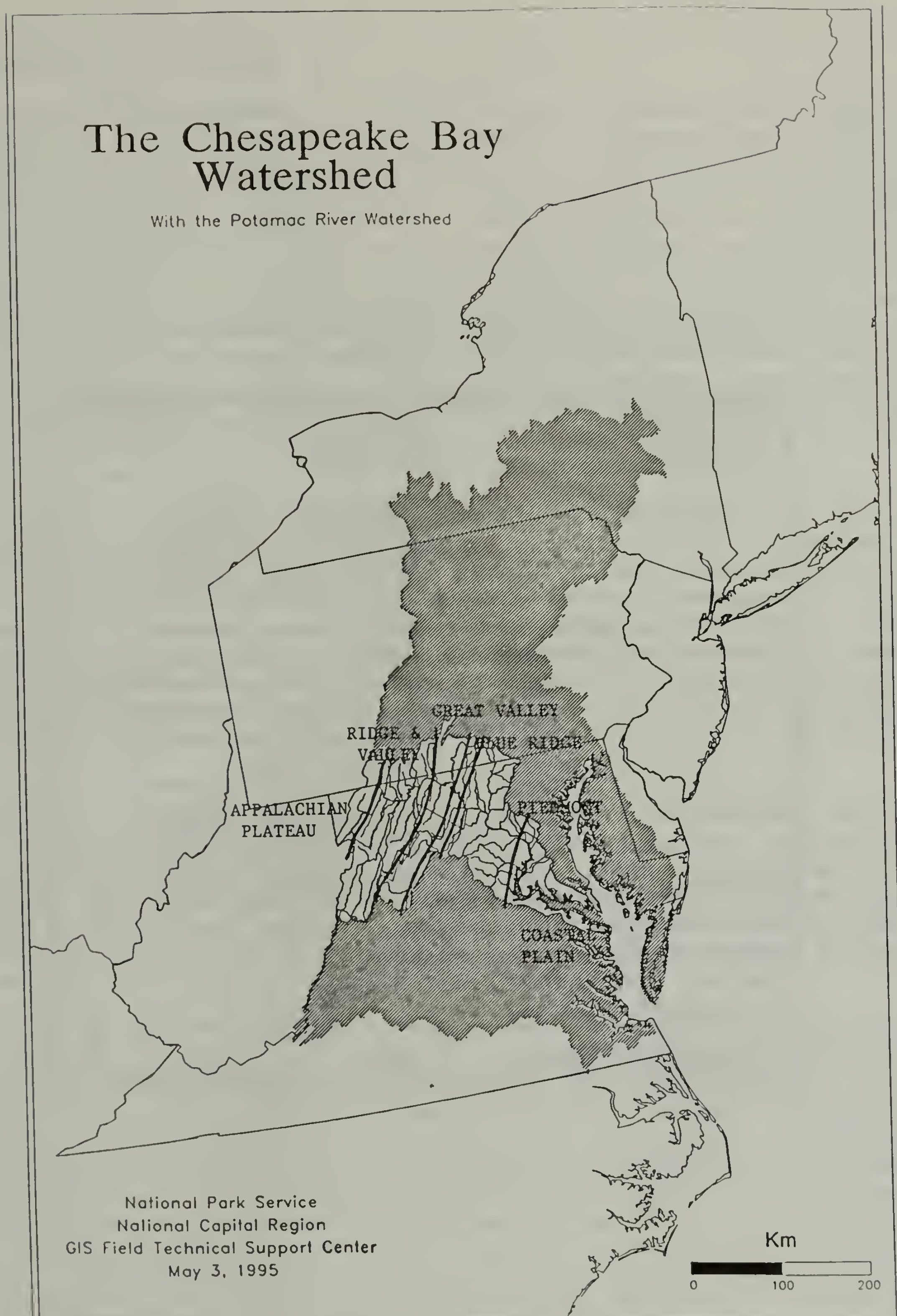

Fig. I.2. *Potomac River Basin showing Physiographic Divisions.*

Table I.5. Locations of Parks within the National Capital Area by Physiographic Region.

PHYSIOGRAPHIC PROVINCE	PARK UNITS OR PORTIONS OF UNITS
Coastal Plain	Greenbelt (CATO), BWParkway (CATO), CHOH, JFKC, GWMP, NACC, NACE, ROCR
Fall Line between Coastal Plain and Piedmont	CHOH, Great Falls (GWMP), Glen Echo (GWMP), Clara Barton NHS (GWMP), Theodore Roosevelt Island (GWMP), ROCR
Piedmont	CHOH, MANA, MONO, PRWI, ROCR, WOTR
Blue Ridge	CATO, CHOH, HAFE
Greater Appalachian Valley (Great Valley and the Allegheny Ridges)	ANTI, CHOH
Allegheny Plateau	CHOH

Environmental Parameters and Constraints

The overall environment in which humans operate is a complex interweaving of physical and social surroundings including perceptions, historical consciousness and future plans; and ideas and beliefs about metaphysical surroundings. In researching prehistoric environmental contexts, archeology generally is able to address only physical and social surroundings, and those with varying degrees of success. Interpretations of historical time periods often have the advantage of contemporary accounts of social and religious beliefs as well as observations on physical surroundings. Human participation in ecosystems must take into account other human groups, including the residue left behind by those already past. Except for the earliest inhabitants, all human societies live in surroundings somehow influenced by earlier human beings.

Much attention in archeology has been focused on physical environment partly due to the legacy of theoretical orientations such as environmental determinism and cultural ecology. Clearly, people live in a natural world and have to adapt to their surroundings. However, relatively little about human societies can be said to be environmentally determined in a strict sense. Although the physical environment provides both possibilities and limitations, these are always filtered through human technology, demography, cultural expectations and priorities, and other human needs.

In addition to amassing data to understand the natural world to which past people adapted, there is another reason for reconstructing environmental conditions. This second goal is to understand changing conditions so that archeological sites may be properly interpreted. Site formation and the effects on sites of natural processes such as erosion, alluvial and colluvial deposits, and chemical disintegration are important.

The form of the landscape itself is affected by changes in precipitation, prevailing winds, and river response to these as well as sea level changes. Dennis Curry and Carol Ebright (1989) and Ebright (1992; personal communication) describe large scale dissection of the Coastal Plain during the Holocene. Floodplains occupied by Paleoindian and Archaic people may today be situated on upland ridgetops due to this geological process. In addition to such large scale topographic changes are small scale changes on sites due to variable aeolian and alluvial affects on site burial, erosion, and deflation. In other words, archeological sites are transformed by many natural processes after material is deposited. Archeologists rarely encounter the "Pompeii effect" wherein a site is frozen in time with relatively unambiguous clues to people's activities.

The physical environment consists of more than climate, plants, and animals. The location, type, and quality of water; the quality of soil; and ambient sunshine are among those factors humans consider important about the physical environment. Raw materials such as stone, wood, and clay are crucial and the distribution of these affect the way people move across the landscape. It cannot be overemphasized that microenvironments, that is, small-scale environmental characteristics, affect specific site location and the duration of occupation.

The reconstruction of past ecosystems is a difficult but necessary task for understanding prehistoric and historic human adaptation. It is a major archeological issue especially for earlier periods, but it is always necessary to understand both general environment and microenvironment, even in recent historic contexts. The basic data are generally derived from soils, floral and faunal remains, pollen cores, and opal phytoliths (the crystallized remains of plant cells).

Victor Carbone's (1976) reconstruction of the paleoenvironment from data in the Shenandoah Valley has been one of the most widely cited sources by archeologists for interpreting past Potomac Basin climate and biomes. His data have often been extrapolated to inappropriate areas such as the Coastal Plain (Ebright, personal communication). Jeffrey Hantman (1989) reminds us that, although Carbone's work in the 1970s set a standard for paleoenvironmental reconstruction, there are more recent data and syntheses which should be incorporated into our interpretations of early adaptations.

Several researchers have addressed prehistoric climate, hydrology, geomorphology, and vegetation including COHMAP (1988), Steven Colman and Jeffrey Halka (1989a,b), Leonard Eisenberg (1978), John Guilday (1984), Arthur Joyce (1988), J. C. Knox (1983), John Kraft (1985), and J. McDonald and S. Bird (1986).

Hazel Delcourt and Paul Delcourt (1981, 1986, 1987, 1991), for example, have synthesized vegetation types in the Eastern United States since the last Ice Age. They provide a set of five paleovegetation and paleoclimatic maps from 18,000 BP to 500 BP. Modern pollen rain was characterized for major vegetational types so that paleovegetation could be classified. Climate was then inferred from vegetational data (Delcourt and Delcourt 1987). Table I.6 is a synopsis of the latter four maps.

Table I.6. Synopsis of Paleovegetation and Paleoclimate, 14,000-500 Years Ago (adapted from Delcourt and Delcourt 1987).

Period	Climate	Vegetation
14,000 BP Late Glacial time period	The Pacific Airmass of dry prevailing westerlies was the dominant airmass affecting climate.	Tundra existed north of the National Capital section of the mid-Atlantic in much of what is now Pennsylvania and New York. Boreal Forest characterized the area south of Pennsylvania approximately to the Carolinas.
10,000 BP Early Holocene time period North and East within the National Capital Area	In this area, the Polar Frontal Zone separates northern subpolar climates from southern temperate climates. "This climatic transition zone is characterized by several months of Arctic Air influence during the late winter and spring, followed by incursions of the Maritime Tropical Airmass bringing moisture in summer, and the Pacific Airmass dominating seasonally from autumn through early winter...Incursions of the Arctic Airmass, resulting in episodes of extreme winter cold ... kill all but the most cold hardy of deciduous forest species" (1987:100).	The ice sheet had retreated to Ontario and southeastern Quebec and Labrador. Northern Pennsylvania and New York were still in Boreal Forest. Much of the National Capital area was occupied by a mixed conifer-northern hardwoods forest.
South and West within the National Capital Area	The Maritime Tropical Airmass provided moisture through the spring and summer. The Pacific Airmass and the southern anticyclone has a comparatively weak influence in the fall and winter. "The southeastern evergreen forest region is under the influence of the Maritime Tropical Airmass nearly throughout the year and receives substantial moisture from both tropical depressions and hurricanes" (1987:100)	In the southern and western portions of Virginia there was deciduous forest.
6,000 BP Mid Holocene time period:	The Maritime Tropical air mass was the dominant airmass (see above for description).	The ice sheet disappeared and the boreal forest retreated to Canada's maritime provinces. Most of Maryland, Virginia, and West Virginia were in deciduous forest. The Delmarva peninsula (not then a peninsula) and southeastern Virginia were in southeastern evergreen forest.
500 BP Pre-European arrival time period:	The Maritime Tropical air mass was the dominant airmass (see above for description).	All of Maryland, all of Virginia except the westernmost portion, and the eastern edge of West Virginia were characterized by southeastern evergreen forest.

Such reconstructions continue to be refined and need to be done for localized areas. Joyce (1988) emphasizes that there is a trend in paleoecology toward understanding continuous change in the environment rather than focusing on episodes of climate. This development will affect archeological interpretations of human reaction to ecological factors.

One archeological (and paleoecological) problem is that of describing microenvironments within broad environmental reconstructions. To the human inhabitant, the environment is confronted on a human scale. It is a challenge to recognize the small-scale affects of broad change and fluctuations in past environments.

Another issue in reconstructing environments is one of compatibility and analogy to modern environments. For example, is what ways is what we would call a boreal forest today similar or dissimilar to a forest 10,000 years ago, which may also be labeled as boreal? In some cases there are no good modern analogues for some forest communities (Delcourt and Delcourt 1987:89).

An Overview of Chesapeake area climate during the past 10,000 years

Grace Brush (1986), a noted palynologist in the mid-Atlantic, summarizes the geologic and climatic history of the Chesapeake Bay area. Her climatic data consist of the pollen and seeds of terrestrial and aquatic plants, diatoms, chlorophyll, charcoal, and metals present in sediments. The following summary is taken from her work.

The lower sea levels during the Pleistocene are important for archeology because greater land masses were exposed and available for human use. Consequently, many sites formed prior to 5,000 BP are now underwater.

The Chesapeake Bay is the latest of several estuaries in the region over the last several million years. At 10,000 BP ocean waters began to flood the mouth of the old Susquehanna River, that is, what is now the mouth of the bay. Sea level rose approximately 0.2 cm/yr. At 8,000 BP the head of the Bay was at Smith Island; 5,000 BP the head of the Bay was at Annapolis; 3,000 BP the head was at the mouth of the Sassafras River. About 3,000 BP the rate of sea level rise began to decline to 0.12 cm/yr and the Bay reached its present configuration, which is probably its maximum extent.

The climatic history is constructed with radiocarbon-dated sediments. At 15,000 BP (13,000 BCE) the pollen of spruce, pine, and fir with some birch and alder indicates a climate 3-8 degrees colder than the present. At 10,000 BP (8,000 BCE) oak became abundant, temperatures increased, followed by an increase in hemlock and hickory. At 5,000 BP (3,000 BCE) there was modern vegetation but abundances fluctuated with climatic variation.

A continuous record for 4,000 years from Magothy River pollen cores shows major shifts in wet and dry periods. For 1,300 years from 2,750-1,450 BCE (4,750-3,450 BP) the forest was dominated by black gum and sweet gum with river birch and ferns, indicating a wet climate. The great abundance of pollen may indicate more and larger trees and high biomass production. There is a sharp drop off of these dominant trees after 1,450 BCE. From 400 until 1,600 CE there are more dry plants such as holly, chestnut, and ericateous shrubs. From 40 - 1,700 CE there are significant oscillations in abundance of dry taxa. For example, from 400-500 CE and 1,000-1,200 CE holly and chestnut more abundant than in intervening or subsequent periods. A core from the Nanticoke River indicates a pronounced dry period from 1,000-1,200 CE when there is a high ratio of dry (oak, hickory, pine) to wet (river birch, sweet gum, black gum) taxa. Sediments indicate that this dry period was characterized by intermittent fires.

Over the last 200 years records from Philadelphia indicate that precipitation has been high from the mid-1800s to the late 1800s and dry from the late 1800s to about 1940. Brush notes the great effect of European populations on the Bay. Human effects include increased siltation from erosion with intensified land use; nutrients from fertilizers and sewage; toxic materials; and the alteration of wetlands areas by channelization and dam building for reservoirs.

It is important to acknowledge that humans have had impact on the natural environment before the historical period. Delcourt and Delcourt (1991:87) summarize fundamental affects of human activity on vegetation over the last 10,000 years. The evidence to support these interpretations comes from the archeological and paleoecological record in eastern North America. They summarize:

> Prehistoric Native Americans (1) changed the dominance structure within forest communities... (2) extended or truncated the distributional ranges of both woody and herbaceous plant species... (3) provided disturbed open areas including agricultural old-fields into which native ruderals invaded and subsequently became weeds... and (4) changed the proportion of forested to non-forested land through time, progressively creating a culturally maintained landscape mosaic.

Further environmental details are provided for each time period in the chronological overview below. Following is some further information on the geography of the Coastal Plain, Piedmont, and Appalachian physiographic provinces.

Coastal Plain

The Coastal Plain is the terrestrial section of the larger Atlantic Plain which also includes the submerged Continental Shelf. A series of southeastern dipping layers of largely unconsolidated sand and clay with some gravel is superimposed on the continuation of crystalline Piedmont rocks. This Coastal Plain slopes gently at about 2-4 ft per mile, although the gradient tends to be steeper inland. Where the land surface lies above stream grade it is dissected into gently sloping hills. The Coastal Plain is often divided into the Inner Coastal Plain and the Outer Coastal Plain, based on the limits of tidal action in streams and rivers. The embayed section of the Coastal Plain is deeply endented by bays or estuaries. From the Hudson to the Potomac this lowland ranges from 5 to 20 miles wide and abuts in places with the steep slope of the Piedmont. From the Delaware to the James, major rivers are offset at the Fall Line between the Coastal Plain and the Piedmont. That is, when the rivers reach the Coastal Plain they turn and follow its inner edge before crossing to the ocean. The Potomac, for example, turns south at Little Falls and hugs the bluffs until, about 40 miles south of Washington, it turns east again (Fennemen 1938).

The surface of the Coastal Plain is terraced south of the glacial border. While geologists do not agree about the origins of the terraces, they generally agree that the oldest gravels, the Brandywine terrace, were deposited by freshwater streams and that those of the youngest, the Talbot, are of marine origin. The highest and oldest terraces are adjacent to the Piedmont. Harold Vokes and Jonathan Edwards (1974) describe a series of four. The Brandywine, between 200-300 ft asl, probably deposited by the ancient Potomac River, has a maximum thickness of about 40 ft. It consists of well-rounded pebbles of erosion-resistant rock-like quartzite, hard sandstone, and chert fossiliferous pebbles. Three terraces date from interglacial intervals. The oldest of these is the Sunderland, from 90-200 ft asl, forming the upland in southern Charles and most of St. Marys and Calvert counties. The Wicomico, from 45 to 90 ft asl, is most extensive on eastern shore and is only scattered on the western shore. The Talbot or Pamlico is from 10-45 ft asl and is widely developed on eastern shore. On the western shore it is developed along the Potomac in Charles and St. Marys counties, from the lowlands of the Patuxent River from Upper Marlboro to its mouth; along Chesapeake Bay between Point Lookout in St. Marys County and Cove Point in Calvert County and from Deale to the mouth of the Susquehanna.

The boundary between the Coastal Plain and the Piedmont is ill-defined as the softer unconsolidated Cretaceous formations overlay the southeastern sloping hard crystalline Piedmont rocks. The boundary is clear in stream valleys where the erosion of softer formations has created dramatic rapids and waterfalls over the crystalline rocks at the eastern edge of the Piedmont. The boundary is called the Fall Line due to this unmistakable characteristic. At Great Falls, for example, the Potomac plunges about 100 ft as its form changes from a broad, shallow, placid river in a wide valley to a narrow, deep, swift river in a steep, rocky gorge (Fisher 1971).

Streams in the Coastal Plain flow sluggishly, winding their way to the Bay. The limit of navigability has been moved downstream significantly due to siltation. Bladensburg, Maryland was once a port for ocean-going vessels as was Dumfries in Prince William County, Virginia and Elkridge Landing on the Patapsco west of Baltimore.

Coastal Plain soils tend to be sandy or silty with a very light to medium texture. They are well-drained except in low-lying lands with a high water table or where hard-pan has been developed. They are usually acidic and, in modern times, need the application of lime to be agriculturally productive (Vokes and Edwards 1974:137).

On the Coastal Plain pines are the most abundant tree. Virginia Pines and scrub oak are dominant secondary growth; pre-European forests would have had much more diversity (Ebright, personal communication). A distinct swamp hardwood forest consists of pine, willow, swamp oaks, red and black gums, red maple, river birch, yellow poplar, sycamore, beech and walnut (Vokes and Edwards 1974:168).

Regarding the fauna witnessed by early European settlers, "A Relation of Maryland" published in London in 1635 reported:

> The woods are free from underwood, so that a man may travell on horseback almost anywhere...In the upper parts of the countrie there are bufaloes, elkes, lions, bears, wolves. And deare there are in great store, in all places that are not much frequented, as also beavers, foxes, otters and many other sortes of beastes. Of birds, there is the eagle, goshawk, falcon, lanner, sparrow-hawk and merlin; also wild turkeys in great aboundance, whereof many weigh fifty pounds and upwards, and of partridge plenty. There are likewise sundry sorts of birds which sing, whereof some are red, some blew, others blacke and yellow, some like our blackebirds, others like thrushes, but not of the same kind, with many more for which we know no names [quoted in Vokes and Edwards 1974:174].

Lithic resources available on the Coastal Plain are limited to secondary sources. Cobbles and gravels in stream beds include jaspers, cherts, and other cryptocrystallines as well as quartz. In the Outer Coastal Plain, available cobbles are larger downstream. From Nomini Bay to the Chesapeake there tend to be cobbles larger than about 4 inches in diameter of quartz and quartzite and less chert and yellow jasper. Smaller cobbles of 1 to 4 inches are present from Mathias Point to Nomini Bay (Bromberg 1987:34-42).

Mineral resources in the unconsolidated deposits of the Coastal Plain include iron ore and clay, including red hematitic clays mined as "paint ores." Iron ore was recognized by John Smith and was used for local needs as early as 1681. Brick clay, pottery clay and kaolin are available in different localities. Other minerals exploited in the historic period include gold and chromium (Vokes and Edwards 1974; Ebright, personal communication).

Piedmont

The seaward boundary of the Piedmont physiographic zone is the Fall Line, which is generally only a few miles wide. North of the Potomac, the steeper element of the stream profile has receded upstream often. The Susquehanna falls 80 ft in 12 miles and reaches tidewater at Port Deposit, Maryland 3 miles back from the edge of the Piedmont. The Potomac falls 40 ft in 3 miles, beginning 10 miles above Washington, DC. For the most part the slope of the Fall Line does not exceed 30 ft per mile but in Washington, DC it exceeds 100 ft per mile. South of the Potomac falls have receded little. For example, the Rappahannock drops 40-50 ft in 2 miles and reaches the tidewater at Fredericksburg where crystalline rocks are exposed. The James falls 84 ft in 3 miles, ending at Richmond. For most of the area south of the Potomac, the edge of the Piedmont is not a strongly marked topographic feature (Fennemen 1938:128-129).

The Piedmont is characterized by a broad undulating surface with low knobs and ridges and numerous incised deep and narrow stream valleys. Low hills increase in elevation from the Fall Line west and culminate in Parrs Ridge, which rises several hundred feet with an average elevation of 800-900 ft. Parrs Ridge attains 1100 ft in northern Carroll County and southern Pennsylvania, but declines southward to lowland heights at the Potomac River. Parrs Ridge forms the divide between streams flowing into the Chesapeake Bay and those that flow into the Potomac, dividing the Piedmont into eastern and western geologic divisions. The Eastern Piedmont is underlain by a complex series of metamorphosed rocks (gneiss, slate, phyllite, schist, marble, serpentine, granite, gabbro). The varied erosion-resistance of these rocks gives rise to a highly diversified topography. Streams in the Eastern Piedmont have steep gradients with rapids and small waterfalls (Vokes and Edwards 1974:56). This Eastern district, also known as the Piedmont uplands, is the largest part of the province and is drained by the Potomac River.

The Western district, or Piedmont lowlands, is underlain in the eastern part by rocks similar to those in the Eastern Piedmont but less strongly metamorphosed. Within the western district is the valley of Frederick County, which is underlain by Cambro-Ordovician limestone. Over this folded base lie red Triassic sandstones, shales, siltstones of Newark group. Most of the drainage of the Western Piedmont is by the Monocacy River.

Streams in the Piedmont tend to run in narrow valleys with steep banks. Their long and winding courses crosscut geological formations rather than follow them. Streams in both the Piedmont and Appalachian have fairly steep slopes and rocky beds with numerous rapids and gorges. In the Piedmont, pore space available for ground water in recrystallized metamorphosed rock is very small; therefore the only openings through which water may move are joints and other fractures. As a result the amount of water from wells in Piedmont depends on local conditions, especially the fracturing and openness of rock (Vokes and Edwards 1974).

Although different formations in both the Piedmont and Appalachian provinces create different soil types, some generalization is possible (Vokes and Edwards 1974). Residual soils developed on limestone terraces especially in the Frederick and Hagerstown valleys tend to be of medium to heavy texture, slightly acidic and moderately permeable. Usually subsurface drainage is good. Residual soils developed on acid schists, gneisses, phyllites, and metabasalts of Piedmont are of medium textures, slightly to moderately acidic, moderately permeable, easily tilled, and with high natural fertility. On slopes soil tends to be shallow, gravelly to shaly, and subject to droughtiness. Residual soils on serpentine tend to be dark brown with yellowish brown clayey subsoil that becomes hard and intractable when dry and relatively impermeable when wet. Surface drainage tends to be strong and therefore erosion is often a problem. Residual soils of gabbros, locally "red lands," are heavily textured, moderately permeable, and have high natural fertility. These soils may be surprisingly deep. Soil developed on red sandstones of Triassic strata of Frederick Valley and of Upper Devonian Hampshire formation in western Washington, Allegeny and Garrett counties is of a deep reddish brown color. While the surface may be grayish to yellowish brown, subsoils always have the characteristic deeper tint. The texture is light except where shales are, then it is moderately heavy. Permeability and drainage are good except over shales and acidity is high (Vokes and Edwards 1974). The soils in karst areas of the Hagerstown Valley are typically red "terra rossas." Karst geology has implications for settlement patterns due to associated springs, karst ponds, odd drainage patterns, and dry sinkholes and caverns (Ebright, personal communication).

Vegetation associations correlate well with geology due to the nature of soil formation. The major separation in the Piedmont is between wet bottomland and dry upland assemblages. The bottomlands support a sycamore-green ash-box elder-silver maple association with red maple, white oak, flowering dogwood, grape and black cherry, and black walnut. River birch is rare except along the Potomac where river birch and sycamore grow along the floodplain into the Appalachian province. The Upland forests contain a chestnut-oak association with black cherry, pignut hickory, and sassafras over a subcanopy of serviceberries, blueberries, and American Chestnut (Wesler et al. 1981:Vol.3:11).

The crystalline rocks of Piedmont include granite, gneiss, gabbro, serpentine, marble and slate. Soapstone (talc and steatite) is found in Carroll, Harford, and Montgomery counties. Mica is abundant in the eastern Piedmont (Vokes and Edwards 1974:128-129). Prehistorically, the most important lithic outcrops were of quartz, steatite, and talc. Cobbles and pebbles provide secondary sources of lithic raw materials in most of the eastern Piedmont. Material available from cobbles includes rhyolite, chert, jasper, quartzite, quartz and sandstone (Barse 1982:4).

Mineral resources include 1) iron mineral pigments such as yellow ochre; 2) gold and silver; 3) copper; 4) lead and zinc; 5) chromium; and 6) manganese, molybdenum, and titanium. Quarries in the historic period were operated for granite, gneiss, gabbro, marble and limestone, limestone breccia, serpentine, quartzite, sandstone and slate. In the later 18th century brown iron ores were found in the Piedmont and Appalachian provinces and furnaces were erected. Available clays include common brick clay in the weathered shales of the Piedmont and Appalachian and ball clay (Vokes and Edwards 1974).

Appalachian Physiographic Province

The Appalachian province is split into three divisions: the Blue Ridge district; the Greater Appalachian Valley with the Great Valley and Allegheny ridges; and the Allegheny Plateau. A few observations about the province as a whole precedes those on the individual divisions. The discussion of soils in the previous section is applicable here and will not be repeated.

Streams, as noted for the Piedmont, have fairly steep slopes and rocky beds. In the Blue Ridge, most streams are tributaries of larger streams in the Piedmont or in the Ridge and Valley province. All streamflow in the basin from west of the Blue Ridge flows through the gap at Harpers Ferry (ICPRB 1986). Numerous rapids and gorges were used early by European settlers for grain and cotton mills.

The relatively small amount of pine in the Piedmont and Appalachian is mostly Virginia Pine, except in the western part of Appalachian where there are stands of mixed hardwoods and white pine and some pure stands of white pine. In western Maryland the ridges support scarlet oak and chestnut oak, mixed with pines. On the upper slopes are black, white, chestnut and scarlet oaks; the lower slopes are in white and red oak, hickory, and tulip trees. Bottoms support ash, elm, maple, willow, sycamore, with white and red oak, hickory, and walnut. Before the Chestnut blight, Chestnut was dominant tree over much of the state, especially in South Mountain and Catoctin Mountain where forests were about half chestnut (Vokes and Edwards 1974).

As in the Piedmont, the major separation in vegetation is between wet bottomland and dry upland forests. In the lower elevations bottomlands support a sycamore-green ash-box elder association while higher elevation bottomlands support hemlock-birch forests. On the Potomac floodplain a river birch-sycamore association extends from the Piedmont west to Allegeny county. In the uplands chestnut-oak is associated with drier soils and sugar maple-bass with wetter soils (Wesler et al. 1981:Vol.4).

Washington County, Maryland is a transition zone between Alleghenian and Carolinian faunas. Maryland in general has more northern than southern fauna with a few distinctly southern species such as the southeastern shrew, harvest mouse, and spotted skunk (Wesler et al. 1981:Vol.4)

The lithics useful to prehistoric populations available in the Appalachian province in western Maryland include rhyolites, which are most widely developed on the western side of the Middletown Valley in the Blue Ridge; Weverton quartzite, which outcrops at the crests of Catoctin and South Mountains; chert, which is abundant in the Hagerstown Valley dolomite formations, and the Keyser limestones and the Shriver formations near Cumberland (Wesler et al. 1981:Vol.4)

Blue Ridge District. The Blue Ridge is a belt of mountains 8-10 miles wide in the Potomac basin west of the Piedmont. North of the Potomac River there are crystalline rocks in the mountains and softer rocks in the adjacent Piedmont. From the Susquehanna to Roanoke the mountains form a narrow strip 12 to 14 miles wide of rounded knobs of varying altitudes. The only well-defined axial crest is near the Potomac where the belt contains three definite parallel ridges. The altitude of the Blue Ridge is about 2000 ft at the Pennsylvania-Maryland border, declining to 1200-1300 ft before the Potomac. There is a broad sag in the summit levels near the Potomac; about 7 miles south of the river altitudes rise to 1500 ft and increase slowly and irregularly to the south, ranging up to 4000 ft (Fenneman 1938:164-186).

The Catoctin and Blue Ridge (or South) mountains unite to form the greater highland of South Mountain in southern Pennsylvania. The eastern border in Maryland is Catoctin Mountain, which forms an unbroken ridge from Pennsylvania to the Potomac River at Point of Rocks. West of the ridge is Middletown Valley, which drains to the Potomac through Catoctin Creek. The western side is South Mountain. The Blue Ridge proper extends from Pennsylvania's South Mountain to the Potomac River at Weverton. Virginia's Blue Ridge is not a direct continuation of the Blue Ridge but continues the Elk Ridge, which joins the South Mountain of Maryland on the west and reaches the Potomac at Harpers Ferry (Vokes and Edwards 1974:69).

In the eastern part of the province, that is, in the Blue Ridge area including Catoctin and South Mountains, Elk Ridge, and the Middletown Valley, most water comes from springs and seeps and there are few wells. In the western part springs are common and shallow wells usually reach the water table, while deep wells reach artesian conditions (Vokes and Edwards 1974).

The heavy underlying rocks of Catoctin and South Mountains and most of the ridges west of Hagerstown valley are resistant to weathering and tend to break into blocky fragments that mix with soil materials to produce cobbly and channery soils on hill slopes and valley margins (Vokes and Edwards 1974:149).

Blue Ridge lithic resources include quartz, quartzite, metarhyolite, greenstone, and jasper (Stewart 1983).

Greater Appalachian Valley. This area is also called the "Valley and Ridge" district. It is a lowland surmounted by long, narrow, even-topped ridges with valley floors trenched by streams (Fennemen 1938:196). It consists of land west of the Blue Ridge to Dans Mountain or the Allegheny front. There is a two-fold division into the Great Valley in the east and the Allegheny ridge in the west. The Great Valley is called the Cumberland Valley in Pennsylvania, the Hagerstown Valley in Maryland, and the Shenandoah Valley in Virginia. It consists of broad lowlands with a gently rolling floor underlain by thick series of limestones and shales in the more western part. The average elevation in Maryland of 500-600 ft this increases from the Potomac to Pennsylvania. The Hagerstown Valley extends from the western foot of South Mountain and Elk Ridge highlands to Powell and Fairview Mountains on the west. It is drained by Antietam creek in the east and Conococheague creek in the west, both of which originate in Pennsylvania and flow towards the Potomac. There is little relief in the valley.

The Allegheny Ridges lie between the Great Valley and Allegheny front. These are a series of northeasterly trending ridges and valleys eroded into weaker shale and limestone. They are distinctive for the even level of ridges (Vokes and Edwards 1974:69).

The physical characteristics of the Valley and Ridge province are connected with its drainages. Streams follow beds of soft rock and cross hard rock through water gaps at right angles. Fennemen (1938) notes that the features which characterize this district are best displayed between the Susquehanna and the James Rivers where the mountains are most nearly parallel, most even-crested, most continuous, and with the most frequent alternation of ridges and valleys.

Allegheny Plateau. The eastern margin of the Allegheny Plateau is the Allegheny front. In Maryland this is Dans Mountain; in West Virginia, Virginia, Kentucky, Tennessee, and northern Alabama it is the Cumberland Plateau.

Streams flow south or east to the Potomac, although part of the plateau is drained north through the Youghiogheny into the Monongahela. Much of Garrett County, Maryland drains to the north (Vokes and Edwards 1974:71). Many streams are swift-flowing and are usually short, without floodplain development. There is significant stream terrace development along the North Branch of the Potomac and near the mouths of larger tributaries (Wall 1981:6). Glades are poorly drained upland meadows at the headwaters of many creeks.

The Allegheny Plateau supports the most diversified fauna in the state of Maryland. However, since 75% of the species and subspecies are common between the Plateau and the Eastern Shore, it is apparent that fauna are reasonably consistent from west to east across the Potomac basin (Wesler et al. 1981:Vol.4).

In contrast to the abundant lithic resources of the adjacent Ridge and Valley district, there are few good lithic resources for stone tool use, although there are some outcrops of blue-grey chert. There is also marble and limestone throughout the Appalachian as well as the Piedmont (Vokes and Edwards 1974:119). Clays are also available in the area. In the historic period flint clays have been mined in Allegeny county since 1841, mainly from the Mount Savage clay bed in the upper part of Georges Creek basin (Vokes and Edwards 1974:127).

The most distinctive resource in the Allegheny Plateau is coal deposits in western Allegeny and Garrett counties. These deposits are part of the Appalachian coal region which stretches from Pennsylvania to Alabama. In the western part the coal beds are approximately horizontal while in the east they are folded. Consequently, there is a grading from west to east in coal quality. Soft bituminous coal is found in the west; semi-bituminous "smokeless" coal is found in the central area; hard anthracite coal fields are in the east. The coal basins in Maryland are in Georges Creek, Upper Potomac, Castleman, Lower Youghiogheny, upper

Youghiogheny. Natural gas fields are in the same general area as coal (Vokes and Edwards 1974).

II. REGIONAL OVERVIEW

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INTRODUCTION: WHAT ARCHEOLOGY IS

This introduction provides some comments on the discipline of archeology to orient both archeologists and non-archeologists to the concepts that underlie the overview in this plan. A glance at the Table of Contents will reveal the structure of this overview.

> While archaeology may in a sense be the past-tense of anthropology, it is not the past-tense of anthropology alone.
>
> Renfrew 1982:4

> In studying prehistoric societies, the archaeologist dealing with goods is not examining the 'debris' or the 'material residue' of culture, but instead a very real part of culture -- the visible part.
>
> Wells 1992:176

> On a map of the sciences, archaeology would be a border state between the natural and social sciences. It is like a social science in that the objects of interest are people, human culture and artifacts created under the influence of ideas and social norms . . . archaeology is also like a natural science in that its focus in on the *material* remains of people in the past and on their relation with the natural environment.
>
> Kosso 1991:621

In the United States archeology is considered part of the broader discipline of anthropology, literally the study of humans. As anthropology developed in this country in academic and museum settings through the 19th and 20th centuries, all of its sub-specialities were closely tied to the study of native American peoples. Ethnography and ethnology were concerned with documenting and comparing contemporary, living societies; anthropological linguists recorded native languages; biological anthropologists studied and compared physical characteristics of peoples; archeologists investigated the tangible remains -- the artifacts and architecture -- of past societies.

Anthropology as a profession has, of course, expanded to study far more than native peoples and archeology is concerned with much more than objects. What Lord Renfrew meant by the first remark quoted above is that because archeology is concerned with the remains of what has gone before, it is relevant to a whole range of fields, since many fields of study have tangible remains that may inform about the past. Such fields include architectural history, cultural landscape studies, and history. The link among all the remains studied by archeologists is an interest in past human activity.

Archeology as a study has the advantage of time depth and a breadth of data for comparisons. The material remains which survive for archeological study are varied, yet they obviously cannot represent the whole of a living culture. Even though the material remains are partial remains they are not inconsequential, but are the remains of human action and intention. Archeology relies to a great extent on insights and methods developed in the natural sciences. The formation, preservation, and degradation of archaeological sites and their contents are only understood by applying geology, soil science, hydrology, chemistry, and the like.

It is commonly accepted that the three main goals of archeology are 1) the establishment of cultural chronological sequences; 2) the elucidation of past lifeways; and 3) explanation of processes of cultural change, such as the development of food producing economies from hunting-gathering ones and the historical development of industrialism. These goals are pursued within the basic frameworks of space, time, and the formal attributes of artifacts and the built environment.

Archeological reconstructions are always to be augmented, challenged, and refined as new data and new theoretical concepts become available. This overview is designed to provide a context for defining issues in prehistory and historical archeology in the Potomac Basin and, more broadly, in the Chesapeake region and the mid-Atlantic.

There are many studies about the history of archeological theory and practice in the United States and in the world (e.g., Willey and Sabloff 1980; Trigger 1989; Malina and Vasicek 1990). There are also numerous explanations and critiques about the way that archeologists make sense of their data (e.g., Trigger 1978; Gibbon 1984; Shanks and Tilley 1987; Gardin and Peebles 1992). This plan is not the place to summarize debates within archeology, but it is necessary to acknowledge that there are important debates and that an overview and discussion of archeological issues could take very different forms than the one presented here.

Many standard summaries of prehistory and history take the form of rote background sections for Cultural Resource Management reports. These outlines, which have the advantage of being short, general, and non-controversial, offer the broadest possible backdrop for whatever study is being written and featured. Only rarely do these grand overviews change as the result of any single study. Like the millennia they represent, prehistoric overviews are slow to change in any substantial way. There are some exceptions to this pattern, exceptions that point up the problems with rote, perhaps ritualized, descriptions of time periods gone by. Disadvantages lie in the general, non-controversial, often simplistic view of the past that is tendered: people came; they hunted; they learned how to plant; they buried their dead. It is no wonder, given such trivial generality, that archeology is often reduced to a hunt for artifacts. Objects seem so much more immediately interesting than the irrelevant commonplaces of human history.

What I have attempted to do here is to present a productive and interesting structure for an archeological plan that may serve for the next few decades. I have assessed the trends in the discipline and have organized this discussion for general usefulness. In addressing each topic I often describe the approach of some major work(s) not necessarily confined to regional concerns in order to provide a context for thinking about archeological data in the Potomac Basin. Not all of the theoretical positions or approaches I mention have been used in the mid-Atlantic and I wish to suggest that they may be applied. I do not, however, seek to develop a critique of mid-Atlantic archeology, as that would be an effort far outside of the scope of this plan.

A Note on Time Notation

Conventional time notation of years as B.C. or A.D. is abandoned here in favor of the theologically neutral BCE (Before Current Era), which is equivalent to B.C., and CE (Current Era), which is equivalent to A.D. Dates are often given as BP (Before Present). For archeologists, "present" is defined as 1950 CE. Usually I have simply added 2000 years to a BCE designation for an approximate date BP.

AN INTRODUCTION TO ARCHEOLOGICAL LOGIC: ANALOGY AND CAUTIONARY TALES

> Analogy: A means of reasoning based on the assumption that if two things are similar in some respects, then they must be similar in other respects
>
> Thomas 1989:648

Archeologists rely quite heavily upon the use of analogy in many ways. Analogies may be made between the past and ethnographic, historical, and current descriptions or models. They may be quite specific, focusing on the function of a particular artifact, or more general, concerning social strategies for dealing with scarce resources.

Analogies between known and unknown cultures have been used from the beginning of archeology with varying degrees of precision and consciousness, but one of the first and most influential attempts to make this logic explicit was by Lewis Binford. In an influential article entitled, "Smudge pits and hide smoking: the use of analogy in archaeological reasoning" Binford (1967) attempted to clarify the structure of analogical thinking and its application to archeological logic. In keeping with the tenets of the new archeology which focused on ecological causes and positivist methodology, the two most important points made in Binford's discussion were 1) the most appropriate analogies were those made between the most similar ecological settings; and 2) analogies in themselves were not answers or explanations, but simply presented hypothetical proposals to be tested with independent archeological data.

Both points are quite important. The first has been modified by a more sophisticated understanding of ecology and environment. For example, Binford's (1980) description of hunter-gatherer adaptations as falling along a continuum of strategies relies on analogy with the structure of resources in the physical environment. His model is explained in the section on landscape, but briefly is this: human strategy for gathering resources (without agriculture) will depend upon the degree of spatial and temporal continuity or patchiness of resources. Of course, most environments in which humans live are quite variable and the continuity of resources changes seasonally. In the eastern woodlands, for example, timber is a continuous resource in both time and space but acceptable lithic sources may be quite discontinuous. Anadromous fish runs are temporally patchy, but such a seasonal windfall can be somewhat evened out by storage technology.

The insight that environmental structure in the broadest sense is more important than factors such as climate or amount or precipitation allows a far greater range of analogies and, therefore, sources of questions and insight. When considered in conjunction with the second point, this insight allows us to see that it may be useful to draw hypotheses from seemingly far-flung sources as Scott Parker (1990) does in using ethnographic data on the !Kung San of southern Africa to model some practices in the Paleoindian boreal forest environment of the eastern United States. The potential comparative value comes from hunting-gathering groups' similar needs to confront periodic shortages, even though the shortages are of vastly different resources.

Binford's second point, that analogies are sources of hypotheses rather than explanations, is crucial for avoiding one of the major potential drawbacks of analogical thinking. The objection that has been voiced about analogy is that we can never understand anything new about the past if we only seek to apply what is known ethnographically or historically. This concern has led to an extension of analogy which may be referred to as argument by anomaly. That is, one finds an analogy appropriate to the archeological problem, identifies and seeks archeological correlates, and looks for the lack of fit or anomalies which should signal at least some of the differences between past and present adaptations. It is this logic which Binford (1977, 1981, 1987) has formalized in his discussion of "middle range theory" and that Mark Leone and others (e.g., Leone 1988; Leone and Crosby 1987; Potter 1992) have adapted for middle range theory in historical archaeology.

To many minds, one of the most desirable use of analogies is the "direct historical approach," wherein ethnographically or historically known practices are traced back into the past to explain archeological phenomena. Pueblo cultures in the southwestern United States provide some of the most well-studied direct connections between archeological and living cultures. There is a potentially false sense of stasis implied by such analogies, as they tend to emphasize what seems to have remained continuous. One important advantage to such situations is that the whole range of culture is considered, whether implicitly or explicitly. That is, religion, social mores, and the like are automatically part of the archeologically known culture, in contrast to purely environmentally focused analogies which tend to leave out "ethnographic" factors.

The Band-Tribe-Chief-State Typology

The most pervasive analogy in American archeology is probably Service's (1962, 1975) model of sociopolitical types: the band-tribe-chiefdom-state evolutionary typology. Such a classificatory system has the advantage of imposing "order onto chaos" and thereby providing some categories and language with which to begin to make sense of a very complex world. However, there are serious criticisms of this model and such models in general. Such typologies tend to artificially reduce the variation of human adaptation as all societies are placed into one of a very few typological boxes.

The band-tribe-chiefdom-state typology is based on ethnographic models of political organization. In general, the types may be thought of as being along a continuum with bands being the most egalitarian and having the least social differentiation and states being the least egalitarian with the most social differentiation. These types generally correspond to an economic classification as well, although there are important exceptions. Bands often characterize hunter-gatherers although, in rich environments such as the ethnographically documented Northwest coast, non-food-producers may be organized as chiefdoms. Tribes are said to characterize horticulturalists and pastoralists while intensive agriculturalists are organized into chiefdoms or states. Industrialists are organized as states.

Many archeologists are rightly critical of the typological approach which uses single attributes to represent whole sets of characteristics. Gary Feinman and Jill Neitzel (1984), for example, argue that such an approach precludes the possibility of recognizing prehistoric variability. Instead they argue that archeology needs to study social differences along a broad range of analytic attributes.

Analogies, Archeological Logic, and Addressing Bias

Analogies provide us with expectations about what we ought to find and how we will label it and therefore they affect the observations we make. The analogies we choose are greatly affected by current understandings as well as current prejudices. While analogies are often called upon for seemingly simple identifications of function, as for identifying the use of artifact types, they are deeply embedded in more encompassing categories and models. Models of evolutionary development of social system and political organization particularly color our expectations. They also affect and sometimes limit the questions we ask because it may seem that we already "know" what people did at particular "levels" of development. In that case it is unlikely that we will ask questions which challenge these assumptions.

Addressing the problem of such archeological bias at the artifact level, Alice Kehoe (1990) points out that conventional terminology in archeology has "hidden" certain artifact classes. She argues that more and better use of ethnographic analogy would help to correct the problem. She uses the northern Athapaskans of the Canadian boreal forest as analogies to upper Paleolithic people in Europe to point out the importance of traps, snares, and nets for hunting.

Ethnographers of the Montagnais-Naskapi, emphasize the necessity and universality of hunting traps, snares, and nets in the survival of human hunting groups (Kehoe 1990:27). Projectiles are the final and sometimes unnecessary step in hunting; traps are the primary means by which hunters get close to their prey (Kehoe 1990:27).

One ethnographer, for example, writes:

> Something has been said already of lines in Ingalik culture but the longer one works on Northern Athapaskan materials, the more intense is one's feeling for their significance...[O]ver two hundred or almost two-thirds of the items of the Ingalik culture include lines in their manufacture [Osgood 1940:435].

According to ethnographically observed division of labor, women work in pliable materials that tend to be perishable, while men work in "wood, stone and bone" (Kehoe 1990:30). "Tools for manufacturing lines and products constructed with lines, e.g., traps, nets, textiles, mats are as a rule deceptively simple awls, both flattened and pointed, flat rods and elongated flat ovals, and multipurpose knives" (Kehoe 1990:30).

Kehoe (1990:31) writes that:

> Archeologists' failure to note evidence for the manufacture and use of lines...is not simply a matter of the perishability of ropes, strings and thongs. It is a problem of working through the dominant paradigm.

Part of Kehoe's point about the dominant paradigm is the difficulty of asking non-traditional questions, learning what kinds of data address those questions, and learning to observe new kinds of evidence. Related to this point is Kehoe's conviction that a failure to consider the material culture of lines is related to a general failure to consider women's work in the past. Therefore, women's artifact classes become invisible. However, such failure to consider both women's and men's work skews our understanding of human life.

Kehoe's observations are important for interpreting life in the boreal forest of the mid-Atlantic states prior to the Late Archaic period. Although there may be little physical evidence recovered of lines and, analogously as well, women's hand in hunting and trapping, there is every reason to incorporate ethnographic observations into models of past technological, social, and labor organization.

Commenting on this problem of limited observation, Joan Gero (1990:113) writes, "Observation in archaeology emerges out of an active interplay of tacit beliefs and formal conventions." She emphasizes the need to restructure observational categories that would provoke new questions.

In the same spirit as Gero's and Kehoe's critique, James Schoenwetter (1990:110) writes that "archeological work is often informed by ideas that rarely come under the systematic scrutiny they deserve." He continues,

> even those powers of observation that allow identification of archeological data are generated and constrained by the character of the theory we are prepared to accept, and that theory may be derived from the research practices and experiences with which we are most familiar [Schoenwetter 1990:110].

Similarly, Bruce Trigger (1985:231) writes,

> increasing familiarity with the development of archaeology in different parts of the world indicates that social, political, and cultural differences influence not only the questions archaeologists ask but also the answers that they are prepared to accept as credible.

The key to addressing these critiques is to maintain flexibility and a healthy scientific skepticism. Many archeologists are attempting to reconstruct both acceptable questions and answers in archeology (e.g., Spector 1993; Hodder 1986). For example, the gist of adding the issue of gender to archeology involves rethinking and looking anew at what archeological interpretation has taken for granted for a long time.

There is relatively little information about prehistory and therefore, it seems as if we are satisfied to "discover" and to "know" something about what happened in the past, even if that something is a biased, 19th-century ethnographic stereotype. Gender, as a social factor, is a valuable avenue to prompt the critical thinking and questioning process (e.g., Gero and Conkey 1991).

The critique raised by these authors is not confined to archeological investigation of "social" issues. It applies as well to issues of tool types and the analysis of tool function. Consider some ongoing analysis of stone tools. For many years it was unquestioned that formal "projectile points" were the primary tool of hunting and were used as spear or arrow points. However, the ubiquitous projectile point needs to be reexamined and interpreted in a broader cultural context. Richard J. Dent (1991a) and Jay Custer (1990) both argue that many of these points were used as knives or generalized bifaces. Douglas McLearen (1991:93) confirms that most archeologists now recognize that many objects formerly identified as projectile points had multiple purposes.

Because in most archeological contexts organic remains are not preserved there is little survival of traps, snares, lines, hafts, and the like. Lithics are often the only available source of data on hunting but interpretations of hunting based on lithics alone have been misleading. George Odell (1988) effectively challenges two long-standing assumptions: 1) items we recognize as diagnostic "points" were the predominant kind of projectile heads; 2) the bow and arrow were adopted no earlier than 500 CE. Use wear analysis reveals that apparent points were used for cutting, slicing, graving, and drilling and that other tips such as unifacial points and unretouched flakes were often used for projectiles.

While it is generally accepted that large points were used as spears and small points tipped arrow shafts, there are some ethnographic indications that this is too simplistic a view and that a trend toward smaller points may indicate developments in arrow fletching (Odell 1988).

In examining lithic material from the Illinois Valley, Odell discovered that only 12.5% of those artifacts identified as morphological projectile points actually functioned as projectiles. In arguing that morphological projectile points were not necessarily used for hunting or as weaponry Odell (1988:345) writes,

> "Point/knives" were used for cutting, shaving, graving, scraping, adze/chop/dig, awl/drill and other identified activities. Retouched flakes were the largest single group of artifact types with projectile use damage: "Debris" manifesting projectile wear is plentiful, a situation that helps to explain the nature of the 'missing' projectile points.

Temporal trends in projectile damage lead Odell (1988) to interpret an earlier use of the bow and arrow than commonly assumed. At least in the Illinois valley, a change in hunting strategy such as the use of the bow and arrow seems to have occurred during the Middle Woodland rather than during the Late Woodland.

The observation that pieces of stone manufacturing "debris" were used to tip projectiles brings forth the larger issue of analyzing all such debris. Because lithic studies are usually done for classification of finds into time periods they may ignore expediently produced tools. Those tools that are not formally identifiable as conforming to a particular style often are classified as debitage or byproducts (Gero 1991a). Of particular interest to understanding stone technology is the functional investigation of expedient, non-standardized tools. For example, Carol Spears (1975) focuses on nutting, Jenny Adams(1988) on leather-working, and Patricia Price-Beggerly (1976) on wood-working. Such studies force us to reexamine what is meant by the category of tools and provide access to past division of labor not possible by focusing on formally and traditionally recognized tool types (Gero 1991a,b).

Critiques of archeological logic and of standard archeological interpretation raise important questions. Where do our categories come from? How does conventional archeological logic compress the complexity of the past into symbolic lessons about the present? There are a variety of avenues to really increase the power of observation in archeology, including refocusing ethnoarcheology toward user meaning, directing attention to gender, and concentrating on intergroup interaction (Nelson and Kehoe 1990; Gero and Conkey 1991).

All of these issues and critiques are, of course, applicable to archeology in the mid-Atlantic. Challenging and refining archeological concepts and methods are ongoing and necessary tasks for archeology to remain a vibrant discipline.

This need is equally compelling for both prehistory and historical archeology even though some of the conceptual tools are quite different. If prehistorians may be lulled into complacency using time-honored typologies to structure their reconstructions of past lifeways, historical archeologists may also be overwhelmed by the seeming authority of documentary evidence and the weight of standing interpretations of the past. In lieu of ethnographers' descriptions of contemporary cultures, historical archeologists often use ethnohistorical accounts, which contain different sorts of biases. Instead of a band-tribe-chiefdom-state typology, historical archeology may adopt historians' and anthropologists' models such as the rural and urban dichotomy, mercantile and industrial capitalism, and colonialism and frontier development.

Prehistoric Analogies and Hunting-Gathering Societies

The ethnohistoric record is useful, but is limited in both time and space. One of the limitations of ethnographic analogy is the small number of ethnographically described cultures, particularly non-food producers. Hunter-Gatherers who survived into the modern era survived only in marginal environments and certainly do not represent the pockets of primitive survivals of earlier human lifeways that they were assumed to during the 19th century. Instead hunter-gatherers were squeezed out of productive environments by agriculturalists, either neighbors or foreign invaders. By necessity, analogies are gathered more broadly and often are considered more appropriate and more informative if they are taken from societies of similar sociopolitical "level," that is, complexity along the continuum of the band-tribe-chiefdom-state typology.

Ethnographic analogy must be used with extreme caution, especially since there are no ethnographically known societies for the vast majority of human history. However, there is little else with which one may begin to ask questions of the prehistoric past. The following discussion provides a general overview of the kinds of ideas drawn from ethnographic knowledge and applied in archeological reconstruction. I also include a caution about making simplistic assumptions about "simple" hunter-gatherers and "complex" food producers.

The social organization of hunter-gatherers is postulated through analogies of settlement size and distribution with ethnographically known groups. Kin-based bands are almost certain. Whether the associated units are based on "nuclear" families made up of a man and woman and their children, extended families of any composition, sisters and their children, or other family forms is unknown.

It is usually taken as a universal that age and sex are organizing principles in human societies. We expect that elderly men and women have different tasks than other adults and that children have roles different from those of adults. But the number of age-grades and gender roles may vary greatly.

Although not universal, it is most common for adult men to be responsible for the tracking and hunting of larger animals. Similarly, adult women do most of the searching and gathering of plant foods. Both sexes often hunt and trap (collect) small animals. Women tend to be responsible for the preparation and distribution of food. Both or either men and women fish. Elderly men and women are often responsible for healing and for spiritual celebration and ritual. Both men and women have (often separate) roles that are spiritual, medicinal, and socially integrative.

It is likely that men and women made and repaired the tools that they used for their respective tasks. Stone tools have long been assumed to have been the special province of men, and since stone is a most enduring and obvious material, the focus on stone tools as virtually the only clues to much of our past has served to render women's activities among mobile hunter-gatherers "invisible." Division of labor probably varied considerably. Most adults probably made and used tools and equipment, working stone, wood, bone, hide, sinew, plant fibers, and other available materials for their shelter, their subsistence, and their amusement. The lines and cords that are essential to survival in a northern habitat are illustrated in the case of the northern Athapaskan, referred to above (Kehoe 1990). As Kehoe and others (e.g., Gero and Conkey 1991) have suggested, the "invisibility" of one gender's work is largely a result of the questions archeologists have asked and the conceptual tools used to address these questions in the archeological record.

Thomas Cook (1976) offers a detailed model of tools and debris for extractive, maintenance, and social tasks. He (1976:13) describes his model as "a melange of various ethnohistoric sources concerning the manufacture of tools and processing of environmental materials for food and items of material culture." This model, which is testable for the mid-Atlantic as well as other regions, is summarized in Table II.1.

The fission-fusion model of settlement and social dispersal and aggregation is widely used. In this model small groups fuse together at certain times of year to use seasonally abundant resources and to socialize and find marriage partners. Large groups split, or fission, to spread across the landscape to use more limited resources. Many ethnographically-known mobile hunter-gatherers split and join together in their movement to exploit seasonal resources. As environmental resources change, the requirements of labor within a social group also change. The division of labor between men and women changes in some ways as seasonality makes an impact on movement. There are variable opportunities to meet with other groups, as the demands of seasonal scheduling require certain movement. There are traveling parties and exchange of information, goods, and marriage partners.

There is a long-standing bias in anthropology which associates a society's means of subsistence with its cultural complexity, assuming that complexity arrives with food production. There are at least two sources of the bias. One is an over-reliance for analogies on ethnographically-known hunter-gatherers, who have survived in marginal environments and therefore may offer misleading analogies for abundant environments. The other is the stage concept in human evolution, which unrealistically downplays the diversity of human adaptation and predicts wholesale changes between stages (Price and Brown 1985:3-20). The familiar band-tribe-chiefdom-state model assumes a regular progression from simple to complex.

However, an increasingly sophisticated understanding of human cultures leads to a rejection of an uncomplicated dichotomy between simple foragers and complex farmers. It is apparent

> that many characteristics previously associated solely with farmers -- sedentism, elaborate burial and substantial tombs, social inequality, occupational specialization, long-distance exchange, technological innovation, warfare -- are also to be found among many foraging societies [Price and Brown 1985:16].

Douglas Price and James Brown (1985:xiii-xv) advocate the exploration of cultural complexity of hunter-gatherers through themes such as the intensification of food production, the origins of sedentary communities, and the emergence of social inequality and hierarchy (Price and Brown 1985:xiii-xv).

Intensification of food production has most often been addressed in the context of the development of agriculture. Abundant resources, however, may instigate complexity. In a characterization that is relevant to Chesapeake societies, although it was not developed for them, maritime-oriented hunter-gatherer groups may be described as possessing: 1) high resource biomass; 2) high resource diversity; 3) low resource seasonality; 4) "unearned" (migratory) resources; 5) linear settlement pattern; 6) sedentism; 7) technological complexity and cooperative socioeconomic focus on resource exploitation; 8) high per capita productivity; 9) high population density; and 10) territoriality, resource competition and warfare (Yesner 1980 in Price and Brown 1985:6). Although Chesapeake societies were not maritime-oriented, there are times and places for which the abundance of estuarine resources make it worth considering carefully the relationship between complexity and both the environment and procurement techniques.

Also writing of the manipulation of resources, Brian Hayden sees two major trends, also relevant to the mid-Atlantic during various time periods: 1) general diversification of resources exploited in areas of poor to moderate resource richness; and 2) a tendency toward specialization in habitually exploited resources in resource-rich areas. This observation may be applicable in understanding the ebb and flow of trading networks in relation to the predictability of food resources. Hayden reverses a traditional expectation about the development of societies by tying the disappearance of extensive trade and interaction networks to emerging complexity. In his view, diversification of the resource base is an expected human response to the need for resource reliability (Price and Brown 1985:6).

Price and Brown (1985) indicate that the conditions of complexity include societal circumscription, abundant resources, and higher population. They suggest that the consequences of complexity include effects upon 1) productivity, with regard to technology, procurement activities and occupational specialization; 2) settlement, particularly increasing sedentism; and 3) decision-making, particularly regarding inequality and status differentiation. They emphasize that the causes of complexity, whatever they may be, are dependent on social relations, especially the relations of production.

Similarly, William Marquardt (1985:67) attributes culture change not only to adaptation to changes in the physical environment but also to "sociohistorical structures" such as values, myths, class relations,and the like.

Successful approaches to complexity "will involve the examination of change in specific variables and institutions of society rather than the attempt to document leaps from bands to tribes or from simple to complex" (Price and Brown 1985:16).

In the mid-Atlantic region, the variability of hunter-gatherer societies is an issue central to most of prehistory since hunting-gathering remained the principle subsistence strategy until the Late Woodland period. This variability and complexity of groups prior to the full-scale adoption of agriculture has yet to be adequately researched.

Table II.1. Cook's Model for Tool-using Behavior (Source: Cook 1976: tables 1,2,3).

EXTRACTIVE TASKS		
Task	Tools Used	Debris
Trapping	Traps	Traps Certain Faunal remains
Hunting	Projectile points Bannerstones, boatstones, and birdstones Knives Bola stones	Broken tools Faunal remains
Fowling	Plummets Net weights	Avifaunal remains Broken tools
Fishing	Leisters Hooks Netting needles Net Weights Boats	Aquatic faunal remains Broken tools
Quarrying	Hammerstones Pry bars Excavation tools	Smashed debris Broken preforms, points, tools Cores Fire-broken rock (optional)
Lumbering	Axes Celts Adzes Wedges	Broken tools Lumber
Hide and Leather preparation	Large scrapers Beamers Scrapers Flakes Knives	Discarded and broken tools Wear patterns
Nut and Seed Preparation	Manos Metates Nutting stones Hammerstones	Discarded and broken tools Nut and seed remains
Preserved meat preparation	Manos Metates Knives Choppers	Discarded and broken tools
Vegetable fiber and food preparation	Choppers Pulverizers Digging Sticks Hoes Manos Metates Knives	Discarded and broken tools Plant remains Opaline gloss

Table II.1. Cook's Model for Tool-using Behavior (Source: Cook 1976: tables 1,2,3).

MAINTENANCE TASKS			
Task	Tools Used	Items Made	Confirmatory Evidence
Manufacture of chert tools	Antler flakers Hammerstones Cores Sandstone abraders	Points Knives Scrapers Perforators Preforms	Exhausted cores Waste flakes Tools broken in manufacture Worn-out tools used in manufacture Unfinished forms
Manufacture of ground stone tools	Chert hammers Sandstone abraders Hammerstones	Axes Metates Net weights Nutting stones Plummets	Chert hammer and other tool fragments Stone flakes Pulverized stone Worn-out tools used in manufacture Unfinished forms
Manufacture of shell items	Burins Drills Flakes Sandstone abraders Perforators	Pendants Spoons Wampum Tools Hoes Fish Lures Fishhooks	Cut shell fragments Broken tools Worn-out tools Unfinished forms
Manufacture of wood items	Saws Knives Axes Adzes Wedges Scrapers Drills Flakes Perforators Burins Sandstone abraders	Tool hafts Structures Containers Shafts Digging sticks Animal traps	Broken and worn-out tools Incomplete forms
Manufacture of woven items	Shuttles Needles Awls	Clothing Baskets Nets Snares	Broken and worn-out tools
Manufacture of hide and leather items	Flakes Drills Microdrills Bone Awls Needles	Clothing Shelter Containers Laces Foot gear	Discarded and broken tools Incomplete forms
Manufacture of bone and antler items	Incising tools Polishing tools Perforators Burins Sandstone abraders Sharpening stones	Points Awls Needles Fishhooks Weaving tools Ornaments Antler flakers Shaft wrenches Beamers	Broken and worn-out tools Incomplete bone and antler forms Bone and antler blanks and scraps

Table II.1. Cook's Model for Tool-using Behavior (Source: Cook 1976: tables 1,2,3).

SOCIAL TASKS			
Social Task	Tools Employed	Items Made	Confirmatory Data
Red paint manufacture	Hematite Scrapers Flakes Abraders	Rubstones Paint cups	Scraps of hematite Stained tools
Facilities Burials Use of ornaments	The various tasks performed in the social realm generally outside the realm of specific tool use which can be tested with the simple linkage arguments of tools, tasks, and confirmatory information.		

CHRONOLOGICAL OVERVIEW

Introduction to Dates and Time Periods

Table II.2 summarizes a few of the dates and time periods used by archeologists in the mid-Atlantic region for pre- and protohistoric periods. As is apparent, there is some disagreement over the definitions of time periods. This plan uses time periods which agree with as many others in current use as possible and practical. There is also some disagreement over the diagnostic artifacts which belong to each time period. However, all researchers are limited by the same basic data in assigning actual dates. Assigning specific dates to periods and developments relies on a combination of techniques.

Chronological control is established through direct or indirect methods to yield chronometric (measured in years) or relative dates. The method(s) of dating obviously affect the confidence we have in our histories and cultural interpretations. Relative dating, which identifies an earlier/later relationship, is important for refining relationships and development of artifact styles within stratified sites. The principle of stratigraphy, borrowed from geology, is at the heart of archeological temporal analysis. The careful combination and comparison of stratified layers, the formally distinctive artifacts found in them, and independently assigned dates form the basis for any region's prehistoric sequence.

The most common and reliable method of chronometrically dating prehistoric contexts in the mid-Atlantic is radiocarbon dating but it must be interpreted correctly. Dates should be cited with the understanding that a radiocarbon date is a probability statement (Levine 1990). Radiocarbon age estimates are best understood as a range rather than as a definitive year. For example, a date of 100 $\pm$ 50 CE means that there is a 67% chance that the actual date falls between 50 and 150 CE. There is the added complication that organic remains could be contaminated by regional forest fires (Patterson and Sassaman 1988), which would call some radiocarbon dates into question due to implied contamination.

Because suitable samples for radiocarbon dating are infrequently available and because analyzing samples is fairly expensive, archaeologists often rely on dates from sometimes distant sites associated with similar diagnostic styles. That is, the radiocarbon date for an xyz point at site A is used to date all xyz points in a broad region. There are few alternatives. However, one of the problems with this reliance on a few dates is obvious: one can never trace temporal relationships among the occurrence of point styles if they have, by definition, the same date.

Table II.2. Pre- and Protohistoric Time Periods in Use in the mid-Atlantic.

	SAIP plan	Maryland State Historic Plan	Virginia Dept of Hist. Resources	Piedmont Kavanaugh 1982	Coastal Plain Wesler et al 1981	Coastal Plain Ebright 1992	Fairfax County Plan	Gardner 1983
	Paleo: 10/12,000-8000 BCE	Paleo: 10000-7500	Paleo: 9500-8000	Paleo: 9500-8000	Paleo: ?-8000	Paleo: pre 10000 -8000	Paleo (First Virginians): ?-8000	Paleo/EA: 9000 - 6500
8000								
	Early Archaic 8000 - 6000		EA: 8000-6500	EA: 8000-6000	EA: 8000-6000	EA: 8000-6000	Hunter Gatherer I 8000-6500	
7000		EA: 7500-6000						
6000			MA: 6500-3000				HG II: 6500-4000	MA: 6500-2000
	Middle Archaic 6000-4000	MA: 6000-4000		MA: 6000-4000	MA: 6000-4000	MA: 6000-3000		
5000								
4000								
	Late Archaic 4000-1200	LA: 4000-2000		LA: 4000-1500	LA: 4000-1150		HG III: 4000-3000	
3000							HG IV: 3000 BCE - 800 CE	
			LA: 3000-1000			LA: 3000-1000		
2000								
		LA/EW: 2000 - 500 BCE				Terminal Archaic: 2000-1000		LA/EW: 2000 BCE - 500 CE
1000				Terminal Archaic: 1500-500				
	Early Woodland 1200-500		EW: 1000 BCE - 300 CE		EW: 1150 BCE - 100 CE	EW: 1000-500		
BCE/ CE	Middle Woodland I 500 BCE - 200 CE	MW: 500 BCE - 900 CE		EW: 500 BCE - 300 CE		MW: 500 BCE-900 CE		
500					MW: 100-1000			
1000	MW II 200 - 900		MW: 300-900	MW: 300-900				MW: 500-900 CE
1500	Late Woodland I 900-1300	LW: 900-1600	LW: 900-1607	LW: 1000-1600	LW: 1000-1600	LW: 900-1600	Agri-culturalists: 800-1500	LW: 900-1650
	LW II: 1300-1500					Contact: 1500-1750	Proto-historic: 1500-1675	

Temporally diagnostic artifacts, specifically point styles, are used most consistently to date prehistoric contexts. Temporally diagnostic tools are useful but there continually lurks the danger that contemporaneous material which is not temporally diagnostic, but is essential for understanding the range of material culture and the economy, is ignored in the quest for temporal context.

For historical contexts, the most common dating methods beyond direct historical documentation are to use pipestem dating for 17th-century sites (if there is a sufficient sample of pipestems) or the known manufacturing dates for ceramics calculating a *terminus post quem* or TPQ (the date after which something must have been deposited), a mean ceramic date, and/or a histogram of ceramic date ranges. Some other artifact categories may be dated according to known manufacturing characteristics, as with glass, or to known dates, such as the date on a coin. In some cases dendrochronology can be used at historic sites in the eastern United States if there is good preservation of wood in a wet context, or if there is a standing structure with original wooden timbers.

Defining time periods brings up an important issue of legitimacy. Various researchers have raised this issue for the Middle Archaic in the mid-Atlantic. Michael Stewart (1991b), for example, wonders if there really are shared adaptations or if the time period is simply a device for organizing disparate data. He asks if it would be better to abandon the attempt at synthesis, since the variability during the period is then obscured. George Nicholas (1987) asks of the Early Archaic:

> Is there, in fact, a discernible character to [the early Archaic]...that is *qualitatively* different from those of earlier or later periods in terms of social organization, economy, and ethnicity, for example, and not simply because of artifact styles?

Such questions are indeed important to address for all of the time periods archeologists create.

Any period scheme colors the way we think about people in the past and the stability, change and variability in their societies. The scheme used in this overview is traditional but is not meant to impose an inflexible understanding of past developments.

Tables II.3, II.4, II.5, II.6 and II.7 provide some of the temporally diagnostic material culture styles recognized in the mid-Atlantic. Table II.3 lists formal styles of stone points. Table II.4 provides selected radiocarbon dates for those point types. Table II.5 lists pre- and protohistoric pottery types. Once pottery is developed and used, it varies morphologically more than identified point styles and therefore provides more sensitive temporal markers. Pottery is described by tempering material, form and manufacturing technique, and decorative technique.

Tables II.6 and II.7 provide material used to date historic sites; the first is a list by time period of common material and the latter is a schematic of the manufacturing ranges of some of the most frequently cited ceramic time markers.

Table II.3. Temporally Diagnostic Point Styles by Time Period.

Paleoindian
- Clovis or Eastern fluted points
- Dalton-Hardaway weakly fluted points

Early Archaic
- Notched points
  - Palmer and Kirk
  - corner-notched variants: Amos, Charles
- Bifurcate base (6800-5800 BCE)
  - LeCroy
  - Kanawha
  - St. Albans
  - MacCorkel

Middle Archaic
- Stemmed and contracting stemmed
  - Stanly
  - Morrow Mountain
- Side-notched
  - Brewerton side-notched
  - Brewerton Eared-notched
  - Otter Creek point

Late Archaic
- Side notched
  - Halifax (= Clagett)
- Stemmed narrow blades of Piedmont Tradition
  - Bare Island (= Holmes)
  - Poplar Island
  - MacPherson
- Broadspears (terminal Archaic 2000-1000 BCE)

(Late Archaic cont'd)
  - Susquehanna
  - Lehigh
  - Perkiomen
  - Snook Kill
  - Savannah River Stemmed
  - Savannah River Contracting Stem variant
- Fishtails
  - Orient
  - Dry Brook

Early Woodland
- Narrow bladed stemmed points
- Late Archaic, Terminal Archaic, and Fishtail points persist
- Piscataway
- Vernon
- Calvert

Middle Woodland
- Selby Bay points
- Corner-notched Jacks Reef
- Rossville

Late Woodland
- triangular points
  - Madison
  - Levanna
- Levanna Large Triangular (Late Woodland I)
- Levanna Small Triangular, small triangular Type A (Late Woodland II)

Table II.4. Radiocarbon Dates for Selected Projectile Points in mid-Atlantic States (adapted from Inashima 1985).

Point Type	Site	Date	Reference
Palmer	Thunderbird	7950 ± 340 BCE	Gardner 1974a:19; Segovia 1974:62
Kirk Corner-Notched, Small Variety	St. Albans	6980 ± 160 BCE	Broyles 1966:19
Kirk Corner-Notched, Large Variety	St. Albans	6900 ± 320 BCE; 6850 ± 320 BCE	Broyles 1966:19
MacCorkel Stemmed	St. Albans	c. 6800 BCE	Broyles 1971:71
St. Albans Side-Notched, Variety A	St. Albans	6880 ± 700 BCE	Broyles 1966:25
St. Albans Side-Notched, Variety A	St. Albans	6870 ± 500 BCE	Broyles 1966:25
LeCroy Bifurcate base	St. Albans	6300 ± 100 BCE	Broyles 1966:27
Kirk Stemmed and Serrated		c. 6200 BCE	Coe 1964:122
Kanawha Stemmed	St. Albans	6210 ± 100 BCE	Broyles 1966:27
Stanley	Doerschuk	c. 5000 BCE	Coe 1964:54
Otter Creek	Sylvan Lake	c. 4610 ± 100 BCE	Kinsey 1972:407
	McCulley No. 1	3780 ± 110 BCE	Funk et al. 1973:20
	Otter Creek No. 2	3120 ± 210 BCE	Funk et al. 1973:25
	Hornblower II	2270 ± 160 BCE	Kinsey 1972:407
Morrow Mountain	Russell Cave	4030 ± 300 BCE; 4300 ± 300 BCE; 4360 ± 140 BCE	Griffin 1974
	Stucks Bluff	4500 ± 120 BCE	DeJarnette et al. 1975
	Icehouse Bottom	5045 ± 245 BCE	Chapman 1976:Table 1
Halifax Side-Notched	Gaston	2330 ± 350 BCE; 3490 ± 350 BCE	Coe 1964:118
Brewerton Corner-Notched, Eared-Notched, Eared Triangle, Side-Notched	O'Neill	2010 ± 100 BCE; 2050 ± 220 BCE	Ritchie 1980:91
Brewerton Side-Notched	Hornblower II	2270 ± 160 BCE	Kinsey 1972:407
	Sheep Rockshelter	2350 ± 180 BCE	Michels and Smith 1967:57, 863
	McCulley No. 1	3780 ± 110 BCE	Funk et al 1973:20
Brewerton Eared-Notched	Hornblower II	2270 ± 160 BCE	Kinsey 1972:407
	Faucett	3230 ± 200 BCE	Kinsey 1972:407
Bare Island		c. 2000 BCE	Funk et al. 1973:25
Poplar Island		c. 2000 BCE	Funk et al. 1973:25

Table II.4. Radiocarbon Dates for Selected Projectile Points in mid-Atlantic States (adapted from Inashima 1985).

Point Type	Site	Date	Reference
Savannah River Stemmed	Gaston	1944 $\pm$ 250 BCE	Coe 1964:97
Holmes (Buffalo Straight Stem)	Buffalo	c. 2000 BCE; 1920 $\pm$ 250 BCE	Broyles 1976:14
Lehigh/Snookkill	?	1670 $\pm$ 1[illegible] BCE	Kinsey 1972:426
	Peters-Albrecht	1720 $\pm$ BCE	Kinsey 1972:426
Susquehanna Broadspear	O'Neil	1250 $\pm$ 100 BCE	Kinsey 1972:429
	?	1520 $\pm$ 125 BCE	Kinsey 1972:429
	Zimmerman	1650 $\pm$ 80 BCE	Kinsey 1972:430
	?	1670 $\pm$ 11- BCE	Kinsey 1972:42[illegible]
Perkiomen Broadspear	O'Neill	1250 $\pm$ 100 BCE	Kinsey 1972:429
	Faucett	1500 $\pm$ 120 BCE	Kinsey 1972:427
	Brodhead-Heller	1670 $\pm$ 1[illegible] BCE	Kinsey 1972:429
	Miller Field	1720 $\pm$ 120 BCE	Kinsey 1972:427
Dry Brook	Brodhead-Heller	1170 $\pm$ 120 BCE	Kinsey 1972:432
	O'Neill	1250 $\pm$ 100 BCE	Kinsey 1972:429
	Zimmerman	1280 $\pm$ 120 BCE	Kinsey 1972:430
Orient	Long Island	763 $\pm$ 220 BCE; 1043 $\pm$ 300 BCE	Ritchie 1980:156
	Brodhead-Heller	1170 $\pm$ 120 BCE	Kinsey 1972:432
Orient Fishtail	Jamesport	783 $\pm$ 220 BCE	Ritchie 1980:156
	Faucett	810 $\pm$ 100 BCE	Kinsey 1972:433
	Stony Brook	944 $\pm$ 250 BCE; 974 $\pm$ 250 BCE	Kraft 1970:7
	Orient No. 2	950 $\pm$ 250 BCE	Kraft 1970:7
Rossville	Miller Field	480 $\pm$ 80 BCE	Kinsey 1972:436
Jack's Reef Corner Notched	Faucett	790 $\pm$ 120 CE	Kinsey 1972:438
	Kipp Island	630 $\pm$ 100 CE; 310 $\pm$ 100 CE	Kinsey 1972:438
Levanna	?	c. 700-1350 CE	Ritchie 1971:31
	Fortin	830 $\pm$ 90 CE	Funk et al. 1973:16
Madison	?	c. 1350-1800 CE	Ritchie 1971:33

Table II.5. Potomac Basin Woodland Pottery Types.

Ceramic Type	Temper	Description	Distribution	Time Period (uncorrected C14 date)
Bushnell Ware[1,2]	schist, clay, fiber, steatite	small shallow bowls w/ lugs	Westmoreland County, Virginia	1110±60 BCE at White Oak Point site
Marcey Creek ware[1,2]	steatite (25-50%);	coiled or modeled, often on matting; rectangular or oval shallow bowls, curved to straight sides, lug handles	Virginia Coastal Plain, especially north of James River; in Piedmont and north to Harpers Ferry along Potomac and James; Shenandoah Valley north of Port Republic; Delaware and Susquehanna valleys	950±95 BCE at Monocacy site and earlier
Selden Island Ware[3]	steatite	thinner walls than Marcey Creek; often cord-marked		early Early Woodland
Dames Quarter ware[3]	steatite		Delmarva peninsula	early Early Woodland
Vinette I[3]			New York, Susquehanna drainage	early Early Woodland
Fayette thick[3]			Ohio	early Early Woodland
Croaker Landing ware[1,2]	clay or clay and soapstone	similar to Bushnell and Marcey Creek	southern Coastal Plain of Virginia	early Early Woodland
Waterlily Ware[1]	shell	similar to Bushnell, Marcey Creek and Croaker Landing	Virginia Beach; Currituck Co., North Carolina	
Hyco Plain and Cord-marked[1]	sand	like Elk Island; friable, plain and cord-marked	Roanoke River	
Elk Island Ware[1]				895±150 BCE
Swannonoa Ware[1]	crushed-quartz to sand tempered	flat base	western North Carolina, mountainous southwestern Virginia	perhaps as early as 500 BCE
Accokeek ware[2]	sand, crushed quartz	medium to large with conical or semi-conical base	Coastal Plain and Piedmont of Maryland and Virginia north of James River; Harpers Ferry	late Early Woodland/early Middle Woodland 800-300 BCE

Table II.5. Potomac Basin Woodland Pottery Types.

Ceramic Type	Temper	Description	Distribution	Time Period (uncorrected C14 date)
Stony Creek[2]	medium sand	coiled, conoidal shape; various surface treatments	associated with Accokeek and Popes Creek; southeastern Virginia, south of James River	Early Woodland/ Middle Woodland
Popes Creek[2]	coarse sand	large jars; thick vessels, pointed bases, interior scouring; net-impressed	Coastal Plain and Piedmont of Maryland and Virginia, north of James	early Middle Woodland 500 BCE - 200 CE
Prince George Ware[2]	pebble	finger pinching or reed punctation below vertical rim; various surface treatment	Interior Coastal Plain of Virginia	early Middle Woodland
Smallwood ware[3]	sand		Severn River, Maryland	
Pottery Hill[3]	sand	net-impressed and roughed	Prince George ceramic series in eastern Virginia from lower Potomac River south	
Albemarle Cord-marked and Net-impressed[3]	sand		Virginia	650±140; 540±60 CE
Brodhead Net-impressed[3]	sand		upper Delaware	
Colburne[3]	sand		Delaware	
Varina[8]	coarse sand and rock		Chickahominy, Lower James	c. 200-300 CE
Mockley ware: Cord-Marked, Net-impressed, Plain[2,4]	coarse shell	medium to large, coil-constructed, thick vessel walls; cord-marked, net-impressed or plain; simple conical jar form with direct rims, wide mouths and semiconical or rounded bottoms	Delaware south through Delmarva and coastal Maryland and Virginia to northeastern North Carolina	Late MW 200-900 CE
Nomini ware[2,4]	quartz particles	large jars, rounded bases, direct rims, cord-marked or fabric impressed	Virginia northern neck	700-900 CE
Hercules Ware[2]	crushed granite and gneiss	fabric, cord or roughened surface	Interior Coastal Plain of Virginia and fall line south of James river	pre-Townsend Ware

Table II.5. Potomac Basin Woodland Pottery Types.

Ceramic Type	Temper	Description	Distribution	Time Period (uncorrected C14 date)
Townsend ware[2,4]	shell	small to large, wide-mouth jars, direct rims, conoidal bodies, rounded or semiconical bases; fabric-impressed; incised and cord-impressed decoration	Delaware south through Delmarva and coastal Maryland and Virginia	Late Woodland
Rappahannock Incised (Townsend pottery)[4]		complex geometric motifs	same as Townsend	Late Woodland I 900-1300 CE
Rappahannock Fabric-Impressed (Townsend pottery)[4]			same as Townsend	Late Woodland 900-1600 CE
Currioman Fabric-impressed[4]	quartz particles, finely crushed oyster shell	large open-mouth jars and shallow bowls, fabric-impressed	Virginia northern neck	Late Woodland I
Townsend Corded[4]	shell	geometric motifs impressed in fabric-marked exterior	same as Townsend	Late Woodland II
Sullivan ware[4]	shell	thin-walled, fine cord-marking; constricted necks and conoidal bases	Maryland western shore; Virginia northern neck	Late Woodland II
Potomac Creek, Cord-marked and Plain[2,4]	medium to fine sand and/or crushed quartz	large to medium globular form, everted to straight rims, rounded bases, cord-impressed designs below rim	western Virginia Coastal Plain south to James River, Maryland Coastal Plain, central Delaware	ca. 1300-1600s, CE
Moyaone ware, cord-impressed, Incised, Plain[2,4]	fine sand, occasionally with crushed quartz or coarse sand	small to medium globular jars or simple bowls	as Potomac Creek	ca. 1300-1500, CE
Yeocomico ware[2,4]	fine, crushed shell	thin, coil-constructed, variety of shapes and rims, plain or scraped exterior, punctates or core impressed decoration below rim	southern Maryland and Virginia Northern Neck	Protohistoric 1500-1690 CE
Shepard Cord-marked[4]	crushed granite and quartz	cord-marked, collared rim, cord and cord-wrapped stick decoration	Piedmont	Late Woodland, ca. 900-1600
Page[5]	limestone		Piedmont	Late Woodland, ca. 1400-1500

Table II.5. Potomac Basin Woodland Pottery Types.

Ceramic Type	Temper	Description	Distribution	Time Period (auncorrected C14 date)
Monongahela[7]	limestone		Ridge and Valley, Allegheny Plateau	1400s
Keyser[5]	mussel shell	cord-marked	Piedmont, Ridge and Valley	Late Woodland, ca. 1500-1600
Paw Paw[6]	crushed mixed-rock	cord-impressed, incised, punctates	Allegheny Plateau	pre-1400
Moore Cord-marked[7]	shell	cord-marked	Ridge and Valley	1400s

1 Egloff 1991
2 Egloff and Potter 1982
3 Read 1990
4 Potter 1993
5 Kavanagh 1982
6 Curry 1983, Kavanagh 1984
7 Pousson 1983
8 McLearen 1992

Table II.6. A General Dating Guide to Selected Artifacts of the Historic Period: *TPQs* and Date Ranges (selected indicators are shown in Table II.7).

CERAMICS

1550-1625	Bellarmine bottles
1567-1800	delftware apothecary and ointment jars
1610-1660	red marbleized slipware
1620-1700	Bellarmine bottles with stylized or grotesque faces, debased
1630-1660	Metropolitan slipware
1640-1800	plain white delftware vessels
1650-1730s	delft chamber pots
1650-1775	Rhenish stoneware, sprig molded, combed lines, blue and purple
1650	North Devon, sgraffito slipware (1650-1710) and gravel tempered ware (1650-1775)
1650-1725	Westerwald sprig molded
1660-1840	Chinese export porcelain in English North America
1670-1795	combed slipware
1670-1795	trailed clear glaze slipware
1685	Famille Rose palette on Chinese export porcelain
1690-1710	embellished Hohr grey Rhenish stoneware
1690	refined red stoneware, unglazed and sprigged
1690	English brown stoneware, saltglazed
1700-1810	Nottingham stoneware
1700-1775	Westerwald, stamped blue floral and geometric
1710-1740	Mimosa pattern on delftware
1715	white slipped saltglazed stoneware
1720-1805	White saltglazed stoneware (general)
1720-1730	scratch brown or trailed white saltglazed stoneware
1720-1775	Buckley ware
1725-1750	Astbury ware, white sprigged and trailed
1740-1770	Wieldon-Wedgwood wares
1740-1780	Jackfield ware
1745-1775	scratch blue white saltglazed stoneware
1745-1795	English porcelain
1745-1780	Iberian storage jars
1745-1797	overglaze Chinese export porcelain
1750-1820	Black Basalt
1750-1800+	large delft forms such as punch bowls, plates remain popular
1752	black transfer print (TPblk)

Table II.6. A General Dating Guide to Selected Artifacts of the Historic Period: *TPQs* and Date Ranges (selected indicators are shown in Table II.7).

1762-1820	Creamware (general)
1765-1795	debased scratch blue white saltglazed stoneware
1770-1880	clear glazed trailed redware
1770-1880	combed tinted glazed slipware
1775	American Blue and Gray stoneware
1780-1830	Pearlware (general)
1780	blue transfer printing (TPblue)
1780-1800	transfer print Chinoiserie motif (TPChin)
1795-1890	Mocha design
1795-1840/present	Willowware transfer print
1800-1840	refined redware (popular)
1800-1825	bone china popular
1800-1920	domestic brown stoneware
1805	Stone China introduced
1810-1830s	transfer print landscape motif (TPLand)
1820-1900/present	whiteware
1820-1900	brown stoneware bottles
1820-1845	embossed whiteware
1825-1910	flow blue decoration (whiteware)
1820s-1840s	brown, red, green transfer print (TPbr,rd,gr)
1830-1900/present	Yellowware (peak popularity 1860-70s)
1830-1900	Rockingham (peak popularity (1840s-60s)
1830-1860	transfer print Romantic motif (TPRomantic)
1835-1860	mulberry transfer print (TPmul)
1840-	sponged decoration
1840-1900	Ironstone/White Granite
1840-1860	painting over transfer print
1840-1860s	sprig style painting
1850-1900	industrial stoneware
1860-present	Yellowware mocha
1860s-1870s	creamware revival
1870-1880s	transfer print Japanese motif (TPJapanese)
1870s	Bennington
1870s	transfer print revival, blue, brown, black (TP revival bl,br,blk)
1880-1900	copper lustre tea leaf motif
1885	painted fill-in on monochrome decals
1891	McKinley tariff requires "Made in [country of origin]" to appear on ceramics
1900	decalcomania on American ceramics

Table II.6. A General Dating Guide to Selected Artifacts of the Historic Period: *TPQs* and Date Ranges (selected indicators are shown in Table II.7).

GLASS	
1650	mold blown English table ware
1730	dip mold blown English dark green glass bottles
1750	embossed lettering
1810-1880	2-piece full-height mold (bottom hinge)
1815-1885	black/opaque glass
1820s-1920s	full-height 3-part dip bottle mold
1850	continuous thread bottle finish
1855-1913	snap case (bottles)
1858	Mason jars
1865	glass electrical insulator with internal threads
1879	hand blown light bulbs
1880-present	clear glass
1880-1925	sun-colored amethyst glass
1886	milk bottles
1890-present	crown bottle finish, cork liners to 1955, then plastic liners
1893-1926	semi-automatic machine made bottles
1895	Coca-cola bottles
1895	machine made electric light bulbs
1906	Pepsi cola bottles
1919-1935	straw-colored and turned-pink glass
1920s	machine made bottles
1920s-1930s	Depression glass
1932-1965	"Federal law prohibits sale or reuse of this bottle" on bottles
1930s	applied color labels on bottles
1948	non-returnable soft drink bottles
METALS	
1600-1800s	handwrought nails
1790s-1820s	cut nails with hand wrought head
1805/15-1830s	machine headed cut nails
1810-present	machine cut sprigs and brads
1814	percussion caps
1820	hole-in-cap tin cans
1830-present	modern machine cut nails
1846	wood screws with gimlet points
1846	brass or copper cartridge caps
1850	shotgun cartridges
1850	wire drawn nails invented
1852	Minie ball
1866	key wind opened cans
1867	barbed wire

Table II.6. A General Dating Guide to Selected Artifacts of the Historic Period: *TPQs* and Date Ranges (selected indicators are shown in Table II.7).

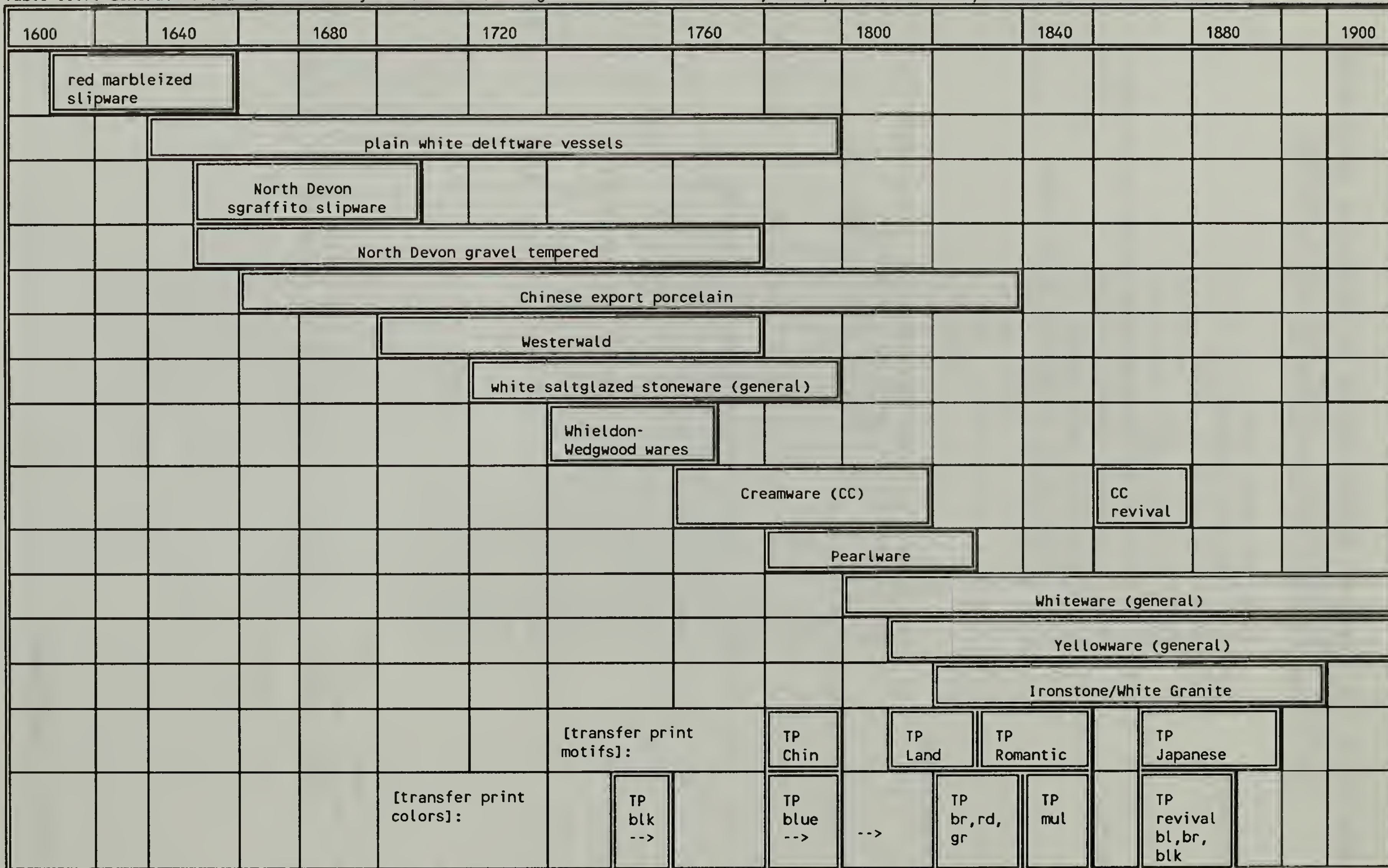
1875	tapered meat can
1880-present	wire nails common
1885	evaporated milk cans
1890s	sanitary tin can
1900s	hole-in-top can
1903	Gillete razor blades and other products
1935-1950s	cone top beer can
1959	all-aluminum beer cans
1962	beer cans with aluminum pull tabs
1965	tin-free steel cans

OTHER MATERIAL

1838	Goodyear Vulcanized rubber, Vulcanite
1840s	gutta percha (natural plastic)
1840s	Parkesine (semi-synthetic plastic)
1851	hard rubber
1860	linoleum
1869	celluloid (semi-synthetic plastic) (common in 1940s)
1870s	vulcanized rubber becomes common
1876	portland cement (common after 1899)
1890s	casein (semi-synthetic plastic)
1907	bakelite (popular in 1920s and 1930s)
1912	cellophane
1919	plastic coated paper cups (Dixie)
1930s	nylon, polyethylene
1947	aluminum foil
1950s	PVC (especially for LP's and 45 rpm recordings)
1953	Saran wrap
1961	plastic milk bottles
1962	styrofoam cups

Adapted from:
Harpers Ferry National Historical Park Division of Archaeology (1989); Lucas (1991); Mullins (1988); Archaeology in Annapolis (n.d.)

Table II.7. General Schematic of Some Major Ceramic Chronological Indicators on 17th-, 18th-, and 19th-century Sites.



Analogies in Mid-Atlantic Archeology

Archeologists have used various analogies to help explain adaptations in the mid-Atlantic region before European contact and settlement. Interpretation of Potomac Basin Paleoindian finds relies on analogies of several sorts. Although the pan-American interpretation of Clovis lifeways based on western sites has been rejected and refined, there continues to be reliance on far-flung sites in the east for interpreting local finds. This dependence is not inappropriate, but needs to be recognized and continually refined as Paleoindian movements and regional variations are recognized.

Jay Custer and Michael Stewart (1990) propose that the best modern environmental analogies for the Paleoindian period are the forests of southern Quebec and Labrador and the scrub forests of coastal Maine. The ethnographically known inhabitants of the Eastern subarctic include the Naskapi, Montagnais, Eastern Cree, and Attikamek (Custer and Stewart 1990).

These groups also may provide the best analogy for the Early and Middle Archaic (Custer 1990; LeeDecker et al. 1991). They practice generalized foraging using a broad range of resources and their social organization is characterized by flexibility, as is that of most hunter-gatherers. Their broad-based hunting is supplemented by fishing and gathering, although the use of fish may be underestimated ethnographically. High residential mobility covers annually a mean area of approximately 48,000 square kilometers. Such far-ranging mobility into several physiographic zones provides access to a great range of resources.

The summary of ethnographic observation on the seasonal characteristics of subsistence and settlement for the Montagnais-Naskapi is provided in Table II.8.

The particular seasonally available resources would be different in the mid-Atlantic but the ethnographically documented correlation between settlement type, social group size, and food resources provide a framework with which to pose questions. But the questions are not limited to the kinds of data which ethnographers saw fit to describe. For example, as is discussed further in the section on the use of the landscape, the effect of lithic resources on early prehistoric settlement has been extensively discussed within the mid-Atlantic. Raw materials, however, are not noted in the seasonal chart of Table II.8.

Table II.8. Montagnais-Naskapi Seasonal Subsistence-Settlement Round; Proposed as Source of Some Analogies for Paleoindian through Middle Archaic mid-Atlantic (Source: LeeDecker et al. 1991:43 from Fitzhugh 1972).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Settlement Type	Trapping Camp	Caribou Hunting Camp	Caribou Hunting Camp	Caribou Hunting Camp	Spring Gatheri ng	Summer Fishing Camp	Summer Fishing Camp	Summer Fishing Camp	Summer Fishing Camp	Fall Hunt Camp	Fall Hunt Camp	Trapping Camp
Social Group	Family Group	Family Group	Family Camp	Family Camp	Band	Band	Family Group	Family Group	Family Group	Family Group	Ind-ividual Family Unit	Ind-ividual Family Unit
Fishing	Ice Hole Fishing and Spearing	Ice Hole Fishing and Spearing	Ice Hole Fishing and Spearing	Ice Hole Fishing and Spearing	Trout	Trout	Trout and Salmon	Trout and Salmon	Trout	Trout		Ice Hole Fishing and Spearing
Hunting	Ptarmigan Caribou, Small Game	Ptarmigan Caribou, Small Game	Ptarmigan Caribou, Small Game	Ptarmigan Caribou, Small Game	Duck, Goose, Black Bear, Seal, Small Game	Duck, Goose, Black Bear, Seal, Small Game	Small Game	Black Bear, Small Game	Black Bear, Duck, Goose, Small Game	Caribou, Duck, Goose, Small Game	Caribou, Small Game	Ptarmigan Small Game
Trapping	Trapping									Trapping	Trapping	Trapping
Plant Food				Berries	Berries			Berries	Berries	Berries		

During the Late Archaic, Early Woodland, and Middle Woodland time periods the environment was largely modern, although there was some variability.

Several different groups from all over the world have been suggested as appropriate analogies for mid-Atlantic societies during these periods. George Nicholas (1987:103) suggests that the Ainu of northern Japan would be an appropriate analogical ethnographic group for Holocene groups in the northern temperate zone. He is critical of using groups such as the desert-dwelling !Kung, and the northern Netsilik, Nunamiut, and Barren Ground Eskimo, Cree, or Montagnais-Naskapi as many archeologists have done. Daniel Mouer (1991a:265) suggests that, due to the richness of the mid-Atlantic environment, appropriate analogies should be made with the Tlingit and Kwakiutl of the Northwest Coast during the 19th century.

An analogy often used for groups displaying some status differentiation but not enough to be considered chiefdoms is that of the ethnographically documented "Big Man" system in New Guinea (Sahlins 1970). "Big Men" are influential individuals who enhance their prestige by displaying and manipulating objects they acquire through trade with other "big men." They also gain and obligate supporters by providing feasts and giving away prestige objects. Because "Big Man" positions relied on individual achievement and persuasion rather than on inherited power or the direct control of resources, they are part of egalitarian systems without institutionalized leadership.

Leadership and social organization analogous to "Big Man" systems has been proposed for some mid-Atlantic groups prior to the adoption of maize agriculture (e.g., Stewart 1992; Blanton 1992). Custer (1988), for example, writes of the Late Archaic to Middle Woodland periods that,

> the combination of circumscribed environments and intensive coastal resource utilization focusing on a variety of resources created biosocial environments where more complex big-man organizations had an adaptive advantage.

For the latter part of the Late Woodland and the protohistoric periods, ethnohistorical data provide the most direct analogies. However, groups west of the Coastal Plain are not well described. Table II.9 summarizes the seasonal characteristics of subsistence for the Virginia Algonquians. Except for those produced by agriculture, food resources may be assumed to have been available since the stabilization of the Chesapeake Bay by the Late Archaic.

A thorough description of the socio-political organization of the Chesapeake Algonquians at the time of contact through the end of the 17th century is provided by Potter (1993; and see Table II.9 below), Turner (1976, 1985), and Rountree (1989).

Table II.9. Coastal Algonquian Seasonal Subsistence-Settlement Round; Analogy for Use of Modern Environment during the Late Woodland (abstracted from Potter 1993:40-43).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Oct	Oct	Nov	Dec
SHELL-FISH	oyster (fresh and dried)	oyster (fresh and dried)										oyster (fresh and dried)
AGRICULTURE	stored corn	stored corn	stored corn	planting	planting	planting	squash, gourds, beans, pumpkins	squash, gourds, beans, pumpkins	squash, gourds, beans, pumpkins		stored corn	stored corn
FISHING	smoked and dried fish	smoked and dried fish	fish weirs, marine fish	fish weirs, marine fish, ana-dromous fish	marine fish, ana-dromous fish	marine fish, ana-dromous fish	marine fish, ana-dromous fish	marine fish, ana-dromous fish	marine fish			
PLANT FOODS				straw-berries, rasp-berries, black-berries, huckle-berries, herbs	straw-berries, rasp-berries, black-berries, huckle-berries, herbs	straw-berries, rasp-berries, black-berries, huckle-berries, herbs	tubers	tubers	walnuts, chestnuts acorns, chin-quapins	walnuts, chestnuts acorns, chin-quapins		
ANIMAL FOODS			turkey, squirrel deer	turkey, squirrel deer						communal deer hunt	communal deer hunt	
GROUP MOVES AND EVENTS	hunting camps est-ablished near Fall Line	hunting camps est-ablished near Fall Line		hunting parties return to village			village dispersal into small companies	village dispersal into small companies	village ag-gregates; major feasts and sacrifice	village ag-gregates; major feasts and sacrifice	village ag-gregates; Chiefly feasts and sacrifice	hunting camps est-ablished near Fall Line

Archeologists have drawn upon a variety of models to provide a context for analysis of historic period resources. Consumer theory, ethnic boundary maintenance, socioeconomic class relationships, and the world economic system are some of the frameworks used. The latter, adapted from scholars such as Fernand Braudel, Immanuel Wallerstein, and Eric Wolf, provides an overarching framework for the historical period. More specifically, a focus on mercantile and industrial capitalism has been suggested as a way to keep the myriad issues of historical archeology connected: "In the United States ... historical archeology is nearly always centered on time periods and people embedded in or buffeted by the complex context of capitalism" (Little 1994:16). Within this overarching framework fit many different research topics which address questions on the global, regional, local, and household levels.

An influential model of archeologically observed change has been offered by James Deetz (e.g., 1977). He describes a general cultural change in the world view of New England colonists, but the change he describes is far more widespread throughout the English colonies. The cultural shift from a medieval mindset, emphasizing values of communality, to a Renaissance and Enlightenment-inspired individuality, is represented in various categories of material culture. Artifacts and other remains relating to food preparation and presentation have been the most archeologically visible of these. For example, in the mainstream Anglo-American culture of the 18th century, bowls for serving shared stews give way to a predominance of platters for serving cuts of meat. Large shared trenchers are replaced by matched sets of individual plates.

Deetz's model of cultural change has been and continues to be tested, applied, and refined. One of the most influential modifications came about the placing the observed changes within the context of mercantile and then industrial capitalism developing as a world economic system (Leone 1988; Shackel 1993a). Several archeologists have suggested that capitalism be considered the proper primary focus of the discipline (e.g., Leone 1977; Leone and Potter 1988; Orser 1988; Paynter 1988). Barbara Little (1994:17) writes:

> Within the world system of capitalism there are certainly different spatial and temporal scales of analysis and different foci for research. Within the United States the phenomenon of capitalism is not necessarily specific to region or time period; it is not unique to East Coast industrialism. Although capitalism supports and is supported by a dominant cultural ideology, neither it nor the ideology is transcendent or all-encompassing; they are challenged, changed, and embraced.

The recognition of capitalism as a complex and multi-dimensional umbrella under which to construct interpretations is leading to the continual refinement of historical archeological frameworks.

General Environmental Parameters During the Paleoindian Period

Within Paleoindian studies, a model has emerged to differentiate early Paleoindian period (c. 11,500-10,500 BP) adaptations in glaciated and unglaciated portions of eastern North America (Meltzer and Smith 1986; Tankersley and Isaac 1990a). This model emphasizes caribou hunting in the former and mixed foraging in that latter. Although there is disagreement, most recent investigations of Paleoindians in North American use this dichotomy of landscape. Custer and Stewart (1990) reject the distinction because the paleoenvironment is unique and has no modern analogues. However, the differentiation is useful because, although unique, human adaptations within glaciated and unglaciated environments certainly may be contrasted against each other.

Edward Smith (1990) agrees that one of most significant conceptual shifts in Quaternary studies is the relatively recent realization that Pleistocene biomes were not at all like those of the present. He summarizes reconstructions of the paleoenvironment and emphasizes the dynamic nature of climatic and biotic change at the late Pleistocene/Holocene interface between 12,000-10,000 BP. The late glacial environment was a complex, highly transitory mix of boreal-deciduous-herbaceous vegetation distinct from closed deciduous forest of Holocene. There was a very rapid reordering of vegetation across eastern North America about 10,000 years ago. By then, an essentially modern Holocene vegetation association had replaced the late glacial mosaic forests.

Charles LeeDecker et al. (1991:27) note the general characteristics of the Late Glacial paleoclimatic episode from 10,000-8,000 BCE:

> Climatic conditions were cooler and moister than at present, but the gradual warming led to the retreat of the Laurentide ice sheet; regional environment characterized by a boreal forest, dominated by spruce, deer, elk, and moose were the largest game animals, but other cold-adapted species were also present.

Pollen cores taken at the Indian Creek V site near the Fall Line in Prince Georges County, Maryland indicate the following for the period 12,000-10,800 BP:

> Pine-Alder-Composite assemblage; cold climate; floodplain environment dominated by conifers (pine and spruce) and alder, with some herbaceous plants, primarily composites; hazelnut, ash and walnut present in moderate numbers; dominant nonarboreal taxa include madder and milkwort; blueberry, buckwheat, ragweed, arrowwood, wood-fern, cinnamon fern, and club moss also present [LeeDecker et al. 1991:32].

There are important implications for human adaptation that have come out of the refinement of environmental reconstruction. Many text-books and traditional archeology describe Paleoindians as "big-game hunters," assuming that mastodon and ancient bison remains which are associated with Paleoindian artifacts in the western United States must have been the preferred game in the east as well. Careful paleoenvironmental reconstruction at the Shawnee-Minisink site in the Delaware Valley indicates that by the time people occupied the area, the megafauna were already gone. Plant and fish remains at the site suggest that Paleoindians were generalized hunter-gatherers rather than big-game specialists (Dent 1991b). By Paleoindian times, c. 11,200 BP, there were spruce-dominated boreal forests with hardwoods and therefore, the main environment to which people had to adapt was the boreal forest, not tundra, mosaic, or spruce parkland. Therefore the available fauna consisted of modern deer, elk, and moose rather than megafauna (Custer 1990).

Overview: Material Characteristics of the Paleoindian Period

One of the most intensely researched topics in North American prehistory is the earliest human occupation, the Paleoindian period. It is not simply time which veils the most ancient American lives; it is also the strangeness of attempting to understand completely new adaptations in an environment without any modern counterpart. Analogies are limited not only for ecological conditions but also for various components of behavior and culture such as economy, mobility, and social interaction.

There are very few sites of the Paleoindian period in the Potomac Basin but there are numerous isolated finds of diagnostic artifacts. The first people to live in the Potomac River Basin walked through a landscape that would be completely unfamiliar to us today. Exactly when they arrived we do not know, but the area certainly has been used by human groups since the end of the Pleistocene era, about 10,000 years ago. They came in waves of migration which swept the continent. For about half a millennium there was an impressive spread of a distinctive artifact first identified near the town of Clovis, New Mexico. The fluted Clovis point spread throughout the New World from about 11,500 to 10,800 years ago, probably carried by a wave of migrating peoples who entered the North American continent via Beringia (the Bering Land Bridge). There are numerous claims throughout the Americas for dates of human occupation much earlier than the 12,000 or so years that has been long accepted (e.g., Dillehay 1986, Dillehay and Collins 1988). None of the claims is noncontroversial, however. In western Pennsylvania, Meadowcroft Rockshelter has yielded the earliest radiocarbon date in the eastern United States, potentially dating human occupation to over 19,000 years ago. The claims for Meadowcroft have been vigorously contested and defended in the archeological literature. The excavator and others (Adavasio et al. 1988:58) recently wrote that humans were in the area "as early as ca. 16,000 B.P. and certainly before 11,300 ± 700 B.P." The earliest occupations at Meadowcroft may be the clearest indication of pre-Clovis occupation in the east, but that very possibility is controversial among archeologists. The earliest widely accepted sites are those with Clovis occupations.

The Paleoindian period as a whole was originally identified by archeologists as initial pre-Holocene adaptation. The only unambiguous chronological diagnostics are fluted points and, although these are highly variable, they tend to be lumped together into an often undifferentiated time period. Kenneth Tankersley and Barry Isaac identify the lack of chronological control in Paleoindian studies as a primary challenge for the field. They (1990b:xiv) write,

> Assuming fairly rapid cultural change, commensurate with rates of change in the nonhuman environment over most of the region at the Pleistocene/Holocene interface, the mixing of Early Holocene cultural materials with those from the Late Pleistocene confounds any attempt to reconstruct the cultural adaptations of the earliest inhabitants.

That is, without strict time control, archeologists will be unable to understand either Pleistocene adaptations or the changes that correlated with the shift in geological eras.

Researchers in the mid-Atlantic do not agree on the dates for the Paleoindian period. Expectedly, due to the uncertain time of human entry, beginning dates vary. Michael Barber and Eugene Barfield (1989) give 12-10,000 to 8000 BCE as the time span. Paul Inashima (1986) cites traditional chronology as 10,000 - 8000 BCE. The Maryland State Preservation Plan ends the period at 7500 BC and William Gardner (1983) ends it at 6500, including in the Paleoindian period the diagnostic point types which many other researchers place in the Early Archaic.

Gardner and Robert Verrey (1979) divide the eastern Paleoindian period into three subperiods based on point styles: Clovis, Mid-Paleo, and Dalton-Hardaway. Gardner (1989:9) provides the following dates for these phases.

Paleoindian I (Clovis) date between 9500 and 8000 BCE. This phase is marked by a typical eastern Clovis point, which is a narrow, fluted, lanceaolate biface with concave base, partial edge grinding and lateral pressure retouch and fluting scars.

Paleoindian II (Mid-Paleo) appears by at least 8600 BCE. The Mid-Paleo point is smaller, thinner and more markedly fluted. Ebright (1992:28) rejects the Mid-Paleo point type, although agrees that a middle Paleoindian subperiod may be a valid concept.

The Paleoindian III (Dalton) phase is over by at least 8000 BCE. The Hardaway-Dalton point type is roughly triangular with deeply concave base and prominent ears and much reduced fluting.

David Anderson (1990) notes that this generally accepted division corresponds to I: initial colonization and exploration; II: settling in and establishing regional population concentrations; and III: switching to Holocene conditions and adaptations.

This plan adopts the traditional end-date for the period at 8000 BCE, recognizing that careful chronological control within the late Pleistocene and early Holocene is critical. Adopting the early-middle-late division of the time period should encourage more careful control and less lumping, as Tankersley and Isaac recommend.

Commenting on tool types and technology, Carol Ebright (1992:29) writes that the:

> Paleoindian tool kit is exceptionally uniform over most of the continental United States. Non-projectile point flaked stone tools are nearly exclusively unifacial in character, including both formal tool types such as end and side scrapers, limaces, gravers and perforators, and heavily-retouched flake tools. Pieces esqillees are well-documented from eastern sites. Workmanship is uniformly excellent, with a technological sophistication unmatched until the much-later Hopewell florescence in the Middle Woodland subperiod. Bone tools have been recovered from many Western Paleoindian sites; their virtual absence in the East is undoubtedly due to lack of preservation.

Commenting on other aspects of paleoindian assemblages, Robert Humphrey and Mary Elizabeth Chambers (1985:9) comment that there is "significant variation among artifacts both in minor detail and major forms" and a "bewildering variety in Paleoindian artifact complexes." Some of this variation is certainly due to function, and stylistic or chronological differences may be due to functional needs, but there are other reasons, including the large number of microenvironments and, as environments changed, regional and seasonal variation.

John Cavallo (1981:15-16) notes that a mix of "aberrant" Paleoindian point forms fits in with idea of regionalization of styles in the late Paleoindian/Early Archaic which has been suggested by various researchers.

> Whether the diversity of styles during this phase is due to the disappearance of later Pleistocene herbivores, the growth and dispersal of Paleo-Indian populations, a technological shift, or cultural lag, remain questions to be addressed by future research.

The single diagnostic artifact is the fluted point, usually made of high quality cryptocrystalline. Other lithics include scrapers gravers, wedges, and bifaces for hacking and chopping (LeeDecker et al. 1991:6) as well as denticulates, burins, hammerstones, and utilized flakes. Michael Johnson (1989) discusses some of the extensive variability of paleoindian lithic technology.

Theodore Reinhart (1989) emphasizes the diversity of point types in eastern compared to western North America. He (1989a:180) issues a warning about the overreliance on single diagnostic forms:

> If we use only the presence or absence of the fluted point for identification we may lack the ability to clearly determine the actual progression of cultural developments and associated changes in population demographics and subsistence.

Smith (1990) is concerned about an overemphasis on lithic technology in interpreting Paleoindian life. Where preservation is good, an elaborate bone and ivory technology is revealed. He points out that stone points are the most expendable parts of a weapons system. That is, hafts, handles, foreshafts, and shafts are likely to be the most heavily curated implements in the weapons systems, and possibly within the whole of Paleoindian material culture.

General Environmental Parameters during the Archaic

The Archaic was characterized by generally modern (Holocene) climatic conditions, although that is not to say that the landscape suddenly looked like today's. There continued to be complex changes. The ancient Susquehannah River, ancestral to the Chesapeake Bay, began to be submerged by encroaching water circa 10,000 BP, but the infilling of the Bay was not complete until about 5,000 BP. The formation of the Potomac basin then, as we know it, presented a slowly changing landscape to humans for thousands of years.

Custer (1986) emphasizes the consequences of the major geologic and climatic changes in place by 5000 BP. First, the dramatic reduction in the rate of sea level rise and the stabilization of the Bay allowed the stability of estuarine settings and the development of extensive shellfish beds and fishspawning habitats. Second, there was dramatic change in vegetation as hickory and pine increased and grasslands spread. Major changes in streamflow patterns and aoelian erosion and deposition and the drying of ephemeral and minor streams were also important. Both of these developments affected human settlement patterns from 5000 to 1000 BP (3000 BCE - 1000 CE) as people shifted their attention to the rich and predictable resources on major rivers and estuarine marshes (Custer 1986).

Overview: Material Characteristics of the Archaic

The Archaic period was so-named in the 19th century to designate an outdated wandering way of life, a perception now itself outdated. The period covers a long time and traditionally includes hunter-gatherer lifeways during the Holocene. With a growing understanding of the complexity of both hunting-gathering lifeways and the development of agriculture, the definition of the period is more nebulous. The end of the Archaic is usually marked by the innovation of pottery, traditionally regarded as a Woodland period trait. General trends of the Archaic have been traditionally identified as population growth and greater dependence on food gathering relative to hunting as well as the absence of agriculture, ceramics, and settled village life. The definition of Archaic lifeways continues to be refined by modern archeologists.

Adaptation to the emerging modern environment is one of the primary ecological challenges through the Early and Middle Archaic. One of the primary issues identified as of anthropological interest during the Archaic is the development of sedentism. James Brown (1983:8) writes the "[t]he proper objective of this interest in settlement analysis is to monitor the development toward sedentary settlement systems." But there is much of cultural interest during the Archaic. As emphasized above in the section on archeological logic, there is a growing realization that Hunter-Gatherer social and cultural complexity is an important topic and that non-food-producers are not necessarily simple or even egalitarian.

James Phillips and James Brown (1983) date the Archaic in American Midwest from 10,000 to 2500 years ago. Mark Wittkofski (1991b) ends the Late Archaic in Virginia at the same time. It is common in the mid-Atlantic to distinguish a Terminal Archaic or Transitional overlap between the Late Archaic and the Early Woodland. In this plan, however, 1,200 BCE is used as the end of the Archaic and the beginning of the Woodland because pottery appears in the region by this time. The dates used here are Early Archaic: 8,000-6,000 BCE, Middle Archaic: 6,000-4,000 BCE, Late Archaic: 4,000-1,200 BCE.

The Archaic chronological and typological sequence is relatively well defined but it is based upon widely scattered sites in a large region from the Delaware valley to the Carolina Piedmont and from the Atlantic coast to the Ohio valley. Such a broad area has led to some typological confusion (Ebright 1992:30). Naming types without adequate definition is a problem as well. Ebright (1992:30) notes that "[t]he end result has been a plethora of named types for the Archaic, many of which overlap morphologically and temporally, or constitute such a small sample that a type designation is inappropriate." It is for this reason that a limited number of point types is listed in Table II.3 in this plan.

Because many Archaic sites in the region are plowed and possess multiple components, control is limited as well. Clarence Geier (1990) cites some limitations for Early and Middle Archaic sites: 1) there are few stratified or other sites in the mid-Atlantic; 2) virtually all site assemblages are limited to lithics; and 3) there is a lack of paleoenvironmental data. Simple logic demands a more diverse tool kit than the one represented by limited lithics. There are hints of complex technology, for example, in basketry impressions and bone tools (Geier 1990).

Trends during the Early through Middle Archaic subperiods include (Geier 1990):

1. population increase into the Late Archaic; only New England underwent possible population decline after the Paleoindian period;
2. broader range of environments during Archaic; technologies developed to maximize resource use and ecosystem complexity;
3. use of lithic raw materials is best known part of Archaic systems due to preservation; increased reliance on locally

available resources, bipolar reduction technologies more common;
4. introduction of ground stone techniques.

Jeffrey Hantman (1990b) cites the paucity of Early and Middle Archaic sites in good context but is more concerned with the conceptual problem in considering the Early and Middle Archaic as period of little change, defined more by what they lacked than by what they had. Instead of assuming linear, directional change leading toward Woodland horticulture, archeologists need to focus on how and why cultural adaptations varied in time and space through the Early and Middle Archaic. For example, permanent habitations, multi-regional exchange, storage, and specialized plant gathering occurred during the earlier Archaic. Even formal cemeteries are during found in the Middle Archaic and perhaps earlier. Generally "it has been recognized that a normative stage concept does us little good in understanding the variation extant in the archaeological record of the first 4000 years of the Archaic" (Hantman 1990b:135). Hunter-Gatherers don't simply respond to a changing environment but create it. Phillips (1983:4, quoted in Hantman 1990:135) writes:

> We cannot view the Archaic period...as monolithic, nor represented by a single mode of existence. [There were] many modes of life, from foragers to collectors, to harvesters and semi-agriculturalists; and, although changes in the environment spurred new adaptive strategies, it is just as true that these adaptive strategies structured and changed their environment.

In the American Midwest, Brown (1983) notes that there is similar technology and economy across the area from Missouri to Kentucky during the Archaic. A number of issue and topics concerning Archaic period hunters and gatherers is raised in the edited volume by Phillips and Brown (1983). Many of the following points are relevant to the mid-Atlantic and Potomac Basin as well as the Midwest and are certainly not exhaustive.

1) The Archaic period includes a very broad range of adaptations;
2) the Late Archaic use of weedy seeds and domestication of native plants as well as tropical squash, horticulture and regional exchange;
3) the effects of Hypsithermal drying on upland and lowland occupation;
4) the relative seasonal group size in and use of upland and lowland areas;
5) identifying local group size and season of occupation;
6) trend to sedentism and increasing duration of occupation after 7000 BP;
7) territorial marking by groups, social identity, political units, social reproduction,and workforce composition; including the territorial exclusion and emergence of cemetery markers as territorial claims of social groups;
8) ceramic innovations;

9) Holocene landscape changes and their effect on site preservation and discovery, indicating the need to look for buried as well as surface sites.

Several authors stress the importance of understanding geomorphology in understanding Archaic sites and changes through the period (e.g., Ebright 1992; Kay 1983, Wiant et al. 1983). Holocene landscape changes, for example have 1) buried or destroyed Archaic alluvial sites and 2) deflated interfluvial, upland sites (Kay 1983). Usually stratification is obliterated in deflated sites and the sequence must be inferred through typology. Johnson (1983) notes that in the Potomac Valley, sedimentation above the Fall Line has buried early sites under as much as 15 ft of alluvium. Curry and Ebright (1989) document major geomorphological changes in the mid-Atlantic, resulting in the deep burial of Paleoindian and Archaic sites in ridgetop settings.

General Environmental Parameters during the Early Archaic

The general characteristics of the Preboreal/Boreal paleoclimatic episode from 8,000-6,500 BCE are:

> increase in duration of southern air masses; slight increase in temperature and reduction of cloudiness; reduction of open grasslands and spread of forests dominated by pine and northern hardwoods [LeeDecker et al. 1991:27].

Pollen cores at the Indian Creek V site near the Fall Line in Prince Georges County, Maryland indicate the following from 10,800-7,600 BP (8,800-5,600 BCE):

> Birch-Oak-Goldenrod assemblage; warming climatic conditions indicated by a dramatic increase in birch and decrease in spruce and pine; oak increases; alder decreases but remains plentiful; hazelnut, beech, ash and walnut present; wood-fern and cinnamon fern increase during this period; black gum and blueberry appear near the end of this period; landscape possibly has some open areas colonized by goldenrod [LeeDecker et al. 1991:32].

Deciduous trees increase and therefore the carrying capacity of forests increases as more forage is available to support a larger deer population.

After 6,500 BCE, with bifurcate diagnostics, marsh and swamp habitats began to emerge, providing new ecological zones which humans took advantage of. There is evidence in the Middle Archaic for an increase in plant processing.

Overview: Material Characteristics of the Early Archaic

Archaeologists disagree over the terminology and placement of the peoples who followed the Paleoindian migration into the mid-

Atlantic region. The Early and Middle Archaic are the most poorly known periods in the region. There are relatively few sites. The sea level continued to rise in this period and other Holocene shifts buried or destroyed sites as well.

The Early Archaic may be subdivided into several phases; Laurie Steponaitis (1980), for example, splits it into five. Here, however, two will suffice: the early Early Archaic, marked by notched points, and the late Early Archaic, marked by bifurcate-based points. There are disagreements over the inclusion of bifurcates in Early or Middle Archaic.

Custer (1990) dates the Early and Middle Archaic from 10,000-5000 BP. He would include bifurcates (8500-8000 BP) in the Middle rather than the Early Archaic.

Gardner and his associates (e.g., Gardner 1989) believe that there is essentially continuity from the earliest Paleoindian settlement through the early Early Archaic that may be characterized as a terrace-oriented base camp pattern.

Synthesizing from the Flint Ridge Complex in the Shenandoah Valley (Thunderbird and Fifty sites) Gardner (1974a,b) sees a three-phase continuum related to point shifts: corner notched (Palmer/Kirk/Amos) to side notched (Warren/Big Sandy/Kessell) to stemmed (Kirk Stemmed). The tool kit for Paleoindians and (early) Early Archaic included side, end and concave scrapers, single and multiple gravers, wedges or bipolar tools, denticulates, burins, bifacial tools such as scrapers, choppers, knives, and preforms, utilized flakes, hammerstones, and split cobble abraders. The toolkit is also marked by the absence of food grinding stones, chipped stone axes, pitted hammerstones and anvils, and drills. Changes in the Early Archaic include changes in hafting techniques (Geier 1990).

At the Shawnee-Minisink site the end and side scrapers of the Paleoindian period become larger and more roughly made in the Early Archaic. Early Archaic tools are more multifunctional than specialized; a perforator/drill is introduced. By the end of the Early Archaic the tool kit includes slug shaped, keeled and flake endscrapers, snapped flake scrapers; flake knives; spokeshaves; "nutting stones" and quartz crystal punches (Geier 1990; McNett 1985).

The Corner-notched tradition is widespread through the Southeast and southern mid-Atlantic as well as West Virginia. Temporally diagnostic points include Palmer corner-notched and Kirk corner-notched. The Corner-Notched tool kit is probably similar to that of the Paleoindian, as evidenced at Flint Run, including scrapers, gravers, denticulates, drills, bruins, hammerstones, utilized flakes, and knives. At the St. Albans site there are also chipped hoes or grubbing tools (Broyles 1971:39). Maureen Kavanaugh notes rhyolite use in the Piedmont. Steponaitis (1980) also notes more rhyolite use in lower Patuxent River drainage and considers that this could indicate the beginning of trade. It may also indicate the continuation of extensive mobility over large areas. There was a continued preference for high quality cryptocrystalline lithic sources.

The Bifurcate tradition is similarly widespread and includes Deeply notched bases and side notched: St. Albans side-notched, LeCroy, and Kanawha stemmed. Tools include knives, scrapers, hammerstones, drills, and hoes (Broyles 1971). Rhyolite is used as a primary lithic with quartz and quartzite in Baltimore county, Anne Arundel, Prince Georges, and Frederick Counties in Maryland. There is more use of local lithic materials in bifurcate points.

The Bifurcate tradition is placed in the Early Archaic by some researchers and in the Middle Archaic by others. Much of the primary research on bifurcate occupations is from the South Atlantic United States and interpretations are extended throughout the Eastern Woodlands (Anderson 1991b). Bifurcates are associated with Eastern deciduous forests from the Mississippi to the Atlantic and from the Great Lakes to the Fall Line but are not in Florida, the Gulf or the Lower Atlantic Coastal Plain. Bifurcate point styles identified and dated in the southeast include St. Albans, 6900-6500 BCE; LeCroy, 6500-5800 BCE; and Kanawha, 6100-5800 BCE. Anderson (1991b) offers some general observations about changes during the late Early Archaic. Besides the obvious change in point form there are pronounced changes in toolkit composition toward expedient technologies. That is, earlier assemblages with formal, curated tools such as gravers and hafted scrapers were replaced with situational tools; utilized flakes became much more prevalent. Wide-ranging mobility in the earlier Early Archaic, indicated by a great deal of extralocal lithic material, was followed by decreased mobility and circumscribed territories, indicated by more use of local raw materials. In the South Atlantic by the beginning of the Middle Archaic, there was year-round occupation within small territories (Anderson 1991b).

The Early Archaic assemblage of stone tools is like that of the Paleoindian period in that there a predominance of unifacial tools and a continued use of high-quality cherts. It is different in that the range of raw materials expands later in the period, with intense rhyolite exploitation in Maryland, and the range of tool types and techniques increases. For example, there are hammerstones, manos and metates as well as flaked stone celts and "hoes." In the Tennessee valley there is an increase in the use of bipolar reduction (Ebright 1992:32).

During both Paleoindian and the Early Archaic periods people carefully managed a curated biface tool technology. It is possible that changes in tool technologies approximately 9000 BP marked a change in mobility. The number of productive habitats increased and the need to travel over great ranges decreased. There may also have been a rise in population density (Custer 1990). Ebright (1992:32) writes, "The increasing use of local, often inferior materials and generalization tool forms imply a less mobile lifestyle in a more predictable environment."

Another change in the Early Archaic is the expansion into a wider variety of settings. There is also less curation of tools and a drift away from the restricted raw material preferences observed in the earlier period. It is evident that regional differences were appearing at by the Early Archaic in projectile types, mode of lithic tool manufacture, and associations of diverse point types.

General Environmental Parameters during the Middle Archaic

Funk (1991) suggests that there is no reason to expect anything other than modern environmental restrictions during the Middle Archaic in New York. However, Stewart and Cavallo (1991:21) characterize the era as not directly comparable to current conditions, although this is when the first fully deciduous Holocene forests exist.

The Atlantic paleoclimatic episode from 6500-3100 BCE is characterized by:

> sharp reduction in duration of Arctic air masses; appearance of modern environmental conditions--early part of period characterized as warm and humid, while later part was increasingly dry; full appearance of modern environment with warm, moist conditions; continental climate with marked seasonal differences; widespread dominance of mesic oak-hemlock forests; establishment of modern faunal communities; expansion of deer and turkey populations [LeeDecker et al. 1991:27].

Analysis of pollen cores dating 7660-5000 BP (5660-3000 BCE) at the Indian Creek V site indicates:

> Oak-Hazelnut-Cinnamon Fern-Sedge assemblage; moist, warm conditions indicated by disappearance of spruce and fir and reduction of pine and birch; oak, hazelnut, and alder are the dominant arboreal species; maple, black gum, beech, ash and walnut are present but in low numbers; cinnamon fern is the dominant herbaceous species; sedges reach their climax and elderberry first appears during this period [LeeDecker et al. 1991:32].

Overview: Material Characteristics of the Middle Archaic

There are very few intact Middle Archaic contexts in the mid-Atlantic. "So little data is present, in fact, that some researchers in the Middle Atlantic do not even recognize the existence of a Middle Archaic subperiod in certain areas (e.g., Kinsey 1972)" (Ebright 1992:33).

Stewart (1991b) notes that, regardless of how it is labeled, the time between 6500 and 3000 BCE is some of the least known in the mid-Atlantic. In spite of the acknowledged dearth of information on the Middle Archaic, Stewart (1991b) offers the following general trends for the period, in which he includes occupations associated with bifurcate-based points (6500-5800 BCE). As a result of a growing population adapting to a seasonal, more fully deciduous forest, there are

1) more sites than earlier,
2) a broadened resource base and seasonal emphases on suites of resources,
3) more frequent reuse of individual sites, and
4) increasing emphasis on locally available raw materials for tool production.

Keith Egloff and Joseph McAvoy (1990) date the Middle Archaic from 6500/6000 to 2500 BCE and use the following criteria:

1) increase in ground stone tools;
2) warmer and drier climate;
3) diffusion east from central plains;
4) use of shellfish;
5) increase in use of hickory nuts;
6) less use of end scrapers and unifacial tools;
7) introduction of net sinkers; and
8) minimal curation of tools.

Material is added to the toolkit for an apparently growing emphasis on woodworking and plant processing. Ground stone tools, such as grooved axes, pestles, mortars, and atlatl weights appear. There is more reliance on bifacially flaked tools as unifacially flaked tools, including scrapers, become scarce. New features include stone-lined hearths on prepared floors (Geier 1990). Ebright (1992:34) states that there is more use of poorer quality lithics, but that these are often from nonlocal sources. There is also extensive use of bone and antler documented in Tennessee.

Although not well known in the mid-Atlantic, the Middle Archaic was clearly an important time period. In the midwest, Late Archaic characteristics such as multiseason base camps, permanent habitations, multiregional exchange, and specialized plant gathering are all projected back more than 5000 years. While the mid-Atlantic Middle Archaic is too poorly understood for any such projections, a warm and dry climatic episode, analogous to the Midwestern Hypsithermal from 8500-5100 BP, affected most sections of the eastern United States (Joyce 1988). Some researchers attribute major changes, including sedentism, during the Middle Archaic to adaptations to changing environmental productivity.

Whether developing during the Middle or Late Archaic, changes in mobility toward sedentism have certain implications and archeological correlates. Certainly, sedentism is interrelated with population growth, the development of food production, storage technologies, property accumulation, and labor organization. Archeological correlates include 1) more permanent facilities of all types, 2) increase in the organization of these facilities, and several effects in food remains, raw material use, and material culture (Brown and Vierra 1983).

General Environmental Parameters during the Late Archaic

The major environmental change was the infilling of the Chesapeake Bay and concomitant development of estuarine resources. The first known use of shellfish is seen about 2,100-2,000 BCE at the start of Broadspear tradition at the White Oak Point site on the Potomac (Waselkov 1982) and along the Coan River (Potter 1982).

The Subboreal paleoclimatic episode from 3,100-800 BCE may be characterized as:

> Warm, dry climate (mid-postglacial xerothermic, circa 2350-200BC) at the beginning of the episode, followed by gradually increasing moisture and cooling temperatures; dry conditions led to spread of grasslands and reduction of oak-dominated forests; reduction in the rate of sea level rise permits florescence of estuarine environments in coastal areas [LeeDecker et al. 1991:27].

The most significant vegetational change was around 5000 BCE with the Coastal Plain pine expansion and the paneastern hemlock decline (Joyce 1988).

Pollen cores from the Indian Creek V site near the Fall Line in Prince Georges county, Maryland indicate the following from 5,000-3,860 BP:

> Oak-Cinnamon-Fern assemblage; warm, dry climatic conditions indicated by the dominance of oak and increased in hickory and pine; alder and birch decrease and hazelnut disappears with only sporadic occurrences in later ones; dominant nonarboreal species include cinnamon fern, which peaks during this period, and blueberry, elderberry, arrowwood, and buckwheat [LeeDecker et al. 1991:32].

Overview: Material Characteristics of the Late Archaic

Some researchers find it useful to combine traditionally identified Late Archaic with Woodland time periods. Stewart (1980) calls the traditional chronological divisions irrelevant in the Great Valley province. Mark Wittkofski (1991b) dates the combined period of Late Archaic and Early Woodland from 3000-500 BCE. Custer (1984) would prefer a time division of Woodland I, encompassing traditional Late Archaic, Early Woodland, and Middle Woodland, since there is evidence of sedentism and increasing social complexity throughout the time span. The Fairfax County, Virginia plan (Table II.2) follows this suggestion.

Throughout the eastern United States archeologists have observed the same general trends during the Late Archaic as people increasingly focused their energy on riverine, estuarine, or lacustrine settings and resources and developed more sedentary settlement systems. Changes in natural environment and population pressure have been the most commonly cited causes (Hodges 1991).

A meaningful goal, though, is not simply to attribute changes in human strategies to external causes, but to address human choices and responses in the face of major changes: response to new resource availability with different organization of labor and production, storage and the distribution of surplus; responses to decreased mobility and demographic changes in terms of social authority and control.

Mouer (1991a) offers the Halifax Complex as the archetypical Late Archaic culture, relying on a "sylvan adaptation" on the James River Piedmont. Late Archaic adaptations until approximately 2500 BCE can be briefly summarized as having a forest specialization with more flexibility on the Coastal Plain than in the Piedmont due to the more patchy resources of the former environment. People would live in small groups which would occasionally aggregate but would have relatively low levels of regional interaction (Mouer 1991a).

The transition between the Archaic and the Woodland period, sometimes labeled as the Terminal Archaic (see Table II.2) or as the Transitional, correlates with environmental change as the Chesapeake Bay estuaries were formed and estuarine resources as well as anadromous fish became available.

This transitional period witnessed changes in every aspect of archeologically-visible culture: site size, density and number; technology, settlement, and subsistence. The major economic changes are marked by the diagnostics of Savannah River and Susquehanna broadspears, steatite bowls, and ceramics. A new, riverine focus is noticed all along the eastern United States and there is also an increased subsistence focus on fishing and probably on drying and storing fish. Trade in steatite and other material indicates much broader regional interaction.

Three basic models have been offered for the Archaic to Woodland transition in Virginia (Hodges 1991). One considers the Late Archaic Savannah river tradition of the James River Coastal Plain and Piedmont to be a result of migration of riverine people from the south (Mouer, Ryder and Johnson 1981). A second sees the development as *in situ*, resulting from increasing efficiency permitted by environmental changes (Gardner 1984). A third considers it to be the result of both environmental change and population growth (Catlin, Custer and Stewart 1982).

McLearen (1991:91) identifies the following trends in Late Archaic technology in Virginia:

(1) the use of a number of stemmed and notched projectile point and knife forms which vary on a regional basis at the beginning and end of the period;

(2) in contrast to the above, a temporally overlapping proliferation of the Savannah River broadspear and its related large biface industry;
(3) localized manifestations of tools/points identical to those of other broadspear complexes which are typical of the northeast;
(4) some regional preferences in lithic types;
(5) use of some ground stone ad the first recognized use of the ground stone grooved axe;
(6) the use of large, heavy tools, usually on quartzite, numerous expedient tools on flakes, and the apparent addition of a few more formalized tools the in earlier times;
(7) the quarrying of soapstone, the manufacture of stone vessels, and the distribution of these vessels statewide and beyond; and
(8) on most intensively occupied sites, larger and more numerous hearths and, in general. slightly more variety in types as opposed to earlier periods.

General Environmental Parameters during the Woodland

Woodland period adaptations were achieved in a modern climate with relatively minor fluctuations. Microenvironments could, of course, vary between locales.

The Sub-Atlantic paleoclimatic episode from 800 BCE to the present may be characterized:

> Cooling reduced the moisture stress of the Sub-Boreal, leading to essentially modern conditions; upland forests include a mix of coniferous and deciduous species [LeeDecker et al 1991:27].

Pollen cores taken at the Indian Creek V site near the Fall Line in Prince Georges County, Maryland indicated the following from 3,860-1,770 BP:

> Herbaceous assemblage; dramatic decrease of all tree pollen and influx of legumes, elderberry, blueberry, and arrowwood; oak is the dominant arboreal species; pollen assemblage is indicative of a landscape covered with herbaceous plants [LeeDecker et al. 1991:32].

For the period 1,770-350 BP, pollen cores indicate:

> Ericaceae (blueberry etc) assemblage; continued reduction of arboreal species; Ericaceae increase but other herbaceous species disappear; cattail is present only during this interval; cooler climatic conditions [LeeDecker et al. 1991:32].

Francine Bromberg (1987) characterizes the Woodland microenvironments of the Inner Coastal Plain, Outer Coastal Plain, and the Piedmont Uplands as follows.

Piedmont Uplands. In the Piedmont uplands different resources are available in the uplands and on the floodplains. In the oak-hickory and oak-chestnut forests of the uplands nuts are available in the fall. Deer are especially concentrated to the west where the forest edge meets the grasslands. Because deer's habits vary according to season, human hunting strategy does as well: individual stalking is more common in the summer and communal hunting is pursued in the fall and winter. Other game animals include squirrel, raccoon, and black bear. Puma, bobcat, wolves and foxes are also available. Turkey congregate in the fall and passenger pigeons would have been abundant before their extinction. On the narrow floodplain there are also oaks and in the rivers and streams there are both freshwater fish and anadromous fish such as shad and white perch. Primary lithic resources are also available in the uplands. Upland resources occur in great abundance periodically and seasonally (Bromberg 1987:25-28).

Inner Coastal Plain. Nuts, turkey, cottontail rabbits, and deer are available in the uplands. In the tidal freshwater marshes are tubers from fall to spring, seeds, and freshwater mussels. From inland marshes may be gathered fruits in summer, tubers, birds and fish, as well as aquatic plants. Fish and anadromous fish are present in the river and streams. The Inner Coastal Plain offers a number of diverse and productive microenvironments (Bromberg 1987:29-34).

Outer Coastal Plain. There are a wide variety of resources in the Outer Coastal Plain. The uplands, heavily dissected by streams, contain resources largely similar to those of the Inner Coastal Plain, although deer and turkey are less plentiful. The freshwater tidal marshes and wooded inland marshes are similar to but with less abundant resources than those of the Inner Coastal Plain. Abundant waterfowl, marine fish, crabs, oysters, mussels, and clams are some of the wide variety of resources in the Outer Coastal Plain (Bromberg 1987:34-42).

Overview: Material Characteristics of the Woodland

The characteristics of the Eastern Woodland period generally are identified as population increase, increased sedentism, manufacture and widespread use of pottery, domestication of native plants, adoption of imported domesticates, and the development of elaborate mortuary practices. The famous Adena and Hopewell interaction networks centered in Ohio and Illinois did not directly or greatly affect material culture of much of the mid-Atlantic, although trade networks penetrated the Appalachians and the Delmarva peninsula (Humphrey and Chambers 1985). In the mid-Atlantic, there is a seasonal hunting-gathering adaptation through the Middle Woodland at least, although there may be some plant domestication as well. In the mid-Atlantic, as in other parts of the eastern United States, many of the characteristics of Woodland societies predate cultigen use (see McBride and Dewar 1987).

Because they result from more sedentary populations, Woodland sites tend to be internally complex, containing storage pits, structure patterns, and burials. However, the Early Woodland is not well known on the Maryland Coastal Plain and there is nearly no excavated data from the Middle Woodland. Late Woodland sites are better documented.

Overview: Material Characteristics of the Early Woodland

There is clear continuity between the transitional Archaic and Early Woodland phases indicated by pottery development in both the James and Potomac drainages. Marcey Creek, Seldon Island, and Elk Island ceramics are nearly always found on the same sites and are almost always near large Savannah River occupations (Mouer 1991a:47). Early Woodland material culture in the Potomac Inner Coastal Plain and the Piedmont include Accokeek ceramics and small, stemmed, foliate and broadly side-notched points. On the Outer Coastal Plain are flat-bottom pots, jars and beakers and on the Lower James River are Croaker Landing wares and related material (Mouer 1991a).

Michael Klein and Thomas Klatka (1991:140) note that assigning point types to the Early Woodland period is problematic due to "blending of morphological attributes, the lack of associated radiocarbon dates, or the persistence of these forms through time." They are comfortable with the following as Early Woodland, although other scholars may not agree: Vernon (unaccepted by some as a separate point), Claggett, Calvert, Rossville (Piscataway), Potts Corner-Notched, as well as Fishtail varieties dating 1,000 - 200 BCE. Others (e.g., Ebright 1992), however, assign Claggett to the Late Archaic or would equate Claggett with Halifax points (S. R. Potter personal communication). Nearby, Delmarva Adena points consist of a series of side and corner-notched points of Ohio cherts and there are also small basal-notched points. Secondary lithic resources, small quartz cobbles, and bipolar technology are commonly employed (Ebright 1992:39).

The Early Woodland witnesses a change in the use of lithics toward the economical use of lithic resources in general for the Coastal Plain and Piedmont. Point forms tend to get smaller and are made with a wider variety of materials. On the Potomac Coastal Plain small quartz stemmed points are associated with early ceramics. By 900 BCE there are smaller, contracting stemmed and lanceolate to teardrop shaped points finished by pressure flaking. A wide variety of lithic types are found as debitage and for other tools as well as points (McLearen 1991b).

Early Woodland pottery is of several types. Keith Egloff (1991) summarizes the development of ceramics during the Early Woodland in Virginia, noting that early ceramics tend to be found as a few sherds at many small sites. Data on early ceramics are sparse for several reasons: 1) encampments are small; 2) sites seldom revisited; 3) early ceramics do not have great time depth; and 4) early low-fired vessels from unsuitable clays are poorly preserved and therefore poorly represented in the archeological record. The earliest pottery in the region is found along the Coastal Plain of Virginia, in the Piedmont along the Potomac and James rivers, and along the lower Shenandoah (see Table II.5.).

It is widely recognized but little addressed that the appearance of pottery is complex and nonuniform in space and type in the eastern woodlands (Sassaman 1993). Social and economic factors rather than technological ones may account for differential acceptance of early pottery. Kenneth Sassaman (1993) draws on gender relations as a social variable to attempt to explain some of the patterns of early pottery use during the archaic-woodland "transition."

Sassaman is correct in insisting that there is a gender/kin division/allocation of labor issue in changing stone tool technology and the development of pottery. The use of these two technologies, as he writes, are expected to be "complementary and interdependent." There are models for an apparent shift from formal to expedient core reduction in flaked stone "degeneration," but in many places this change occurs as pottery appears.

Sassaman (1993) suggests that the consideration of gender adds a needed dimension to understanding this shift. But Sassaman understandably falls into the trap that Gero inadvertently set by equating formal, diagnostic tools with men's production and informal expedient, non-diagnostic tools with women's labor. Odell's (1988) careful use-wear analysis negates any simple correlations between hunting and finely-made temporally diagnostic "points" or between women's work and crude, poorly made tools.

The origin of ceramics in Virginia may be locally evolved technology inspired by soapstone bowls developing from either the northern Susquehanna Broadspear/Soapstone bowl tradition or the southern Savannah river broadspear/soapstone bowl tradition. It is also possible that some Virginia pottery is derived from the fiber-tempered pottery of the southeastern United States (Egloff 1991).

Egloff (1991) hypothesizes that the demand for soapstone vessels may have been catalyst for inexpensive durable vessels. Soapstone vessels are found as both thick, heavy containers and elegant, thin bowls. Their manufacture seems to have been limited to areas where stone was available, that is, the Piedmont. As production was unable to keep up with demand, a new solution had to be developed. Ceramic production was accepted first in areas far removed from soapstone quarries. The earliest ceramics were shaped like soapstone containers in a wide variety of vessel forms. The use of soapstone vessels almost certainly continues with the late acceptance of pottery in Virginia (Egloff 1991).

McLearen (1991:113-114) identifies six trends for Early Woodland material culture:

1. There is a rapid phasing out of the broadspear, with broadspear-derived, stemmed point forms--particularly those of the Savannah River tradition--decreasing in size

and continuing into at least the first few hundred years of the time period. By about 900-750 B.C., the large biface tradition and preferred use of mainly coarse materials has been replace by the use of a number of small lanceolate, notched, and stemmed forms made on quartz, chert, and various other lithic materials. A rather economical use of lithics predominates; the regional preferences have broken down or have been dramatically altered; and by at least the end of the period, small tools are generally the norm.

2. Ground stone technology carries over from the Late Archaic, with some of the same forms being used, but with the addition of more elaborate and well-made polished implements and ornaments.
3. Ceramics technology develops, followed by a dispersal of a simple technology which is initially based on the model of the stone bowl of the Late Archaic. Within an extremely short period of time, an experimental stage in pottery manufacture encompasses the entire region, with full blown typical Woodland technology and vessel forms by about 900 B.C. in most areas. There appears to have been a lag in southwestern Virginia until this latter technology is introduced from the south, perhaps ca. 600 B.C. or slightly earlier.
4. The rock cluster and hearth platform feature type continues.
5. A few sites show pit forms which appear typical of storage and cooking technology.
6. At one site there is evidence of architecture which is not too dissimilar to late of later Woodland phases.

Bone and shell tools include splinter bone awls, deer antler tines, bone and shell awls, shell beads, bone beamers and hair pins, turtle shell bowls and cups and miscellaneous unidentified tools (McLearen 1991:126).

Overview: Material Characteristics of the Middle Woodland

The Middle Woodland is traditionally dated ca. 500 BCE to 800/900 CE, but the chronology may be refined to subdivide Middle Woodland I, 500 BCE-200 CE, and Middle Woodland II, 200-900 CE.

Middle Woodland I is marked by sand-tempered, net-impressed Popes Creek pottery. Middle Woodland II is marked by coarse shell-tempered types of pottery, including Mockley net-impressed, cord-marked and plain. Associated diagnostic lithics include Selby Bay points and knives and corner-notched Jacks Reef points as well as Fox Creek (Steubenville) and Nomini points, which are found on the Northern Neck of Virginia (Ebright 1992; Potter 1993).

There is a resurgence in technical sophistication in knapping during this period. In the Coastal Plain non-local rhyolite and high quality jaspers are preferred lithic materials. Selby Bay points and knives are nearly always rhyolite while Jacks Reef are usually chert (Ebright 1992).

The tool kit is diverse. With Popes Creek pottery are found such tools as knives, grinding stones, mortars, axes, choppers, hammerstones, and bone awls. With Mockley wares are found a variety of tools and elliptical two-holed gorgets, hematite squares, grinding stones, three-quarter grooved axes, bifacially retouched flakes and reworked bone.

Middle Woodland II witnessed a major change in the organization of groups. On the James River the change to permanent settlements occurs between 200-800 CE. Similarly, on the Potomac Coastal Plain, mobility decreases and group boundary definition increases as very large midden sites appear after 550, probably closer to 700-900 CE (Potter 1993:140). Increasing localization of groups took place during that time. For example, Northern Neck society became more distinct from surrounding peoples south of the Rappahannock basin, north of the Patuxent basin and west of the Fall Line (Potter 1993:141).

The Middle Woodland saw interregional interaction, the continuation and development of localized styles along with interregional influences, increased sedentism, and evidence of non-egalitarian as well as egalitarian societies. On the Coastal Plain the James River marks the southern edge of the mid-Atlantic region (McLearen 1992).

McLearen (1992:41) summarizes:

> From Delaware and Maryland throughout Coastal Virginia there are shared traits, particularly from ca. A.D. 200 through 800 or 900. Such shared traits include the use of Mockley ware ceramics in Middle Woodland II, Pope's Creek and related ceramics in Middle Woodland I, some trade and exchange networks involving Maryland or Pennsylvania metarhyolite which is usually associated with Fox Creek/Selby Bay points and bifaces of the Middle Woodland II Subperiod, and accumulations of dense shell middens in the appropriate estuarine areas. Along with these common traits are appearance of local non-shell-tempered ceramic varieties which are concentrated in the Inner Coastal Plain from the fall line to the saltwater-freshwater transition.

Both Stewart (1992) and McLearen (1992) note the similarity of elaborately decorated vessels between coastal Virginia and the Delaware Valley. Stewart (1992:11) hypothesizes that these "highly decorated ceramics functioned in public ceremonies, perhaps feasting, related to the gathering of groups during annual fish runs."

Several issues are critical to the exploration of Middle Woodland material culture. The physical characterization of clays, clay sources, and temper is necessary to identify trade items and locally made and used items. A broader question requiring such information is connected to the interpretation of regional trends in ceramic production (Stewart 1992:9). An issue related to stone tool technology is the apparently changing relationship between tool production and the presence of specialists. It is also important to delineate the role of the bow and arrow in changes in stone tool technology.

A new kind of feature appears during the Middle Woodland (and likely earlier) to alter the cultural landscape. Burial mounds were built in the Potomac Valley in Maryland and West Virginia and the Shenandoah Valley in Virginia. Stewart raises these issues connected with burial mounds: public symbolism of mounds; role in integrating communities and dispersed settlements; territory covered by integrating mechanism of mound building. McLearen (1992:52) suggests that mounds appearance and disappearance may accompany the rising and falling of early ranked social systems.

Territoriality, that is, the definition and control of an area by people, is a factor that becomes more important in the mid-Atlantic during the Middle Woodland. Stewart (1992:20) writes,

> What needs to be explored further with archeological data are models of how territoriality was defined, communicated, and enforced between groups; what was the nature of social relations between these groups; and whether territoriality was perceived or operated as a seasonal or year-round aspect of the social system.

Other boundaries were forming as well. For most of prehistory physiographic regions did not mark significant cultural boundaries, but during the Middle Woodland divergent cultural adaptations appeared in the Coastal Plain and Piedmont.

Randolph Turner (1978) has suggested that the Fall Zone was used as a cooperative border zone for hunting and Mouer (1991b) suggests that it was a political buffer zone. Hantman and Klein (1992) suggest that both factors were probably relevant and that both limited settlement in the area. Egloff (1985) proposes that this boundary represents Algonquian and Siouan language groups.

One of the major issues is the nature of sociopolitical organization of Piedmont groups during the Middle and Late Woodland. At contact the Piedmont groups were the Monacan along the James River drainage and the Manahoac along the Rappahannock. These groups formed a single polity, but there is no detailed ethnohistoric record comparable to the rich descriptions of the Coastal Plain Algonquians.

The cultural boundary along the Fall Line between Algonquian speakers of the Coastal Plain and Siouan speakers of the Piedmont may have been initially defined much earlier in the Woodland (Mouer 1991a), but it is certainly archeologically identifiable around 900 CE (Potter 1993:142).

Overview: Material Characteristics of the Late Woodland

The beginning date for the Late Woodland is largely agreed to fall between 800 - 1000 CE and the end, marked by contact between native peoples and Europeans, is placed at either 1500, beginning a protohistoric period, or ca. 1600, with the settlement of Jamestown and John Smith's exploration of the Potomac River.

Depending upon location within the Potomac Basin, there are various ways to subdivide the Late Woodland. In the Maryland Piedmont there are at least three complexes. The Montgomery, marked by Shepard pottery, dates from 1000-1450 CE. Mason Island, marked by Page pottery, dates from 1400-1500 CE. Luray, marked by Keyser pottery, dates from 1500-1600 CE. In the upper Shenandoah Valley, Gardner (1983) splits the period into five phases based on specific pottery types. For the Coastal Plain of the lower Potomac River, Potter (1993) specifies three subperiods: Late Woodland I, 900-1300; Late Woodland II, 1300-1500; and Protohistoric, 1500-1650. The first is marked primarily by Rappahannock Incised pottery and Levanna large triangular points. The second is marked by Potomac Creek ware and associated Moyaone ware. Point types are primarily Levanna small triangular points and small triangular "type A" points, both of which persist into the protohistoric period. Yeocomico ware appears as a protohistoric ware and several ceramic types continued from the Late Woodland II into the protohistoric and early historic period. These are Potomac Creek, Moyaone Plain, Rappahannock Fabric-Impressed, simple Rappahannock Incised, Townsend Corded, Potomac Creek Cord-marked, and Moyaone Cord-marked (Potter 1993). Madison points are also characteristic of the Late Woodland.

Egloff (1992:203) comments on the meaning of ceramic types:

> For years archaeologist have defined ceramic wares as if they represented particular groups of people that were linguistically, socially, and politically connected. In the last twenty years, however, accumulating evidence suggest that the distribution of ceramic wares do not correlate consistently with the boundaries of linguistic or political units. However, they do represent the increasing regionalization of cultures in the Late Woodland Period and may reflect the type and intensity of interaction within and between socially connected groups.

Blanton (1992:74,76) proposes regionalization during the Middle Woodland as well. He provides maps of idealized culture areas based on ceramic attributes. Within Virginia he delineates nine during Middle Woodland I and ten during Middle Woodland II.

Although much research has been done on ceramics, minimal attention has been paid to Late Woodland lithics "despite the presence of a wide variety of implements ranging from such examples as flaked projectile points and blades to ground axes and pipes" (Turner 1992:104).

Turner (1992) describes the rich material culture of the period. Copper, often shaped as pendants and beads, was used as status marker. The craft of clothing manufacture and decoration is displayed elaborately in Powhatan's mantle, which was made of deer hide decorated with thousands of small marginella beads. Shell was fashioned into pendants, gorgets, beads, and stylized masks. Beads, pins, and fishhooks were crafted from bone.

The most apparent and major change during the Late Woodland in the mid-Atlantic is the establishment of large villages with economies based on maize agriculture. It was during the latter part of this period that major changes in social and political organization occurred concurrently with this reliance on imported crops. Populations aggregated to form large, albeit often dispersed, villages as territorial and social boundaries became increasingly distinct and important. Evidence for intergroup and interregional hostility increased after 1400 (Potter 1993). The development and dynamics of chiefdoms and competition among them have been some of the most compelling research issues for archeology.

General Environmental Parameters during the Historic Period

Major changes due to large-scale deforestation and cultivation are indicated by a ragweed assemblage in the pollen cores dating from 350 BP to the present at the Indian Creek V site near the Fall Line in Prince Georges County, Maryland (LeeDecker et al. 1991:32).

The environment of the modern Chesapeake Bay area clearly is very different from that used by Native Americans before European contact. Henry Miller (1986) synthesizes archeological and historical data to lend insight into ecological change in the region and identify when human actions became a significant factor in this change. During the 17th and early 18th centuries there was little increase in sedimentation in the estuary and consistent soil fertility, but by the latter half of the 18th century soil erosion and stream siltation were having serious ecological effects. The change was brought on by different land use practices, particularly farming methods.

The single cash crop of tobacco dominated the Chesapeake economy during colonial times. During the 17th century colonists worked the fields in the Native American fashion of "slash and burn" agriculture. In a new field trees were cut and the undergrowth cleared and reduced to ashes by burning. The soil was worked with hoes for planting corn or tobacco in little hills. After several years of tobacco and a few years of corn harvests, the exhausted field were left fallow for about 20 years. Because of the long fallow periods only a small percentage of the land was worked every year. Therefore, only small amounts of land were exposed and vulnerable to erosion. Other aspects of the farming system also reduced erosion and run-off into streams: the use of hills for planting; stumps left in the fields; and vegetation bordering worked fields (Miller 1986).

Late in the 18th century new methods of farming were adopted due to demographic, economic, and social factors. Human population growth rendered obsolete the long-term fallow system requiring 40-50 acres of land per laborer. Land values rose and short term leases were instituted. The intensive plow agriculture which replaced the fallow system allowed no time for the soil to rejuvenate. Also, during the 18th century the Piedmont was settled and cleared for agriculture (Miller 1986).

The widespread adoption of plow agriculture in the Coastal Plain and Piedmont produced major ecological changes in the Chesapeake Bay watershed. Rainwater runoff increased; therefore more fresh water entered the Bay and affected salinity. Soil erosion became a serious problem. Sediment increased the turbidity of streams and, because runoff contained phosphorous and nitrogen rich topsoil, it affected the nutrient flow. Some of the changes were very rapid. In the mid 18th century many of the creeks draining in the Potomac were navigable. By 1807 Port Tobacco creek in Charles County and Mattawoman, Piscataway, and East Branch creeks in Prince Georges county were silting up and their ports abandoned (Miller 1986:183). Clearing of land for iron ore mining and production of charcoal for iron furnaces also contributed to this erosion problem (Cronin 1986:189).

Available archeological data on fish species strongly suggest that major transformations in the ecology of the Bay's tributaries were occurring by the early 19th century (Miller 1986:185).

Even if populations had already been affected, early 19th century harvests were impressive. An 1835 report stated that 22,500,000 shad and 750,000,000 herring were caught in the Potomac River per year (Cronin 1986:190). In contrast, Eugene Cronin (1986:193) writes that presently "shad are so scarce from the combined effects of over-fishing, damming of tributaries, and pollution that Maryland has prohibited their capture since 1980" (Cronin 1986:193).

Changes in harvesting technologies and distribution during the 19th century drastically affected the estuarine resources. Shallow oyster beds were harvested in small quantities in the early part of the century but the introduction of the deep-water dredge by Connecticut oystermen brought the possibilities for greatly increased harvests and damage to oyster beds (Cronin 1986:193). Both Virginia and Maryland outlawed the use of the dredge in 1820 and 1830 respectively.

Cronin (1986:194) summarizes,

> Between 1836 and 1890, about 400,000,000 bushels of oysters were harvested in Maryland with virtually no effort to protect brood stocks, avoid destruction of small oysters, enhance reproduction, or take other protective measures despite the detailed analysis, warnings, and recommendations of scientists and surveyors... Natural reproduction was no longer replacing the harvest...Oyster bars had been destroyed, enforcement of

> laws and regulations was weak, and the oyster wars were at their worst.

During the 19th century concern about water quality focused on sedimentation and local threats to health and aesthetics (Cronin 1986:197). Agricultural run-off, industrial waste, and pollution from coal mining, in addition to household waste, created serious pollution problems. Yellow fever, malaria, and cholera were common but not explicitly connected to water quality. It took the publicized occurrence of some students getting typhoid from oysters to stimulate attempts to clean up parts of the estuary through the establishment of sewage treatment plants. Cronin writes (1986:197):

> The oyster was to become the most potent single stimulus for the control of domestic pollution around the Chesapeake....It is widespread, accumulates pollutants, is eaten raw, has high economic importance and has had remarkable political clout.

Andrew Marcus (1994:39) points out that

> Only in the 20th Century has an appreciation grown for the role that siltation plays in destroying spawning grounds, generating turbidity, storing toxins and nutrients, and drowning benthic habitats.

Awareness of the siltation problem in the later 18th and 19th century focused instead on the detriment to navigation, as deep water ports became useless for shipping. Currently, runoff still presents the worst pollution problems in the lower Potomac.

Since the mid 18th century environmental constraints primarily have been created by human action. These ecological changes have been widespread and far reaching and they continue today.

Overview: Archeological Themes for the Historic period

Once archeological attention turns to historically documented periods, the whole tone of investigation changes in response to the often rich and always biased data that are available. Oddly, historical archeology tends to ask both more and less sophisticated questions than prehistory; this dual tendency is due, in part, to the difficult methodological issues of integrating, challenging, or confirming documentary data in addition to archeological data. Archeology of historic periods is neither easier nor superfluous, but it does require a somewhat different orientation and methodology than that of prehistory. Consequently, this overview is arranged differently from those preceding as it is assumed that the reader is familiar with the basic trends of the historic period.

Following are the historic theme subdivisions used by preservationists in the region. Preservation plans tend to link themes and time periods into categories general enough to cover the sorts of cultural resources under their jurisdiction. Such categories are good for organizing information on resources and are not meant to limit the questions one may ask within time periods.

The Maryland Comprehensive State Historic Preservation Plan (Maryland Historic Trust 1986) divides the historic period into only five subperiods. These are:

1. Contact and Settlement Period -- 1570-1750
2. Rural Agrarian Intensification -- 1680-1815
3. Agricultural-Industrial Transition -- 1815-1870
4. Industrial/Urban Dominance -- 1870-1930
5. Modern Period -- 1930 - present.

The Virginia Department of Historic Resources department (1991) defines the following seven historic periods. These are:

1. 1607-1750 Settlement to Society
2. 1750-1789 Colony to Nation
3. 1789-1830 Early National
4. 1830-1861 Antebellum
5. 1861-1865 Civil War
6. 1865-1914 Reconstruction and Growth
7. 1914-1991 World War I to Present.

These divisions emphasizes the most general changes that characterize these state histories.

The Fairfax plan, written for a more restricted area, is more complex. There are ten study units for the historic period defined in the Fairfax County Heritage Resource Management Plan (Chittenden et al. 1988) These topical units overlap in time and therefore indicate some of the complexity of attempting to segment centuries of development into small time divisions. The Fairfax plan periods are as follows:

1. Exploration and Frontier -- 1550-1675
2. Early Colonial Settlement -- 1650-1720
3. Tobacco Plantation Society -- 1720-1800
4. Free Black Society -- c. 1775-1861
5. Early Diversified Agriculture -- 1750-1840
6. Agrarian Fairfax -- 1840-1940
7. Quakers in Fairfax county -- 1840-1920
8. Civil War and Reconstruction -- 1860-1870
9. Fairfax Black Community -- 1861-1964
10. Suburbanization and Urban Dominance -- 1890 - present.

The District of Columbia's Preservation Plan (DCHPD 1991) contains still more specific historic contexts. D.C.'s Historic contexts are listed below. Only those subcategories with some relevance to archeological issues are included.

A. Agrarian and Native American Economies

A1 Native American Cultures (before 1730)
A2 The Trading and Plantation Economy (1650-1800)
A3 Farmsteads and Mills in Washington County (1790-1889)

B. Building Style and Technology

C. Commerce and Industry
C1. Port Commerce in Georgetown and Washington (1750-1830)
C2 Canal Commerce in Georgetown and Washington (1828-1889)
C3 The Commercial Strip (1800-1945)
C4 Dry Goods Merchants, Department Stores, and Dime Stores (1800-1945)
C5 Banks and Financial Institutions (1796-1960)
C6 Commercial Offices and Institutions (1845-1960)
C7 Hotels (1800-1945)
C8 The Press and Printing Establishment (1800-1945)
C9 Railroad Commerce and Warehousing (1852-1945)
C10 Service Industries (1800-1945)
C11 Facilities for the Automobile (1910-1960)

E. Education and Science
E1 Public Schools (1804-1945)
E2 Educators and Educational Institutions (1788-1945)
E3 Science and Technology (1815-1945)

G. Government and Politics

H. Health and Public Welfare
H1 Hospitals and Health Institutions (1800-1945)
H2 Benevolent and Charitable Institutions (1852-1945)

M. The Military and Wartime
M1 The Military Presence (1800-1945)
M2 The Civil War Era (1860-1875)
M3 The First and Second World Wars (1916-1920; 1940-1945)

N. Neighborhoods, Housing and Real Estate Development
N1 Neighborhoods of Georgetown and the L'Enfant City (1751-1930)
N2 Rural Settlement Clusters in Washington County (1800-1945)
N3 Early Suburbs of Washington (1854-1945)
N4 Country Houses and Estates (1800-1945)
N5 Neighborhood Subdivisions (1889-1945)
N6 Real Estate Developers (1870-1945)
N7 Apartment Buildings (1880-1945)
N8 Working Class Housing, Alley Dwellings, and Public Housing (1865-1950)

P Planning and Public Facilities
P1 Creation of the Federal City (1791-1878)
P2 Local Public Buildings (1871-present)
P3 Roads and Bridges (1800-1945)
P4 Public Transportation and Utilities (1800-1945)
P5 Vernacular and Planned Landscape (1800-1945)
P6 Monuments and Memorials (1807-1945)
P7 The McMillan Commission Plan (1893-1940)
P8 The Park and Planning Movement (1920-1945)

S. Social History, Religion, and Culture
S1 Ethnic Communities (1800-1945)
S2 Slavery and Free Black Society (1650-1865)
S3 The African-American Professional Community (1850-1945)

S4 The Civil Rights Movement (1900-present)
S5 Religious Institutions and Architecture (1800-1945)
S6 The National Church Movement (1880-1920)
S7 Fraternal and Social Organizations
S8 The Social Register (1880-1920)

S9 Arts and Culture (1800-1960)
S10 Theaters and Entertainment (1835-1945)
S11 Blacks in the Arts (1920-1945)

Other historical archeological overviews simply use centuries as divisions, allowing the research topic to guide the time frame used. For example, Paul Shackel and Barbara Little (1994) divide Historical Archaeology of the Chesapeake into four sections: Early European Settlement, which is essentially the 17th century; Plantation and Landscape Studies, which are relevant throughout the historic period; 18th-century life; and 19th-century life. The topics they point out for these time periods represent some of the general archeological issues in the mid-Atlantic.

Concerning the 17th century, Shackel and Little (1994:17) write:

> Conflict, cooperation, negotiation, and other forms of interaction among the groups that inhabited the bay area are central anthropological themes. Continual power struggles between Europeans, Native Americans and Africans, and between wealth groups, religions, and European and colonial authorities characterize the period of early settlement as well as later periods.

The ethnohistorical record of the Coastal Algonquians is an invaluable source for understanding the Native American world at the time of European settlement. Captain John Smith began his travels on the Potomac River in June 1608. He and his men received a hostile reception from the Powhatan groups and a friendly one from the Conoy. He mapped settlements and described, from the perspective of a military observer and strategist, the political organization and general way of life of the people encountered (Potter 1993).

Southern Algonquian groups inhabiting the Coastal Plain from Maryland to North Carolina varied in the degree of sociopolitical centralization but their organization "featured rank-differentiated roles and functions, dress, and burial customs; polygyny; matrilineal descent of chieftains; tribute systems; and trade monopolies" (Potter 1989:152).

Powhatan, reigning from the late 1500s-1618, was the paramount chief or mamanatowick of the Powhatan chiefdom. He inherited small chiefdoms along the James and York rivers and expanded his control eastward to the Bay, conquering the coastal chiefdoms. By 1608 Powhatan controlled all groups except the Chickahominies on the James and York rivers. To the north was his chiefdom's periphery, where he influenced but did not command. Groups on the Potomac were influenced by their location between the two chiefdoms of Powhatan and Conoy. The Patawomekes were trying to maintain autonomy from the Powhatan and the Tauxenents were under the influence of the Conoy (Potter 1993:19).

In southern Maryland, groups were part of Conoy except those on the Patuxent River. In both the Powhatan and Conoy chiefdoms there was a hierarchy of political power.

There were both small and large settlements. Only two palisaded villages are mentioned by Smith, but six villages are documented archeologically. The houses of most villages were dispersed. Settlements were arranged in longhouses which were functionally specific structures. There were the werowance's (district chief's) longhouse, mortuary temple and treasury, houses of associated elite, commoners' houses; household storage units, sweathouses, and menstrual huts.

Shackel and Little (1994:149) write of 18th-century issues:

> Research into the eighteenth century must deal with a host of issues: subsistence and economic strategies; settlement patterns; the group relations of class, race, ethnicity, and gender; and cultural and political tensions between the mother country and the colonies. The eighteenth century witnessed transformations in every aspect of life, as the dominant culture came under the influence of the rationalization of the Enlightenment.

Plantations of all sizes were a critical arena of economic and social interaction for much of the historic period. Historical archeologists have begun to address

> many of the social, political, and economic implications of plantation economy, its place in a profit-making system, the creation and integrity of an African American culture, and implications for an archeology of racism today [Shackel and Little 1994:97].

During the 19th century, broad cultural changes took place. Shackel and Little (1994:249) summarize:

> The new culture of capitalism and its accompanying standardized behavior were created and reinforced by the spread of mass-produced goods throughout the century. But this culture was far from homogenous, despite the innovation of new transportation technologies, such as the railroad and canals. Regionalism and rural and urban differences were not erased. Not all people subscribed to the wage-labor system. . . some industrialists used slave labor for manufacturing. . . Others who continued to use slaves in their plantation called on the ideological mechanism of historical precedent to justify this practice. . . Industrialism obviously had a tremendous impact on everyday social relations and influenced class, gender roles, and ethnicity.

The 20th century, which is almost over, traditionally has not provoked much archeological interest. The deficit of research is due only in part to the perceived overabundance of documentary information and redundant site types. It is also due to a bias against using archeology to examine the "present." Clearly, much of importance occurred during the past century: two world wars and several other major wars, pervasive technological developments inside and outside the home; Prohibition; the Great Depression; suburbanization, women's suffrage, and the struggle for Civil Rights. These are not events which archeology should ignore; what it may contribute will become evident during the next several decades.

Table II.6 and II.7 provide brief lists of the variety of datable manufactured items which often appear in archeological deposits. Various kinds of trade items, such as beads, firearms, and cooking pots, are not included in these tables but comprise a whole category of material culture essential to interpreting contact period sites.

The variety and volume of domestic material at European American sites tends to increase through time, with relatively little found at 17th-century sites and more at 19th and 20th century sites. Even wealthy settlers in the early years of the colonies did not leave dense archeological deposits. The consumer revolution of the 18th century (e.g., McKendrick et al. 1982) drastically changed the material world of the middle class and this transformation is clearly visible archeologically. Consumer choice and the relationship of consumer purchasing and discard to class and ethnicity (e.g., Spencer-Wood 1987) and gender (e.g., Wall 1994) are some of the most compelling archeological issues for the late 18th through early 20th centuries.

The questions which may be asked of consumer choice are broad and apply not only to European ethnic groups but also to Native Americans and African Americans. Issues of consumption are linked to consumer characteristics -- such as purchasing power, occupation, status, class, race, and gender -- and to external factors such as transportation networks, marketplace availability, labor-management relations, and price-fixing.

There is a large archeological literature on plantations and plantation-based slavery (see, for example, Singleton 1985, Orser 1990). Slaves' resistance to enslavement and creation of a sustainable culture under that condition are found to occasionally leave evidence in the archeological record (e.g., Epperson 1990; Ferguson 1992).

One of the most compelling historical questions which has yet to be adequately investigated through archeology in the mid-Atlantic is the changing relationships among European, African, and Native Americans. One of the material culture keys to begin asking archeological questions of these relationships is so-called colonoware, an American-made ceramic which may have been made by Native Americans, enslaved African Americans, or both.

Leland Ferguson (1992) has strong evidence to tie much of the colono-ware in the Carolinas to West African traditions maintained by slaves. Deetz (1988) and Matthew Emerson (1994) have suggested that colono-ware and pipes in the mid-Atlantic were also made by slaves. Other researchers, however, have demonstrated connections to Native American makers (Stephen Potter, personal communication).

The manufacture, trade, sale, and use of this category of ceramic present some of the most interesting archeological research questions in the historic period mid-Atlantic.

ECONOMY

Archeologists typically consider subsistence when attempting to reconstruct past lifeways. Subsistence could be broadly conceived as encompassing all the ways people interact with the environment in order to make a living; that is, it could be seen as economy. However, it is more usually seen simply as diet, a situation which causes concern for many archeologists.

Economy encompasses production, consumption, distribution, and exchange of goods that sustain or reproduce human livelihood. Therefore, as a topic economy covers much more than subsistence and, once identified, it is nearly impossible to narrow to a manageable breadth. Just as it is difficult to discuss diet alone without discussing ecology and settlement patterns, it is difficult to consider economy without social organization, division of labor, and complexity as well as diet and the ecological setting. Therein lies the advantage to an approach that targets economy rather than simply subsistence: it forces us to ask anthropological, cultural questions of the evidence of past societies.

For these reasons economy is offered as the rubric under which subsistence, uses of the landscapes, and human interaction function.

Much work remains to be done within economic archeology. Barry Isaac (1990:332) emphasizes that serious attention to the cultural component in general and the economic in particular is largely missing from the study of prehistoric subsistence. He adopts Rhoda Halperin's (1989) distinction between ecological and economic anthropology wherein the former is largely concerned with locational movements and rearrangements of settlements on the landscape while the latter is concerned with more socially encompassing arrangements for how people appropriate and distribute resources and labor. Both the ecological and the economic need to be interrelated in order to encompass the sociocultural dimension of human livelihood.

Isaac is concerned about archeologists confounding ecology and economy. During the 1970s and 1980s archeologists were influenced greatly by optimal foraging models. He (1990:332) writes,

> these models impel us to think in terms of *behavior* - not culture or that institutional component we think of as economy - and, despite their inclusion of food processing as well as food production, those models again incline us to think in terms of locational movements and caloric input-output.

He warns against the tendency to equate subsistence with food with economy because doing so omits much of what is interesting about human behavior from archeological analysis and interpretation. One of the major issues identified by Tankersley and Isaac is the limitation of the ecological paradigm that has dominated for the past fifty years and the accompanying need for an economic framework to balance out the study of prehistoric livelihood (Tankersley and Isaac 1990c:345-6):

> Succinctly put, the crux of the matter is this: behavioral/cultural analysis - of which economic analysis is an important part - requires a very different existential referent than ecological analysis requires.

An ecological analysis requires ecological analogies and hence expends a great deal of energy on paleoenvironmental reconstruction. Behavioral/cultural analysis requires ethnographic analogy. Archeology cannot have a science of prehistoric human behavior or culture without sophisticated procedures for evaluating and using ethnographic analogy or ethnographic models (Tankersley and Isaac 1990c:346). This point has been made above in discussing analogy in archeological logic. Environmental parameters, of course, must be considered as well.

In reflecting on the results of decades of subsistence analysis, Brown (1986) argues for the need to place subsistence information into a broader context of mobility and organizational strategies.

Michael Shott (1990) objects that if something approaching behavior and social organization is identified as a major focus for Paleoindian research, it is expressed and addressed as subsistence. He (1990:7) is unhappy with a diet-centered model: "Without a broad frame of reference, the discovery of subsistence remains does no more than add entrees to the Paleoindian menu." He urges archeologists to focus instead on structural properties that produce variability even in stable environmental and economic conditions. We should expect flexibility, resourcefulness and opportunism as systematic variability within hunter-gatherer societies.

In his objection that the social context of primitive economies is ignored in eastern Paleoindian studies, Shott touches upon a common problem in much of prehistory. Economic strategies depend not only on environmental factors but also on social properties such as information gathering, goals, and decision making rules. Shott argues that in focusing on diet "archaeology surrenders its unique anthropological potential of documenting cultural organizations not represented in the ethnographic record" (1990:10).

In a similar vein, William Keegan expresses his goal for examining the development of horticulture. He writes (1987:xv),

> The purpose . . . is to go beyond the current emphasis on the origins and diffusion of plant domestication to address the socioeconomic conditions that promoted the intensification of

horticultural production and the sociocultural consequences of such increased reliance on cultigens.

The following discussions serve as an introduction to some of the issues in economic archeology.

Subsistence

To understand human adaptation, the available environment must be understood. What is available depends upon 1) the physical surroundings, including climate, geology, and topography; 2) technologies for extraction, processing and storage; and 3) the social organization of labor and strategies for interaction within and between groups. The nature of subsistence resources depends on age, sex, seasonal growth, population cycles, and behavior of floral and faunal species.

Emphasizing one of Marshall Sahlins' points about social production, Kenneth Sassaman (1992:71) writes, "technology constitutes a labor process for appropriating nature that is inherently social." Social relations of production guide the way in which surpluses are created and appropriated through exchange or other means.

Many changes are expected to occur with subsistence innovations. Some of the following are certainly more pronounced with the establishment of food production, but any major reorganization in economy will have far-reaching effects. Changes will occur in 1) demography, 2) settlement organization and degree of mobility, 3) physical environment, 4) technological innovations, 5) social organization, including labor organization, 6) conflicts and competition, 7) markets, trade and exchange, 8) diet, 9) ecology, and 10) human biology including health and disease.

Hunter-Gatherer Subsistence. Testart (1982) distinguishes two radically different hunter-gatherer economies. One, characterized by flexibility, emphasizes multiple alternative strategies and immediate use of resources. The other relies on large-scale seasonal food storage. He rightly points out that for hunter-gatherers to sustain a storage economy, they need both one or more seasonally abundant resources and the technical ability to gather, process and store those resources so that they are available year-round. He suggests that because of the seasonal variation in food-gathering there would be seasonal variation in leisure and ceremonial time as well and that some rigidity in planning would be essential. He also expects 1) a high degree of sedentism, since mobility would be neither possible nor necessary; 2) high population density; and 3) socioeconomic inequality. The latter is largely due to the fact that stored food is a very different commodity than food which must be used quickly before spoilage. Changes are expected in the nature of ownership, the morality of sharing and accumulation, the division of labor and the degree of interpersonal exploitation possible. It is the opinion of Testart that storage rather than agriculture marks the turning point in human history. Some of the recent work on the variable complexity of hunter-gatherers, discussed above in the section on archeological logic, would support the idea that there are several different kinds of economies among societies which forage for their food rather than producing it.

An increasing amount of evidence in the mid-Atlantic supports the idea that Paleoindian people were generalized foragers. It now seems evident that in the eastern United States the earliest inhabitants did not rely on the hunting of megafauna to supply their needs.

Food remains were found at the Shawnee-Minisink site in the Delaware Valley in a hearth dated to 8,640±300 BCE. Fish bones were found along with hawthorne plum pits, hackberry, blackberry, grape, Chenopodium, Acalypha, Amaranth, Physalis, ragweed, and sedge (Dent and Kaufman 1985).

Ebright (1992:410) reports hickory phytoliths on Clovis point fragments and turkey feather fibers from a feature in the Paleoindian component of the Higgins site in Anne Arundel County, Maryland. These findings "bolster the concept of a much broader Paleoindian resource base for the Middle Atlantic area than one focused solely on large game animals occupying a boreal forest environment."

Based on a limited sample of skeletal remains, Gentry Steele and Joseph Powell (1994) suggest that Paleoindian diet was generalized and similar to later Archaic people. They base their conclusion on dental microwear analysis (1994:189).

> Three types of microscopic enamel damage have been noted in the Paleoindian sample: pitting, striations, and polish. Pitting, or "compression fracturing," of enamel occurs when hard materials are processed in the mouth. Striations are associated with grit introduced either through a coarse diet, accidental food contamination, or the use of stone grinding implements, . . . Enamel polishing, and the smoothing of margins in striations and pits, is associated with the consumption of dietary fiber.

While a long-held interpretation states that the beginning of the Archaic is represented by a shift away from the very specialized big-game focus of the Clovis hunter, a re-examination of Clovis people demands that this characterization of subsequent periods be revised.

As seasonality became more of a factor in resource availability, the complications of scheduling movements and labor increased. Patchiness of the environment both spatially and temporally probably increased. There may have been a decline in quarry-based settlement (in areas where such a focus occurred) because other resources became more patchy and difficult to schedule.

There is very little direct evidence for subsistence in the Early Archaic, especially of floral material, but there is some. Models of subsistence are based on inferred environmental settings of sites. Current understandings emphasize the importance of faunal food, but there has been little research into the archeological remains of plant food from this period.

A general picture of plant and animal food used during the Early Archaic is drawn from several sites throughout the eastern United States, although not from the mid-Atlantic. David Meltzer and Bruce Smith (1986:17) list the following species from archeological contexts:
Plants: oak acorn, hickory nut, black walnut, hackberry seeds, persimmon seed;
Mollusk: freshwater mollusk;
Fish: sucker, gar;
Reptile: box turtle;
Bird: turkey, trumpeter swan; and
Mammal: mole, voles, rodents, beaver, cottontail, squirrel, muskrat, raccoon, coyote/dog, elk, and deer.

The general picture of subsistence in the Early and Middle Archaic is of generalized foraging during warm seasons when food was more or less evenly distributed across landscape. This strategy shifted to one of collecting (*sensu* Binford 1980) in cooler months when elk and deer could be the focus of group hunts. Freshwater fish and mollusks along interior drainages of the eastern United States were exploited but marine or estuarine foods were not (Whyte 1990).

For most of the Middle Archaic period, reliance on deer, turkey, waterfowl, and anadromous fish is assumed. A broader resource base than pre-bifurcate emphasis on hunting is indicated by in the greater variety of toolkits (Stewart and Cavallo 1991:23).

Discussing the Shell Mound Archaic in western Kentucky, William Marquardt and Patty Jo Watson (1983) generalize about broad based subsistence. Archaic people fished, hunted, grew gourd-like squashes, and collected mussels, hickory nuts, and other riverine foods. At some sites hickory nuts are recovered in vast quantities. Marquardt and Watson indicate that the nuts themselves could be pounded and thrown into hot water to make hickory nut butter and the nutshells could be used as fuel.

Although there is very little floral evidence collected or interpreted from prehistoric sites in the Potomac basin, ecological reconstructions make it clear that nut-bearing trees were available early. Hickory, oak, and chestnut were the primary sources. Thomas Jackson's (1991) discussion of acorn production in the southern Sierra Nevada offers an analogy that may be applicable to some time periods in mid-Atlantic prehistory. Acorns were important because they were abundant and storable; in this they were similar to cultigens. All family members collected acorns but women were responsible for processing, storage, and distribution. Equipment included baskets, brushes, mortars, and pestles. Mortars created in bedrock are clearly immobile features. Milling stations were segregated in large winter villages and integrated in smaller summer camps. Fixed production facilities were created, particularly along deer migration routes.

Charles LeeDecker et al. (1991) discuss some of the evidence for subsistence and material culture during the late Early Archaic (bifurcate base points) and the Late Archaic at the Indian Creek V site near the Fall Line in Prince Georges County, Maryland. Very good plant preservation and careful analysis revealed an important botanical assemblage. Discovered were fruits, tubers, starchy seeds, nuts, shoots and leaves with seasonal availability in the spring, summer and fall. Tubers represented over 80% of the taxa, while there were very few nuts. The authors believe that nuts are probably over-represented and over-interpreted in most archeological contexts. Nearly all of the 37 charred plant species have documented ethnographic uses. Such plants were used to medicate and intoxicate, and for cordage, mats, baskets, decorative objects, dyes, and shelter.

Describing coastal adaptations between the Late Archaic and the Middle Woodland (3000 BCE-1000CE), Custer (1988:125) writes, "In general, this shift can be characterized as an emphasis on the rich and predictable resources of the major river valley floodplains and the estuarine marsh settings."

Shell middens appeared worldwide during the Holocene; in the Americas most formed after about 5000 years ago. Shell middens are unusual archeological features because they are much more visible than most short term sites which would be formed for the periodic exploitation of any particular resource.

Because this shift is central to subsistence strategies and other related changed from the Late Archaic on, Gregory Waselkov's (1982) observations on shellfish collecting are noted at length as follows.

Waselkov's (1982) research goals concerning shellfish gathering may be applied to the study of any particular part of the subsistence system. These goals are to determine:

1. the role of shellfish gathering in relation to the total seasonal subsistence round;
2. the significance of shellfish gathering to overall settlement-subsistence; and
3. the relationships of shellfish gathering strategies to changes in other areas of subsistence and changes in social organization and the development of chiefdoms.

Gleaning information from ethnographic writings, Waselkov notes that shellfish procurement is usually done by hand from exposed rocks and shallow wading by both women and women with children. English observers noted Powhatan boys diving for freshwater mussels. Ethnohistoric sources also note preparation methods for the Maryland and North Carolina Algonquians, the Virginia Powhatans, the Delaware, and European colonists in Philadelphia. According to these sources, shellfish could be opened by cracking or perforating the shell or by using a shucking knife. Cooking methods for shellfish included roasting, baking, steaming, and boiling. Shellfish meat was either dried or smoked prior to storage or trade. Archeological evidence for preparation is sought in cooking pits and other features (Waselkov 1982).

Seasonal use of shellfish depends not only on availability but also on peoples' assessment of all food resources, needs, costs and other expectations and perceptions. Among the Maryland Algonquians fall and winter were shellfish gathering seasons; among the Virginia Powhatan it was winter, late spring, and early summer (Waselkov 1982:38).

Six main conclusions offered about shellfish use at the White Oak Point site and surrounding area are as follows (Waselkov 1982).

1. the White Oak Point site was occupied in Spring by small groups in temporary oystering camps from the Late Archaic through the early Historic;
2. Most meat was obtained from oysters but there was also clam digging, crabbing, fishing, deer hunting, and the gathering and processing of acorns and hickory nuts;
3. techniques of hunting and gathering changed little if at all;
4. in the Late Archaic shellfish other than oyster contributed a larger percentage of meat than at any later time;
5. the average number of oysters per volume of midden increased after the Late Archaic;
6. beginning in the early Late Woodland, there were a number of important changes: species diversity dropped; roasting basins were first used; mammals and fish contributed larger proportions of available meat; and the average number of oysters per volume sharply increased.

The latter conclusion in particular gives rise to the following scenario. There is a large scale drying of oyster meat for storage and trade and a larger number of mammals and fish compensates for the loss of immediately consumable oysters. The shift could be in response to agricultural demands and the need for spring planting. The increased specialization and production of storable commodities by some individuals or group segments would have freed others for different tasks (Waselkov 1982).

Waselkov discusses interrelationships between shellfish gathering, population growth, and the origins of agriculture. In several places around the world, the earliest evidence for plant domesticates is found either at shell middens or at non-shell sites occupied by seasonal shellfish gatherers who are doing other things. When domesticated plants began to play a significant role in the diet, the use of shellfish declined rapidly (Waselkov 1982:115). For example, in the riverine shell middens of eastern North America, squash remains date as early as 4,400 BP and sunflower and sumpweed appear to be domesticated by 2,900-2,400 BP. Both the plants and the river mussels would have supplied high protein and presumably only one type of resource would have been necessary.

Cheryl Claassen (1991) explores questions of gender and labor scheduling for shellfish gathering during the Shell Mound Archaic. Some of her hypotheses fit neatly with Waselkov's observations. Joining critics of cultural ecology, Claassen cites Barbara Bender, who characterizes much archeology as having "rejected both specific history and principles of social structure in favor of an assumed ecological common denominator." Women are almost universally recorded as shellfish collectors in the ethnographic record. It is not necessarily the case that women were shellfish collectors in the unrecorded past, but Claassen uses this as a hypothesis to help create more complete models of past social and labor organization by including considerations of gender division of labor.

Claassen explores ideas about the organization of women's labor and questions how women accommodated shellfishing in the eastern United States when it appeared about 8,000-9,000 BP and why the Shell Mound Archaic peoples stopped shellfishing about 5,500-3,000 BP. This early shellfishing activity took place in Tennessee, Kentucky and West Virginia. The Shell Mound Archaic is identified by the mounding of shells, the use of mounded shells for burials, and the lack of evidence of permanent housing. Hypotheses for the cessation of mussel collecting have included the overexploitation of the mussel population, environmental change, and human migration outside the area. Claassen raises the possibility that a radical change in women's labor necessitated the abandonment of shellfishing. Such an abundant food source would not be abandoned unless there was something to replace it. Claassen argues that competition for time needed for harvesting crops changed the economic organization as cultivated food came to be substituted for much of the diet.

It would be useful to add Claassen's hypothesis to Waselkov's synthesis of this subsistence focus in the Potomac basin, where shellfish collecting is documented much later, after 3000 BP, and continues from the Late Archaic into historic times.

Food Production. Barbara Bender (1978:206) emphasizes social structure and, in the context of developing food production, asks how developing social relations promote economic change. Addressing the development of food-producing economies out of hunting-gathering ones is "about increased production and about why increased demands are made on the economy."

She is unsatisfied with technoenvironmental explanations that ignore internal dynamics of a society. Within a hunter-gatherer economy, households, however they are constructed, are responsible for basic production within a larger system of social support and demands. Alliances embedded within kinship systems provide the social rules and terms that constrain actions. Alliance systems may be more or less complex and make greater or lesser demands on production. Even within impoverished hunter-gatherer social systems that survive ethnographically, there are marriage alliances and ceremonial exchange and trade. Further ethnographic detail offers four observations concerning the variable social structure of hunting-gathering societies:
1. individual bands are integrated into wider social networks;
2. different alliance networks are important in binding various groups together;
3. demands may be generated over and above subsistence requirements of individual bands; and
4. demand varies according to the type of alliance and exchange.

Sedentism escalates demand for increasing production as it encourages storage, accumulation, control of labor, and control of land. Archeologists need to attempt to delineate how demands were generated rather than simply how they were met. Trade and exchange, ceremonial undertakings, and status differentiation are some of the archeologically-visible particulars that shed light on changes in economic organization (Bender 1978).

Although it is premature to judge plant domestication during the Early Woodland in the mid-Atlantic, certainly there is intensive harvesting of wild seeds evidenced by the considerable numbers of grinding stones on Savannah River (Late Archaic) and Early Woodland sites in the James Valley (Mouer 1991b). Discussions of early gardening focus on data in the midwest (Smith 1992); there are only a few contexts in the mid-Atlantic region with possibly domesticated seeds dating to Transitional/Early Woodland.

Parallels may be drawn between the conditions which gave rise to domestication in the Midwest and transitional/Early Woodland conditions in the mid-Atlantic. The clearance of floodplain forests and disturbance and enrichment of soils around camps were some factors contributing to domestication (Smith 1992). In the mid-Atlantic the appearance of anadromous fishing camps during the Late Archaic initiated the process of floodplain clearing along interior streams (Mouer 1991b). Comparisons between the regions' relative reliance on domesticated and collected food would offer interesting insights into economic strategies.

J. Sanderson Stevens (1991:200) argues that the subsistence strategies of both Late Archaic and Early Woodland people were focused on a few resources. They gathered shellfish and anadromous fish and intensely harvested plant resources. Major faunal species used include deer, black bear, turkey, squirrel, rabbit and other small mammals, turtles, fish, water fowl, beaver, otter, and muskrat. The social relations of production developed with these new strategies may have been more complex than those of earlier groups.

Species available during the Woodland period generally may be assumed to be those in use at contact. The seasonal round of foods used by Potomac area Algonquians at time of initiation of sustained European contact is synthesized by Stephen Potter (1993:40-43) and is presented schematically in Table II.9, above.

Subsistence during Late Woodland II among the Virginia Algonquians was based on the swidden farming of maize. Beans, squash, pumpkins, gourds, sunflower and tobacco were also grown (Potter 1993:33). Corn contributed over half of the diet and was consumed by at least part of the population throughout the year (Potter 1993:40). Maize is found throughout the mid-Atlantic by 900/1000 CE and becomes intensively used by 1200/1300 CE (Stewart 1993).

At the Paw Paw site on the Allegheny Plateau carbonized corn kernels, seeds, nut shells, and remains of various indigenous plants were found. Knotweed (*Polygonum*) and goosefoot (*Chenopodium*) are disturbed zone plants cultivated in the eastern Woodlands. Sumac (*Rhus*) is a multipurpose plant used ethnographically for food, beverage, and medicine and its leaves can be smoked. Dock (*Rumex*) and copperleaf (*Acalypha*) were also found (Curry 1983:38ff).

Table II.10 provides radiocarbon dates from sites containing plant domesticates from the Potomac and James River basins and adjacent areas.

Table II.10. Radiocarbon Dates from Sites containing Plant Domesticates from the Potomac and James River Basins and Adjacent Areas (source: Potter 1993:144-145).

Archeological Site	Comments	Uncorrected dates, years A.D. [CE]	Reference
Gnagey, Pa. (36SO55)	Corn, beans, and squash	Site dates are 920 ±80, 1030 ±80, and 1190 ±65	George 1983:5
Cresaptown, Md. (18AG119)	Corn and beans. Charred corn kernels from feature 275 were radiocarbon dated to A.D. 855 ±60	A series of additional dates from the site range from 965 ±105 to 1635 ±70	Curry and Kavanagh 1991:6-7
Moore, Md. (18AG43)	One corncob fragment, one corn kernel, and one possible bean seed	Site dates are 1400 ±70, 1420 ±50, and 1500 ±50	Pousson 1983:146-48
Paw Paw, Md. (18AG144)	Five carbonized corn kernels	1010 ±65	Curry and Kavanagh 1991:7
Rosenstock, Md. (18FR18)	One carbonized corn kernel	Site dates are 1015 ±60 and four dates between 1335 ±60 and 1475 ±60	Curry and Kavanagh 1991:14
Shepard, Md. (18MO3)	Several limps of charred corn kernels fused together	Site dates range from 320 ±240 to 1630 ±280; however, two dates of 1220 ±60 and 1200 ±50 probably date the main occupation	Curry and Kavanagh 1991:15; MacCord et al. 1957:22
Winslow, Md.	Several carbonized corncobs	Site dates are 825 ±150, 1285 ±100, and 1315 ±80	Curry and Kavanagh 1991:14
Hughes, Md. (18MO1)	Corncobs (1990 field season) and possible bean seeds (1991 field season)	Site dates are 1290 ±55, 1370 ±60, 1440 ±50, and 1530 ±60	Dent and Jirikowic 1990:51; Richard J. Dent, personal communication 1991
Posey, Md. (18CH281)	Possible corn fragment	1575 ±90	Barse 1985:158; Boyce and Frye 1986:10
Stearns, Md. (18CV17S)	Corn	C13/C12 date, 1459 ±125	Wayne E. Clark, personal communication 1989
Reedy Creek, Va. (44HA22)	Corn and beans	1150 ±65	Coleman 1982:188, 206, 208
Spessard, Va. (44FV134)	Squash seeds and corn cupules	1160 ±80	Jeffrey L. Hantman, personal communication 1988
Point of Fork, Va. (44FV19)	Corn	1030 ±75	L. Daniel Mouer, personal communication 1988
Reynolds-Alvis, Va. (44HE470)	Squash and bean seeds	920 ±75	Gleach 1987b:221-23

Table II.10. Radiocarbon Dates from Sites containing Plant Domesticates from the Potomac and James River Basins and Adjacent Areas (source: Potter 1993:144-145).

Archeological Site	Comments	Uncorrected dates, years A.D. [CE]	Reference
White Oak Point, Va. (44WM119)	One corn kernel, one corn cupule, and one corn embryo	1310 ±50 and 1460 ±45	Waselkov 1982:240, 312
44HT37, Va.	Possible corn kernel fragment from feature 1024	300 ±70	Edwards et al. 1989:51

Development of Agriculture in the Eastern United States. It is relatively recently that Eastern North America could be said to possess one of the most detailed records of the development of agriculture. This record is due, in part, to the use of new technologies: flotation to recover plant remains, scanning electron microscopy (SEM), radiocarbon dating of small samples with accelerator mass spectrometer (AMS), and stable carbon isotope analysis of human bone (Smith 1989). Classic archeological models to explain agriculture (e.g., Braidwood 1960) often assumed speedy and wholesale adoption after its "invention" and therefore archeologists often focused on tracking down the origins -- the oldest corn cob, for example -- so as to pinpoint the time and place in which evolution progressed. More research and careful thinking about the process have made it clear that the development of food production, as Smith (1989) points out in his synthesis of eastern North America, was a longer and far more complex process than once thought.

Bruce Smith's (1989, 1992) syntheses of data for plant cultivation in the Eastern United States differ somewhat in detail and interpretation, indicating that research of the topic is extremely active. It is important to note that much of his discussion concerns the mid-latitude area stretching from the Appalachians west to the prairie margin. The eastern Coastal Plain and Piedmont, therefore, are outside the zone where there is evidence for indigenous agriculture. Much further work remains to be done in the Chesapeake region.

Indications of agricultural development include direct representation of crop seeds and pollen and remains in human coprolites; hoes; pollen and macrobotanical indications of field clearing; storage vessels and features for seeds; processing and cooking technology (Smith 1992).

Smith's (1992) six periods of agricultural development are summarized here to provided a baseline for questions outside the zone of agricultural development.

I. Early and Middle Holocene foragers prior to 7,000 BP (5,050 BCE).
People used the broad resources of the forest, including acorns and hickory nuts, and the forest edges, including seeds and berries. There is no human intervention in the life cycle of plants except for the fortuitous disturbance of soils in campsites.

II. Middle Holocene collectors, 7,000 to 4,000 BP (5,050-2050 BCE).
A change in stream flow changed the floodplains and resource distribution. Occupations changed to shell mound and midden mound settlements with continuous ground disturbance. Weedy invaders into disturbed zones included cucurbita, goosefoot, sumpweed, and sunflower, which would have provided supplementary food sources.

A transition in human intervention "from simple toleration to inadvertent, and then active encouragement...was critical in the co-evolutionary trajectory leading to domestication" (Smith 1992:283). Then "planting, even on a very small scale,...marks both the beginning of cultivation and the onset of automatic selection" (Smith 1992:282). Smith also notes, however, that sunflower was not indigenous to the region (1992:283). During this period there is also a dramatic increase in hickory nuts after 7,500 BP which may indicate new nut-processing technologies such as hide-lined and rock-heated boiling pits for separating hulls from meat and the active management of hickory trees to increase yields (Smith 1992:287).

III. The initial domestication of eastern seed plants, 4,000 to 3,000 BP (2,050-1,050 BCE).
By this time there was distinctive morphological change in the four weedy species of cucurbita, goosefoot, sumpweed, and sunflower. However, Smith (1992:288) writes,

> there is little evidence that this process of domestication occurred within a framework of deliberate human selection, or that these domesticated plant species contributed substantially to the diet of fourth millennium B.P. populations.

IV. The Development of Farming Economies 3,000 to 1,700 BP (1050 BCE to 250 CE).
Storage contexts recorded for this period include grass-lined pits, woven bags, and gourd containers. Processing equipment includes wooden mortars, stone slabs, and mortar holes in stone slabs. There are also chert hoes, indications of land clearing, and changes in settlement patterns. The dietary importance of indigenous cultigens increased greatly during this period and there was a concomitant dramatic cultural change.

V. The Expansion of Field Agriculture 1,700 to 800 BP (250-1150 CE).
This period could be divided into two subperiods based on the rapid adoption of maize and technical innovations associated with it around 800 CE. The period 200-800 CE is marked by a growing importance of plant husbandry and the addition of the tropical cultigens of maize and tobacco as well as population growth and dispersal. After 800 there are a number of innovations: exchange of large, well-made chert hoes; elaboration and improvement of ceramic vessels; and increase in storage pit size. Between 800-1150 Mississippian chiefdom societies emerged. It is also during this latter part of the period when areas outside the domestication zone shift to maize agriculture (Smith 1989).

VI. Maize-Centered Field Agriculture after 800 BP (1150 CE).
Stable carbon isotope analysis indicates that maize was not a staple food until after 1,100. It is important to note that there

is a great deal of variability in reliance on maize and in the varieties of maize grown. A low variability, 8-row maize was grown after 1100 in the Ohio Valley, Northeast and upper Midwest but in other areas there was considerably more variety in the maize itself (Smith 1992:293), possibly because there were more frequent arrivals of new varieties into the southeast from the Southwest, Mexico, or the Caribbean (Smith 1992:294).

Smith calls on archeologists to pay more attention to the different varieties of maize grown in the east and to improve the level of analysis in order to address some of the developmental issues. Many indigenous plants continued to be cultivated after maize was adopted. Smith lists sumpweed, sunflower, knotweed, varieties of chenopod, maygrass and little barley, Jerusalem artichoke, maypops, amaranth, purslane, pokeweed, ragweed, chenopod and carpetweed (1989:295). He notes that there is no reason to expect that indigenous crops were grown only at a garden scale while maize was grown for larger yields. Especially prior to 1000 CE the pre-maize crops were probably grown for large harvests (1989:295-6).

Some researchers have suggested that the early introduction of 8-rowed Northern flint corn came through the Caribbean into eastern North America. A later infusion of another variety of maize, the 12 to 16-rowed Midwestern 12, came east from the American Southwest or the Gulf Coast. Maize was present for several centuries before it became a staple. It has been suggested that maize agriculture supported the use of green corn early, from the end of the Archaic. One indirect piece of evidence offered is the near universal term for maize in Central and Eastern Algonkian languages, indicating that the crop was known before the language branches split around 1000 BCE (Riley et al. 1990). Such evidence has not been confirmed with archeological discoveries.

Patty Jo Watson and Mary Kennedy (1991) discuss the process of developing horticulture with a view that explicitly incorporates gender. They assume a male/female division of labor and formalize it for the eastern woodlands using archeological, ethnohistoric, and ethnographic information. They take exception to reconstructions that implicate women as passive and non-innovative, criticizing both Smith's (1987) coevolutionary framework for weedy plant domestication and Guy Prentice's (1986) proposition that male shamans were responsible for gourd domestication.

Their conclusions in questioning the automatic characterization of plant domestication and the coevolutionary formulation are as follows.

1) Sunflower and maygrass were grown outside their natural ranges by 3000-2500 BP. Therefore, their cultivation must have been purposeful. Smith (1992) places non-indigenous cultivation of sunflower even earlier, during his period II, 7000-4000 BP.

2) The best dietary evidence for the eastern woodlands from fecal matter dating 2800-2500 BP in Salts Cave and Mammoth Cave indicates that over 60% of the plant food consumed was of indigenous cultigens: sunflower, sumpweed, and chenopod. Clearly the addition of domesticated species had more than a slight dietary impact.

3) Women collectors and gardeners around 3500-2500 BP devised and used techniques of tilling, harvesting, and processing and applied them to maize production. The significant difference in maize related tools and techniques in the East as opposed to that in the Southwest and Mexico suggests that eastern maize was adopted into a preexisting pattern.

4) Most generally, the great botanical knowledge of hunter-gatherer people and women's extensive knowledge of using plants makes the image of unintended and automatic plant domestication untenable.

Our understanding of the sequence of agricultural development in the eastern United States has improved dramatically due to both better collection and analytic methods and more innovative questions. Clearly, much analysis and interpretation remains to be done, especially in the context of an economic archeology which may begin to address division of labor and the social consequences and motivators for technical and dietary changes.

Plantations and Industry. The tobacco economy characterized 17th- and early 18th-century European settlement in the Potomac Basin. There was also some early vital industrial development, such as iron furnaces during the 18th century. The place of the English colonies within the world economic system was that of an economic periphery servicing the British economic core. Throughout the 18th and 19th centuries, plantations and farms remained vital to regional and local economies. Market economies developed their own cores within the colonies and early Republic. Various crafts, manufacturing, and trade continued to expand. Since the late 19th century the service industry of the federal government has become one of the most powerful economic factors in the area.

It would be well beyond the scope of this overview to attempt to summarize historic period diet, agricultural strategies, crafts, manufacturing, and business. Some of this type of information in included in the discussion of uses of the landscape rather than here under subsistence. Some brief comments on subsistence will serve as examples of the sorts of information which archeology can contribute to understanding historic lifeways.

Discussing the colonization gradient in relation to the 17th-century Chesapeake, Henry Miller (1984) hypothesizes that subsistence practices in colonies will tend to be less complex and specialized than those in the homeland. That is, colonial settlers will use a wider range of resources than at home. As population increases there will be more emphasis on dependable resources which can be intensively exploited. Subsistence should become more stable and complex through time and, initially, be similar throughout socioeconomic levels. As opportunities decline and the social system becomes more rigid, there should be increasing differentiation in subsistence strategies and diet between classes.

Fish make up 34% of the faunal remains on 17th-century sites in the Chesapeake region. Remains of oysters and blue crab are found at most sites and are abundant at many of them. Oysters don't show signs of overharvesting in rural areas but do in the urban setting of St. Mary's City, where overharvesting reduced oyster sizes as human population increased (Miller 1986:181).

By the end of the 17th century Chesapeake colonists were focusing on cattle and pigs for their meat. Miller (1984:382) writes,

> in addition to meat, dairy products, and cooking fats, cattle and swine also provided a secondary source of income, a buffer against economic difficulty, and a means of improving the lives of one's children through inheritance.

Faunal data from Harmony Hall, located on the late 17th-century western frontier of Maryland in Prince Georges County, supports Miller's thesis (Sonderman et al. 1993).

After 1700 domestic animals account for over 90% of the meat remains on rural sites. Fish were still used but were far less important. Nets were used more often than previously, but the hook and line were still the primary fishing equipment. Commercial fishing of herring and shad began in the 1760s (Miller 1986:182; Middleton 1953). Oysters began to be harvested by tongs in the early 18th century, permitting harvesting of beds in deeper waters (Miller 1986:182).

Food remains provide insight into site inhabitants' participation in the economic system. For example, the cuts of meat used may demonstrate self-sufficiency (the butchering and use of whole animals), production for the market (retention and discard of certain parts), or buying meats from the market (limited parts).

Several historical archeologists have suggested that status may be investigated through faunal analysis, with relative wealth indicated by species, cut of meat, and method of preparation. Some have suggested that during the 17th century, the presence of deer in European households may indicated wealth and leisure (e.g., Miller 1986; Reitz 1987; see Manning-Sterling and Atkins 1995). This suggestion is based on the English hunting tradition, access of the colonial land-owning class to more land, and the documented hiring of Native Americans to hunt for wealthier households. Investigation of 17th-century Virginia faunal assemblages, however, conclude that there is no clear-cut distinction between wealthy and poor inhabitants based on the presence of deer (Manning-Sterling and Atkins 1995).

Faunal analysis of 18th-century urban contexts has been carried out at some sites in Annapolis, Maryland (e.g., Reitz 1989). Just under half of the early 18th-century meat of the wealthy Calvert family of Annapolis was made up of cattle, pig, and either sheep or goat. Much of the remainder was fish and fowl (Yentsch 1994:222).

Resources of the Chesapeake Bay were abundant until overharvesting and pollution affected them. John James Audubon wrote in 1840 (in Cronin 1986:196):

> The Chesapeake Bay with its tributary streams, has from its discovery, been known as the greatest resort of waterfowl in the United States. This has depended upon the profusion of their food, which is accessible on the immense flats or shoals that are found near the mouth of the Susquehanna, along the entire length of the North-East and Elk Rivers, and on the shores of the bay and connecting streams as far south as York and James Rivers.

Intensive harvesting so affected the bird population that commercial wildfowl hunting was outlawed nationwide in 1919 (Cronin 1986:196).

Cronin (1986:193-194) documents the 19th-century overharvesting of the oyster through the following series of events which greatly affected the oyster population.

1828 -	Baltimore and Ohio Railroad opened, improved transportation
1836 -	well established land transportation of fresh, pickled and spiced oysters
1840 -	discovery of vast, deep oyster beds in Tangier Sound, available only by dredging
1845 -	method perfected for hermetically sealing metal cans, making feasible the canned and processed oyster, or "cove"
1857 -	1,600,000 bushels of oysters handled in Baltimore
1865 -	dredging legalized
1865 -	4,000,000 bushels of oysters handled in Baltimore
1868 -	10,000,000 bushels of oysters handled in Baltimore
1892/3 -	over 900 dredges under license in Maryland
1898 -	decline in the harvest begins and continues drastically for next 20 years

For most of the 19th century blue crabs were consumed only locally. The extension of the railroad to Crisfield, Maryland stimulated a new industry in this resource as well (Cronin 1986:195).

In an urban 19th-century context, two assemblages from the first half of the 19th century were analyzed from the Master Armorers House in Harpers Ferry. About 1830 there occurred a decreased dependence on home-raised pigs and an increased dependence on beef bought in the marketplace. This change is tied to the arrival of the canal and railroad and on a more urban, market-oriented way of life (Shackel 1994b).

Plantation diet has also been studied for the 19th century (McKee 1988) and earlier (Crader 1984, 1990). Some aspects of the diet of slaves at Monticello have been explored through the examination of faunal remains.

Diana Crader (1984) compared the faunal remains of two features at Monticello: the Storehouse, a suspected slave dwelling, and the Dry Well, which served the main house. The differences reflect the status of the occupants. Crader (1984:556) writes:

> Occupants of the Storehouse (presumably slaves) primarily ate less meaty cuts, which may have been prepared as stews. Mutton was rarely eaten by slaves, but an occasional rabbit, opossum, squirrel, game bird, or chicken was prepared. The bone refuse was discarded outside the dwelling where it was subjected to a fair amount of trampling. Individuals in the main house dined on hams, pork roasts, beef, mutton and lamb. A variety of other meats may have been eaten including squirrel, various birds, and fish. Bones were ultimately discarded relatively intact as part of the fill for the Dry Well. On interesting feature of both assemblages is the absence of large, wild game such as deer.

However, even among slaves on the same plantation there were major differences in diet. Faunal remains at another slave dwelling, Building "o," at Monticello suggest a higher quality meat from that of the Storehouse site. Questions are raised about relative slave status and provisions, alternative reasons for the preservation of discarded bone, and the formation of site deposits.

Because the broader economic, rather than subsistence context may be constructed for the historic period, this discussion closes with a brief description of the complexity of one location along the Potomac.

Writing specifically of Georgetown, Janice Artemel et al. (1987:125-126) identify several time period themes relevant to changes on the waterfront. The definition of these periods is quoted here in full.

> a. *Colonial Mercantilism and Maritime Trade (1608-1751)*. This period includes that first European contact, the fur trade and early colonial settlement, and the establishment of the town as a stable, regionally recognized distribution center for the

tobacco plantations, with an economic base in mercantilism and maritime trade. The political base focused on the Colony and Great Britain.

b. *The Port of Georgetown and Maritime Development (1751-1781).* This period includes the formation and development of the tobacco port, and the growth of the permanent settlement through the Revolution. The economic base continued in mercantilism and maritime trade, and the political base remained with the Colony and Great Britain.

c. *Federalism, Merchants, Industrialists and the Sea (1781-1827).* This period includes the formation of the federal district within the new nation, prominence of the town and its merchants, and the growth and decline of international maritime trade. The economic base remained in trade, with unprocessed goods including tobacco and grains, with significant activity resulting from early industrial development along the Potomac. The political base centered on the new republic, the federal district and the Corporation of Georgetown.

d. *Industrial Growth and Maritime Trade (1828-1881).* This period begins with the use of the C&O Canal for transport of grains from the hinterland to the port of Georgetown, and ends with the transport of raw materials including coal, lime and fertilizers used in industrial facilities and agricultural centers, to the industrial centers of the nation. The economic base and transportation network began to shift away from a maritime focus. A diversified industrial economy and a rail transport and distribution system developed and flourished. The political base continued to focus on the developing nation and the federal district.

e. *Decline of a Waterfront: Industrial Maturation and Modern Development, (1881-Present).* This period encompassed the development and maturation of an economy focused on industrial products and their distribution with a corporate business structure integrated into national spheres.

Use of the Landscape

Archeologists use the term settlement pattern to refer to the way a population arranges itself on a landscape. The use of space, including arrangements of settlements, and of features within settlements, is responsive to the internal social and ideological dynamics of a cultural group, its technology and economy, and the distribution of resources and other characteristics of the natural environment.

Some archeologists have begun to use landscape as a concept to unify various approaches to spatial analysis. Carole Crumley and William Marquardt (1990) describe landscape as the spatial manifestation of relations between humans and their environment. Landscapes are determined and defined by sociohistorical structures, which are political, legal, and social; physical structures, which are climatic, topographic, and geologic; and their interpretations, which are aesthetic, symbolic, religious, and ideological. Stephen Savage (1989) also uses landscape as a concept with which to integrate interpretations of the social and physical worlds in his study of Late Archaic landscapes.

Mobility and sedentism often have been correlated with simple hunter-gatherers and more complex horticulturalists, respectively. However, there is a great deal of flexibility and variety in human settlement style. Sedentary agriculturalists, for example, send out hunting and collecting parties and periodically move their villages. Hunter-gatherers change their degree of mobility according to seasonal resources and social needs for aggregation and dispersal.

From ethnoarcheological studies, Binford (e.g., 1980) has observed a great deal about hunter-gatherer strategies and mobility and the way archeological patterning results. The scale of land-use among hunter-gatherers is surprisingly large to people accustomed to thinking about sedentary settlements, and Binford cautions us that we have approached mobile groups with a sedentary frame of mind. In his Alaskan (Nunamiut) case study the residential core area through which a family moves in one year is 5,400 square kilometers. The territory used during a lifetime is approximately 22,000 square kilometers. There are a great number of sites generated by a mobile population, but there is also a great variation in their use; some are used often and for different purposes. A larger site, therefore, does not necessarily indicate a large population but may indicate repeated use.

Mobility provides a means of security for hunter-gatherers. Information directly gathered about the environment is of primary value. Catastrophes can be dealt with by knowing what alternatives are available. To become sedentary there must be a situation where information about a broad area is no longer useful or the option of moving into unoccupied territory is no longer realistic. Binford (1983) describes the shift away from hunting-gathering to food production as a shift from a system based on an "information bank" to one based on a "labor bank."

Binford, and many others, see the prime mover in this shift as population growth. Although there is no predictable rate of growth, there is constant growth and with it the useable environment fills up. This "packing" of the environment thwarts extensive mobility as security. More kinds of resources get used and developed with the need to stay longer in one place (Binford 1983). In developing and applying this model Binford and others are primarily concerned with food and fuel resources. Clearly, however, other raw materials are essential to human survival. Suitable lithic resources, for example, will influence decisions about mobility as will social considerations such as the matching of suitable marriage partners.

Mobility patterning for hunter-gatherers depends upon their placement on the forager-collector continuum. Foragers move frequently and gather daily rather than store food. Only two general types of sites are expected, although there may be very little archaeological visibility at all. According to the model, there should be residential base camps and locations or extractive camps (for hunting, nut gathering, and other collecting tasks). At the other end of the continuum, logistically-oriented collectors move resources to themselves rather than move themselves to resources as foragers do. They store food at least part of the year. Collectors are expected to create more types of sites: residential base camps; extractive camps; field camps, which are temporary bases for task groups; stations, used for information-gathering by task groups; and facilities, such as caches for food storage, traps, or fish weirs (Binford 1980, 1982).

The strategy of any particular group may change seasonally as resources become available. The pure forager moves in a continuous pattern, spending little time in any base camp. The collector moves base camps from point to point and then exploits a wide radius of resources with logistical collecting parties who return to the central camp. The types of sites expected to result from different strategies may well overlap within a system. For example, a collector's base camp may be used at other times of the year as a transient camp or hunting camp. Archaeologically identified sites, therefore, may be the result of considerable layering of uses which are nearly impossible to distinguish. Recurrent patterns of artifacts may have nothing to do with their use together and instead result from the history of use of the site (Binford 1980, 1982).

Binford (1980) has correlated mobility strategies with climate and with the nature of resource availability. Foragers are fully nomadic in equatorial and semi-tropical settings. Collectors are semi-sedentary and sedentary in temperate and boreal settings. Foraging works if all critical resources are within range of a base camp. Residential moves are undertaken when an area's resources are depleted. Residential moves won't help collectors because moving closer to one critical resource moves the group farther from some other equally critical resource. Storage helps to address temporal incongruity in the environment, but stored caches of food add to the spatial incongruity or patchiness of the environment (Binford 1980, 1982).

Use of the Landscape in Prehistory. The earliest pre-Holocene landscape on which people lived in the eastern United States contained both glaciated and unglaciated sections. Much of the mid-Atlantic region was unglaciated and offered a wider variety of resources than glaciated regions. Meltzer and Smith (1986) argue that such a landscape supported generalized hunter-gatherers.

There are other models, of course. Robert Kelly and Lawrence Todd (1988) hypothesize about the initial strategies of people traveling into a completely new environment. They refer to such people as "technology oriented" because, in their model, the technology of hunting for game is the method of getting food that is the most quickly and easily translated from one ecological setting to another. A summary of their scenario follows.

The environment 12,000 years ago in the eastern United States was a patchwork boreal and deciduous forest with low seasonality and with greater diversity of species, greater numbers of any given species and larger individuals than any modern analog. People were entering a rapidly changing environment. By 10,000 BP seasonality was increasing, dozens of Pleistocene genera were extinct, and latitudinally and elevationally segregated biotic zones were appearing (Kelly and Todd 1988).

Paleoindians had to react to resource stress by switching strategies with changes in resources or territories. Modern hunter-gatherers rely on information, but where territories are nearly completely unknown high mobility and transferable strategies are expected. Because they are more understandable and harvesting strategies are transferable, animals are hypothesized to be the focus of subsistence. However, because the fauna are changing rapidly, there should be high residential and logistical mobility and range mobility. Kelly and Todd (1988) list four parts and some implications of their model of early Paleoindians.

1. New environments across the continent did not necessitate new behaviors or tools since the adaptation was simply to different prey size rather than species.
2. The landscape was used redundantly, with known places used repeatedly. Paleoindians behaved as foragers, performing

largely similar functions at each site. Early quarry sites in the east, for example, often contain a full range of tools, while later ones do not.

3. Technology had to be suited to a life of high mobility and be transferable to unknown territories. Paleoindian assemblages contain lots of bifaces of high quality stone which could provide flakes and be repeatedly resharpened.
4. No storage is expected because stored food would restrict mobility options.

There are no true modern analogies for the earliest Paleoindians. Kelly and Todd (1988) characterize the adaptation as that of "high technology foraging," incorporating elements of both foraging and collecting. Foraging elements include high residential mobility, variability in mobility based on local abundance of resources, emphasis on search-and-encounter hunting tactics, and lack of stored resources. Collecting elements include complex, curated technology; repetitive use of style; high logistical mobility; and large territories.

Anderson (1990) offers a model of the Paleoindian settlement of eastern North America based on the same assumption that a population is entering an empty social landscape about 12,000 BP. Pronounced concentrations of fluted points are found in central Tennessee, the Cumberland and Ohio River valleys, and along the Atlantic seaboard in western South Carolina, southern Virginia, and north-central North Carolina, New Jersey and eastern Pennsylvania. These concentrations are interpreted as "loci of initial colonization, staging areas from which the settlement of the larger region proceeded" (Anderson 1990:171).

Paleoindian adaptations were geographically extensive. The population initially would have had to been highly mobile with fairly sophisticated information exchange and mating networks (Anderson 1990:181). The peopling of the Potomac Basin may have taken place from earlier "staging areas" along major interior waterways such as the Mississippi, Ohio, and Tennessee drainages (Anderson 1991a). As foraging bands made their way across the continent they may have practiced "High Technology Foraging". As particularly attractive, resource-rich areas were encountered, groups stayed and began to focus their activities within these particular places.

The focus on particular sources of lithic raw materials has been considered crucial to Paleoindian adaptation. Several archeologists (e.g., Gardner 1974a,b; Goodyear 1979) consider the essential resource to be high quality cryptocrystalline rock. Gardner (1977, 1989) suggests that such lithic resources provided fixed points around which the rest of a groups' movements focused. The largest Paleoindian base camps are quarry base camps such as Thunderbird of the Flint Run Complex.

Paleoindian hunters, their settlement pattern focused on quarry locations, may not have been highly mobile. Catchment areas with a suggested radius of 30-80 miles suggest a tethered nomadism more like foragers than collectors (Turner 1989).

On the other hand, exotic chert use at the Higgins site in Anne Arundel county suggests a very large territory. Ebright (1992:411) reports that two-thirds of the flaked stone tools were made from exotic chert, including green Hudson Valley chert far to the northeast and a mottled chert from southern Virginia.

In contrast to an orientation to cryptocrystalline lithic resources in the Ridge and Valley province, suggested by Gardner (e.g., 1989), there seems to be a riverine orientation on the Coastal Plain, at least in Maryland (Ebright 1992; Wesler et al. 1981: Vol.2). In the Piedmont as well, the settlement is wide-ranging with a focus on river zones (Kavanagh 1982).

Paleoindians were present throughout the Appalachian province, at least during parts of the period. For example, there are no fluted points in Maryland or Pennsylvania made of rhyolite, but by the Hardaway-Dalton phase there are rhyolite points in the Maryland Piedmont, indicating that people are starting to use that area.

Gardner notes the absence of Paleoindian materials on floodplains and terraces in the Ridge and Valley province. However, Stewart notes that sites are associated with floodplains, alluvial fans, and low terraces near small streams. Kit Wesler et al. (1981:Vol.4:135) suspect that Gardner's quarry-oriented site distribution represents a truncated upland data set. Both the Flint Run complex base camps and Shawnee-Minisink are on terraces. Quarries are likely to have been long term foci for activity, but riverine settings were probably of equal or greater importance and evidence for them simply may be obscured by deposition and historic activity. Wesler and his co-authors expect a foraging economy with an emphasis on hunting, and twin settlement foci on riverine base camps and cryptocrystalline lithic quarries.

As stated above, hunter-gatherers depend upon their mobility in the landscape for security. Scott Parker (1990) looks to ethnographically known hunter-gatherers for models of social systems incorporating exchange networks as part of adaptation to environmental conditions and risks. Although the societies he chooses, the !Kung of the Kalahari desert of southern Africa and the aborigines of the Western Desert of Australia, inhabit arid environments quite unlike the temperate mid-Atlantic, they do offer relatively well-studied and well-theorized examples of hunter-gatherer strategies. He expects exchange based on reciprocity and risk reduction for Archaic period hunter-gatherers. Settlement systems function to obtain critical resources, but mobile groups cannot be in close proximity to all resources at all times.

Therefore, groups need social processes such as exchange networks (Parker 1990:113).

Exchange networks are based on material needs and environmental characteristics but are still social systems with social structures. Sahlins' continuum of reciprocity and social distance is useful: closer social ties lead to more generalized reciprocity. For example, the hxaro exchange system of the !Kung is non-competitive and provides access to wide variety of resource areas. It would be impractical to have formal exchange networks based on prestige through debt relationships because such a system requires enough surplus to support creditor-debtor relationships. Among these highly mobile hunter-gatherers, accumulation of wealth is not only impractical but also socially unacceptable.

Pauline Weissner (1982, 1983) states that hunter-gatherers may practice some form of generalized reciprocity to allow them to "map onto" other groups' resources and thereby reduce risk. Hunter-gatherers may adopt different strategies. If they pool their risk, then household or band identity would be deemphasized as the population seeks to blend together. The opposite is expected for those who use storage. That is, stylistic variation would mark different memberships. Therefore, there are different strategies that are dependent not only upon the environmental characteristics, but also upon the strategies of interaction with other groups.

For the Archaic period mid-Atlantic, it would be reasonable to examine the structure of exchange systems in the eastern boreal forest as an analogy for later Paleoindian and Early to Middle Archaic strategies.

Charles and Buikstra (1983) discuss some of the social-political implications of Archaic cemeteries on the landscape. Although they are discussing the Central Mississippi drainage, their theoretical position and observed relationships are important for understanding sedentism and territorial marking in the eastern United States in general. They start with a long-accepted assumption that formal cemetery areas are associated with corporate lineal inheritance of crucial and restricted resources. They offer four postulates that start with the earlier assumption. These are:

1. the use of formal cemeteries correlates with sedentism of groups using the cemetery;
2. spatial structuring in mortuary behavior correlates with the degree of competition among groups for resources;
3. within a larger society, corporate groups will be distinguished by separate cemeteries or in distinct areas within a cemetery; and
4. inclusion of individuals within the cemetery implies inclusion in the corporate group.

Clearly, land is a crucial resource and a cemetery is one obvious way of ritually signifying a relationship to a specific area and its resources. While they correlate the elaborateness of the ritual expression to the importance of the required affirmation of relationship (or competition), they are not willing to make the case that the lack of a cemetery indicates the lack of resource competition or an organized claim to resources.

To the point of territoriality and social group identity, Kenneth Reid (1983:35) has this to say of the Late Archaic in the Lower Missouri Valley as he seeks to explain the high degree of lithic biface formalization. The formalization is associated with

> unilineal societies increasingly concerned with reproducing themselves as political and ideological units through time, rather than with bilateral kindreds preoccupied with subsistence requirements and equipped with simple flakes and choppers.

He goes on to characterize the unilineal groups as "competitive, and demographically expansionist descent groups" and contrasts them against earlier, reciprocally allied bilateral bands. Reid's observations are interesting because he seeks to uncover economic and political contexts for the Archaic-Woodland transition, including participation in regional exchange, innovation in ceramics, and population size and density. He seeks to tie observed archeological changes to changes in strategies for social reproduction and work force composition.

Two patterns of seasonal movement are offered for early prehistory in the mid-Atlantic: the cyclical model, and the serial model (Custer 1990). Evidence for the first, where people move between base camps focused on quarries, is expected where lithics are few and widely spaced. The second, where people move between base camps that are not quarry-related, is expected in areas where there are numerous small lithic outcrops. It has been suggested that movements followed the cyclical model in all areas during Paleoindian and Early Archaic times, with serial movement replacing this strategy after 8500 BP (Custer 1990). However, as mentioned above, some researchers have suggested early movement focused on riverine resources rather than primarily on lithic availability.

Gardner (1974a) suggests a shift in the settlement pattern accompanying the Early Archaic shift to notched points (Kirk and Palmer phases). Processing stations appear along floodplain margins, especially along margins of inland swamps and bogs. In the Appalachian province of Maryland, large river terraces and upland swamp margins are used beginning with the Palmer phase (Wall 1991).

In the Southeast Atlantic Slope settlement model for the Early Archaic (Anderson and Hanson 1988) a combination of collector and forager strategies is proposed, with seasonal movements on river drainages crosscutting the Coastal Plain and Piedmont. Base camps are set up in the Coastal Plain in winter and a series of foraging camps are used the rest of year. Lithic availability is a constraint in the Coastal Plain, but not in the Piedmont.

Wide-ranging mobility in the earlier Early Archaic, indicated by a great deal of extralocal lithic material, is followed by decreased mobility and circumscribed territories, indicated more use of local raw materials. In the South Atlantic by the beginning of the Middle Archaic, there is year-round occupation within small territories (Anderson 1991b).

Common across physiographic provinces is the late Early Archaic focus on water resources. Interior swamps on the Maryland, New Jersey, and Delaware coastal plains (Custer 1984), upland and interior ponds in western Maryland (Wall 199a), and ponds, marshes, and springheads in the Great Valley (Stewart 1980) all are increasingly used during the latter part of the Early Archaic.

Settlement pattern changes around 9,000 BP include the increasing use of upland settings in western Virginia. This use is probably prompted by the expansion of deciduous species into upland slopes and summits and to population growth. This expansion reached its maximum extent during the Late Archaic around c. 5000 BP, when most of the settlement system remains focused on major drainage floodplains (Custer 1990).

The settlement pattern hypothesized for the Upper Ohio Valley Middle Archaic (Cowin 1991) is probably applicable to the upper Potomac basin. Base camps are located on post-Pleistocene terraces where riverine and floodplain habitats provided seasonal subsistence. Procurement stations for plant and animals are located in the uplands and small lithic reduction camps are near lithic outcrops.

In the Virginia Piedmont most Early and Middle Archaic sites are clustered along major drainages. These are primarily small procurement sites associated with swamps and bogs in uplands and at springs and seeps and along small low order drainage floodplains (Custer 1990). In the Maryland Piedmont there is movement for the first time away from the river to the foothills and uplands (Kavanagh 1983). Overall, there seems to be a more varied foraging economy and increasing use of uplands, with continued preference for riverine settings for the location of base camps (Wesler et al. 1981:vol. 3).

The Fall Line and Coastal Plain are especially poorly known but on the Coastal Plain freshwater wetlands, swamps, and bogs are the location for sites from the Paleoindian through the Middle Archaic. There was opportunistic use of these areas as they became available with the sea level rise. Coastal areas were not an area of settlement until there were stable resources about 4000 years ago (Custer 1990).

There was increasing use through the Late Archaic of riverine and estuarine resources. In both the Piedmont and the Appalachian province the Late Archaic witnessed the highest dispersal of sites and the greatest variety of micro-environments. By the end of the Late Archaic with the Broadspear tradition, there was a shift back to the main rivers (Stewart 1980; Wesler et al.: vols. 1,4).

Base camps along major drainages supported larger populations and there is a corresponding decrease of sites in other locations. Custer (1984) attributes this change to climatic change as warm, dry conditions decreased the carrying capacity of marginal areas used earlier.

Late Archaic settlement pattern is marked by increasing territoriality, reflected in the lithic resources used. For example, on the Maryland Coastal Plain there is extensive use of local quartz and quartzite cobble and a dramatic decrease in the incidence of rhyolite use (Ebright 1992).

Numerous similarities between Late Archaic, Early Woodland, and early Middle Woodland settlement patterns may mislead archeological interpretation into assumptions of cultural stasis, an unlikely situation.

Early Woodland settlement patterns indicate the intensive use of estuarine resources. During the Late Archaic and Early to Middle Woodland there was a shift in location of base camps away from interior swamps to estuarine areas for shellfish in the outer Coastal Plain (Gardner 1982). The pattern is less clear in the inner Coastal Plain. The Early Woodland pattern shows seasonal interzonal movements between freshwater and saltwater zones, both of which are highly productive (Gardner 1982).

A new type of site appears in the Appalachian province of the Potomac Basin during the Early Woodland. The presence of small stone burial mounds related to the mid-continental Adena is noted in the Appalachians, extending well into western Maryland (Fowke 1894; Ritchie and Dragoo 1971). Burial mounds and cairns are reported mounds as far east as Antietam creek in the Hagerstown Valley (Hill 1831; Stewart 1981).

For the most part, however, Early Woodland sites tend to be in the same places as those of the Late Archaic. There is a riverine orientation supplemented by upland hunting camps near large streams or stream heads.

During Middle Woodland II, people live on the inner Coastal Plain along freshwater streams in intermediate size base camps. Storage pits at some of these settlements suggest that these camps were probably used throughout the year at different times. Smaller sites, which line the Potomac and its tributaries below the Fall Line, are probably fishing camps and processing sites for spring anadromous fish runs (Potter 1993:107). Associated with this use of the Coastal Plain are sites in other areas. Temporary camps, for example, are found in the interior uplands of the Piedmont and sites associated with the collection of rhyolite from the Blue Ridge are found in the Piedmont and Blue Ridge (Potter 1993:108; Curry and Kavanagh 1991).

In the Patuxent River drainage on Maryland's Coastal Plain there is a dramatic change in settlement organization during Middle Woodland II. Steponaitis (1986) describes and attributes the decline in residential mobility and increase in logistical procurement strategy to environmental stress and changes in social relations and alliance networks (Potter 1993:109-110).

Certainly one of the major effects on settlement pattern as well as social and political relationships in the Potomac Basin during the Middle Woodland was the long distance migration of Algonquian groups to the area from the Great Lakes region. Although the timing of this migration is unclear, it is likely to have occurred either early or late in Middle Woodland II (Potter 1993:3-4). It is possible that environmental stress in the Algonquian homeland, also seen in drier, cooler periods around 400-500 in the mid-Atlantic, contributed to this migration.

During the Late Woodland I there was population dispersal in the Coastal Plain as single large villages split into several smaller villages. This change in settlement pattern resulted, at least in part, from two related changes: the introduction of agriculture and a climatic dry period from 1000-1200 CE (Potter 1993:142).

Around the beginning of Late Woodland II there was a coalescence of population and after 1,300 CE the settlement pattern is characterized by large villages. There were also several population movements of groups between physiographic regions. Some Montgomery Complex groups moved from the Piedmont to the inner Coastal Plain, where they are identified archeologically as Potomac Creek Complex groups (Potter 1993:143-5). They perhaps were prompted to leave the Piedmont by the arrival of Mason Island groups who moved there from the west. In the Maryland Piedmont Late Woodland villages are large and stockaded (Kavanagh 1982), as are Potomac Creek Complex villages. In the upper Potomac, Late Woodland villages are palisaded, and closely related to the Monongahela of the upper Ohio Valley and southwest Pennsylvania. People of the Luray complex, who moved into the Piedmont around 1,500, seem to have come from this area. Most of the Rappahannock Complex villages, those of Late Woodland Coastal Plain inhabitants who were in the lower Potomac before Piedmont groups moved in, are instead spread out over large areas and are not stockaded (Potter 1993:147).

From his study of shell middens and shellfish gathering, Waselkov (1982) offers these conclusions about site types and locations from Middle Woodland II through Late Woodland II. There are small seasonally occupied oyster gathering sites from the late Middle Woodland (200 CE), if not earlier. By about 700 CE the first large villages are occupied for much of year. These are supplemented by small and intermediate upland hunting camps and oyster gathering camps. Around 900-1,000 the dominant settlement type consists of a dispersed large village with individual houses and house clusters. Around 1,300 small permanent settlements coalesce to form large villages with some outlying house clusters. By 1,500 villages absorb outliers and are more consolidated but still are internally dispersed. Houses within villages are so widely spaced that middens between them are very thin over large areas.

Use of the Landscape during the Historic Period. The Coastal Plain settlement patterns of Late Woodland II, 1300-1500 CE, are essentially those in place at the time of European settlement. There is little ethnohistory concerning the Piedmont, although there are indications that native groups deserted the area by the 1630s and returned by the end of the 17th century. There are several references to the return or migration of native groups to the Piedmont. There was a settlement of Piscataway on Heater's Island c. 1699-1720 (Snyder 1967; see Wesler 1977) and a return of Susquehannocks and Shawnee to the Susquehanna River in Baltimore county (Wesler et al. 1981:vol.4). The 1697 report of John Oldton, captain, describes the activities of rangers who "have Ranged and made discovery of all Good Lands back of our Road and found a great many Indian Cabbins and Tents where we marked Trees and set up our names" (quoted in Wesler et al. 1981:vol.4). Such a statement suggest that native Americans were living in the Appalachian province as settlers were claiming it.

Soon after the initial settlement of Jamestown, the official policy of the Virginia Company and then the British Crown was to encourage and demand the formation of towns. However, circumstances in the Chesapeake region worked against directives from across the sea and dispersed, largely self-sufficient plantations became the norm through the 17th and much of the 18th century. The Virginia Company's policy in the early 17th century is expressed as follows (quoted in Reps 1972:46):

> Wee think it fitt, that the houses and buildings be so contrived together, as may make if not hansome Townes, yet compact and orderly villages; that this is the most proper, and successfull maner of proceedings in new Plantacons, besides those of former ages, the example of the Spaniards in the West Indies, doth fully instance.

Miller (1984) describes the rapid tempo of change and marked fluidity in frontier settlement, social structure, and economics. Within colonies there is greater spatial simplification and flexibility as distance from the homeland increases. He indicates that settlement types found in the 17th-century Chesapeake -- dispersed settlements, semi-nucleated villages, nucleated villages and frontier towns -- reflect this "colonization gradient" typical of frontier settlements.

Tobacco and the trade and profit it engendered were major factors in the dispersion of plantations and people along the deep, navigable rivers of the Chesapeake drainage. The ease of water transportation made it possible for trade to take place at individual plantations and hampered the formation of towns and cities.

An observer in 1688 wrote (quoted in Reps 1972:58)

> No Country in the World can be more curiously watered. But this Conveniencey...I look on [to be] the greatest Impediment to the Advance of the Country, as it is the greatest Obstacle to Trade and Commerce. For the great Number of Rivers, and the Thinness of the Inhabitants, distract and disperse a Trade. So tht all Ships in general gather each their Loading up and down an hundred Miles distant; and the best of Trade that can be driven is only a Sort of *Scotch* Pedling; for they must carry all Sorts of Truck that trade thither...The Number of Rivers, is one of the chief Reasons why they have no Towns.

In discussing 17th-century settlement studies, Andrew Edwards and Marley Brown (1993:291) admire Deetz's (1987, 1988, 1993) analysis of early regional settlement as a "creative application[s] of often-overlooked survey-level evidence to the broader dynamics of settlement patterns ... in historical archeology." They emphasize that his analysis of the temporal sequence of Flowerdew Hundred sites could be done only with archeological data. Results from the authors' similar study at Carters Grove supported Deetz' results, which he summarizes (1987:66, quoted in Edwards and Brown 1993: 292-293):

> In the early decades of the seventeenth century, tobacco yielded quick profits and the Flowerdew bottomlands were settled and farmed evenly... When tobacco no longer was a source of instant wealth, there was a shrinking of occupation; families moved nearer the river and away from the center of the plantation... When slavery made it possible for a person of relatively modest means to possess a labor source that enabled him to produce tobacco, settlement expanded again. Finally, settlement dwindled as the plantation lands came into the hands of three wealthy planters and finally fall into the possession of only one.

The correlation of the "temporal structure of early 17th-century settlement patterns, seen in fluctuating periodicities of site occupation spans, ... with economic developments on an international scale" (Edwards and Brown 1993:301) provide a world system context for the interpretation of site location.

The system of mercantile capitalism needed towns for centralized control of administration and trade. It also relied upon colonies to supply raw materials and therefore colonial manufacturing was discouraged, although the encouragement of manufacturing and trades would have helped to encourage towns. John Reps points out that English policy was contradictory. He (1972:60) writes that

> throughout the seventeenth and eighteenth centuries English colonial administrators continually grumbled about the lack of towns in Virginia and Maryland...Nothing appeared less natural and rational than a settlement pattern of small farmers and large plantations dispersed almost uniformly across the land. Surely this was quite un-English.

Large plantations, however, served many of the functions of towns, including the location of crafts. Travelers commented on the village-like characteristics of large plantations. At the turn of the 18th century one observer wrote (quoted in Reps 1972:62), "every Plantation is a little Town of itself, and can subsist itself with Provisions and Necessaries, every considerable Planter's Warehouse being like a Shop."

During the 18th century towns were established differently in Virginia and Maryland. In the former, individuals often laid out towns on their own land and then sought legislative approval, while in the latter the General Assembly created towns, often in response to petition from residents in the proposed areas (Reps 1972:232). Port Tobacco, originally established in the 17th century, was reactivated as a town. It and other port towns underwent a similar sequence: "a period of slow and uncertain development, an era of prosperity, and ultimate stagnation or decline." Port Tobacco in Charles County, Maryland and Bladensburg on the Anacostia River both suffered from the siltation of their harbors and the decline in the importance of tobacco as the wheat and flour trade moved prosperity to Baltimore and Alexandria (Reps 1972:243).

Sylvia Fries (1977) describes American colonists as essentially anti-urban but culturally accepting of the idea that civilization is nourished and manifest in cities. She writes (1977:xiv) that, "The symbolic American landscape has included not only the edenic garden but the New Jerusalem." Fries considers Williamsburg specifically, but both of the central 18th-century Chesapeake cities, Williamsburg and Annapolis, were planned in the 1690s to fulfill the cultural expectations of urban places. A Virginia clergyman expressed a widespread opinion (quoted in Fries 1977:113):

> When I have considered the Antiquity of Towns and Cities, known to as many as are conversant with Sacred and Profane History, and the Universal Copy cast us by the whole Christian and Pagan World, I have been justly amazed to see the unaccountable Humour and Singularity of Virginia and Maryland, who have so patiently, and for so long a time, sat down with a kind of stupid satisfaction under those pressing and Innumerable Disadvantages both they and their posterity must still endure, by their scattered and remote Settlements, without Towns and Cohabitation.

According to Fries' cultural analysis, Williamsburg as an aesthetic statement was designed to fulfill a largely ceremonial function. She (1977:129) explains,

> The principles of that aesthetic, the principles of formalized and rationalized harmony achieved through mathematically contrived proportions, were a projection of a cultural style adapted by and for an elite planter class to enhance its own aspirations toward social and political ascendancy. Derived from a European tradition of the constructed, refined, and cultivated self it became identified, in the context of its origins, with the city.

The sequence and seeming purpose of urban places is remarkably similar in Virginia and Maryland. Both colonies replaced their frontier period capitals -- Jamestown and St. Mary's City, respectively -- with carefully planned ceremonial capitals at the end of the 17th century. After the Revolution, these cities' functions as physical representations of political and social sovereignty perhaps became unnecessary and the central places shifted inland to the Fall Line, to Richmond and Baltimore (see Fries 1977:128). Although Annapolis is still the political capital of Maryland, economic and social activity centered in Baltimore during the late 18th and throughout the 19th century. The Federal city was established as well at the end of the 18th century. Washington, D.C. is also on the Fall Line between the Coastal Plain and Piedmont.

Other urban places flourished as well. Georgetown had been established after 1734 and was authorized as a town in 1751. The town prospered and grew. During the late 18th century, opinions about the town's fate varied. Benjamin Stoddert commented in 1783 (quoted in Artemel et al. 1987):

> Baltimore was then a flourishing place almost beyond calculation, and Alexandria was a place of very considerable commerce. I was urged by my friends to fix myself in each of these places, but I had reasoned myself into a decided preference for Georgetown, then entirely destitute of every appearance of being commercial. There was but one trifling retail shop in it, and it had not a man who ventured five pounds on any foreign voyage. Still, I said that no place in

> this quarter of the union, not Baltimore itself, was convenient to so great a proportion of the products of the country as Georgetown, and in such a state of peace I knew that the commerce of such a place must depend in a great degree on the products of the country, it was from situation entirely to receive, and that if this position was correct, which I could not doubt, that the trade of Baltimore, and of Alexandria would decline and that of Georgetown would increase beyond the conception of common minds.

Another man wrote instead of the town's economic disadvantages in 1791 (quoted in Reps 1972:247):

> Georgetown is said to have risen to some importance in the commercial world from the same cause as Baltimore, viz., the impolitic revenue laws of Virginia, which carried her produce to Georgetown and sent the imports from Europe, which otherwise would have gone to Alexandria. The navigation is certainly not equal to that of Alexandria, for there are some rocks opposite Georgetown, the channel is narrow and bad, and no vessel can withstand the ice which comes down the Potomac, for which reasons insurance cannot be made on vessels till they have got to the Eastern Branch. The situation of Georgetown is likewise inconvenient for trade, the land being very uneven, and full of steep declivities, and hollows, and lofty eminences, which although beautiful to the eye of the traveler, and afford delightful prospects, are certainly ill-calculated for trade.

Core-periphery relationships within a city have been studied in Alexandria, Virginia (Cressey et al. 1982). The guiding questions of this research were, broadly, 1) how and why did urban hierarchy become more highly stratified between the 18th and 20th centuries and 2) how do archeologically observed relationships among settlement pattern and material culture patterns address this stratification.

The archeological study of core-periphery relationships continues to explore questions on regional and world-wide as well as local scales. Such core-periphery relationships affect landscape use and, of course, economic and other interaction.

Rural areas functioned as economic peripheries to local and regional core areas. Patricia Parker (1986) describes the 17th- and 18th-century Virginia Piedmont focus on tobacco farming and the increasing difficulty of living by farming after tobacco farming devastated the soil and landscape. Herbert Fisher (1983) describes two major phases of settlement in Louisa county in the Virginia Piedmont. The first was during the 1730s and 1740s as English settlers and their black slaves established tobacco plantations, purposely eroding the land to maintain drainage. The second was after the Civil War as freed slaves moved to the abandoned tobacco lands, which were eventually lost, abandoned or sold to timber and pulp wood companies.

Settlement pattern analysis helps to tell the story of migration as settlers moved across the Piedmont and into the mountains. For much of the 18th century within the Tidewater area small independent farmers, tenants, indentured servants, and slaves were all directed and controlled by the planter elite. In contrast, to the west there was more ethnic diversity and more economic diversity. In the mid-18th century, for example, there was an influx of Quaker and German settlers from Pennsylvania into Loudoun county, Virginia and Frederick and Washington counties in Maryland. Some of their culture and building traditions spread east as well, making the built landscape in the western third of Fairfax county, for example, look quite different from the eastern portion. Sully Plantation was one of few plantation-type farms in western Fairfax built in late 18th century; it relied on diversified crops and was never a tobacco plantation (Chittenden et al. 1988).

The settlement of Washington and Allegany Counties in Maryland began by the 1740s with military and trading posts. Thomas Cresap established a trading post about 1739 near Hagerstown and then moved to the Oldtown area near Cumberland in the 1740s. Cumberland and Oldtown on Potomac river were near Warriors Path, a major north-south Indian trail. Water power and mills were especially important in Washington County where farmers invested in grain agriculture. Small mills were established along creeks and tributaries.

In 1790 there was a limited white population of less than 20,000 west of South Mountain. The completion of the National Road in 1818 brought an influx of population. The Cumberland area was sparsely settled until the B&O Railroad and the C&O Canal reached the area in the 1840s and 1850s. By 1860 the population of Cumberland was over 3000 (Sprinkle et al. 1994:9).

As soils became exhausted and the market for tobacco declined, the nature of agricultural production changed. Crop diversification, more pasturing of livestock, and new techniques such as crop rotation and fertilization were adopted. Northern farmers familiar with these techniques migrated into Virginia in the 1840s. Such agricultural change affected the spatial organization of areas that had been organized as plantations. Smaller farms that were less labor intensive and used more machinery developed. Sources of craft other than the formerly self-sufficient plantations had to be established. In northern Virginia, Alexandria remained the major regional center with luxuries, services, industries (potteries, breweries, fisheries, shipyards, banks); newspapers, educational institutions, and lyceums. At transportation crossroads, other villages grew, such as Centreville, Dranesville, and Falls Church in Fairfax county (Chittenden et al. 1988). Matildaville, an NPS property in Great Falls, is an example of a town which served and was served by major transportation routes, in this case the Patowmack canal.

During the era of the Civil War northern Virginia was a border area, both militarily and philosophically. The area was already very different than rest of state culturally, economically, and socially; opinions about secession were divided (Chittenden et al. 1988).

The effect of the Civil War on the use of the landscape was far reaching and longlasting. Battles, encampments and the construction of forts had obvious, although often underestimated, effects. The temporary and permanent displacement of people also changed settlement patterns. Large-scale migration of escaping slaves during the war and freed slaves after the war resulted in very different demographics in and around the District of Columbia. A system of refuge camps was established and after the war Congress created the Freedman's Bureau. Freedmen's villages were established in Alexandria, Arlington, and Falls Church. Smaller clusters were organized at Lewinsville, Vienna, Fairfax Station, Fairfax Courthouse, and Frying Pan, while more isolated communities grew around black-owned farm land at Lincolnville, Odrick's Corners, and Gum Springs. The latter community was associated with Mount Vernon (Chittenden et al. 1988).

The landscapes of plantations and urban estates have been subjected increasingly to archeological analysis. Larry McKee (1992), for example, investigates the transformation of slave housing and plantation landscapes in Virginia during and after the pressures for slavery reform during the 1830s. He is particularly interested in the attempted use of housing by owners to better control slaves and the resistance by slaves to that control.

He explains (1992):

> The architectural engineering of social behavior by masters went beyond simply providing small dwellings for what were expected to be well-behaved families. Writings in the agricultural press indicate that planters put strong emphasis on controlling the visible results of what they considered to be slave misbehavior: the appearance of slave dwellings and the yards around them.

McKee (1992:210) summarizes the role of archeology in approaching the power relations and struggles of life on the plantation.

> Slave cabins, both the ones still standing in late 20th century Virginia and other states and the ones ideally conceived in the writings of plantation reformers, tell us about planters' goals and desires for orderly slave communities. The full context of these dwellings, as provided by the archeology surrounding them, the histories of their

> occupants, and a consideration of how groups within a social setting grapple for power and autonomy, shows how slaves largely rejected these simplistic attempts to program their lives by architectural design. When archaeologists attempt to read artifacts and to divine the intended signals of the artifact makers, there is a consequent need to try to understand and reconstruct the responses of those for whom the objects' message was intended.

The archeological investigation of a 19th-century plantation in southern Maryland reveals both the landscape mechanisms of control over slave behavior and the attempts of the owners to use landscape to symbolically strengthen their place in the social hierarchy of the region (King 1994).

Other provocative archeological interpretation of 19th-century landscapes in the area has been done at Harpers Ferry National Historical Park (Shackel 1993b) in the context of interdisciplinary investigations. Pollen and phytolith analysis provide clues to changing yardscapes. Paul Shackel (1994b:9) summarizes:

> Significant differences are found between the armory's craft ethos phase, the armory's industrial phase, and the town's commercial and residential phase. While pollen and phytolith grass data are nonexistent in the pre-armory landscape, they are abundant by the 1820s. New buildings were constructed and the armory maintained a well-groomed landscape. But the garden-like landscape disappeared by the 1840s when industrialization no longer had to be justified as coexisting harmoniously with nature.

Particularly interesting to rural industrial landscape studies are the planned industrial communities of Lonaconing, Mount Savage, and Weverton in Western Maryland. These towns were all laid out by industrial companies. The first mill in Weverton in Pleasant Valley, Washington County, was built in 1846 and lasted until 1860. Initially, the company planned to rival Lowell, Massachusetts. Both Lonaconing and Mount Savage were built for iron production in 1837 to use local George's Creek coal for fuel. Iron production was successful in Lonaconing for only 3 years but reopened in 1842 for mining only. Mount Savage shut down in 1868 with production of iron and steel replaced by fire clay and brick (Wesler et al. 1981:Vol.4).

During the World War I era, northern war production recruited tenant farmers to supply labor, thereby starting the "Great Migration" of blacks to the north that lasted until the 1960s. The Fairfax County plan (Chittenden et al. 1988) identifies three themes which may be related to racially-influenced use of the landscape in the region as a whole, since black and white population centers tended to be separate, even within the same town. In addition, developments in Fairfax County, Virginia are likely to have had some impact in the surrounding area. These themes are: 1) steady growth of black population until after the turn of the 20th century followed by absolute and relative decline thereafter; 2) coalescence of blacks into communities largely segregated from whites, first by custom and later by law; and 3) continual struggle by blacks for economic and social acceptance into the wider society.

Interaction Within and Between Societies

Interaction studies comprise a large and important part of archeological thought. Interaction refers to contacts between and among individual societies. In a recent book Edward Schortman and Patricia Urban (1992:3) explain that "interaction studies," as a focus of archaeological inquiry,

> refers to research founded on the notion that individual societies, or 'cultures,' are not viable but depend on inputs from other societies for survival and reproduction from generation to generation.

They contrast interaction studies with cultural ecology, which was the reigning theoretical paradigm in American archeology in the 1960s and 1970s. Cultural ecology emphasized internal mechanisms with such models as feedback loops and homeostatic mechanisms operating within territorially-bounded ecosystems. As was pointed out in the introductory discussion of economy, the causes in this approach tend to be technoenvironmental rather than social. In the creation of a new school of interaction studies, Schortman and Urban (1992:11) hope that the best threads of earlier research will be adopted.

The goal of interaction research is to write "total histories" by placing developments within a rich network of connections maintained by each society. Schortman and Urban's work highlights three types of interregional interaction: world systems, trade, and warfare; but certainly other categories such as migration, acculturation, and ethnic group formation and disintegration could be specified.

Research issues important to interaction studies include the following (Shortman and Urban 1992).

1. What is the significance of elite control over basic subsistence resources as opposed to luxury resources as a foundation for controlling labor?
2. Is adaptation a significant concept in understanding sociopolitical impact of interregional linkages? In other words, what is the relationship between elite strategies to promote their own well-being and the needs of a whole society?
3. How is labor distributed among cores and peripheries and to what extent are peripheries underdeveloped in relation to the cores?
4. What is the role of warfare in the stabilization of exchange for the benefit of cores?
5. What is the sociopolitical significance of persistent conflict?
6. Within a context of competition and threat, what strategic use of visible material forms stresses unity in the face of powerful oppressors?

Following are brief discussions of three kinds of interaction: world system, trade and exchange, and conflict and warfare. None of these topics is limited to any particular time period. Because more archeological attention has been focused on trade and exchange, there is more background information provided. The scale of the "world" in a world system may change greatly; however, in the historic period it becomes increasingly global. Following these summaries is a discussion of some aspects of interaction in the mid-Atlantic. This example is neither exhaustive nor comprehensive, but serves to illustrate the sorts of issues which may be addressed archeologically.

World Systems. Many archeologists have embraced the world system ideas of Immanuel Wallerstein (1974, 1980, 1989) and have critically adapted them. World systems are not necessarily global but comprise an arena of interaction with more than one cultural grouping. World systems are not necessarily politically unified whereas world empires are. World economies connect more than one political system. There are also minisystems that are territorially small and rely on reciprocal exchange. The most familiar part of the model is the three-part characterization of regions as core, semiperiphery and periphery based on relative economic centrality and power. Archeologists using Wallerstein's model recognize that despite similarities or regularities each system is unique (Schortman and Urban 1992:21).

The impact of the European world system on native cultures develops over the period of initial and sustained contact. The relationship of the colonial settlers also changes within the world economy. International competition was played out in the New World colonies and developments must be viewed in that context.

Trade and Exchange. The study of trade complements a world-system perspective. The political context of exchange is one way to investigate regional power relations. Peter Wells (1992:175) writes that it is far too simple to define trade as the peaceful transmission of goods since "any interaction resulting in the movement of goods between societies involves complex economic, social, and political processes and raises numerous questions."

To establish sociopolitical preeminence, developing elites must "extract surpluses and services from their followers while maintaining the simulacrum of reciprocal relations among different social levels" (Schortman and Urban 1992:15). In other words, those who wish to gain power must make their followers willingly dependent and convince them that the system is just and fair. The symbolic character of exchange within and between regions is crucial for developing and maintaining political ideology. Luxury or prestige goods, called "preciosities" by Wallerstein, are politically important.

A cultural ecology approach traditionally argues that elite control rests on control over local basic resources like land and water. Schortman and Urban (1992:155) accept that such control is important but write that "access to and control over local resources is mediated through the manipulation of 'luxuries'." Mechanisms for moving goods include gift-giving, plunder from raids, protection payments, and "real trade," i.e., peaceful exchange (Wells 1992:176).

Meltzer (1984:27-28) notes five conditions to document exchange archeologically: 1) knowledge of raw material source area; 2) demonstration of group territoriality; 3) location of territory in relation to resource; 4) knowledge of mobility of settlement system; and 5) demonstration that raw material doesn't occur in territory naturally.

Stewart (1989) identifies two forms of exchange in the mid-Atlantic: broad-based, which has two variants, and focused. In the first variant of broad-based exchange there is a distinct fall-off of traded material 30-50 miles away from the source:

> The noted distributions are a fingerprint of both the distinctive territories of groups or bands who can procure a material directly, and down-the-line exchange of tools and implements of these same materials [Stewart 1989:52].

The second variant of broad-based exchange, called hoarding, exhibits the same fall-off but territories at some distance have an unusually high percentage of trade items. Stewart, however, does not consider this pattern as indicative of formalized or elite trade. He (1989:55) explains:

> The documented volume and distribution of traded artifacts throughout the region argues against the existence of groups with preferential access to specific sources of material or production centers. The geographic extent of . . . [certain resources] would have precluded the control of any of these resources by a particular group.

Hoarding indicates manipulation of traded goods by local groups. In general, broad-based systems correspond to kin-based sharing and exchange and related hoarding (Stewart 1989:65).

The focused form of exchange is indicated by items which are not drawn off of the broad-based networks. It indicates that local people have somehow inserted themselves into other broad-based networks. Focused exchange networks:

> involved relatively few contacts, not the series of interlocked, down-the-line transactions associated with broad-based systems. Artifacts related to focused networks show

> extremely discontinuous spatial distributions, not down-the-line decreases, and are found in both burial and general site contexts. While some exchanged items show signs of having served functional lives prior to being discarded, others do not [Stewart 1989:66].

Several kinds of personal interactions of hunter-gatherers could result in the exchange of goods. Such actions include (Stewart 1989:66): 1) obligatory sharing and gift-giving founded on kinship ties; 2) fission-fusion of communities; 3) payment of marriage dowries; 4) establishment of personal relationships and trading partnerships; 5) redistribution of goods at feasts and ritual.

In politically complex societies there are additional actions which result in exchange, such as collection of tribute and tax and the chiefly redistribution of various material. Various motivations of the elite for power and prestige may initiate focused exchange, particularly to gain exotic goods (Stewart 1989:66).

Conflict and Warfare. Warfare and conflict have received less attention within interregional interaction theory than is needed. Studies of domination and resistance (e.g., Miller et al. 1989) tend to focus on symbolic expressions, especially in response to threats to autonomy. Stephen Athens (1992) highlights ethnicity as an adaptive strategy within an intensely competitive social environment. Although interregional interaction is often seen as creating a context for group blending, there is also separation of social groups, especially those in competition for scarce resources (Athens 1992).

Interaction of mid-Atlantic Societies. According to Stewart (1989), extensive exchange networks first become visible in the mid-Atlantic after 2,500 BCE, during the Late Archaic. He attributes earlier exchange or the presence of exotic goods to expansive territories, frequent movement, and unpatterned exchange or gift-giving. As might be expected from general characteristics of the Late Archaic, exchange is interrelated with group territoriality and population growth and cyclical use of resources. Its purposes include the transfer of information, the reduction of potential conflict, and the creation of networks to serve as subsistence insurance (Stewart 1989).

During the Late Archaic several types of materials are recognizable as traded. Argillite, copper, jasper, rhyolite, soapstone, and ironstone have sources within the mid-Atlantic region. Flints and cherts from the Ohio Valley and Midwest, Canada, and Tennessee; marine shell, and obsidian are from outside the region (Stewart 1989:51). Perishables probably also were traded, but leave no record. Most Late Archaic exchange is broad-based. Focused exchange is sporadic during the Late Archaic and is seen in the distribution of some lithics, shell, and copper (Stewart 1989:56).

The manufacture and exchange of steatite vessels is a hallmark of the end of the Late Archaic period. A transitional "soapstone culture" was identified by John Witthoft (1953) and William Ritchie (1969) to describe the association of steatite vessels with large-stemmed broadspears of the Susquehanna and Savannah River traditions. Ritchie (1969:162) suggests that the Washington, D.C. area, rich in steatite, was core of movement northward for this soapstone culture. William Henry Holmes speculated the same in 1898 (Humphrey and Chambers 1985:13).

Steatite occurs at various places in the Piedmont. Along the Fall Line this weather-resistant stone is exposed and forms major outcrops that became the sites of quarries. The Rose Hill quarry in the District was excavated in 1890-1891 by Holmes, who reconstructed the technical sequence of the manufacture of steatite vessels (Holmes 1890; 1897).

As an area of contact and overlap between two major traditions, the Piedmont lowlands present an important opportunity to study the Late Archaic/Early Woodland mixing and recombination of the Savannah River and Susquehanna broadspear traditions (Rust 1983). William Rust observes a gradient of rhyolite use decreasing down the Potomac River and quartzite use decreasing upriver, with the midpoint around Selden Island. There is also more mixing of lithic materials in the interior stream drainages and floodplains than on the upper terraces. It may be interpreted that Savannah River cultures were using the upper terrace quartzite cobble sources as well as the floodplains and that the Broadspear groups were using the floodplains and streams. Rust interprets the Early Woodland merging of the two traditions as including the emergence of quartzite use promoted by the migration of groups to the Piedmont from the Coastal Plain.

During the Early Woodland these items were added to those traded during the Late Archaic: ceramics; pipestone clay; Onondaga, Indiana, and Tennessee cherts; and slates (Stewart 1989:56). Early in the period, exchange of chipped stone items declined in volume but maintained its earlier geographic extent. Exchange was both broad-based and involved hoarding. Steatite-tempered pottery was as widely distributed as earlier steatite vessels had been (Stewart 1989:57). Early focused exchange is found north of the Potomac Basin in west and central New York.

After 600/500 BCE, there was a dramatic increase in both quantity and extent of exchanged materials from outside the mid-Atlantic. The trade in exotic, Adena-like material continues through the early Middle Woodland. Both broad-based exchange and hoarding continued and there was focused exchange as well. On the Delmarva peninsula, east of the Potomac Basin, there is impressive evidence for long-distance exchange. Commenting on the source of this mid-continental trade, Stewart (1989:57) writes:

> It has long been assumed that the Monongahela-Potomac drainages were a major trade route for Adena-like exotics reaching the Delmarva Peninsula and points north...A small center of mound building, possibly dating to this period and later times, occurs along sections of the Potomac River as it cuts through the Great Valley, but its relation with Adena-like phenomena is uncertain.

There is no direct evidence for contact between the Great Valley and the Coastal Plain. Because there is not evidence for chain-like exchange between the Adena heartland and the Delmarva peninsula, direct and focused exchange is postulated (Stewart 1989:58).

Sedentary village societies may have developed in Virginia in the James River drainage as early as the Early Woodland (Mouer 1991a). In developing an Early Woodland sequence for the James River Inner Coastal Plain, Mouer (1991a) finds that the area probably was not habitually occupied but was used by a variety of groups normally living elsewhere. Archeologists should not be surprised, Mouer writes, to find sedentary tribal societies before the introduction of cultigens. Northwest coast societies can serve as an analogy for competition over very productive areas and the balance of power between groups. Such competition may lead to the formation of buffer zones and reorganization of groups into year-round settlement.

Mouer suggests that there may have been intraregional competition between Susquehanna Complex groups from the north and estuarine-adapted groups to the southeast. Some of the evidence for this competition includes: squeezing of particular groups into restricted, nonriverine habitats; intergroup violence evidenced by dismembered bodies at the site of Currituck on the Outer Coastal Plain of the James; and transregional trade in steatite, gorgets, and axes meant to integrate general use of buffer zones and alleviate conflict. Mouer draws a parallel with historically documented long-term blood feuds and boundary wars to explain some of the developments during the Early Woodland. Much of the Coastal Plain and uplands of the James River appears to have been used as a buffer zone during the Early Woodland while sedentism increased in the Piedmont and below the mouth of the Chesapeake (Mouer 1991a:26).

The Early Woodland, then, may witness the beginning of the Fall Line buffer zone that was observed in the 17th century as a boundary between the Siouan and Algonkian societies of Piedmont and Coastal Plain Virginia (Turner 1978; Mouer 1991a). It was certainly in place by the end of the Middle Woodland and is archeologically identifiable by 900 CE (Potter 1993:142).

Stewart (1989) feels that trade during the Middle Woodland is much like that of earlier periods, that is, with little formalization. During the early part of the period there is a reduction in the broad-based exchange of lithics. Group territories are also less extensive than previously. After 200 CE, however, through the Middle Woodland, there is an increase in exchange as goods flow from the west to the Coastal Plain. Some Coastal Plain groups were making trips to collect raw material directly. Coastal Plain pottery found in Piedmont and Blue Ridge rockshelters near rhyolite quarries and workshops is evidence of their trips (Curry and Kavanagh 1991; Potter 1993:107-108). Focused exchange with mid-continent cultures may be indicated by burial mound complexes in the Great Valley of Maryland, West Virginia, and Virginia, and the presence there of such materials as "*Marginella* beads, mica sheets, quartz crystals, copper crescents and beads, blades of Ohio Valley cherts/flints, and gorgets of Carolina slates" (Stewart 1989:62). Although the volume of trade as a whole is greater during the later part of the Middle Woodland, the frequency of copper items declines dramatically after 200/300 CE (Stewart 1989:62).

During the Middle Woodland, the most important interactions may have resulted from migrations of peoples into the Potomac Basin and between physiographic regions within the Basin. The long-distance migration of Algonquian speakers from the north, the movement of Mason Island people from the west to the Potomac Piedmont, and the movement of Montgomery Complex peoples from the Piedmont to the Coastal Plain are the major population redistributions (Potter 1993).

During the Late Woodland, regional interactions are a significant influence on the development of native cultures. There is little archeological evidence of trade, but cultural interaction is indicated by stylistic and cultural traits. There is a severe decline in the broad-based exchange of lithics and very little evidence for hoarding within the much smaller group territories which are characteristic of the period (Stewart 1989). It is suggestive of increasing nucleation of group activities that the cessation of the trade in rhyolite blanks on Virginia's Northern Neck around 900 CE correlates with the appearance of agriculturally-based village sites in the Piedmont (Potter 1993:141-142).

However, ceramics and pipes were traded through both broad-based and focused exchange from the Ridge and Valley province and the Coastal Plain of Maryland to the Delmarva peninsula (Stewart 1989:63). Marine shell ornaments and unmodified shell are the only items traded more frequently during the Late Woodland. Copper artifacts, often associated with burials, indicate focused exchange (Stewart 1989).

Mark Seeman (1981:105) proposes a possible emerging East Coast-Midwest trade during the Late Woodland following the decline of the Hopewell trade:

> As support, one could point not only to the replacement of Ohio pipestone by steatite across much of the Midwest, but also to the east-west diffusion of pentagonal arrow points, barbed bone harpoons, and so forth over much of this area.

He suggests that steatite is traded west from the mid-Atlantic, although he acknowledges that tracing sources of the stone is quite difficult.

During the Late Woodland contact through trade diminished, but the cultural world became an increasingly complicated place. Stewart (1993:172-173) writes about the "world system" comprised of the several different cultures in the Mid-Atlantic:

> population growth during early segments of the Late Woodland period result in the fissioning of settlements (hamlets/villages), and the expansion of new groups into previously unoccupied areas. Through time population densities reach the point where further fissioning and expansion of populations and settlements are not possible. Evidence of increasing population densities is seen in the location of sedentary settlements in more peripheral environments . . . Nucleation into planned villages, intensification of subsistence production, concomitant elaborations in social organization, and ultimately, inter-group conflict are the presumed results...In short, the cultural landscape has filled to the point where changes in one part of the Late Woodland "world system" influence other components or members of the system. Late Woodland cultural changes in the Middle Atlantic Region must be studies and understood at different scales -- local, regional, and the "world."

During the Late Woodland there were influences on the Potomac Valley from surrounding areas (e.g., Geier 1992). The Monongahela culture of the upper Ohio Valley influenced the upper Potomac (Stewart 1993). The Late Woodland people of the Paw Paw area in the upper Potomac had some degree of interaction with people of surrounding areas. Influences are seen in ceramic characteristics and suggest affiliations with three areas: 1) Monongahela and Ohio River drainages to the northwest, related to Fort Ancient of Ohio Valley; 2) upper Shenandoah River and Great Valley to east; and 3) upper Susquehanna to north and northeast, related to Owasco and Clemson Island (Kavanagh 1984). Describing the early Late Woodland pottery of the upper Potomac and hypothesizing about its makers, Henry Wright (1959) writes,

> This group is closely related to the so-called Montgomery Focus found in Zone B of the Shepard Site which is located on the Middle Potomac... The Morgan People are probably related to the Owasco Aspect of New York and similar groups scattered throughout the Northeast. They were apparently absorbed by the invading early Late Prehistoric group.

A generalized interaction sphere from New York to North Carolina influenced the Ridge and Valley region. In the upper and middle Potomac valley before the late Late Woodland, 1,300/1,400 CE, settlement was in small, unfortified villages, similar to those of the Shenandoah Valley. In the Ridge and Valley and Appalachian areas the presence of mounds and rock cairns is similar to that in the middle and upper Susquehanna Valley. After 1,300/1,400 CE, burial mounds and cairns disappear from both the upper Potomac and the northern Shenandoah and stockaded villages with outlying hamlets form the dominant settlement pattern. In the middle Potomac Valley mounds also disappear and some villages are stockaded. In the Coastal Plain, there is the rise of petty chiefdoms (Stewart 1993).

After 1,300/1,400 CE, there is increased evidence for hostilities, although there is probably sporadic and perhaps even sustained inter-group violence prior to this, as suggested by Mouer's (1991a) findings for the James River during the Early Woodland. Palisades around villages attest to the need for defense.

Given the competition and both potential and realized hostilities, it is not surprising that social and/or ethnic boundaries and their material culture markers seem to become more visible and more important during the Late Woodland. Custer, for example, notes the possible use of petroglyphs in the lower Susquehanna Valley (1989) and various ceramic motifs (1987) as cultural boundary markers.

At the time of successful European settlement, the Powhatan chiefdom was the largest and most complex social organization in the region. There was political control by a single leader, the power of taxation and tributary rights, high ranking religious specialists, incipient hereditary class ranking, and special mortuary rights and privileges (Fitzhugh 1985; Potter 1993). The territory of the Powhatan extended from the Potomac to the James River and inland to Richmond. This area of approximately 16,500 square kilometers was divided into 31 districts, each controlled by a district chief (male werowance or female weroanqua) subject to a sub-chief ultimately under the rule of the paramount chief (mamanatowick) (Potter 1993).

William Fitzhugh (1985) questions if the Powhatan chiefdom is entirely indigenous or whether its development was stimulated by European contact. Several researchers (Binford 1964; Rountree 1989, 1990; Turner 1985; Potter 1993) provide evidence to support that it was in place earlier. Fitzhugh suggests that there may be a connection between European military goals during the 1500s and native political reaction. However, indigenous chiefdom development is supported by Late Woodland developments, including a major shift in population concentration to the core area of the Powhatan chiefdom, agricultural stress, redistribution. Local settlement patterns observed in 1,500-1,650 CE are in place by 1,300-1,500 CE (Potter 1993).

Jamestown settlers traded a variety of European goods to indigenous people in return for maize and later for furs. During the earliest contact the leaders of Algonquian society "sought to control the flow of European goods into aboriginal society, much as they controlled the flow of luxury and status items gathered through tribute from their own people" (Potter 1989:151).

The werowances paid tribute to the paramount chief from the tribute they themselves collected from their own groups. In 1612 William Strachey wrote,

> Every Weroance knowes his owne Meeres and lymitts to fish fowle or hunt in (as said before) but they hold all of their great Weroance Powhatan, unto whome they paie 8. parts of 10. tribute of all the Commodities which their Countrey yeildeth, as of wheat [i.e., corn], pease, beanes, 8. measures of 10. (and these measured out in little Cades or Basketts which the great king appoints) of the dying roots 8. measures of ten; of all sorts of skyns and furrs 8. of tenne, and so he robbes the poore in effect of al they have even to the deares Skyn wherewith they cover them from Could, in so much as they dare not dresse yt and put yt on untill he have seene yt and refused yt; for what he Comaundeth they dare not disobey in the least thing [quoted in Potter 1989:153].

Prestige goods, particularly copper, were strictly controlled. Powhatan, as reported by Strachey in 1612, tried to

> monopolize all the Copper brought into Virginia by the English: and whereas the English are now content, to receave in Exchange a few measures of Corne for a great deale of that mettell...Powhatan doth againe vent some smale quantety thereof to his neighbour Nations for 100. tymes the value, reserving notwithstanding for himself a plentiful quantety [quoted in Potter 1989:156].

Trade eventually had the effect of diminishing the authority of the werowances and the Paramount Chief. By the middle of the 17th century a number of factors, including "population decline, displacement or loss of land, discrediting of the priesthood through its ineffectiveness against European diseases, and perhaps loss of clear matrilineal successors to the chieftainship" (Potter 1989:160) had weakened the werowances' power and thereby their control over tribute and trade.

The chiefdom was disintegrated by 1646, barely two generations after the founding of Jamestown. The effect of disease is difficult to assess but the effects of violent conflict are better documented. Extensive hostilities among native groups and between them and the English are described by Potter (1993).

By 1619 there were 900 English settlers in Virginia in 25 plantations; by 1622 there were another 23 plantations. Powhatan attacked English settlements in 1622. By 1644 the English population in the Coastal Plain was over 8,000 and hostilities continued. A formal peace treaty in 1646 effectively subjugated the chiefdom to the British crown, collecting yearly tribute to the governor from Powhatan. In 1669 a census listed 2,000 Powhatan in Virginia; a 1666 census counted 40,000 English.

Hantman (1990a) describes the complex political relationships between the interior, Siouian Monacan and the Algonquian Powhatan. Copper was a key symbol of power and authority in the complex social and political life of the Algonquian. The Monacans were probably a source for vital Algonquian copper at the same time there were political and military enemies (Hantman 1990a:685). English copper traded by Jamestown settlers was politically charged in ways that the English almost certainly did not fully comprehend as Powhatan manipulated it to increase his own regional power.

Some differences in the type of contact between Europeans and native groups are evident comparing Maryland and Virginia. Within the Chesapeake, Frederick Fausz (1985) traces a development from fascination and hospitality to fear and hostility to cooperative alliances. In Maryland there was a change in English policy to emphasize trade rather than direct conquest. The immediate and long-range effects of this difference in the colonies' policies and histories should include such archeologically visible patterns as intra- and inter-site settlement, evidence of trade, and patterns of syncretic material culture.

In his contact theme study for National Historic Landmarks, Robert Grumet (1992) summarizes many of the issues and well-documented sites for North Atlantic, mid-Atlantic and Trans-Appalachian regions. The sub-regions directly relevant for the Potomac Basin are the Potomac and Rappahannock Rivers in the mid-Atlantic and the Maryland and Virginia Uplands in the Trans-Appalachian region.

The 17th century saw a series of wars, including the Powhatan wars between 1609-1646. The rapid movement of many peoples, the mixing of groups undergoing rapid cultural change, the establishment of refuge communities, missions, and far-reaching economic changes create some of the challenges facing archeologists who wish to investigate 17th-century life in the region. For example, in 1675 the Susquehannock established a short-lived fortified settlement on the Potomac River near the Accokeek Creek site. Piscataway were trapped in Zekiah Swamp by the Susquehannock in 1680-81. Jesuits and then Franciscans established missions along the Potomac in the 1640s (Grumet 1992). All of these events are tantalizing to archeologists interested in Native American ethnocide and ethnogenesis. The exploration of refuge sites is an important research issue.

During the 18th century a few thousand Indians remained along the coast, but to the west the Iroquois continued to greatly influence the Appalachian frontier.

The Monongahela culture along the Allegheny River, the Lower Monongahela Valley, and the Upper Ohio and Potomac, is marked by oblong longhouses in fortified towns on defensible hilltops. Sixteenth-century Monongahela towns are found on the hills and high terraces of western Maryland, southwestern Pennsylvania, northern West Virginia, and eastern Ohio. There may have been quite a bit of ethnic, social and linguistic variation within Monongahela groups, influenced by the Iroquois to the northeast and by Fort Ancient to the west (Grumet 1992:259).

On 17th-century sites European wares are found with various Monongahela wares (Grumet 1992:259). It is possible that the Iroquois dispersed earlier inhabitants by 1635. During the 18th century dispossessed Delaware, Shawnee, and others moved into the area, again creating a dynamic archaeological record containing the evidence of migration and interaction.

Relatively little is known of 17th-century groups such as the Mannahoacs, Monacans, Occaneechis, and Saponis west of the Virginia Fall Line (Grumet 1992:256). There are very few known remains from the 18th century as well. Mary Ellen Hodges (1993) feels that the archeology of native American life in the context of European contact has been, for the most part, disappointing, particularly west of the Blue Ridge.

The site of an early 18th-century Shawnee village on the C&O Canal near Cumberland, Maryland holds great potential for addressing some of these questions.

Relatively little information is available on the first Africans to be brought into the region. The first known Africans were brought to Virginia by a Dutch trading ship in 1619. They were either servants or slaves, as there was no legal recognition of slavery as an institution in Virginia in the early 17th century. It seems as if for the first few decades Africans made up about 2% of the population. By 1700 Africans and African Americans made up about 10% of the non-Indian population of Virginia. The 300 Africans recorded as residing in Virginia in 1649 are described as "servants," but their legal status is unclear. The first law acknowledging hereditary slavery passed in 1662. In 1670 non-

Christians imported into the colony were declared slaves for life and by 1682 legislation was passed that kept Africans as slaves even if they were Christians. Thus, by the third quarter of the 17th century, racially based slavery of Africans and African Americans was firmly institutionalized both legally and socially (Davidson 1994).

During the 19th century there were three waves of immigration from Europe to the United States. The first started around 1844; the second started during the Civil War and lasted until 1873; the third began 1878 and lasted until 1898 (Noble 1992:7). Allen Noble discusses ethnic landscapes which resulted partly as a result of these large population movements. He lists both positive and negative factors which influence the clustering of ethnic settlement. These factors may vary in rural and urban setting. They apply to racial as well as ethnic neighborhoods.

Noble (1992:23) summarizes:

> Among the positive factors were (1) the presence of ethnic fellows speaking a common language and offering mutual support, (2) the low level of inner-city rents, (3) the location of appropriate churches and other ethnically oriented institutions, and (4) close proximity to places of employment or to public transportation routes, Negative elements included: (1) the residential segregation practiced in "better" neighborhoods, (2) higher rent levels in the outer city, (3) the necessity to use the English language in most parts of the city, (4) and the overt discrimination found in both public and private facilities.

He also comments of the cohesiveness and visible elements of the ethnic landscape (1992:401):

> homogeneity produces a material culture landscape that is easily recognizable by members of the community itself and, with instruction and exposure, to members of the larger surrounding society. The presence of a distinctive material culture landscape is a major factor in promoting group consciousness in rural areas, and it has an effect even in urban areas, where it may be expressed mostly by signs being in a vernacular language and by distinctive church architecture.

Some of the related issues which historical archeology addresses is the creation, maintenance and dissolution of such neighborhoods. Not only the landscape emphasized by Noble but also the consumer habits, buying patterns, and food choice and preparation are markers of ethnic identity. Historical archeology contributes to the investigation of different theories of ethnic tenacity.

Three of the main theories of ethnic tenacity are as follows (Noble 1992:400). In the "melting pot theory," groups ultimately lose their identities and get submerged into larger identity. Under "cultural pluralism" there is continued independent survival of various ethnic groups, although they may survive in modified form. In "ethnic revival theory" acculturation swings like a pendulum between generations. The first generation is ethnic; the second is unsure about its ethnicity and Americanizes; the third generation can explore its ethnic heritage with confidence.

Archeology has a role to play in researching various aspects of the Civil War and its aftermath. Clarence Geier and Susan Winter (1994) and the contributors to their volume emphasize and demonstrate this point. Indeed, archeology may be particularly valuable in examining the larger context of the war, which is essential to understanding the United States during the latter half of the 19th century and the 20th century. Geier (1994:191-192) puts this succinctly:

> Though the Civil War has been recognized as an important, often romanticized event of history, many of its students have treated it as if it were a self contained event. For all the war's epic quality, the conduct and cessation of hostilities were certainly not ends in themselves. Instead, the war must be regarded as the beginning of a progression of major economic, social, political, demographic, and philosophical events that have shaped, and continue to shape, our nation.

Case studies in Civil War archeology have been conducted by mid-Atlantic regional archeologists in the National Park Service at Petersburg, the Wilderness, and City Point National Parks in Virginia. They have explored the following topics (Orr 1994:23):

> (1) the experience of soldiers in combat, (2) the disruption of civilian domesticity by battle and siege, (3) the necessity of understanding the historical and archeological evidence in terms of a larger cultural landscape encompassing both past and present, (4) the didactic value of sites and the great opportunities they present to communicate a challenging array of interpretive themes.

Some of the best preserved Civil War fortifications and campgrounds are on the mountains surrounding Harpers Ferry. In the National Capital Area, archeologists have documented these remains on Maryland and Loudoun Heights (Frye and Frye 1989; Winter and Frye 1992).

There are topics related to the Civil War era which have little to do with the battles themselves and everything to do with the changes affecting the country. For example, Shackel (1994a) explores the complex connections between the Civil War and industrialization and the commemoration of the War, the development of tourism, and the celebration of selected stories about the past.

Historians and historical archaeologists have studied 19th-century Southern agriculture, including post-war tenant farms and the newly freed labor force of former slaves. Charles Orser (1994) points out that the rural North was also affected by the war, although its transformations have received much less scholarly attention. He describes social and economic relations of farmers in the corn belt of the Midwest during the Civil War era and documents important shifts in the structure of northern agriculture.

"Whatever one's perspective regarding the effects of the Civil War on industrial life, it cannot be doubted that the war played at least some role in helping to transform the United States from a rural to an industrial nation" (Orser 1994:175). Historical archaeology researches this transformation.

PREVIOUS SURVEY AND PREDICTIVE SITE MODELS IN THE POTOMAC BASIN

Previous Survey

Professional archeological work in the Potomac basin began during the late 19th century. There has also been a great deal of avocational activity which has contributed much information on site locations.

The explosive growth of Cultural Resource Management since the 1970s has provided a great number of small and large scale surveys throughout the mid-Atlantic. The Potomac basin lacks any comprehensive cartographic record of the location of surveys although the locations of sites are recorded in state and district Historic Preservation Office site files. A long-term project is underway in Maryland to include survey boundaries in an archeological GIS data base.

Several compilations guide the researcher to the usually unpublished information on archeological survey. These sources include those by Howard MacCord (1990); Michael Smolek, Dennis Pogue and Wayne Clark (1984); Mark Wittkofski (1991); and Wittkofski et al. (1989).

Some survey has extended across boundaries of physiographic regions. For example, William Gardner and Charles McNett (McNett n.d.) have conducted an extensive survey of work in the Potomac basin, but the results of their research are not yet available. The Maryland State Highways Administration sponsored a statewide overview and survey along selected road corridors. The results are presented in several large volumes which cover the Eastern Shore, Western Shore, Piedmont, and Western Maryland (Wesler et al. 1981). In research on two creek drainages in Prince William County, Virginia, William Barse (1982) surveyed portions of the Inner Coastal Plain, Piedmont uplands and lowlands, and the edge of the Blue Ridge. Much earlier, Gerard Fowke (1894) reported on investigation in both the James and Potomac valleys. Edward Larrabee (1963) reports occasional surveys by Richard Slattery along the Potomac in the 1930s and 1940s. Syntheses of data such as the compilation of distribution information on fluted points throughout eastern North America (Brennan 1982) are relatively rare, but provide a broad spatial perspective on land use.

Following is a chronological listing of some of the major professional survey within or adjacent to the Potomac Basin by physiographic region. Many small surveys, particularly those which have been undertaken for Section 106 compliance are not listed here. Work that has been undertaken in the units of the National Park Service within the National Capital Region is addressed in Part III of this plan: Status of Archeological Inventory. Results of survey important to predictive site models are provided in the subsequent section.

Coastal Plain. Francine Bromberg (1987) provides a useful overview of research in the Coastal Plain and Fall Zone (see, for example, Table II.10). MacCord (1957) summarizes both professional and amateur work in the Anacostia Valley, where collecting began at least as early as the 1870s.

Archeological work in the Coastal Plain began well over a century ago. The Potomac was of national archeological interest in the late 19th century; not the least reason was the attention of the most prominent archeologist in the country, William Henry Holmes. A symposium publication in the 1889 volume of American Anthropologist included articles on shell middens, villages and workshops in the District of Columbia, and pottery of the Potomac.

During the 1890s William Dinwiddie, William Henry Holmes, and Gerald Fowke conducted surveys in the area (Fowke 1894; Holmes 1897, 1903, 1907; Holmes et al. 1891). After Holmes' work in the region, however, there was very little professional attention until T. Dale Stewart's excavations in the 1930s (Stewart 1939, 1940, 1941; Stewart and Wedel 1937). Richard Stearns (1943, 1949) undertook some survey along the Patapsco in Maryland.

Shell middens have always intrigued archeologists. Elmer Reynolds (1881a, 1881b, 1889) wrote of the "shell heaps" of Popes Creek and of the Potomac and Wicomico Rivers in the 1880s. Holmes added his observations for shell middens in the Tidewater in 1907. Nearly 100 years later, Steven Wilke and Gail Thompson (1977) looked at shell middens and other sites in Maryland and Waselkov (1982) conducted extensive work on the White Oak Point site in Virginia.

There are several modern surveys which have provided systematically collected data useful for reconstructing settlement and subsistence patterns. Surveys conducted south of the Potomac Basin yield important comparative data. Such work includes survey along the Nottoway and Meherrin rivers (Binford 1964) and along the James, York and Rappahannock rivers (Turner 1976). Stephen Potter's (1982, 1993) survey of the Coan River on the Northern Neck of Virginia, and surveys along the Patuxent by Barse (1988) and Steponaitis (1980, 1983, 1986) are the most comprehensive in the National Capital Area. In Virginia, Barse (1982) conducted a survey of Neabsco and Powells creeks in Prince William county and Michael Johnson has surveyed parts of Fairfax county. Henry Wright (1973) surveyed a portion of the Severn River in Ann Arundel County, Maryland in the late 1950s and early 1960s. Wanser's (1982) study of collections from south central Maryland identified areas with particularly high probability of site location.

The Virginia Department of Historic Resources initiated a study of the settlements dating to the Virginia Company period 1607-1624 for the 400th anniversary (Turner and Opperman 1993).

Piedmont. Data from the survey of the Monocacy River valley in Maryland (Kavanaugh 1982, 1983) have been widely used for reconstructing settlement in the Potomac Basin Piedmont throughout human use of the area. In addition Joseph McNamara surveyed a number of state-owned areas in Maryland during the 1970s: Gunpowder Falls State Park (McNamara 1977a); Patapsco Valley State Park (1977b); Seneca Creek State Park (1977c); and the Monocacy Natural Resources Management Area (1978).

In the Virginia Piedmont, Cromwell and McIver (1985) surveyed portions of Broad Run, Bull Run, and Quantico Creek in Prince William County. There have been a number of recent surveys by the University of Virginia of the inner Piedmont counties outside of the Potomac Basin, including Albemarle (Hantman 1985), Buckingham (Klatka et al. 1986), and Fluvanna (Klatka 1988). Archeological resources in the Richmond area were surveyed by Mouer et al. (1985a, 1985b) and in Henrico county (Mouer 1986; Mouer et al 1980; Mouer and Ryder 1986). Survey along the James river was also conducted (Mouer 1983, 1991a).

Appalachian Province. There have been several important surveys in the various districts of the Appalachian Province. Work in caves and rockshelters in Maryland is summarized by Tyler Bastian (1971). In 1892 in the South Mountain area of Frederick and Washington counties, Holmes (1897:73-77) attempted to locate rhyolite quarries on valley's east side into Pennsylvania. Stewart (e.g., 1987) has written a good deal on the exploitation of rhyolite. His assessment (1983) is one of the few systematic considerations of the settlement pattern of the Blue Ridge.

The Great Valley, called the Hagerstown Valley in Maryland and the Shenandoah Valley in Virginia, has received extensive archeological attention. Gardner's and his associates' work with the Flint Run complex is particularly well known and widely used (e.g., Gardner 1974a, 1974b). Other portions of the Ridge and Valley province were surveyed in the George Washington National Forest (Gardner and Boyer 1978), in Shenandoah National Park (Inashima 1988), and in Berkeley County, West Virginia (Carr and Gardner 1979). Gardner (1986) has also synthesized his work in the Shenandoah Valley. Portions of Loudoun County, Virginia have been surveyed and predictive models for site location proposed (Ballweber 1988; Haynes 1988; Rust 1986).

Fowke did some work in the Hagerstown Valley in 1891-1892 (Stewart 1980:69). Stewart (1981) collects information from nonsystematic observations to summarize what is known about prehistoric burial mounds in the Hagerstown Valley. The data from Stewart's (1980) dissertation work, a systematic survey of the Hagerstown Valley, have provided the standard for reconstructing settlement in that area.

In the upper Potomac in the Allegheny Plateau, Henry Wright's (1959) and Robert Corliss's (1965; Corliss and Wright 1967) surveys have provided important baseline data. More recent work by Wall (1981) provides data from a systematic survey for prehistoric sites of western Maryland's coal region in Garrett and part of Allegany county. In the same area Kenneth Lacoste and Robert Wall (1989) report on an archeological survey for historic resources.

Predictive Site Models

Archeological sites can be anywhere; they often are found in unexpected places. Statistically, however, they are more likely to be in certain environmental settings than in others. It is this latter observation which fuels site predictive models. The former observation stands as a caution against overreliance on such models. Predictive site models rest on the assumption that there are fairly regular patterns of human settlement for any particular time period in a particular environment. These models begin with a hypothesized pattern drawn from known site locations and analogies with ethnographically-known societies. Confirmation is then sought through site survey.

One of the products of archeological survey is a data base of site locations which forms the basis for documenting the long-term use of the landscape. A complete understanding of a society's settlement pattern would include the variety and relationships between sites of different functions occupied during different seasons and the variations in these through time and across space. It would also put the use of the landscape into a context of social, political, economic, and ecological relationships both within and between cultural groups.

Such a task is not accomplished easily and it has taken the work of generations of archeologists to flesh out an understanding of this topic. It is by no means complete.

Connected to the site identification goal of survey is a great deal of effort expended to identify the most consistent predictors of site location. Much of the impetus can be traced to the needs of compliance-driven archeology to cut the cost of survey by predicting where it is *not* necessary to look. Driven by this purpose, site prediction becomes an insidious method to continue to discover what we think we already know. However, a great deal of data collected in the context of building predictive models has contributed to models of human use of the landscape and has enriched our understanding of that use. The challenge is to continue to use these models as flexible and hypothetical baselines rather than as fixed discoveries.

A "red flag model" may be useful in the management of sites. Jeffrey Altschul (1990:227) writes that "what is needed are not models predicting the unknown, but rather models that bring some order and direction to . . . huge databases." He emphasizes that for both land management and archeological needs, we need ways to identify sites which do not fall within predicted locations. The archeological value of such an approach is clear. He explains (1990:227-8):

> By highlighting sites located in areas where sites are generally absent we can begin to explore portions of the archaeological record that are presently unclear. Sites in anomalous settings by definition must be the result of behaviours that do not fit current models of why prehistoric inhabitants settled where they did. Under any definition, these sites must be significant, for they more than any others have the potential of telling us something about prehistory that was heretofore unknown.

Archeology is still in its infancy of anthropological understanding of past human lives. Prediction of site location, pursued as a self-contained goal, mistakenly implies a certain maturity to the discipline. Site prediction is not the point; site discovery leading to the interpretation of human lives in a regional context is.

James Ebert (1992:46) makes this point forcefully:

> Without knowing the systemic mechanisms behind the placement of activities across the landscape -- that is, without knowing about the articulation of systems components -- there can be no generally applicable predictions.

Ebert is highly critical of predictive modeling, which is, he believes, rooted in present expectations. He writes (1992:72), "Even if predictive modeling is possible, it is simplistic. It cannot help but be unsatisfactory in explanatory terms and should not occupy much of our time or energy."

The careful assessment of microenvironment necessitated by increasingly detailed site predictive models does, however, occupy our time and is worth our effort as it contributes to our understanding of the human use of the landscape.

Much of the focus on locational predictive models is on features in the physical environment. Clearly, social factors influence where people live and how they move across the landscape. On a regional scale, it is more common to extract hypotheses about social relationships from settlement pattern than to propose models of settlement based on social needs.

Wall (1981:138) points out that environmental factors influencing settlement pattern may be identified as physiographic, biotic, and climatic. Climatic factors include such elements as the number of frost-free days, seasonal temperature extremes, precipitation, and sunlight exposure. Biotic factors include plant and animal resources, seasonality, and paleoecological factors. Physiographic factors include the topographic (degree of slope, local relief), geologic (lithic raw resources, rockshelter formation, soil fertility), and hydrologic (floodplain development, stream order, surface water availability, river navigability, and stream junctures). He is clearly most concerned with predictive models of site location based on physiographic factors, although it is clear that the others play crucial roles.

An example of an environmental characteristic influenced by several factors is the relative amount of sunlight and shadow in a particular location. Human decisions about the use of that spot will be influenced by sunlight. Solar energy was a factor both prehistorically and historically. A historic period farmstead, for example, might have the farmhouse situated on the south slope of a relatively treeless hill to take advantage of solar heat and the orchard on the north to take advantage of the cooler air (Mires 1993).

There are major challenges for predictive site models and for site identification and description if survey information is to be useful in constructing regional settlement models. One of these challenges is that of refining prehistoric site typology, particularly the terminology used in describing site function. While terms such as base camp, hunting camp, foray camp, and the like are used extensively in reporting the results of site survey, they have not been adequately described, tested, or explained in the literature (Hantman, personal communication).

Although there have are periodic attempts at rationalizing and quantifying the characteristics of some site types there has been little explicit attention to this problem. The informal application of vague definitions damages efforts to more fully describe, explain, or even ask new questions of regional archeological data.

An additional important challenge for predictive models is to adequately characterize the physical environment. Michael Klein and Douglas Sanford (1995) point out that

> Unfortunately, predictive models often include unwarranted assumptions about the structure of the environment. For example, many studies assume a normal distribution of

> environmental variables within study areas. This assumption implicitly lurks within an argument that the environmental variables associated with site locations represent the locational requirements of historic [and prehistoric] peoples, rather than simply reflecting the structure of the local environment.

Fortunately, with the technology currently available in Geographic Information Systems (GIS), more sophisticated environmental analyses are possible (e.g., Allen et al. 1990).

With the understanding that predictive modeling should be approached with flexibility, I summarize some of the models that have been created from survey data for the different physiographic areas of the Potomac basin. Because the methods used for predicting and analyzing site location differ greatly for prehistoric and historic resources, predictive factors are discussed separately here. Prehistoric factors are discussed first.

Coastal Plain and Piedmont. Potter (1993) discusses some of the factors influencing site location during the Late Woodland on Virginia's Northern Neck and the Coastal Plain in general. Synthesized from ethnohistoric observations, criteria for village location included nearness to rivers, fresh water, topographic rises, marshes, and good agricultural land (Potter 1993:28-29). Villages near the Bay should be on broad necklands along smaller estuaries. Due to a variety of factors, it is "unlikely that a major Late Woodland or historic period village in the Chicacoan locality would have been located along the Potomac River nearshore environment" (Potter 1993:29).

Large Late Woodland Rappahannock Complex components on the Patuxent River are associated with lowland terraces and estuarine settings (Potter 1993:118). Soil type becomes critical as a site predictor during Late Woodland II. Potter (1993:35) writes,

> Three soil associations containing soils favorable to slash-and-burn maize cultivation are found in the vicinity of the general village locales in significantly higher proportions relative to their overall distributions within the two-county [Northumberland and Lancaster] area. These associations are the Mattapex-Bertie, Matapeake-Mattapex, and Woodstown-Dragston.

He continues, listing soil associations further up the river (1993:39):

> As one moves up the Potomac River, toward the fall line, the soil associations and topography change . . . [but] probably were chosen for slash-and-burn maize cultivation for the same reasons. On the Virginia side of the river the Nansemond-Tetotum-State, Tetotum-Bojac-Pamunkey, Tetotum-Bladen-Bertie,

> Galestown-Sassafras-Woodstown, and Matapeake-Mattapex-Woodstown soil associations would have been best. . . . In Maryland soil associations like the Matapeake-Matapex-Sassafras, Elkton-Othello-Keyport, Sassafras-Keyport-Elkton, and Collington-Matapeake-Galestown would probably have been most favorable. . .

In an extensive review of known sites in the Inner and Outer Coastal Plain and Piedmont Uplands of Virginia, Bromberg (1987) classifies sites as follows: base camp, macrosocial unit basecamp, microsocial unit basecamp, exploitative foray camp, quarry-related, isolated find, lithic scatter. She collected information for 17 drainages in the Inner Coastal Plain, 2 in the Outer Coastal Plain and 1 in the Piedmont.

Table II.11 below summarizes Bromberg's counts, averaging data where necessary. Base camps include all types of base camps. (Bromberg's counts and percentages are interpreted here without knowledge of relative survey coverage between or within the regions.)

Table II.11. Prehistoric Site Locations for Coastal Plain and Piedmont Uplands (abstracted from Bromberg 1987).

	floodplain/terrace		upland	
	total # (%)	base camp # (%)	total # (%)	base camp # (%)
Inner Coastal Plain	191 (60)	47 (86)	192 (40)	11 (14)
Outer Coastal Plain	74 (80)	56 (98)	18 (21)	1 (5)
Piedmont Uplands	25 (29)	2 (40)	62 (73)	3 (60)

In the Inner Coastal Plain 60% of the sites are on the floodplain/terrace and 40% are upland. On the other hand, 86% of the base camps are on the floodplain/terrace and only 14% are in the upland. The 58 base camps are only 15% of the total number of sites counted.

In the Outer Coastal Plain 80% of the sites are on the floodplain/terrace. Nearly all of the base camps are here and base camps make up 62% of known sites.

In the Piedmont uplands the percentages of floodplain/terrace to upland sites is opposite that of the Coastal Plain. Base camps make up a very small percentage (6%) of the known sites.

In her survey of Monocacy River region in the Piedmont lowland of Maryland, Kavanagh (1982) identifies four geomorphological zones based on topography, elevation, soil, and surface water. The foothill zone includes a narrow strip adjacent to the mountain from the slope of Catoctin Mountain to the top of the first ridge, containing all colluvial and alluvial outwash soils. The River zone includes the river terraces, floodplains and bluffs of the Potomac and Monocacy rivers. The Piedmont zone includes the uplands with rolling topography and highly dissected streams, is higher than the valley, and has more shallow, excessively drained soils. The Valley Floor zone has level topography, dendritic drainage and well-drained soils. Kavanagh summarizes the presence/absence of different site types in each of these four zones as below.

Table II.12. Prehistoric Site Locations in the Piedmont (from Kavanagh 1982).

SITE TYPE	FOOT-HILLS	RIVER	PIEDMONT	VALLEY
Rockshelters	X	X	X	
Quarries	X			
Habitation	X	X	X	X
Ephemeral/ temporary	X	X	X	X
Village		X		
Rhyolite Processing	X			X
Unknown	X	X	X	X

Analysis of site predictive models finds that the following landforms within the Coastal Plain and Piedmont are usually cited as having a high probability for archeological sites in the general Washington, DC area (Bellomo-McGee 1990:82):

1) terraces and floodplains along the Rappahannock and Potomac;
2) terraces adjacent to wetlands;
3) inner floodplains at the base of uplands;
4) interior ridges or terraces near interior wetlands;
5) middle reaches of larger creeks;
6) upland levels, between headwaters of at least two small (1st order) streams;
7) ridge tops along 1st order streams, especially on the ends of ridges oriented toward streams;
8) edges of low terraces where bottomlands develop, i.e., first terraces within aggrading alluvial formations;

From their analysis of site components and their geomorphological positions, the authors of the Washington Bypass study conclude that the following four factors are key to identifying areas of high site probability: distance to water, soil association, slope, and direct historical information (Bellomo-McGee 1990:88).

Appalachian Province: Blue Ridge. Paul Inashima (1986) summarizes the occupation of prehistoric sites in the Shenandoah Blue Ridge. Although there is no apparent occupation during the Paleoindian period the mountains are regularly used during the Early and Middle Archaic, as evidenced by small, low density sites. Several kinds of sites with Late Archaic diagnostic artifacts include base camps and ephemeral encampments such as crossover sites, bench sites, and landmark stations. There is very little evidence of Early Woodland occupation along the upper ridge but the Middle Woodland is well represented. Late Woodland sites are sparse along the upper ridge and occasionally extensive along the lower ridge. Extensive base camps are present in the lower gaps.

Evidence of prehistoric use of the Maryland Blue Ridge, as summarized by Stewart (1983), is similar in some ways to that described by Inashima. No use is seen in Paleoindian phases or in the Palmer phase of the Early Archaic but by the Kirk and Warren phases there is substantial use of the mountains indicated by isolated points, short term stations, small group hunting stations and revisited stations. During the Middle Archaic metarhyolite quarry/workshops are added to these site types. During the Late Archaic the number of sites in upland settings above stream valleys increased, as did settlement periodicity. Rhyolite processing stations are added to the site type inventory. During the Early Woodland there is an increase in forays into the Blue Ridge but this intense use declined by the end of the Middle Woodland.

Appalachian Province: Great Valley and Ridge and Valley. Because of the extensive work reported by Michael Stewart (1981), there is detailed material available for the Great Valley. This work is summarized here at some length.

In his survey work in the Great Valley of Maryland Stewart (1981) identifies four geomorphological zones within the Hagerstown Valley itself and two in the Ridge and Valley west of the valley. In the valley these zones are 1) valley floor, 2) uplands of the valley floor, 3) foothills, 4) foothills and mountains. To the west his study included transects in the 1) valley floor and 2) foothill and mountain.

Stewart (1980) offers a model for site types and locations per cultural time period for the Ridge and Valley province. Table II.12

presents much of this information, listing functional site types followed by their location per time period.

Generally, Paleoindian sites are found "within the valley systems of relatively high order streams with the presence/absence of suitable lithic materials being a limiting factor" (Stewart 1980:105). Hunting camps and individual hunting stations are also on low order streams. In floodplains sites are "located on older terraces, alluvial fans, and around backwater swamps, marshes, or floodchute areas, many of which may be buried beneath more recently deposited sediments."

During the Early Archaic (8,000-6,500 BCE) sites are of the same types and are found in the same settings but also in a wider range of settings. New areas included

> terrace positions in relatively broad lower order streams (e.g. third order) and portions of some high order stream floodplains that were more or less newly created by changes in stream morphology attendant upon various climatic and environmental changes [Stewart 1980:108].

There is a change in settlement pattern with the Middle Archaic (6,500-3,000 BCE) which, for the most part, continues into the Late Archaic (3,000-1,000 BCE). Early Woodland (1,000-300 BCE) and Middle Woodland (500 BCE - 900 CE) patterns are essentially the same as Late Archaic. However, there is the addition of burial cairns as a site type. Site predictors for burial mounds are recreated from reports of mounds and mound groups. In the Great Valley those recorded are always associated with high order streams, specifically the Potomac, Antietam, or Conochogue. They may be found on the floodplain or on high Pleistocene terraces or bluffs. In the Shenandoah burial mounds occur in pairs or groups in uplands (Stewart 1981).

Late Woodland sites are not found in the foothill and mountain zones of Ridge and Valley province. In the Upper Potomac in the Allegheny Plateau Monongahela sites may occur either in river bottoms near the mouths of tributary streams or on the high hills overlooking these areas (Stewart 1981).

Table II.13. Prehistoric Site Locations for the Great Valley and Ridge and Valley (abstracted from Stewart 1980).

Site Types	Paleoindian	Early Archaic	Middle Archaic	Late Archaic	Early Woodland	Middle Woodland	Late Woodland
Quarry sites	raw material locations	-->	raw materials and secondarily by other resources, such as water	-->	-->	-->	undocumented as separate sites
Quarry reduction or Quarry related	raw materials and secondarily by other resources, such as water;	-->	not found as separate sites	-->	-->	-->	undocumented as separate sites
Base camps	floodplain terrace/upland ecotones	-->	rather than floodplain terrace/upland ecotones found in 1) infrequent floodplain of relatively high order streams adjacent to floodplain swamps, or slopes of alluvial fans in association with or along a low order lateral tributary and 2) on broad low relief portion of Pleistocene terraces of high order streams adjacent to the junction or at the head of a number of low order streams or drainage patterns	-->	-->	-->	Base Camps/Farming Villages - floodplains of major drainages in association with tributary streams; geomorphologically recent such as levee portion of floodplain

Table II.13. Prehistoric Site Locations for the Great Valley and Ridge and Valley (abstracted from Stewart 1980).

Site Types	Paleoindian	Early Archaic	Middle Archaic	Late Archaic	Early Woodland	Middle Woodland	Late Woodland
Periodically revisited hunting/ exploitative camps	ecologically attractive zones of maximum habitat overlap	-->	more accurately defined as transient camps: ecologically attractive zones of maximum habitat overlap [but now more defined]:floodplain, terrace, upland; major predictive factor is relative density of streams; primary focus is low order streams that cut across floodplains of high order streams	increased appearance in upland and especially foothill zones of transient and hunting camps	-->	-->	Hunting/Exploitive Camps - floodplain, Pleistocene terrace and upland; range of settings reduced
short term hunting camps	less ecologically favorable zones than type 4	-->	not specified for this period	increased appearance in upland and especially foothill zones of transient and hunting camps	-->	-->	
stray point finds and individual hunting stations	nearly any setting	-->	-->	-->	-->	-->	floodplain, Pleistocene terrace and upland; range of settings reduced
Burial cairns	n/a	n/a	n/a	n/a	high order streams on floodplain or high Pleistocene terraces or bluffs	--> -->	n/a

Appalachian Province: Allegheny Plateau. Wall (1981:139ff) identifies four geomorphological zones and a number of subzones in the Allegheny Plateau:

These areas are

1) floodplain:
   1) large floodplains,
   2) isolated floodplains,
   3) isolated floodplain at stream confluence,
   4) floodplain swamp,
   5) Pleistocene/Early Holocene Terraces, Alluvial fans and relict terraces,
   6) recent floodplains in wide valleys,
   7) recent floodplain in V-shaped valleys,
   8) floodplains of large tributary creeks;
2) foothills;
3) slopes:
   1) slopes according to gradient, including areas that may contain rockshelters,
   2) benches;
4) uplands:
   1) hilltops above major drainages,
   2) hilltops above minor drainages,
   3) minor ridges,
   4) major ridges,
   5) saddles,
   6) headwater flats,
   7) upland swamps.

It is clear that the more finely the local environment is defined, the more detailed may be the description of changing locational preferences and economic choices. The key factors for site location identified in Wall's (1981) survey in western Maryland were 1) surface water setting, 2) relief, 3) surface character, that is levelness and presence of spring(s), 4) available lithic resources, and 5) soils.

Summary of Prehistoric Predictive Factors. Gardner (e.g., 1982) probably has been the single most influential archaeologist in modeling prehistoric site distribution in the mid-Atlantic states, particularly in the Potomac basin. Certain variables affecting site distribution, generalized from studies in several physiographic provinces, are cited as being more or less important depending on the time period. These are the distribution of:

1) lithic raw material;
2) water;
3) game attracting habitats;
4) zones of maximum habitat overlap;
5) well-drained, low-relief topography;
6) higher order perennial streams and distance from them;
7) maximum sunlight exposure;

8) maximum extent of easily tillable arable land (Gardner 1987; Gardner and Boyer 1978).

Stewart (1980) omits Gardner's third factor, the distribution of game attracting habitats, presumably because it is redundant with the fourth. These factors are general. Only through understanding the local setting can models be offered that are of localized predictive and explanatory value (Stewart 1980:98; Gardner 1987).

Historic Period. Historic site prediction often involves looking for indications of settlement on historic maps or tracking down descriptions of locations in deeds or other historical documents. Ecological factors are also considered. Different kinds of surveys and predictive models may be necessary for different sorts of sites and for sites of different time periods. Residential sites, for example, will have different locational needs than industrial sites. Nineteenth-century sites will be located in a very different physical and social environment than 17th-century sites.

Not surprisingly, determinants of site location during the 17th century in Maryland include access to good soil, fresh water, and transportation routes as well as previously cleared land (e.g., Edwards and Brown 1993:288).

Craig Lukezic (1994:13) summarizes:

> It is assumed that [colonists] placed themselves nearest to the resources that they valued the most and/or used most often. If one can identify and prioritize these resources or factors, insights can be gained into the locational selection strategy used by Tidewater colonial Virginians.

Lukezic (1994) emphasizes that the type of soil influences the taste of tobacco and hence its marketability. He classifies prime tobacco soils and recognizes soil type as a major locational factor for mid to late 18th century sites. He found that prime tobacco soils were the closest resource to known sites in 87% of 64 sites and that drinking water was the closest for 10.9% of these (1994:27).

Access to navigable water was an important factor in the 17th and 18th centuries (Smolek 1984; Smolek and Clark 1982) and land transportation via roads was also more important than previously assumed (O'Mara 1983; Lukezic 1994). Michael Smolek (1984) enumerates some site location factors during the 17th century: soil type, proximity to drinking water, and access to the waterfront. Settlement sites correlate with prime soil and with both fresh and navigable water.

Some researchers have attempted to identify factors which affect different types of European land use. Potter and Waselkov (1994), for example, have investigated the location of early European settlements on Virginia's Northern Neck and found that they are strongly associated with earlier Algonquian sites. For various reasons, European settlers placed their homesteads on depleted agricultural fields and cultivated the rich soils that had been Indian habitation sites.

In a study of mill placement in the Hagerstown Valley in Maryland Susan Winter (1994b) considers not only environmental factors but also the broader context of site location. She analyzes the transformation in mill locational patterns as an effect of core-periphery relations, and shifts in local and regional markets.

The emphasis of her study is on "correlating changes in mill production with changes in transportation patterns and how these reflected changes in the political economy" (1994b:68). Locational information alone was found to be inadequate for understanding regional economic change, but it is essential for documenting local conditions.

> Since mills were a fixed entity on the landscape involving large investments of capital and thus not readily movable, change in core-periphery relations are reflected in increases or decreases in flour production at individual mills rather than changes in physical location [Winter 1994b:67].

Environmental factors such as elevation, slope aspect, and soil type affected the placement of 19th-century farmhouses and farmstead outbuildings, fields, orchards, and pastures (Mires 1993). Although Peter Mires writes of the Green Mountains of Vermont, his observations about 19th century use of solar energy are widely applicable. He recommends (1993:89) that "aspect should be included as an important component of any predictive model when historic farmsteads are involved. Its importance in North America, in fact, probably increases with latitude and local relief." For this reason, aspect would be a locational factor in the Appalachian province and parts of the Piedmont rather than in the low-relief sections of the mid-Atlantic.

Lacoste and Wall (1989) identify various factors affecting land use for the Maryland Coal region of the Allegheny Plateau. Their table of factors is reproduced here as Table II.13.

Table II.14. "Environmental and Cultural Factors Influencing Western Maryland Historic Period Settlement Patterns" (Source: Lacoste and Wall 1989:82-84).

ACTIVITY	SUB-CLASS OF ACTIVITY	LOCATION INFLUENCED BY
Early Settlement (1730-1825)	Economic and Domestic	Agricultural Potential of land; Elimination of Aboriginal Threat; Slope; Topography, Water resources
Nineteenth Century Occupation (1825-1899)	Economic and Domestic	Availability of land; Kinship; Ethnic and religious settlement; Agricultural potential of land
		Access to central place and services (trade, milling, etc.) Previous settlement in an area (re-use of structures and land) Accessibility Existence of industries
Grist- and Sawmills		Availability of pertinent natural resources; Accessibility
Coal industry	Early Coal Industry	Presence of Coal; Association with iron industry; Transportation outlets

Table II.14. "Environmental and Cultural Factors Influencing Western Maryland Historic Period Settlement Patterns" (Source: Lacoste and Wall 1989:82-84).

ACTIVITY	SUB-CLASS OF ACTIVITY	LOCATION INFLUENCED BY
	Associated Settlements	Location of coal mines; Company towns in English "tradition" and later in unofficial mode
	19th-century Coal Industry	Presence of coal; Availability of railroad access and services; Interaction of old and new companies
	Worker Settlements	Proximity to Mines; Trolley System in Georges Creek Valley allows some dispersion; Unionization allows some miners the monetary ability to own land
Iron Industry	Economic	Availability of natural resources (ore, coal, lumber); Topographic requirements
	Domestic	Location of Iron Operation

Table II.14. "Environmental and Cultural Factors Influencing Western Maryland Historic Period Settlement Patterns" (Source: Lacoste and Wall 1989:82-84).

ACTIVITY	SUB-CLASS OF ACTIVITY	LOCATION INFLUENCED BY
Lumbering Industry	Economic	Availability of natural resources (trees); River or large stream needed for washing and/or transporting logs to mill; Drainage systems used as routes for logging railroad and trams
	Domestic	Lumber camps and towns (usually of short duration); Location of logging operation/sawmill
Military	Defensive Works	Strategy; Topography
Taverns and Services		Existence of roadways and degree and nature of travel on them; Supply and demand; Location of other taverns and services
Resort Industry		Availability of pertinent natural resources; Accessibility
Community Activities	Schools, Churches	Accessibility

ARCHEOLOGICAL ISSUES

Throughout this overview, research topics in need of archeological study have been identified. Traditional archeological interests in chronological control, subsistence, settlement pattern, and social organization need to be further addressed for nearly all periods throughout the Potomac Basin within frameworks of anthropological and historical questions. Economy has been suggested as a comprehensive framework for forming and addressing questions for both the prehistoric and historical past. Specific research issues, of course, will be formulated for each particular project.

There are several categories of issues, all of which are necessary to address. In the technical category are issues of site discovery, identification, and appropriate data collection strategies. In the analytic category are issues such as chronology, typology, floral and faunal analysis, and raw material source analysis. An interpretation category includes such issues as the creation of ethnographic and historical analogies and models, hypotheses concerning the relationship of social strategies to material culture patterning, and the meaning of style in artifacts and the built environment. Finally, the category of modern context considers the current cultural context of archeological knowledge and includes issues of various biases (e.g., ethno- and gender "centrisms") in defining appropriate questions and answers.

The very definition of time periods and culture areas, while essential for making sense out of all our disparate data and analyses, is itself a methodological issue.

Within archeologically defined time periods and within a region neither conformity nor consistency should be expected. Instead there will be some degree of stability, some change, and some variability. In a discussion relevant to all periods of mid-Atlantic archaeology, Michael Nassaney and Charles Cobb (1991) discuss these characteristics for the Late Woodland periods in the mid-Continent. Stability, they argue, may be maintained by sociopolitical, ecological, technological, and ideological constraints. Descriptions of transformations must ask the question of who benefits from the change. Documenting variability within regions is difficult because so much archeological energy is devoted to classification based on similarity. These authors (1991:250) ask, "does variation in the archeological record necessarily correspond with human behavioral variability?" and insist that all three dimensions of variability normally considered archeologically -- temporal, spatial, organizational -- are significant and must be considered simultaneously.

In order to gain an emphasis on social dynamism and historical context, archeologists need to "refocus our view of societies from one of static, bounded entities toward a vision of more fluid, open systems composed of individual actors capable of making their own history" (Nassaney and Cobb 1991:254).

Two points made earlier in the overview are important to keep in mind while defining issues and the broader orientation of archeological research. The first, emphasized by Shott (1990) is that the shortcoming with much research is not the data but the interpretation: archeologists should be reconstructing social context rather than merely diet. Related to this complaint about the often reductionist approach taken to the archeological past, is the more general statement by Tankersley and Isaac (1990c; Isaac 1990) that by confounding ecology and environment, we tend to think in terms of behavior rather than culture.

Elizabeth Brumfiel (1992) offers a powerful critique of the limitations of cultural ecology school of interpretation in a recent article entitled, "Distinguished Lecture in Archeology: Breaking and Entering the Ecosystem -- Gender, Class, and Faction Steal the Show." She emphasizes the need to consider social motivation and incorporate it into our models and hypotheses. To gender, class, and political faction can be added race, ethnicity, occupational guild, and other social categories appropriate to whatever historical context is under study.

The development of inequality and mechanisms for sustaining or overcoming it are vital for understanding social relationships. Nassaney and Cobb (1991:x) summarize the problem, "In societies that are generally agreed to lack social classes, how does unequal access to resources come about and what kinds of conflicts propel social change?"

Because it is increasingly clear that social inequality is not limited to agricultural societies and states, it is important to create some ways to understand this phenomenon in hunter-gatherer societies. Jeanne Arnold (1995) studies marginalization, or the creation of powerlessness, in this context. She develops a political model wherein emerging leaders create marginality through the control over resources, production, reproduction, information, and technology. Three scales of social, political, and economic separation from power are the marginalization of 1) specialists within groups; 2) classes of landless laborers or whole communities; 3) ethnic groups via conflict or conquest. With data from the Northwest Coast, she supports a model of greater inequality within communities than between them, and joins a number of scholars who emphasize political motivation in the rise of social inequality rather than attributing it to a passive and natural development. Such interpretations may provide appropriate analogies with which to explore the Late Archaic through Woodland Potomac Basin, as the Northwest Coast has been suggested by local researchers as a source of hypotheses.

General issues of archeological importance in the Potomac Basin are those identified for the broader region and have been identified in planning documents for Maryland and Virginia.

The Virginia Department of Historic Resources (1991) has developed a priority list for archeological investigations in the state. The questions implied are not limited to Virginia. These are:

1. Virginia and the Settling of the Americas: Native American Colonization and Adaptations to a Changing Environment, 9500-8000 B.C.

2. Adaptations of Hunting and Gathering Societies in a Temperate Environment: Virginia from Estuary to Mountain, 9500 B.C. - A.D. 900.

3. The Origins of Agriculture and Sedentary Life: Virginia From Estuary to Mountain, 3000 B.C. - A.D. 1607.

4. The Evolution of Native American Chiefdoms in Virginia. A.D. 900 - 1607.

5. Native and American and European Interactions in the New World: Effects in Virginia During the Sixteenth Through Eighteenth Centuries.

6. Virginia During the Seventeenth Century as the First Permanent English Settlement in the Americas.

7. The American Plantation System: Its Growth and Development in Virginia. 1607-1865.

8. English Westward Expansion into the Interior of North America: The Role of Virginia During the Seventeenth and Eighteenth Centuries.

9. Virginia as a National Leader During the American Revolution and Early Federal Period: From Battlefields to Presidents, 1781 - 1830.

10. A Nation Divided: Virginia and the Civil War, 1861-1865.

The specific themes suggested by the Department for developing contexts for all time periods are the following:

1. Domestic
2. Subsistence/Agriculture
3. Government/Law/Political
4. Health Care/Medicine
5. Education
6. Military/Defense
7. Religion
8. Social

9. Recreation/Arts
10. Transportation/Communication
11. Commerce/Trade
12. Industry/Processing/Extraction
13. Landscape
14. Funerary
15. Ethnic/Immigration
16. Settlement Patterns
17. Architecture/Landscape Architecture/Community Planning
18. Technology/Engineering
19. Other

Maryland (Maryland Historical Trust 1986) offers separate themes for prehistoric and historic periods. These are the following.
Prehistoric Period themes:
1. Subsistence
2. Settlement
3. Political
4. Demographic
5. Religion
6. Technology
7. Environmental Adaptation

Historic Period Themes:
1. Agriculture
2. Architecture, Landscape Architecture and Community Planning
3. Economic (Commercial and Industrial)
4. Government/Law
5. Military
6. Religion
7. Social/Education/Cultural
8. Transportation

The District of Columbia's Preservation Plan (DCHPD 1991) contains specific themes as well. These are listed in the chronological overview above (see archeological themes for the historic period).

National and regional research goals identified by local archeologists for the historic period (Little 1988) include 1) the anthropology of war, 2) race and ethnic relations among Europeans, Native Americans, and African Americans from the 17th through the 20th centuries, and 3) urban, rural and hinterland economic adaptation, including life on plantations.

Grumet (1992:289-319) uses the National Historic Landmark thematic framework to define research needs and questions. These issues are quoted below.

Theme I: Cultural Developments: Indigenous American Populations
- Sub-Theme I.D: Ethnohistory of Indigenous American Populations
  - I.D.1: Native Cultural Adaptations at Contact
    - I.D.1.i: Native Adaptations to Northeastern Environments

- I.D.2: Establishing Intercultural Relations
    - I.D.2.a: Trapping and Fishing for Newcomers
    - I.D.2.b: Whaling and other Maritime Activities
    - I.D.2.c: Military Scouts
    - I.D.2.d: Guiding Explorers Across New Territories
    - I.D.2.e: Defending Native Homelands
    - I.D.2.f: Defending Native Religious Systems
    - I.D.2.g: Introductions to Foreign Religious Systems
    - I.D.2.h: New Native Military Alliances
    - I.D.2.i: Trade Relationships
    - I.D.2.j: Cash Cropping
    - I.D.2.k: Helping Foreigners Survive: Providing Food, Clothing, and Shelter
- I.D.3: Varieties of Early Conflict, Conquest, or Accommodation
    - I.D.3.a: Transfer of Technology to Native People
    - I.D.3.b: Forced and Voluntary Population Movements
    - I.D.3.c: The New Demographics
    - I.D.3.d: Changing Settlement Types
- I.D.4: Native Contributions to the Development of Nation's Cultures
    - I.D.4.a: Transferring Native Technology to Newcomers
    - I.D.4.b: Native Roles in Decorative and Fine Arts, Literature, and Music
    - I.D.4.c: Native Roles in the Development of Humanism, the Social Sciences, and the Law
    - I.D.4.d: Native Roles in the Changing Images of America

Following are some examples of archeological issues under the above-mentioned categories. These lists are neither exhaustive nor complete. Archeological issues, whether pertaining to prehistoric or historic time periods, are flexible.

Examples of Technical Issues

♦ reconstruction of past microenvironments:
    the recovery and interpretation of evidence of paleoenvironmental data

♦ site discovery:
    geomorphological analysis of landforms to identify likely site locations and depth;

    deep testing methods for buried sites

♦ effective survey techniques:
    testing and implementation of effective transect intervals and shovel test pits;

use of geophysical prospecting and aerial photography;

effective GIS data base development for overlay of historic maps

- site definition:
  consistent site typologies and description;

  determination of site boundaries or boundaries of other archeologically defined phenomena

- Adequate debitage recovery:
  Kalin (1981), for example, is concerned that relatively little stone working debris is recovered. His experiments (1981:134) "show that the majority of diagnostic material lay within the 1/16 in. grid and that as much as 98% to 100% of the recoverable material was lost by sifting with the 1/4 in. screen commonly utilized in archaeological field work today." He suggests flotation or finer mesh screen to recover this material.

- Adequate data recovery for subsistence:
  Barber (1991:255-256), for example, makes specific suggestions to aid in the analysis of subsistence practices:
  1. More extensive use of wet screening and flotation techniques in order to recover a better representation of seed remains, phytoliths, and charcoal for dating.
  2. More refined, multiseasonal excavations where detailed research designs can be examined.
  3. More and better excavation of inundated sites which reflect the changing utilization systems accompanying sea level rise.
  4. More large-scale, multiseason excavation on known large village sites.
  5. More large-scale excavation on known Archaic sites.
  6. More extensive gathering of pollen data across the state in order to better map paleoenvironment through time.
  7. An increased focus on interior sites, away from major valley system, in order to understand broader settlement and utilization systems.

  Blood residue analysis needs continued refinement.

Examples of Analytic Issues

- full use of interdisciplinary sciences

- site formation and effects of natural processes on sites:
  interpreting deflated sites;

appropriate methods for interpreting the plowzone

- ♦ improved chronological control:
  need radiocarbon dates for several formal point types

- ♦ contemporaneity problem in settlement pattern analysis:
  Variability in occupation must be estimated in order to address the fact that the archeologically defined settlement pattern of any period is not equal to the actual use of the landscape by people (Dewar 1991).

- ♦ Lithic analysis:
  Henry and Odell (1989:ix-x) identify three major topics in their collection of studies on lithic analysis. These are:
  (1) distinguishing between function and ethnicity as the forces governing patterned variability within artifact assemblages, (2) recognizing reduction strategies through quantitative techniques and linking these to systems of economy and settlement, and (3) detecting and interpreting of inter- and intra-site artifact patterning over a broad front of integrated lithic analyses (e.g., wear pattern, technologic, typologic, raw material usage).

  use of flakes rather than formal "points" as projectile points (Odell 1988);

  use-wear analysis on tools and debitage and controlled experimentation;

  identification of curated and expedient tools;

  use and curation of exotic and local materials;

  reuse and remanufacture of lithic tools;

  sourcing studies of raw materials to track trading networks

- ♦ Ceramic analysis:
  relationship between pottery technology (e.g., temper, wall thickness) and cooking practices, food selection (e.g., Braun 1987)

- ♦ Predictive Modeling:
  More systematic work is needed to understand settlement systems and the ecological settings of different functional site types.

  Questions need to be directed toward those sites which fall outside of predictive models.

Examples of Interpretative Issues

♦ relationship between ceramics and culture change:
  Egloff (1991:248), for example, identifies one of the main archeological issues concerning the impact of ceramics: Did the incorporation of pottery bring any developmental change in the cultural system of societies? The new technology would require new strategies and labor organization for procurement, manufacture and use, and supporting social organization.

♦ defining appropriate ethnographic analogies and historical models

♦ using anomalies to flag research topics

♦ scheduling labor:
  scheduling for resource procurement;

  division of labor

♦ meanings and uses of goods in creating and maintaining social hierarchy
  intrasocial access to exotic material;

  comparison of consumer choices

♦ interpretation of style in artifact form
  meaning of point types in terms of technology, style, and interaction;

  relationship of non-temporally diagnostic items to temporally sensitive formal types

♦ Potomac Basin as border area:
  region of Maryland and Virginia as a meeting ground for different culture areas;

  ecological transition between Northern deciduous and Southern coniferous forests;

♦ development of creole cultures of various mixtures

♦ demography:
  population estimates;

  effect of disease and warfare on populations

♦ Social interaction:
  effect of mutually unintellible languages among native peoples; between Europeans and Natives; among Africans; and between Africans, Europeans, and Natives

Examples of Modern Context Issues

♦ implementation of economic archeology to expand approach beyond cultural ecology

♦ identification of misleading stereotypes of race and gender which are incorporated into archeological interpretations

♦ examination of influences of modern political issues on archeological questions and answers

♦ investigation of the effects of NAGPRA and Native American activism on archeological questions and data bases

III. STATUS OF ARCHEOLOGICAL INVENTORY

N.B. Bibliographic information for reports cited in this section may be found in the section, "Reports on File, by Park."

III. STATUS OF ARCHEOLOGICAL INVENTORY

For most parks in the National Capital Area the status and adequacy of archeology is poor. One park and some sections of others have a formal Overview and Assessment. Site forms are incomplete. The only historical base maps for archeological resources or surveys for the region as a whole was created in 1963 and therefore is missing not only many known sites, but also whole park units.

There is locational information in paper files for all recorded sites in the National Capital Area, although it is clear that many sites known on park land have not been recorded with the appropriate state or district repository. In most cases site locations are marked on USGS maps. There is not yet a coherent GIS data base of archeological sites in the region. Setting up such a data base, with appropriate security measures to protect locational information, should be a priority of each park.

Table III.1 summarizes data for the status of inventory and documentation for each park. Column 1 lists Overview and Assessments and other substantial survey documents. Column 2 notes the date of the most recent Resource Management Plan (RMP). Column 3 indicates the approximate number of known sites in the park. The vast majority of these are not recorded to current standards. Column 4 indicates whether there is some kind of site form on file. These site forms are nearly always missing vital information. Column 5 indicates whether there are submerged archeological resources within park boundaries. Only in the C&O Canal NHP are submerged resources in waters owned by the park. Column 6 indicates special concerns. Looting by relic hunters is a particular concern in all of the Civil War parks and in nearly all other parks as well. Many parks lack clearly marked boundaries, a situation which adds to the problem of effectively prosecuting cases under the Archeological Resources Protection Act (ARPA). The final column notes the National Register status of each park and sites within each park.

Of the approximately 78,000 acres in the National Capital Area parks, about 6% has been inventoried at a sufficient level of intensity that further systematic inventory is not necessary (given current standards). Approximately another 11% has been inventoried by less than full-coverage and requires further inventory to meet current standards.

Table III.2. indicates the status of archeological collections as of October 1994. The collections for most parks are stored at MARS in Lanham, Maryland. Catalog status varies, but many of the collections are catalogued in ANCS.

In some cases documentation indicates that there has been survey in a park or portion of a park. However, in many cases the survey was done decades ago or was done in such a cursory manner that resurvey is necessary. For example, the survey of the C & O Canal done over thirty years ago (Larrabee 1963) was largely a literature search of large prehistoric sites only and included very little field work. Many early archeological surveys did not consider historical period resources.

Much of the archeological work in the parks has been done as compliance in advance of construction rather than as planned research. There is some archeological information, however, for nearly every park in spite of the fact that less than 10% of the acreage has been systematically surveyed.

A brief synopsis for each park is provided in the following pages. The sources for much of the information on the parks are the Statement for Management (SFM) and Resource Management Plan (RMP) for each park. Sample issues for archeological research also are noted. Site forms and information are on file in the office of the archeologist at the System Support Office for the National Capital Area.

Tables III.3 through III.15 provide a chronological listing of archeological work in each park. Included are identification and evaluation studies and data recovery projects. Some small compliance projects, recorded in memo reports, are not included; neither are monitoring projects. A record of these small scale archeological services may be found in each park's files and in the office of the archeologist at the System Support Office for the National Capital Area. The section of this plan entitled "Reports on File, by Park" should also be consulted for park information.

Table III.1. Status of Archeological Documentation (as of January 1995).

PARK	Overview & Assessment (and other major survey)	RMP/ DATE	SITES RECORDED[1]	SITE FORMS	SUBMERGED RESOURCES	SPECIAL CONCERNS	NATIONAL REGISTER STATUS OF PARK AND SITES
ANTI	underway in FY94	1994	6	yes	no	archeological protection for lands under scenic easements	Antietam National Battlefield is listed for themes: battle of Antietam and the period of commemoration of the battle
ANTI - MONO	assessment of Bush tract (EDAW 1993)	1993	16	yes	no	looting by relic hunters	Monocacy Battlefield is listed; the Gambrill House is listed
CATO	literature search (Seidel 1984)	1994	30 (includes CATO, GREE, AND BWPKWY)	yes	no	looting by relic hunters; erosion	Multiple Property Listing: Emergency Conservation Work (ECW) Architecture at Catoctin Mountain Park. Both Camp (1) Misty Mount Historic District and Camp (2) Greentop Historic District are listed.
GREE (NACE)	none of any use	1994	see CATO above	no	no	increased erosion of stream banks	
BWPKWY (NACE)	partial reconnaissance (Curry 1978)	1994	see CATO above	yes	no	encroachment and monitoring of boundaries; relic hunting	Multiple Property Listing: Parkways in the National Capital Region, 1913-1965: Evolution of Urban Parkways; Development of the National Capital Parkway System. Baltimore-Washington Parkway is listed.

Table III.1. Status of Archeological Documentation (as of January 1995).

PARK	Overview & Assessment (and other major survey)	RMP/ DATE	SITES RECORDED[1]	SITE FORMS	SUBMERGED RESOURCES	SPECIAL CONCERNS	NATIONAL REGISTER STATUS OF PARK AND SITES
CHOH	Literature survey (Larrabee 1961); O&A Georgetown Waterfront Park (Artemel et al 1987); inventory and assessment of Oldtown locality (Handsman 1977)	1988	215	yes	Scuttled canal boats at Lilly Pond are a potential resource (Maryland owns the Potomac river to low water mark above Great Falls (riverine), to high tide mark below Great Falls (tidal)	looting by relic hunters; erosion	Canal and canal-related features are listed. numerous structures have been determined eligible. There are separate listings for: 18FR100 The Monocacy Prehistoric Archaeological Site - Piedmont, deepest known stratified site in state of Maryland; late archaic to historic 18AG20 - Shawnee Old Fields Village Site, or King Oppessa's Town - early 18th-century native American village near Oldtown, MD 18AG144 The Paw Paw site - Ridge and Valley Province, Woodland village 18AG43 Moore Village Site - Ridge and Valley Province, Late Woodland Village Seneca Quarry (Potomac Red Sandstone Company, Seneca Stone Company)

Table III.1. Status of Archeological Documentation (as of January 1995).

PARK	Overview & Assessment (and other major survey)	RMP/ DATE	SITES RECORDED[1]	SITE FORMS	SUBMERGED RESOURCES	SPECIAL CONCERNS	NATIONAL REGISTER STATUS OF PARK AND SITES
GWMP	O&A for Arlington County, VA (Cissna 1990); Glen Echo Park (Ziek 1982); summary of Potowmack Canal research (Barka and Troup 1979)	1994	76	yes	submerged boats along shore of Theodore Roosevelt Island	looting by relic hunters; erosion	Multiple Property Listing: Parkways in the National Capital Region, 1913-1965: Evolution of Urban Parkways; Development of the National Capital Parkway System. Mt. Vernon Memorial Highway is listed. The Clara Barton Parkway is also listed. Arlington House is listed. Fort Circle Parks are listed. Fort Hunt is listed. Glen Echo Historic District is listed. Great Falls Historic District NHL includes Patowmack Canal Historic District. Lock #1 is a National Historic Civil Engineering Landmark. Clara Barton National Historic Site and National Historic Landmark is listed. LBJ Memorial Grove is listed. The Jones Point Lighthouse and the D.C. South Cornerstone are listed.
HAFE	Surveys of Maryland Heights (Frye and Frye 1989); Loudoun Heights (Winter and Frye 1992); Virginius Island (National Heritage 1977, Seidel 1985)	1994	155	yes	ruins of bridge abutments and bridge structure (in state-owned waters)	looting by relic hunters; erosion on heights; flooding in lower town	Harpers Ferry National Historical Park is listed for significance of first settlement, industrial development of water power, mass production, communication link, John Brown raid, Civil War, Storer College. The Baltimore and Ohio Railroad crossing of the Potomac is listed.

Table III.1. Status of Archeological Documentation (as of January 1995).

PARK	Overview & Assessment (and other major survey)	RMP/ DATE	SITES RECORDED[1]	SITE FORMS	SUBMERGED RESOURCES	SPECIAL CONCERNS	NATIONAL REGISTER STATUS OF PARK AND SITES
MANA	park survey (McGarry 1981, 1982, 1986); Survey of Stuart's Hill Tract: Galke 1992; survey of Wheeler Tract (Parker 1988, Parker and Hernigle 1990)	1987	97	yes	no	looting by relic hunters	Manassas National Battlefield Park is listed as site of two major battles; historical archaeological resources, e.g., Pittsylvania, are mentioned but are not detailed.
NACC	none	1994	2	no	no	deep burial of some areas	There are 52 park areas and associated structures listed.

Table III.1. Status of Archeological Documentation (as of January 1995).

PARK	Overview & Assessment (and other major survey)	RMP/ DATE	SITES RECORDED[1]	SITE FORMS	SUBMERGED RESOURCES	SPECIAL CONCERNS	NATIONAL REGISTER STATUS OF PARK AND SITES
NACE	Final report of Piscataway Park survey underway (Cissna in prep); Assessment of Anacostia Park (Bromberg et al.1989)	1993	106	some	no	looting by relic hunters; vandalism Piscataway Park has a special concern in its relationship with descendants of local Piscataway people	Piscataway is listed as an archeological district. National Historic Landmark: Accokeek Creek Site (Moyaone) - multicomponent site archaic to historic native American DOE for Jenkins Archeological Site (Fort Drive Parcel 228/9) - significant under criterion D Multiple Property Listing: Parkways in the National Capital Region, 1913-1965: Evolution of Urban Parkways; Development of the National Capital Parkway System. Suitland Parkway is listed. The Anacostia Historic District is listed. The Landston Golf Course Historic District is listed. Fort Circle Parks are listed. Harmony Hall is listed. Kenilworth Park and Aquatic Gardens are listed. Frederick Douglass NHS is listed. Fort Washington is listed. Sewall-Belmont House NHS is listed. Determined eligible: Lincoln, Stanton, and Marion Parks
PRWI	O&A (Parker 1986)	1994	18	yes	no	erosion and site deflation	Multiple Property Listing: ECW Architecture at Prince William Forest Park 1933-1942. Camp (1) Goodwill Historic District, Camp (2) Mawavi Historic District, Camp (3) Orenda/SP-26 Historic District, and Camp (4) Pleasant Historic District are listed.

Table III.1. Status of Archeological Documentation (as of January 1995).

PARK	Overview & Assessment (and other major survey)	RMP/ DATE	SITES RECORDED[1]	SITE FORMS	SUBMERGED RESOURCES	SPECIAL CONCERNS	NATIONAL REGISTER STATUS OF PARK AND SITES
ROCR	survey at Fort Reno (Lackey 1983); survey at Piney Branch (Mumford 1982); overview of natural and cultural history of Rock Creek (Inashima 1985)	1988	22	some	no	erosion along creek; resources vulnerable to vandalism and looting by relic hunters	The Piney Branch Quarry Site is listed as significant for research potential and its association with W.H.Holmes. The Potomac Palisades Site is listed as significant for research potential on stone tool manufacturing. Multiple Property Listing: Parkways in the National Capital Region, 1913-1965: Evolution of Urban Parkways; Development of the National Capital Parkway System. Rock Creek and Potomac Parkways are listed. Fort Circle parks listed The Godey Lime Kilns are listed. The Rock Creek Park Historic District is listed. Meridian Hill Park is listed. Klingle Mansion, Pierce Mill, Pierce Mill Carriage House, Pierce Springhouse and Barn, Boulder Bridge, and Ross Drive Bridge are listed.
WOTR	assessment (Pousson 1979)	1993		no	no	erosion along creeks	
WHSE	assessment of President's Park (Pousson and Hoepfner 1995)	?			no	limited access due to security concerns	The White House is listed. Presidents Park South is listed.

[1] SITES RECORDED counts historic and prehistoric components at one location as two sites.

Table III.2. Status of Archeological Collections at MARS (as of October 1994).

PARK	CATALOG	DATA ENTERED	FINAL D.BASE	DOC. XEROX	100% INVENT	SEALED	NOTES
ANAC Anacostia	N	N	N	N	N	N	Barney Circle Collection still w/ contractor.
ANTI Antietam	Y	Y	Y	Y	Y	Y	Contractor excavations pending.
ARHO Arlington House	Y	P	N	N	P	N	Backlog. Parts of collection have been entered and finalized. This portion ready for inventory and sealing. See backlog notebook for exact status of DE.
CATO Catoctin	Y	P	P	N	P	P	Excavations from Rt 197 need all but cataloging. Backlog needs xeroxing, it has been entered and the database is final.
CHOH C&O Canal	P	P	P	N	P	P	Some requiring cataloging are prehistoric. 13 CD canisters. A good portion is data entered, but needs proofing. Several small sites have been inventoried and sealed.
CLBA Clara Barton	Y	Y	Y	N	Y	Y	
FOCE Fort Circle	Y	Y	N	Y	N	Y	Sites need to be put in individual database file.
FOTH Peterson House	Y	Y	Y	?	Y	P	Need several numbers before boxes can be sealed.
FOWA Fort Washington	P	P	P	N	P	P	This Park has accession and catalog number problems. Backlog and RAP material to be processed. Backlog after FY92 has been processed, but not xeroxed.

Y = Work Completed, **N** = Work not completed, **P** = Work partially completed, see notes. **Database final** = the file has been proofed for errors and any found have been corrected. **Doc Xeroxed** = All supporting documentation has been xeroxed onto acid-free paper. **100% inventory** = All catalog numbers listed on outside label are in the box. **Sealed** = All artifacts have been accounted for and the boxes have been sealed with polyethylene flagging.

Table III.2. Status of Archeological Collections at MARS (as of October 1994).

PARK	CATALOG	DATA ENTERED	FINAL D.BASE	DOC. XEROX	100% INVENT	SEALED	NOTES
FRDO Frederick Douglass House	P	P	P	?	Y	P	Partial only because some new additions need processing.
GRFA Great Falls	Y	Y	N	N	N	N	Artifacts have been cataloged and data entered, but nothing else has been done.
GWMP George Washigntön Parkway	P	P	P	N	P	P	Several small sites have been finalized. Other sites are backlog waiting for processing. Most of the sites (60-70%) are prehistoric.
HAFE Harpers Ferry	P	P	N	N	N	N	Archeology is ongoing. Database needs proofing and individual files for better data management. Majority of remaining backlog is HAFE estimated at 65,000 objects.
HAHA Harmony Hall	Y	Y	N	N	N	N	Artifacts not in individual bags. Unit files need to be combined into one site file.
KEAQ Kennilworth Aquatic Garden	Y	Y	Y	Y	Y	Y	Check w/ Richard to make sure he has the most recent copy of file.
MANA Manassas National Battlefield	P	P	P	N	P	P	Most of the Stuarts Hill tract has been completed except xeroxing. Pohoke & Portici need database work and inventory. Newly excavated items not yet at MARS. Backlog (Old Stone House and Survey) are completed except xeroxing.
NACC National Capital Parks-Central	Y	Y	Y	N	Y	Y	LINC

Y = Work Completed, **N** = Work not completed, **P** = Work partially completed, see notes. **Database final** = the file has been proofed for errors and any found have been corrected. **Doc Xeroxed** = All supporting documentation has been xeroxed onto acid-free paper. **100% inventory** = All catalog numbers listed on outside label are in the box. **Sealed** = All artifacts have been accounted for and the boxes have been sealed with polyethylene flagging.

Table III.2. Status of Archeological Collections at MARS (as of October 1994).

PARK	CATALOG	DATA ENTERED	FINAL D.BASE	DOC. XEROX	100% INVENT	SEALED	NOTES
NACO National Colonial Farm	Y	Y	Y	Y	Y	Y	Check w/ Richard to make sure he has most recent file.
OLST Old Stone House (ROCR)	Y	Y	P	N	N	N	Parts of site still in cabinets. Backlog working on this.
OXHI Oxon Hill	N	N	N	N	N	N	OOPs. This is a RAP project that got overlooked.
PIMI Pierce Mill	??????						Not sure if we have any artifacts.
PISC Piscataway Park	Y	Y	N	N	N	N	Only a small amount of database has been proofed. Some catalog number problems.
PRPA Presidents Park	Y	N	N	N	N	N	Artifacts are in trays, not boxes.
PRWI Prince William	N	N	N	N	N	N	Backlog Cataloging James Madison University, May 1985.
ROCR Rock Creek Park	P	P	P	P	P	P	See OLST also. Blagden '81, completed. Blagden '83 ready for DE. Georgetown Market 2/3 completed except for xeroxing. Small sites in Backlog, some prehistoric. Whitehurst Freeway to be excavated this FY by contractor.
SUIT Suitland PKway	Y	Y	Y	Y	Y	Y	Check w/ Richard for most recent version.
TRIS Theodore Roosevelt Island	N	N	N	N	N	N	Backlog Cataloging, some prehistoric.
WHLI White House Liaison	Y	Y	Y	N	N	N	Made up of WESF and WWHD. Backlog.

Y = Work Completed, **N** = Work not completed, P = Work partially completed, see notes. **Database final** = the file has been proofed for errors and any found have been corrected. **Doc Xeroxed** = All supporting documentation has been xeroxed onto acid-free paper. **100% inventory** = All catalog numbers listed on outside label are in the box. **Sealed** = All artifacts have been accounted for and the boxes have been sealed with polyethylene flagging.

Table III.2. Status of Archeological Collections at MARS (as of October 1994).

PARK	CATALOG	DATA ENTERED	FINAL D.BASE	DOC. XEROX	100% INVENT	SEALED	NOTES
WOTR Wolf Trap	Y	Y	Y	Y	Y	Y	

Y = Work Completed, **N** = Work not completed, **P** = Work partially completed, see notes. **Database final** = the file has been proofed for errors and any found have been corrected. **Doc Xeroxed** = All supporting documentation has been xeroxed onto acid-free paper. **100% inventory** = All catalog numbers listed on outside label are in the box. **Sealed** = All artifacts have been accounted for and the boxes have been sealed with polyethylene flagging.

ANTI - ANTIETAM NATIONAL BATTLEFIELD

The themes for which Antietam National Battlefield is listed on the National Register of Historic Places (NRHP) are the Battle of Antietam and the Period of Commemoration of the Battle. In addition there are landscape, architectural, and archeological remains of the rural community around Sharpsburg dating from the 18th, 19th, and 20th centuries. Prehistoric use of the land is poorly documented in a few finds as the property had never been systematically surveyed for archeological resources until the project which began in FY94.

The commemoration of Antietam began soon after the battle and in 1867 the national cemetery was dedicated. Antietam National Battlefield site was established in 1890. In 1960, Congress mandated that the National Park Service is "to provide for the maintenance of the site...in, or its restoration to, substantially the condition in which it was at the time of the battle" (P.L. 86-438).

The park is easily accessible by road and is within 70 miles of both Washington, DC and Baltimore, Maryland. Its rural location in Washington County, Maryland is just east of Sharpsburg. The recorded visitor use of approximately 150,000 per year is expected to continue to grow.

Three miles of Antietam creek and its 100-year floodplain run through the park. There are a handful of wetlands within the park boundary. All of the park lies within the Great Valley physiographic province.

There are several historic buildings which survive from the time of the battle. The commemorative landscape of the 1890s includes monuments, roads, and memorial tablets. Associated with the commemoration period is the memorial avenue of trees from Sharpsburg train station into town where veterans marched on annual trips to cemetery.

There were several farmsteads, some of which partially survive, and at least one mill at the time of the battle and during the commemoration period. In addition is the documented site of the early 19th-century health resort known as Belinda Springs and the later Belinda Springs hotel. It is likely that archeological remains of these properties exist. Research is required to locate and describe the contributing farmsteads and other features which made up the battlefield.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

There are only three prehistoric sites recorded in the Maryland state site files within the boundaries of Antietam NB. None of these are well documented. There is a study, however, of prehistoric site distribution in the Hagerstown Valley (Stewart 1980). Archeological issues in Antietam NB might include the intermittent use of the area for hunting and gathering in proximity to base camps closer to Antietam Creek.

Antietam National Battlefield lies within Washington County in Western Maryland. The first settlement of Euro-Americans in the county occurred around 1730 and by the later part of that decade there was a grist mill on Antietam Creek. By the second half of the 18th century there was major thrust of immigration into the area by Pennsylvania-German and German settlers. The earliest known farm on the property of Antietam National Battlefield is what is now known as the Piper Farm, established as early as the 1740s. Several farms were established through the 18th and 19th century. At the time of the battle there were a number of family farmsteads in operation, including that of Piper, Mumma, Sherrick, D.Miller, D. R. Miller, Otto, John Poffenberger, Joseph Poffenberger, Samuel Poffenberger, Rohrer, Middlekauff, Morrison, George Line, Kennedy, Roulette, Clipp, and Philip Pry. Also within the boundary of the park are other smaller farms and farmhouses, the Dunkard Church, mills, roads, bridges, fords, a toll house, and the early 19th-century resort of Belinda Springs. Standing structures remaining from the time of the battle include some of those at Miller, Piper, Otto, Sherrick, and Pry farms.

The primary applicable historical themes contained in the Maryland Historical Trust's 1986 "Maryland Comprehensive Historic Preservation Plan" are Agricultural and Military. Research within these could be quite broad and other themes are possible. An example of exploring the Agricultural theme would be a community study through historical archeology of the rural community around Sharpsburg, Maryland. General questions might include the following: What was the community at the time of the battle of Antietam? How did it develop? What changes occurred in and around the community after the battle and after the war? For example, what were the effects on the community of the battle, the war, the creation of the National Cemetery, the commemorative landscape and the touring of veterans and others, and the establishment of the National Battlefield?

Archeology also may contribute information to the history of the battle. In general, the physical evidence recovered by archeology may provide new data on troop positions and movements, on landscape features which may have affected the battle action, and on the life of the soldier in camps as well as on the battlefield.

Table III.3. Chronological Listing of Work done at ANTI.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
c. 1966	Snell and Brown 1982 (Administrative History)	testing of Hagerstown Pike and Burnside Bridge road
1977	Phillips, S. J.	Monitoring at Visitor Center
1983	Seidel, E. M.	test excavations at Piper Barn
1985	Sonderman, R. C.	test excavations at Piper Farm House (18WA321)
1986	Potter, S. R.	Survey of Visitor Center Drainfield #2
1993	Walker, M., and J. Bedell	investigations at the Mumma Farm House
1994	report pending	geophysical testing of Mumma family cemetery
1994	report pending (Greiner, Inc.)	survey of West Woods; geomorphological study of park

Monocacy National Battlefield currently is administered under the superintendency of Antietam National Battlefield. Congress created Monocacy National Military Park in 1934 and in 1976 authorized the acquisition of land for the newly named Monocacy National Battlefield. The park is easily accessible by road and neighbors the growing city of Frederick, Maryland. Washington, D.C. is approximately 45 miles to the south and Baltimore, Maryland is approximately 45 miles to the east.

Monocacy NB is in the Piedmont and contains floodplain of the Monocacy River as well as Bush Creek and several small tributaries. There are several historic farms as well as roads, the B&O Railroad, and battle features such as rifle trenches and blockhouse foundations within park boundaries. Prehistoric use of the land is documented in a few sites and the probability of more extensive use is high, particularly along the Monocacy and its tributaries.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

There is a study of prehistoric site distribution in the Piedmont (Kavanagh 1982). This work provides good baseline data for predicting the kinds of sites in Monocacy NB. A range of occupations from Paleoindian to Late Woodland times is likely. The Woodland occupations on the floodplain of the Monocacy may yield important information on agriculture and on the use of the Piedmont after a cultural boundary developed along the Fall Line.

The primary applicable historical themes contained in the Maryland Historical Trust's 1986 "Maryland Comprehensive Historic Preservation Plan" are Agricultural and Military. Research within these could be quite broad and other themes are possible. An example of exploring the Agricultural theme would be a community study through historical archeology of the rural community of Frederick, Maryland. Such a study could include a comparison with a similar one for Antietam NB and the community of Sharpsburg. General questions might include the following: What was the community at the time of the battle? How did it develop? What changes occurred in and around the community after the battle and after the war? For example, what were the effects on the community of the battle, the war, and particularly the extensive need for medical and convalescent services.

Historically a great variety of ethnicities -- Polish, Irish, German, Scandinavian, African, French and others -- are recorded for the farmsteads within the boundaries of Monocacy NB.

Therefore, the comparison between ethnic households within a community before, during, and after the battle could be made.

Archeology also may contribute information to the history of the battle on either National Battlefield. In general, the physical evidence recovered by archeology may provide new data on troop positions and movements, on landscape features which may have affected the battle action, and on the life of the soldier in camps as well as on the battlefield.

Table III.4. Chronological Listing of Work done at MONO.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1975	Handsman, R.	Reconnaissance of Ballenger Creek site (18FR22)
1982	Kavanagh, M.	survey of Monocacy River region
1984	Seidel, E. M.	Evaluation of Archeological Resources on the Bush Creek Tract
1991	Hernigle, J.	clearance of septic field and parking lot
1993	EDAW, Inc., Land and Community Associates, and John Milner Associates	Cultural Landscape Evaluation and Archeological Evaluation
1994	Child et al. 1994	Investigations of the Proposed Urbana Sewer and Water Connector, Frederick County, Maryland (partially in park).

CATO - CATOCTIN MOUNTAIN PARK

There is no specific legislation which establishes Catoctin Mountain Park as a National Park. The land is owned by the National Park Service and administered for recreation and conservation. Federal ownership originated with the National Industrial Recovery Act of 1933. The National Park Service received the heavily eroded and deforested land in 1936 to rehabilitate with WPA labor as the Catoctin Recreational Demonstration Area. The original intent was to give the land to the state of Maryland after the land was reforested and rehabilitated. However, in 1945 Truman decided to retain the land under the National Park Service. In 1954 the State of Maryland received the southern half of the park, which is now Cunningham Falls State Park, and the Demonstration Area became Catoctin Mountain Park.

With the exception of Camp David, the Presidential Retreat, and the Naval Support Facility, the park is accessible to the public by road and trail. Most of the rurally located park is in Frederick County, Maryland and a small portion is in Washington County. The park borders the western edge of Thurmont. The town of Foxville is also nearby. Park visitor use has increased since U.S. Route 15 was expanded in the late 1970s.

Catoctin Mountain Park lies in the Blue Ridge Mountains. It is 95% forest covered and is drained by Big Hunting Creek and Owens Creek.

Stewart's (1981) survey of the Great Valley and adjacent Ridge and Valley and his overview of the Blue Ridge are important archeological references for this area. There are a few recorded prehistoric rockshelters and more are expected, given the steep topography with exposed cliffs and rock faces. The Blue Ridge contains lithic resources such as rhyolite which were important to prehistoric people, particularly during the Archaic period, for both trade and their own use. Isolated finds and lithic scatters are the most typical prehistoric sites known in the park. Extensive erosion from timbering and charcoaling probably has deflated many of the prehistoric sites on the mountain.

Nearby the park, an archeological survey was done at Catoctin Furnace and Cunningham Falls in Frederick County (Milner 1981).

The Cabin Camp facilities at Misty Mount, Greentop, and Round Meadow and the Country Store and Blacksmith shop at Round Meadow are the major built resources. In addition there are abandoned farmsteads, stills, collier pits and charcoal hearths, and other sites associated with historical use of the mountain since the mid-18th century.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One of the prehistoric research questions which could be addressed concerns the use of the mountain for the rhyolite trade. Questions include, was the trade controlled by local groups or did many peoples have access to the resources? How did the local use of the mountain change when the regional rhyolite trade decreased in volume?

One example of exploring the historical period economic life of the mountain would be to examine the rural industry associated with the iron furnaces and the changes in families' strategies as that form of livelihood declined. Archeological evidence could contribute data to understanding the changing relationship of the mountain to the economy of the rest of the state as industry was removed from rural areas. Prosperity and poverty and changing market relationships are often discernible in the comparisons of consumer objects recovered archeologically.

Table III.5. Chronological Listing of Work done at CATO.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1980	Stewart, M.	transect through park as part of broader study of Blue Ridge and Great Valley site patterns
1983	Seidel, E. M.	literature search; survey of proposed waterlines (Package 109)
1985	Sacchi, R.	very limited investigations at Camp Misty Mount (Package 109)
1992	park staff	survey of cultural resources visible above ground

CHOH - C & O CANAL NATIONAL HISTORICAL PARK

C & O Canal Historical Park was established in 1971 by the "Chesapeake and Ohio Canal Development Act"(PL 91-664)

> to preserve and interpret the historic and scenic features of the Chesapeake and Ohio Canal, and to develop the potential of the canal for public recreation, including such restoration as may be needed, ... in the states of Maryland and West Virginia and in the District of Columbia.

The park, which averages only hundreds of feet wide, runs for nearly 185 miles from the mouth of Rock Creek in Georgetown to Cumberland, Maryland paralleling the Potomac River.

Most of the park's land is in Maryland. Five miles are in the District of Columbia and there are four small portions in Morgan and Mineral counties, West Virginia. Maryland counties though which the park runs are: Montgomery (37 mi), Frederick (16 mi), Washington (78.5 mi), and Allegany (48 mi).

Accessibility to the park varies. Surroundings vary from urban in the lower part to remote in the interior, northern sections. As a whole, however, the park is quite accessible along its entire length. For example, numerous roads intersect or parallel the park: I-495 crosses near Great Fall; I-81 crosses near Williamsport; four federal and Maryland highways cross the canal; 40 county roads (some unpaved) provide access at regular intervals; the Clara Barton parkway and MacArthur Boulevard are adjacent or nearby between DC and Great Falls; MD 51 is adjacent or near from North Branch to Spring Gap near Cumberland.

Estimated visitor use is two million annually; 75% of the visitation occurs in the lower 20 miles.

The Canal is unique among parks in the National Capital Region in that it passes through all of the physiographic provinces in the region. The first mile is in the Atlantic Coastal Plain and the next 60 are in the Piedmont Plateau. The Blue Ridge contains 63 miles from Harpers Ferry water gap through Great Valley to Hancock. From Hancock to Cumberland, 60.5 miles run through the Ridge and Valley province.

Environment is mostly floodplain with 2nd and 3rd growth eastern bottomland forest; there is some upland and some swamp. Eighty-five percent of the park is in the 50-year floodplain of the Potomac River.

The physical remains of the canal include the canal bed, towpath, 11 aqueducts, dams, 162 original historic culverts, 50 locks above Seneca, 26 of original 57 locktenders houses (lockhouses) and associated structures (600 features).

There are also mills, bridges, houses, and foundations. Associated towns include Seneca, Brunswick, Williamsport, Hancock, Little Orleans, and Oldtown.

There are numerous known sites in the park even though the vast majority of it has never been systematically surveyed. A great deal of avocational activity before the establishment of the park resulted in the recordation of many sites. The potential for both prehistoric and historic sites is very high.

There was a systematic survey of approximately 100 acres of the Oldtown locality (Handsman 1977). There is an Overview and Assessment of Georgetown (Artemel et al. 1987).

Particularly important sites which have been investigated are the Moore Village site (Pousson 1983), the Paw Paw site (Kavanagh 1984; Curry 1983), the Winslow site (Slattery 1975; Tidwell 1975), and the Monocacy site (Ayers et al. 1967). The Hughes site (Stearns 1940; Dent and Jirikowic 1990) is adjacent to park land and it is likely that part of this site is on NPS property.

In addition, there has been archeological work on canal features such as the investigation of walls (McGarry 1981), a dry dock (Meltzer 1979), locks (Ziek 1979), culverts (Pousson 1977), and lockhouses (Hsu 1975).

Several archeological studies have been done in Georgetown (Artemel et al. 1985, 1987, 1991; Engineering Science 1985; Crowell et al. 1987). There has been a good deal of recent work at the western end of the canal at Cumberland in connection with studies for the Canal Parkway (Cheek et al. 1994; Helms et al. 1993; Sprinkle et al. 1994; Uunila and Ebright 1993; Yamin et al 1993).

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

Every time period and nearly every theme listed in the Maryland Preservation Plan (MHT 1986) is probably represented in archeological resources in the C&O Canal park boundaries. Therefore, there are myriad issues to be explored.

One prehistoric research topic is comparison of Late Woodland settlement along the Potomac floodplain between physiographic regions. A systematic comparison would shed light on the cultural boundaries and interregional influences in the Potomac Basin during a very complex time.

The C&O Canal contains sites critical to documenting the response of Native American groups to European settlement through the 18th century. Relatively little attention has been paid to the struggle of Native Americans after the first several generations of contact. Such neglect is due, at least in part, to the longstanding but mistaken belief that Native Americans surviving after the mid-17th century simply left the area (Cissna 1986). There is a great deal of research to be done concerning ongoing contact and the creation of syncretic cultures by various native groups. The Shawnee Old Fields site in Allegany County is an important resource in this regard. There are probably other sites with similar importance.

An additional historical period issue of particular relevance to the canal and its operation is that of rural industry. The canal permitted and demanded far-reaching economic changes along its entire route. It encouraged settlement and provided direct links with urban commercial and political centers to areas which had been quite remote. The economic effects of the canal and of its demise and the landscape effects of both the canal and the B&O Railroad are important topics which may be partially addressed through archeology.

Table III.6. Chronological Listing of Work done in CHOH.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1940	Stearns, R. E.	Report on work at the Hughes Site, on the Potomac River in Montgomery County, Maryland.
1960	Slattery, R. G.	The Winslow Site, A Progress Report
1960	Tidwell, W. A.	report on a feature at the Winslow Site
1961	Larrabee, E.	A survey of Historic and Prehistoric Archeological Sites Along the Chesapeake & Ohio Canal National Monument 1961-1962
1966	Hobbs, H. P., Jr.	Report on Rock Dams in the Upper Potomac
1967	Ayers, H. G., and J. G. Little	Report on the Monocacy site (18FR100)
1969	Straudberg and Tomlinson	photoanalysis of fish weirs in Potomac River
1975	Hsu, Dick Ping	limited test of Lockhouse 28

Table III.6. Chronological Listing of Work done in CHOH.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1975	National Heritage Corporation	Archaeological Requirements Plan
1976	National Heritage Corporation	Archaeological Requirements Plan (Supplement)
1976	National Heritage Corporation	Survey of Paw Paw Tunnel Hollow.
1976	Handsman, R. G.	Research Proposal for Oldtown, Maryland Locality (Robert Moore tract 351-136)
1977	Handsman, R. G.	Study of the Oldtown, Maryland Locality: Resource Inventory and Assessment
1977	Pousson, J. F.	Surveys at Culverts Nos. 65, 126, and 237
1977	Phillips, S. J.	Reconnaissance of Loudoun to Leidy Pipeline (Montgomery County)
1978	Phillips, S. J.	Excavation of the Power Station, Williamsport, Maryland
1979	Meltzer, D. J.	Excavations at an Historic Dry Dock, Lock 35
1979	Pousson, J. F.	Assessment and Reconnaissance Survey, North Branch Area (Allegany County)
1979	Ziek, R. D.	Testing at Lock #24
1979	Ziek, R. D.	Survey at Ferry Hill
1980	Franklin, K., and S. Gregory	Reconnaissance Survey of Park Service Property Affected by the Rock Run WSSC Alternate Points of Discharge
1981	McGarry, T. E.	Testing for repair of the Walls in the Georgetown Level
1981	Seidel, E. M.	Investigations at the Miller Brothers Lumber Mill Site, Williamsport

Table III.6. Chronological Listing of Work done in CHOH.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1981	Stewart, M.	literature overview of burial mounds in Great Valley of Maryland
1983	Curry, D. C.	Reconnaissance of the Proposed Maryland Route 51-Potomac River Bridge Approaches at Paw Paw, Allegany County, Maryland and Morgan County, West Virginia
1983	Evans, J.	Preliminary Reconnaissance of National Park Service Property, Rivers Edge Subdivision, Montgomery County, Maryland
1983	Pousson, J. F.	Archeological Excavations at the Moore Village Site (18AG43)
1984	Kavanagh, M.	Phase II Investigations at the Paw Paw Site (18 AG144), Allegany County, Maryland
1984	McGarry, T. E.	Testing along the Harpers Ferry Road (package No. 176)
1985	Artemel, J. G. et al.	Georgetown Waterfront Park Archaeological Testing Program Phase I
1985	Engineering-Science	Georgetown Waterfront Park Archaeological Overview and Assessment Phase I
1987	Artemel, J. G. et al.	Georgetown Waterfront Park Archaeological Overview and Assessment
1987	Crowell, E. A. et al.	Survey of Baltimore and Ohio Railroad, Georgetown Subdivision
1990	Neumann, T. W., and M. T. Moran	Phase I Investigation of the Proposed Waste Water Discharge Pipeline Corridor (Washington County)
1991	Williams, M. and M. T. Moran	Phase II Investigations at the Water Intake Pumphouse Site, Brunswick, Maryland.

Table III.6. Chronological Listing of Work done in CHOH.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1991	Artemel, J. G. et al.	Whitehurst Freeway Improvement Project Phase I Archaeological Testing
1991	Goodwin, R. Christopher et al.	Phase II Investigations at the Water Intake Pumphouse Site, Brunswick, Maryland
1993	Helms, A. et al.	Background Research for the Canal Parkway Development Study, Allegany County, Maryland
1993	Mintz, J. J. et al.	Phase IB Investigations of the Proposed Dalecarlia Reservoir to Chain Bridge Water Supply Main, Washington, D.C. and Montgomery County, Maryland
1993	Yamin et al.	Phase I and Phase II Archeological And Historical Investigations; Station Square Project, Cumberland, Maryland.
1993	Uunila, K. E. and C. A. Ebright	Supplementary Background Research, Canal Parkway Development Study, Allegany County, Maryland.
1993	park files	Identification and recording of site near Ernstville
1994	Sprinkle, John et al.	Phase I survey for Canal Parkway Development study in Allegany County

GWMP - GEORGE WASHINGTON MEMORIAL PARKWAY

In 1924 the National Capital Park Commission was directed to acquire land suitable for development into a National Capital park, parkway, and playground system. The broad mandate given was to "to prevent pollution of Rock Creek, and the Potomac and Anacostia Rivers, to preserve forests and natural scenery in and about Washington" (PL 202).

In 1930 the Capper-Cramton Act (46 Stat. 482) was passed to establish the George Washington Memorial Parkway to protect and preserve the natural scenery of the Gorge and Great Falls of the Potomac and the historic Patowmack Canal. Three distinct roles are defined in the park's Statement for Management:
1. preserve the Potomac shoreline from pollution and commercial development;
2. provide for a variety of recreational needs of the Washington, DC area
3. provide a scenic memorial roadway to the nation's capital and the Mt. Vernon estate

The park is very accessible and is a major commuter route. It runs along the Potomac River from Great Falls to Mount Vernon, Virginia and from Chain Bridge to MacArthur Boulevard in Maryland and encompasses island land as well. It is one of the most highly visited units of the National Park System with an annual recreational visitor count of 5 to 6 million.

The surrounding urban lands contain well-developed neighborhoods and commercial centers in Fairfax and Arlington counties, Virginia; Alexandria, Virginia; and Montgomery County, Maryland.

George Washington Memorial Parkway runs through both the Piedmont and the Coastal Plain along the Potomac River. Parts of 16 tributaries are included in the Parkway boundaries. Between Great Falls and T. Roosevelt Island the water flow changes from waterfalls and cataracts in a tight gorge to a restricted channel of rapid water with many islands, narrow rocky flood plains and high bluffs. Below T. Roosevelt island the river opens onto the Coastal Plain and comes under tidal effect, producing an estuary.

George Washington Memorial Parkway is an linear urban park made up of many pieces. These include the following: Arlington House, Clara Barton NHS, Glen Echo Park, Great Falls Park, T. Roosevelt Island, L.B.J. Memorial Grove, Belle Haven, Daingerfield Island, Fort Hunt, Fort Marcy, Gravelly Point, Roaches Run Wildlife Area, Mount Vernon Memorial Highway, Riverside Park, Turkey Run Park and Claude Moore Colonial Farm, U. S. Marine Corps War Memorial, Lady Bird Johnson Park, Columbia Island, Jones Point Park and Lighthouse, Dyke Marsh Wildlife Preserve, Langley Fork Park, Arlington Memorial Bridge and Avenue, and the Netherlands Carillion.

There are many important sites of interest to archeologists, including Matildaville, which is an 18th and 19th century village site at Great Falls, and Fort Marcy and several other Civil War features.

Arlington House, The Robert E. Lee Memorial, (ARHO) was the home of Robert E. Lee from 1831, when he married Mary Anna Randolph Custis, the daughter of George Washington Parke Custis, until 1861. In 1925 Congress voted to restore the home to its pre-war condition and in 1955 Arlington house was designated as a permanent memorial (PL 84-107). ARHO is located in Arlington, Virginia and is surrounded by Arlington National Cemetery, which is administered by the Army. The House is visited by approximately 400,000 - 500,000 persons per year.

Congress established the Clara Barton House (CBNHS) as a National Historic Site in 1974 (93 Stat. 486) "to tell the early story of the American Red Cross through the interpretation of the life and times of its founder, Clara Barton."

Glen Echo Park is managed primarily to further cultural arts and education, drawing on its beginnings as a National Chautauqua Assembly site in 1891. Glen Echo Park was an amusement park from 1899 - 1967. Glen Echo is on the second of three terraces above the Potomac River on the Maryland side. This position along the Fall Line likely would have seen some prehistoric use and it is possible that some resources survive. However, virtually all usable land in the park has been modified by construction between 1890 and the present.

Great Falls (GRFA), which receives approximately 500,000 visitors per year, is situated on the Fall Line between the Piedmont and Coastal Plain. After a drop of 76 feet the river flows into a gorge, the upper three miles of which form the park's eastern boundary. The park is heavily forested, mainly with secondary growth on formerly tilled and clear-cut areas. Great Falls contains the Potowmack Canal, developed by George Washington to make the Potomac River navigable upstream from Georgetown. Three of five locks, the canal prism, and many stone structures remain from this one-mile long canal. The town of Matildaville was developed by Henry "Light Horse Harry" Lee along the canal. Several structures in Matildaville have received some archeological attention. These include: Samuel Briggs Grist Mill; Potts/Wilson Iron Forge/Foundry; Springhouse; William Dickey House or Mrs. Meyer's Tavern; Superintendent's House or Potowmack Company House; and the Saw Mill.

T. Roosevelt Island (TRI) was established as a memorial to Teddy Roosevelt and was incorporated into the National Capital Parks system in 1932 (PL 72-146). The island is located in southwestern Washington, DC in the Potomac River between Georgetown and Rosslyn, Virginia. It is managed primarily as a natural park for recreation. Access to the is by trail and a pedestrian bridge. The physical environment is that of a deciduous forest, including swamp and marsh habitat along eastern edge of island. The location and natural resources of the island make the likelihood of prehistoric occupation very high and there are recorded sites on the island. Both prehistoric and historic archeological resources are documented. The Mason Family residence stood on the south end of island and there are likely other historic uses as well.

Most of the known sites are from a few sources. A portion of the Parkway has an Overview and Assessment (Cissna 1986). There were early surveys by Smithsonian; compliance surveys at construction locales (Inashima 1985) and survey along the shore line by Michael Johnson of Fairfax County Heritage Resources Division. There is very little information available for most of the sites but these require phase II evaluation to judge their significance.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One prehistoric research issue concerns the various uses to which the Fall Zone was put, particularly during the Middle and Late Woodland when the Fall Line came to mark a cultural boundary between Siouan speakers on the Piedmont and Algonquian speakers on the Coastal Plain.

It is worth noting that for south central Maryland, Wanser (1982) identifies three areas with especially high likelihood of sites: 1) Zekiah Swamp, Gilbert Swamp, Allen's Fresh Wetland and adjacent terrace uplands; 2) Popes Creek and Piccowaxen Creek coastal area on the Potomac; and 3) St. Clements Bay and Breton Bay.

One historic period research issue concerns the European settlement in the area before the establishment of the Federal city and the changes in the economy as the capital grew through the 19th century.

Table III.7. Chronological Listing of Work done at GWMP.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1942	Devlin, R. A.	removal of Mason House ruins: "all artifacts and other pertinent material uncovered as a result of the archeological survey were placed in a concrete vault in the basement prior to grading over the foundation."
1948	Manson, C.	Report on Marcey Creek Site (44AR2)
c. 1966	Little, J. G. and H. Ayers	work at Jones Point Lighthouse
1959	Holland, C. G.	Report on Pimmit Run Site (44AR4)
1969	Gardner, W. M.	Report on the Stout Site (44FX2)
1969	Gardner, W. M. et al.	Excavations at the Stout Site (44FX2)
1972	Deppe, H. B.	Report on the Donaldson Site (44AR3)
1973	Meyersburg, M. P.	Preliminary Report on Matildaville, Virginia and the Potowmack Company Canal (Great Falls Park, Virginia)
1974	McNett, C. W., Jr.	Excavations on Theodore Roosevelt Island, Site TRI#1 (51NW3)
1975	McNett, C. W., Jr.	Excavations at the Spring Branch Site (44AR6)
1977	Comer, D. C.	Test excavation of the Potowmack Canal (Great Falls Park, Virginia)
1978	Troup, C. G.	Archaeology of Potowmack Canal: Matildaville; An Archaeological Survey of the General Environs of the Canal (Great Falls Park, Virginia)
1978	DSC memos	limited testing in basement of Clara Barton house
1979	Barka, N. F., and C. G. Troup	Summary of Research on the Potowmack Canal (Great Falls Park, Virginia)

Table III.7. Chronological Listing of Work done at GWMP.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1979	Troup, C. G.	Testing at William Dickey House Potowmack Canal (Great Falls Park, Virginia)
1979	Troup, C. G.	Testing at "Ruins of Old Jail" Potowmack Canal (Great Falls Park, Virginia)
1979	Troup, C. G., and A. G. Barnes	Testing at the Springhouse Potowmack Canal (Great Falls Park, Virginia)
1979	Troup, C. G. et al.	Testing at the Samuel Briggs Grist Mill Potowmack Canal (Great Falls Park, Virginia)
1979	Troup, C. G. et al.	Testing at the Potts and Wilson Iron Forge/Foundry Potowmack Canal (Great Falls Park, Virginia)
1979	Ziek, R. D.	Testing at Lock #1 Patowmack (Canal Great Falls, Virginia)
1980	Ziek, R. D.	Investigation of the Lock Gates in Lock #1, Patowmack Canal, (Great Falls, Virginia)
1982	Potter, S. R.	Reconnaissance of proposed waterline and its potential affects on the Historic Refuse Site associated with Arlington House
1982	Ziek, R. D.	Glen Echo Park George Washington Memorial Parkway Archeological Overview
1983	Pousson, J. F.	excavations at Arlington House
1983	Cheek, C. D. et al.	Phase I Investigation of National Park Service Lands in the Vicinity of Chain Bridge, District of Columbia and Virginia
1983	Dent, R. J.	Investigations at Lock No. 1 of the Patowmack Canal (Great Falls, Virginia)

Table III.7. Chronological Listing of Work done at GWMP.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1985	Inashima, P. Y.	Survey of Selected Construction Locales Along the Mount Vernon Memorial Highway. (Package GWMP 325-42)
1985	LeeDecker, C. H., and A. Friedlander	Survey of a Proposed Bike Path, Foot Path and Soccer Fields at Jones Point Park, Alexandria, Virginia
1986	Inashima, P. Y.	Preliminary Reconnaissance on Mount Vernon Memorial Highway near Fort Hunt (GWMP Pkg. no 325C)
1987	Shephard, S.	survey along northern boundary of Jones Point Park
1990	Potter, S. R.	recording of Difficult Run petroglyph
1990	Cissna, P. B.	Historical and Archeological Study of the George Washington Memorial Parkway, Arlington County, Virginia.
1992	Virta, M. (memo)	testing at Fort Hunt
1992	Goodwin, R. C. et al.	Phase IA Investigations of the Proposed Dalecarlia to Chain Bridge Water Supply Main Project, Washington, D.C., and Montgomery County, Maryland
1993	Sonderman, R. C. (memo)	limited testing at Jones Point Lighthouse

Harpers Ferry National Monument was established in 1944 (PL 78-386) and was expanded through the addition of Storer College and the John Brown Fort in 1960 (PL 86-655). The Monument became Harpers Ferry National Historical Park in 1963 (PL 88-33).

The park is located at the confluence of the Shenandoah and Potomac rivers and contains land in three states: Jefferson County, West Virginia (44% of park land), Loudoun County, Virginia (17% of park land) and Washington County, Maryland (34% of park land). Accessibility is variable; some is easily accessibly by vehicle and other areas are accessible by trial.

Harpers Ferry lies in the Blue Ridge and Short Hill Mountains at Harpers Ferry gap. Elevations range from 1448' asl at Maryland Heights to 235' asl at the confluence of the rivers. The floodplain area is subject to frequent, damaging floods.

The park contains several distinct areas. Lower Town, Virginius Island and Hall Island are on the floodplain. Camp Hill is west of Lower Town. Bolivar Heights and Elk Run are ridgetops. The Shenandoah City area and Short Hill contain steep slopes and shoreline. Loudoun Heights and Maryland Heights consist of mountainous, forested land. Each of these areas has had different historic and prehistoric uses.

Virginius Island was extensively developed for water-powered industry in the 1820s. By 1859 there was an iron foundry, machine shop, cotton mill, flour mill, sawmill, and carriage manufacturing shop as well as workers' housing. The Shenandoah City area contains part of the Potowmack Canal, ruins, old roads, and the B&O Railroad.

This park has received a good deal of archeological attention and has a rich archeological record of early industry and the domestic response to it. The extensive flooding to which much of the land has been subjected has deeply buried many parts of the archeological record. It has also scoured some of it away. Prehistoric occupation is still represented on the floodplain, however, as evidenced by an occupation several feet under rich historic deposits. The potential for prehistoric resources has not been determined but may be moderate. The potential for historic resources is demonstrated to be very high.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One prehistoric issue is the seemingly limited use of the ridge tops and mountains. Such use could be compared with the more extensive use of the mountain resources in Catoctin Mountain Park. There is a known prehistoric (Woodland) occupation which was excavated in Lower Town (YoungRavenhorst 1994). Data from this site provides information on trade between physiographic regions, a topic which could be further explored.

A great many historical archeological issues have been explored in Harpers Ferry (see, for example, Shackel 1993b,c; 1994a,b; Shackel and Winter 1994). Landscape, industry, domestic responses to industry, a changing craft ethos, boarding house behavior, health and sanitation, Civil War commemoration, and the changing symbolism of the John Brown Fort are some of the topics explored.

The importance of rural industry during the 19th century can hardly be overestimated. The agrarian-industrial economy of the United States before the Civil War was quite different than that which developed afterwards. Industry concentrated in urban areas with large, often immigrant, labor pools. Archeology helps to document and interpret the development of the earlier industrial economy and the changes that accompanied the shift.

Archeology also contributes information to the history of the Civil War era use of park lands. In general, the physical evidence recovered by archeological survey has provided data on fortifications and campsites on both Maryland and Loudoun Heights. Archeology can provide insight into the use of the landscape and on the life of the soldier in camps (e.g., Winter 1994a).

Table III. 8. Chronological Listing of Work Done in HAFE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1959	Cotter, J. L.	Preliminary Investigations Harper House Garden & Building #23, Arsenal Area at Shenandoah and High Streets; also observations at Shenandoah Street and site of Market House
1960	Cotter, J. L.	Testing at Corner of New Arsenal Building
1960	Larrabee, E.	Exploratory excavations on the Lower Hall Island Rifle Factory
1960	Larrabee, E.	Investigation of the Arsenal Square

Table III. 8. Chronological Listing of Work Done in HAFE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1961	Larrabee, E. M.	Exploratory excavations at the U.S. Rifle Works on Lower Hall Island
1962	Carson, H. H.	Resistivity and Seismic Surveys, and Excavations at U.S. Rifle Works
1962	Larrabee, E.	Exploration of the Civil War Rifle Trenches on Bolivar Heights
1962	Larrabee, E. M.	Exploratory excavations at the U.S. Rifle Works Lower Hall Island
1964	Hershey, W. D.	Survey of the Lockwood House (Paymaster's House)
1965	Campbell, J. D.	Various limited investigations 1964-1965
1965	Campbell, J.D.	Summary of investigations on Shenandoah Street
1969	Hannah, D.H.	Excavations on Virginius Island 1966-1968
1970	Hannah, D. H.	Excavation on the Sidewalk of Shenandoah Street
1974	Gardner, W.M.	Excavations in Lower Town (Back Yards) and the Paymaster's House (Yard) 1973-1974
1976	Bauxar, D K., and C. H. Blee [also see authors separately]	Investigation of Buildings 9 and 10
1977	National Heritage	Survey and Assessment of Virginius Island
1978	Blee, C.H.	Investigations on the Wager Block Buildings 1977-1978
1978	Carpenter, S. L.	Clearance Survey and Testing of Elk Run Area
1978	Carpenter, S. L.	Clearance Survey of Boundary Street Area
1978	Powell, J. W.	miscellaneous salvage work, 1976

Table III. 8. Chronological Listing of Work Done in HAFE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1978	Denver Service Center memo	survey of Cavalier Heights; Elk Run area
1979	Seidel, M. (memo)	survey of Lot FF3 drainage trench
1981	Ziek, R. (memo)	survey of water line
1985	Seidel, E. M.	Excavations for Package No. 115, Buildings 3, 37, 38, 39, 40, 43, and Lot 55B
1985	Sonderman, R. C.	Limited testing at Morrell House and Brackett House
1985	Denver Service Center memo	Mitigation at Visitor Transportation Center
1986	Acuff, L.	Harpers Ferry Artifact Project (Package No. 226-82)
1986	Pousson, J. F.	Investigations Package No. 110A, Wager Block Backyards
1986	Seidel, E. M.	Summary of investigations on Virginius Island 1977 to 1981
1987	Bevan, B.	Geophysical Survey on Virginius Island
1987	Mueller, J. W., B. Fischler, and S. W. Frye	Preservation and Discovery along the Shenandoah Canal in 1983 and 1984
1988	Carpenter, S. L. et al.	Investigations for Visitor Transportation System
1988	Frye, S. W. and C. YoungRavenhorst	Investigations on Virginius Island, 1985-1987
1989	Ravenhorst, J. W.	Investigations at Building 14
1989	Ravenhorst, J. W.	Investigations at Building 38
1989	Ravenhorst, J. W.	Supplemental investigations at Building 38
1989	Frye, S. W., and D. E. Frye	Maryland Heights Archeological & Historical Resources Study.
1990	Frye, S. W.	Lower Town Bus Lot, Mitigation and Monitoring

Table III. 8. Chronological Listing of Work Done in HAFE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1990	Shackel, P. A.	Testing in Lower Town Parking Lot, Blocks B, C, and D.
1990	HAFE Division of Archeology	Test Unit for Parking Lot Gate
1991	Wall, R.	Phase I Investigations of Harpers Ferry Bridge Project; Jefferson County.
1992	Halchin, J. Y., Editor	Investigations at Building 37, Wager Lot 52
1992	Halchin, J. Y.	Investigations of Wager Lot 48
1992	Winter, S. E., and D.E. Frye.	Loudoun Heights Archeological & Historical Resources Study
1993	Lucas, M. T.	Investigations of Shenandoah Street Sidewalk
1993	Ravenhorst, J. W., Editor	Building 40 Excavations
1993	Shackel, P. A., Editor	Excavations of Package 116, Government Block B
1994	Parsons, M. T.	Investigations of Park Buildings 5 and 7, Package 118
1994	Halchin, J. Y.	Archeological Views of the Upper Wager Block, A Domestic and Commercial Neighborhood in Harpers Ferry.
1994	Shackel, P. A.	Domestic Responses to Nineteenth-Century Industrialization: An Archeology of Park Building 48, Harpers Ferry National Historical Park.
1994	YoungRavenhorst, C. C., editor	Archeological Investigations in the Backyards of Park Buildings 32 to 36 Harpers Ferry National Historical Park: The Package 116 Prehistoric Occupations.
1995	report pending	Excavations of workers' housing on Virginius Island

Table III. 8. Chronological Listing of Work Done in HAFE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1995	Borden, A. C. (report pending)	Investigations of Lewis Wernwag's Sawmill, Virginius Island
1995	Parsons, M. T. (report pending)	Investigations at Wernwag's Machine Shop, Virginius Island
1995	Ravenhorst, J. W. (report pending)	Investigations at Curtis Freewill Baptist Church
1995	Parsons, M. T. (report pending)	Investigations of Shenandoah Street Sidewalk
1995	Parsons, M. T. (report pending)	Investigations of the Harper Terraces

Manassas National Battlefield Park was designated a national historic site in 1940. Congress established boundaries "to preserve the most important historical lands relating to the two battles of Manassas."

Situated 25 miles southwest of Washington, DC and 5 miles north of Manassas, Virginia, the park is easily accessible by road. It is bisected by two major highways. The park gets between 600,000 to 800,000 visitors annually.

Manassas NBP is located in the Piedmont upland in both Fairfax and Prince William counties. Gently rolling hills are interspersed by small, relatively steep stream valleys. The main drainage is Bull Run along north and east boundaries; small feeder streams drain the higher western ground. There are rock quarries north and east of the park.

The areas of the historic scene of the battles include some original houses, the partially reconstructed Stone Bridge, historic road traces, the Unfinished Railroad, house sites, cemeteries, trenches, earthworks, and monuments. There are significant 18th- and 19th-century farm and plantation sites such as Pittsylvania and Portici. Some of the most archeologically important resources are those concerning African-American life both before and after the war.

Archeological surveys in several areas of the battlefield have demonstrated relatively high potential for both significant historical and prehistoric sites. Nearly all of the recorded prehistoric sites need further field work, as there is very little information available.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One possible prehistoric research issue is the development of a context for lithic scatters, which are very common prehistoric resources within the park boundaries. Lithic scatters are often dismissed due to a lack of temporal diagnostics, but they potentially hold valuable information on the use of the landscape.

Archeology may contribute information to the history of the battles. In general, the physical evidence recovered by archeology may provide new data on troop positions and movements, on landscape features which may have affected the battle action, and on the life of the soldier in camps as well as on the battlefield.

Another issue of historical archeological interest concerns the life of African-Americans before and after the battles and the Civil War. An example of exploring this theme would be a community study through historical archeology of the rural communities in the area. General questions might include the following: What was the community at the time of the battles? How did it develop? What changes occurred in and around the community after the battles and after the war?

Table III.9. Chronological Listing of Work Done in MANA.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1960	Griffin, J.W.	testing at the Stone House
1981	McGarry, T. E.	Archeological Overview of Manassas National Battlefield
1982	McGarry, T. E. [see also 1981]	Archeological Survey
1985	Cromwell, J. R., Jr., and R.McIver	Phase I evaluation of three streams in Prince William County, Virginia: Broad Run, Bull Run, and Quantico Creek
1986	McGarry, T. E., and C.F. Bohannon	Archeological Survey of Selected Portions of the Battlefield
1987	Hazel/Peterson Companies	cursory reconnaissance survey of Stuart's Hill tract (pre-park ownership)
1988	Park memo	limited testing for bridlepath; Bald Hill maintenance project
1988	Parker, K. A.	Site Summary, 44PW336
1988	Parker, K. A.	Site Summary, 44PW339
1988	Parker, K. A.	investigations of Wheeler Tract
1988	Parker, K. A.	Investigation of the Nellie Edwards Tract 02-176
1989	Parker, K. A.	National Register Eligibility of the Lewis House (44PW345)
1989	Parker, K. A.	Assessment of the Brawner Farm House

Table III.9. Chronological Listing of Work Done in MANA.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1990	Parker, K. A., and J. L. Hernigle	Identification and evaluation of Portici Plantation (1986-1988)
1991	Strutt, M.	Remote Sensing in the Ball Family Cemetery
1991	Park memo	survey of septic field at "Silk Purse"
1992	Galke, L. J.	Survey and Inventory of the Stuart's Hill Tract
1994	report pending	geophysical testing and archeological testing at Brawner Farm
1995	Neville, A. et al.	transmission line corridor survey

NACC - NATIONAL CAPITAL PARKS - CENTRAL

There are numerous park units administered under National Capital Parks - Central (NACC). At least 14 separate acts of Congress make up the enabling legislation for these memorials and park areas. The first was the Residence Act of 1790, which brought the Federal City into being. The National Mall links the Washington Monument, Lincoln Memorial and Jefferson Memorial as well as the Vietnam Veterans Memorial. Other units include Ford's Theater Historic Site, Constitution Gardens, Pennsylvania Avenue National Historic Site, East and West Potomac Parks, and 150 small parcels of park areas throughout the District of Columbia.

All of the units of NACC are urban and receive intensive visitor use. The National Capital parks receive approximately 4 to 5 million visitors per year. These parks are within the Tidewater Coastal Plain. A significant portion of the land has been created through artificial means since the founding of the city. Therefore, in some areas there is no potential for prehistoric remains except those which were redeposited with imported soils. In some other areas the ground surface which would have been used prehistorically is so deeply buried by artificial means that prehistoric archeological resources are, for practical purposes, effectively protected (although inaccessible). On the other hand, there may be areas which are neither disturbed nor deeply buried and there is a high probability of historic period archeological remains. As with most of the District of Columbia, the 19th and 20th centuries would predominate.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

Archeological research which would aid greatly in the assessment of both prehistoric and historic resources is the documentation of created land and land boundaries in existence before the establishment of the Federal City. This project would involve documenting areas of original shoreline and marshlands and landforms before extensive landscaping during the 19th and 20th centuries. John Pousson and Christine Hoepfner (1995) did such a study for the White House grounds. It would be valuable to use GIS technology to create such a data base.

Table III.10. Chronological Listing of Work Done in NACC.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1985	Potter, S. R.	Discovery and recording of early 19th-century cistern associated with Old War Office
1985	Potter, S. R.	Lincoln Memorial Reconnaissance
1991	Virta, M.	Excavation at the Peterson House (The House where Lincoln Died)

NACE - NATIONAL CAPITAL PARKS - EAST

National Capital Parks East includes, in 96 separate land parcels: Anacostia Park, Capitol Hill Parks, Fort Circle Parks, Fort Washington, Frederick Douglass Home NHS, Harmony Hall, Kenilworth Park and Aquatic Gardens, Oxon Cove/Oxon Hill Farm, Oxon Run Parkway, Piscataway Park, Sewall-Belmont House, Suitland Parkway and the recent additions of Greenbelt Park and the Baltimore-Washington Parkway.

Several park areas were acquired under the Capper-Cramton Act of 1930 for the eventual construction of a parkway.

An act of June 6, 1924, amended Apr 30, 1926 (section 1) established the need "to preserve the flow of water in Rock Creek, to prevent pollution in the Potomac and Anacostia Rivers, to preserve forests and natural scenery in and about Washington."

The park parcels are urban and easily accessible. They are located east of the U.S. Capitol in Washington, D.C. and in Prince Georges and Charles Counties, Maryland.

Several major rivers and streams transect or border NACE lands. These include the Potomac River, Anacostia River, Watts Branch, Nash Branch, Oxon Run, Henson Creek, and Broad Creek. There is a major wetland system in these Coastal Plain parks.

There are numerous built resources of many kinds. Archeological potential varies considerably, from very high in Piscataway Park to very low along Suitland Parkway.

Anacostia Park (ANAC)

The District of Columbia Appropriations Act for fiscal year 1919 designated Anacostia Park as part of park system of the District. It was to include: "the entire area reclaimed and to be reclaimed from the mouth of the Anacostia River extending to the District Line."

ANAC is managed as a community park for recreation use and open space in the core of the city. It includes: Kenilworth Aquatic Gardens, Kenilworth Park, Langston golf course, Anacostia Pavilion, and facilities, and RFK stadium, Kingman Island Development, and marinas.

Kenilworth Aquatic Gardens' swamp, marsh and open water are the only remnants of the once extensive Anacostia River wetlands. Kenilworth Park had been used as open-burning trash disposal and is result of sanitary land-fill.

Fort Circle Parks (FOCE)
Forming the defenses for the Capital during the Civil War were 68 forts supported by 93 detached batteries, blockhouses, connected rifle pits, and covered ways. FOCE preserves some of those features, including: Fort Dupont, Fort Stanton, Fort Stevens, Barnard Hill, Fort Bunker Hill, Fort Mahan, Fort Chaplin, Fort Davis, Fort Totten, Battery Ricketts, Fort Carroll, Fort Greble, and Fort Foote. Prior to the establishment of the National Capital Planning Commission in 1942, the forts were owned by War Department.

Fort Washington (FOWA)
In 1940, Fort Washington was transferred from the War Department to the Department of Interior. The park was created to provide a historic and aesthetically pleasing location for the southern end of the Maryland portion of George Washington Memorial Parkway and to preserve the historic coastal defense fortifications. Its use is largely recreational.

FOWA is bounded on north by Swan Creek and on the south by Piscataway creek. The land varies from small river flats to steep hardwood forested slopes to level grassy areas.

The earliest fort on the site stood from 1808 to 1814. Fort Washington was built between 1814-1824 with improvements in 1848. Additional batteries were built between 1896 and 1903. In addition to the fort are the remains of Diggs family mansion, built in 1729 and destroyed in 1819.

Frederick Douglass Home NHS (FRDO)
In 1962 Congress authorized the Secretary of Interior "to designate, for preservation as a part of the park system in the Nation's Capital, the former home of Frederick Douglass" (PL 87-633). Frederick Douglass owned the house and outbuildings from 1877 until his death in 1895. There have been several small archeological projects carried out on this property.

Harmony Hall (HAHA)
Harmony Hall is located on low lying bottom and marsh lands along Broad Creek which flows into Potomac River. Harmony Hall was built during the late 17th or early 18th century. The ruins of 17th-century Want Water structure and canal and at least one significant prehistoric site along Broad Creek are within this unit's boundaries. Archeological excavation was carried out in the immediate vicinity of Harmony Hall.

Oxon Cove/Oxon Hill Farm (OXCO)
Oxon Cove is formed by the confluence of Oxon Run and the Potomac River. The land varies from floodplain, to marsh and swamp, to high river terraces with rolling hills created by sanitary landfill, to forest. Oxon Run drains an extensively developed watershed. The rich bottomland was farmed as a rehabilitation program for patients at St. Elizabeth's hospital. There has been extensive alteration to the landscape such as grading, landfill, and the building of a golf course.

Oxon Run Parkway (OXRN)
The approximately 100 acres of the parkway contains forest, wetlands, and floodplain. The wetland areas include the only example in the National Park System of an Atlantic Coastal Plain bog. It was part of the DC National Guard Facility Camp Simms. Remains include Rifle ranges, fox holes, and other resources associated with the Fort. Some of the associated toxic waste and ordnance has been identified and removed.

Piscataway Park (PISC)
Piscataway Park is managed as a historic landscape. It was established to ensure scenic and historic values for views from Mount Vernon and Fort Washington (PL 87-362).

The older part of Piscataway Park hugs the shoreline of the Potomac River at the mouth of Piscataway Creek. The development of 3000 acres above the shoreline is not owned in fee but is controlled through scenic easement.

The area has been a semi-rural agricultural area but is increasingly encroached upon by suburban development.

Piscataway park contains two distinct terraces separated by a steep escarpment and drained by streams which have cut deep ravines perpendicular to the shore. The land slopes upward from shore evenly, forming a broad and level floodplain terrace. Marshes predominate at stream mouths.

There are many documented archeological sites. Historic sites include the Marshall Hall amusement park and Marshall Hall (c. 1690) and family cemetery. Prehistoric sites include many significant sites including the Accokeek Creek site NHL.

Sewall-Belmont House (SEBE)
The Sewall-Belmont House was established as a National Historic Site to interpret contribution of National Woman's Party in human rights movement (PL 93-486). The site has been occupied since the

18th century. Sewall built house in 1800, incorporating an already standing structure.

Suitland Parkway (SUIT)
Suitland Parkway is a limited access scenic parkway between Andrews Air Force Base and the District. The land was acquired in 1942 by the Army Corps of Engineers for a military highway. Grading, drainage, and bridges were finished before it was transferred to the National Park Service by Congress in 1949. Both Oxon Run and Henson Creek cross under the parkway. Henson creek was widened east of the Suitland Road culvert to relieve flooding in town of Morningside.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

There are numerous archeological issues which could be addressed in the various park parcels in National Capital Parks - East. One important issue is the Native American adaptation to the presence of Europeans and Africans and the nature of refuge communities as Native Groups were affected by disease and warfare. Questions to consider include: What groups coalesced in refuge communities? How did Native groups interact with slaves and runaway slaves? How did they interact with different classes or ethnic groups among European-Americans?

Archeological research which would aid greatly in the assessment of both prehistoric and historic resources is the documentation of created land and land boundaries in existence before the establishment of the Federal City. This project would involve documenting areas of original shoreline and marshlands and landforms before extensive landscaping during the 19th and 20th centuries. Pousson and Hoepfner (1995) did such a study for the White House grounds.

It is worth noting that for south central Maryland, Wanser (1982) identifies three areas with especially high likelihood of sites: 1) Zekiah Swamp, Gilbert Swamp, Allen's Fresh Wetland and adjacent terrace uplands; 2) Popes Creek and Piccowaxen Creek coastal area on the Potomac; and 3) St. Clements Bay and Breton Bay.

A variety of questions under a military theme also could be addressed archeologically. There are resources from several different periods. Archeology may contribute information on the life of the soldier in camps and forts.

Table III.11. Chronological Listing of Work Done in NACE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1958	Powell, B. B.	Investigations of "Old Fort" Area, Fort Washington
1960	Ferguson, A. L. L., and H. G. Ferguson	investigations of Piscataway
1963	Woodward, D. R.	Test excavations at Colonial Farm, Bryans Point, Prince Georges County (18PR3)
1967	Woodward, D. R.	Excavations at the Piscataway Site
1968	Little, J. G., II	Investigations of Fort Earthworks: Fort Davis, Fort Mahan, Fort Dupont
1968	Woodward, D. R.	Reconnaissance of the Farmington Landing Site
1968	Young, J. M.	Excavations at Fort Lincoln, Washington, D.C.
1969	Gardner, W. M.	Survey of Piscataway Park,
1972	Thurman, M. D.	Re-Excavation of the Accokeek Creek Site
1973	Gardner, W. M. et al.	Investigations at the Frederick Douglass Home
1973	Woodward, D., and G. Phebus, Jr.	Excavations at the Piscataway Site (18PR7)
1975	Chambers, E.	Preliminary assessment of Accokeek Creek site Shoreline
1975	Hume, G. W.	Assessment of utility corridor, Anacostia
1976	Hume, G. W.	Mitigation of the Accokeek Creek Site Related to Piscataway Park Shoreline Improvements
1978	McGarry, T. E.	Investigations at Fort Washington
1980	Dent, R. J. et al.	Reconnaissance and Mitigation of the National Colonial Farm's Gatehouse Complex

Table III.11. Chronological Listing of Work Done in NACE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1980	Dent, R. J.	Reconnaissance of a Proposed Tobacco Barn Construction Site on the National Colonial Farm, Piscataway National Park
1980	Dent, R. J.	Reconnaissance of Proposed Visitor Contact Center and Drinking Well Construction Sites of the National Colonial Farm, Piscataway National Park
1980	Fehr, A. M.	Archival Investigations of Fort Circle Connector Parcel on Alabama Avenue, N.E., Washington, D.C.
1980	Fehr, A. M. et al.	Field Reconnaissance of the Proposed Transit Line Between the Waterfront Station to near Alabama Avenue and the two alternatives from near Alabama Avenue to near Auth Village and Rosecroft Raceway
1980	Potter, S. R.	Review of Archeological Resources in Piscataway Park, Maryland
1981	Garson, A. G. et al.	Prehistoric Archeology for the Barney Circle Area Environmental Impact Assessment
1981	Herron, J. G.	Excavation of the Growlery, Frederick Douglass Home
1981	McGarry, T. E.	Investigations at Fort Washington
1981	McGarry, T. E.; and McGarry and Zmoda	Investigations for the Restoration of Old Fort Washington, 1977-1979
1981	Soil Systems, Inc.	Determination of Eligibility Documentation, Jenkins Archaeological Site
1981	Ziek, R. D.	Investigations at Frederick Douglass Home
1982	Dent, R. J.	Reconnaissance of the National Colonial Farm, Piscataway National Park

Table III.11. Chronological Listing of Work Done in NACE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1982 1983	McGarry, T. E.; see also Vrabel et al. 1985	Piscataway Park Archeological Survey, 1981, 1982
1983	Salwen, B., and A. Pickman	Investigations for Barney Circle
1985	Archeology program memo	test units for wheelchair ramp
1985	Flanagan, E. et al.	Phase II Studies for Barney Circle
1985	Rule, P.	Reconnaissance, Mockley Point Trailhead Parking Lot, Piscataway Park
1985	Taylor, R. K.	Investigations near RFK Stadium, Washington, D.C.
1986	Louis Berger & Associates, Inc. Cultural Resource Group	Archeological, Architectural, and Historical Investigations at the Howard Road District, Washington, D.C.
1986	Potter, S. R., and R. C. Sonderman	Investigations at the Site of the Proposed Stable Complex, Harmony Hall
1988	Strutt, M. A.	Investigations at Kenilworth Aquatic Gardens Visitor Center (Clearance Testing)
1988	Strutt, M.	Investigations at the Suitland Maintenance Yard, Silver Hill Road, Suitland, Maryland (Clearance Testing)
1988	Strutt, M.	Investigations Fort Washington Park
1988	Virta, M. R.	Investigations at National Colonial Farm
1988	Virta, M. R.	Investigations at Fort Washington
1988	Virta, M. R.	Test Excavations at the Proposed Site of The Marshall Hall Boat Ramp, Piscataway park

Table III.11. Chronological Listing of Work Done in NACE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1988	Archeology program memo	testing of garden area, Frederick Douglass NHS
1989	Bromberg, F. et al.	Report on Anacostia Park from a Historical and Archaeological Perspective Corporation
1990	Bromberg, F. et al.	Phase II Studies at Barney Circle
1990 1991	DSC	limited testing at Suitland parkway
1991	Strutt, M.	Remote sensing in the Marshall Family Cemetery, Marshall Hall, Piscataway Park
1992	Gibb, J. G.	Phase I Survey of a Portion of Marshall Hall, Piscataway Park,
1993	LeeDecker, C. H.	Mitigation Plan for Jenkins Farm Archaeological Site (51SE4)
1993	Sonderman, R.C. et al.	Excavations at Harmony Hall (1986)
1993	Glumac P. D. et al.	testing at Whitehurst freeway:2 sites
1994	LeeDecker, C.H.	Data recovery at Jenkins Farm Site
1994	Sanders, S. L. et al.	Phase II investigation at proposed radar facility in Anacostia
1996	Cissna, P. B. (report pending)	Survey and Inventory of Piscataway Park

GREENBELT PARK AND BALTIMORE-WASHINGTON PARKWAY

There is no specific legislation which established Greenbelt as a National Park. In 1950 lands were transferred from the Farm Security Administration to the National Park Service for the parkway:

> to provide a protected, safe and suitable approach for passenger-vehicle traffic to the Nation's Capital and for an additional means of access between the several Federal establishments adjacent thereto and the seat of government in the District of Columbia [P.L. 81-643].

In 1953 the U.S. Park Police assumed jurisdiction and in 1965 both Greenbelt and the Parkway were placed under Catoctin Mountain Park. In 1995 they were placed under National Capital Parks - East.

Both Greenbelt and the Parkway are easily accessible. Greenbelt is in a suburban and increasingly urban setting just six miles from Washington, DC in Prince Georges County, Maryland. Major commuter routes border three sides of the park. The Parkway is a major commuter route between Baltimore to Washington. Its width varies from 350 to 1000 feet as it travels through portions of Baltimore, Anne Arundel, and Prince Georges Counties.

Greenbelt, within the Atlantic Coastal Plain, is in the Anacostia River watershed. Deep and Still Creeks drain into the northwest branch of the Anacostia below Indian Creek. Many of the park soils are relatively impermeable, causing the forest to be interspersed with wet meadows and swampy areas. There is a peat bog in the eastern part of the park.

The Parkway is on the western edge of the Atlantic Coastal Plain. The southern part is drained by minor tributaries of the Anacostia River but drainage north of Powder Mill Road runs is to the Chesapeake Bay via the Patuxent, Little Patuxent, and the Patapsco rivers.

What is now a mature forest of pine and oak in Greenbelt Park is primarily reforested tobacco farmland. Historic maps from the Civil War era indicate farm house sites and vegetative groupings indicate old fields. A brief, informal survey along the north branch of Still Creek discovered some lithics and ceramics (undocumented).

Both prehistoric and historic sites are recorded on the Parkway but there is no documentation for sites in Greenbelt Park. Both areas have relatively high potential for prehistoric sites due to their location near the Fall Line. There are several recorded sites in the vicinity. If the presence of inland swamps and wetlands in Greenbelt can be confirmed prehistorically, then that would add to the high probability of hunting and collecting sites. Although the likelihood of site survival is somewhat compromised due to stream bank and other erosion in Greenbelt and the effects of limited grading on the Parkway, there is still high potential for prehistoric sites. The likelihood of historic period site is high as well. There are several documented along the parkway and historic maps indicate sites in Greenbelt.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One prehistoric issue for Greenbelt is the use of the tributary streams and inland marsh. One historical period issue is the use of the landscape after the Civil War, when soil exhaustion must already have taken its toll.

Table III.11 continued: GREENBELT PARK.		
DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
Feb 1979	Ziek, R. D.	Background Research and Evaluation of Existing Data
BALTIMORE-WASHINGTON PARKWAY		
DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1978	Curry, D. C.	Reconnaissance from the Washington, D.C. Line to the Baltimore City Line, Prince Georges, Anne Arundel, and Baltimore Counties, Maryland
1995	Sonderman, R. C., and M. C. Creveling report pending	Investigation of unanticipated archeological discovery near Rt. 197 interchange

President Roosevelt issued an Executive Order in 1936 to transfer exhausted land to the Department of Interior. One result of this transfer was the establishment of the Chopawamsic Recreation Demonstration Project. In 1940 the Demonstration project became part of the National Park Service and in 1953 Congress authorized the Secretary of Interior to acquire interest in land within the watershed.

Prince William Forest Park is in Prince William County, Virginia just 35 miles south of Washington. It is visited by approximately 500,000 persons per year. Except for the camping areas and trails and boundary areas, park lands are not particularly easily accessible, although they are bordered by I-95 and State Routes 619 and 234. The Chopawamsic Backcountry area is managed as a wilderness.

The park straddles the Fall Line with two-thirds of its land in the Piedmont and one-third in the Coastal Plain. The park is one of the most significant representations of a Piedmont ecosystem in the National Park System. Most of the Quantico Creek watershed is within the park.

The CCC camps are the only intact historical structures in the park, but there are remains of the Pyrite Mine which operated until 1920, abandoned communities and farm sites, and over 30 cemeteries.

In the Overview and Assessment for the park, Parker (1985) suggests that for most of prehistory the park area was a hinterland used in a transient manner. Little intensive settlement is expected to have occurred in prehistoric times. The land was more extensively settled by tobacco farmers in the early 18th century. Small farmsteads and both black and white communities grew during the 19th century. There is a very high likelihood of historic archeological resources throughout the park and a high likelihood of prehistoric sites along the stream drainages.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One prehistoric research topic is the hypothesized use of the area as a "demilitarized zone" between Potomac chiefdoms on Coastal Plain and Siouian settlements in the Piedmont. There are potentially many sites in the park which would indicate transient use of the area.

Another issue is the development of a context for lithic scatters, which are very common prehistoric resources within the park boundaries. Lithic scatters are often dismissed due to a lack of temporal diagnostics, but they potentially hold valuable information on the use of the landscape.

One historical archeological research issue would address 18th and 19th century farming and rural communities (both free black and white before the Civil War and black and white after the war). Research could address consumer behavior, resource sharing and cooperation, competition, and the degree of integration or segregation of races between and within rural communities before the Depression.

Table III.12. Chronological Listing of Work Done at PRWI.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1982	Archeology program memo	limited investigation at Cabin Camp #1
1985	Parker, Patricia L.	Overview of the Prehistory and History of Prince William Forest Park
1990	McLearen, Douglas C.	Phase I Survey of Areas of Proposed Highway Improvements to Route 234 Prince William Forest Park

ROCR - ROCK CREEK PARK

Rock Creek Park was established in 1890 for recreational purposes. It is a large urban park in the northwest quadrant of Washington, DC and is completely accessible by public roadways. Over 2 million people visit the park annually.

Rock Creek and Potomac Parkway were authorized in 1913 "for the purpose of preventing the pollution and obstruction of Rock Creek and of connecting Potomac Park with the Zoological Park and Rock Creek Park."

The park straddles the Fall Line with land in both the Piedmont and Coastal Plain. Rock Creek contains mile-long rapids over the Fall Line. Approximately 80% of the park is in second growth forest.

The built resources in Rock Creek Park are extensive. Pierce Mill, for example, is the only mill remaining of eight along Rock Creek. There are also some of the Fort Circle Parks, some features of the C&O Canal, the Godey Lime Kilns, the Old Stone House, Klingle Mansion, and many other historic resources. It is very likely that many or most of these have archeological resources associated with them. The prehistoric use of quarries within park lands was documented in the late 19th century. Transitory basecamps are also documented.

Inashima (1985:51,83) summarizes some of the uses of the area:

> The regions of the lower falls appears to have been a transitional zone between two mutually antagonistic groups, the Massamacks and the Pascattowies...The almost four centuries of the historic era of the lower Rock Creek Valley have contained a large number of changes. At first, the valley, as it had previously, served as a frontier between different cultural groups. During prehistoric time, it had roughly defined a boundary separating various Indian tribes. Later, it marked an upper limit of contact between the European pioneers and traders and the native Indian groups. Following this, Rock Creek provided the water power to drive the initial industrial base of the Territory of Columbia. In the last century, it has functioned as a natural enclave within the urban confines of Washington, D.C.

Archeological potential within the park is high for both prehistoric and historic resources.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

One prehistoric issue, besides the obvious concerns about quarrying, is the use of the area by mutually antagonistic groups on either side of the Fall Line during late prehistory.

A related historic period question would address the use of the area, perhaps as a trading zone, before European settlers moved into the Piedmont.

Table III.13. Chronological Listing of Work Done in ROCR.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1890 1897	Holmes, W.H.	Investigation of the Quarry Workshops in Washington D.C.
1981	Barse, W.	Investigations of the Potomac Palisades Parcel, Crosstown Watermain Project, Washington, D.C.
1981	Fehr, A. M., and R. A. Verrey	Preliminary Reconnaissance of the Potomac Palisades Parcel, N.W., Washington, D.C.
1981	Fehr, A. M.	Preliminary Reconnaissance of the Proposed Crosstown Watermain - Tunnel Section Foundry Branch Work Site, Northwest Washington, D.C.
1982	Munford, B. A.	analysis of the Piney Branch Quarry Site
1983	Lackey, L. M.	Preliminary Archeological and Historical Survey of a Portion of Fort Reno Park in Washington, D.C.
1983	Soil Systems, Inc.	Survey for Archaeological and Historical Resources along the WMATA E-Route from Fort Totten Drive to the District Line.
1985	Inashima, P. Y.	Investigation of Thirty-One Erosion Control and Bank Stabilization Sites along Rock Creek and its Tributaries (Package 206-42) Rock Creek Park and Rock Creek and Potomac Parkway, Washington, D.C.

Table III.13. Chronological Listing of Work Done in ROCR.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1985	LeeDecker, C. H.	Survey of sections of Fort Totten Park, District of Columbia.
1987	Archeology program memo	Survey for Kahlil Gibran Memorial

The White House has been the official residence and office of every President since John Adams. The surrounding park lands are known as President's Park.

Within this administrative unit are the White House and South Lawn, Ellipse, Treasury and Old Executive Office Buildings, and Lafayette Park. President's Park encompasses the area from Constitution Avenue north to H Street between 15th and 17th streets with the exception of two privately owned blocks flanking Lafayette Park.

The residence act of 1790 authorized Washington as the permanent seat of government and stated that it was necessary to "provide suitable buildings for the accommodation of Congress, and of the President, and for the public offices of the government of the United States" (1 Stat. 130). In 1797 Reservation Number 1 set aside 83 acres for the President's residence and park. This reservation included the present day Lafayette Park, White House grounds and President's Park South.

In 1961 The National Park Service was given responsibility for administering the White House and its surrounding grounds (75 Stat. 586).

The land is within the Coastal Plain and, before infilling during the 19th century, overlooked Tiber Creek. An archeological evaluation of President's Park compared the land contours documented during the late 18th century with the current landscape. It is highly likely that there was prehistoric use of the site and "prehistoric resources may be preserved wherever landscaping of the site has involved the deposition of fill over the original grade of elevated areas" (Pousson and Hoepfner 1995:10). The authors of the evaluation suggest, however, that ground moving and landscaping have probably disturbed most of the potential resources. They infer that the only high probability of survival of intact archeological resources is of the World War II barracks south of the First Division Memorial (Pousson and Hoepfner 1995).

This plan is in agreement with the recommendation of Pousson and Hoepfner that provisions be established for unanticipated discoveries of potentially significant archeological resources in President's Park.

Table III.14. Chronological Listing of Work Done at WHSE.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1977	Young, J. M.	Analysis of Excavations at the White House
1995	Pousson, J. and C. Hoepfner	Evaluation of President's Park

Wolf Trap Farm Park was the first park specifically designated as a national area for the performing arts. In 1966 Congress established it as "a park for the performing arts and related educational programs, and for recreational use in connections therewith" (PL 89-671).

The park is located in a suburban area of northern Virginia and is easily accessible by road. The park is bisected by Trap Road, which connects major highways.

Much of the park is wooded and is drained by Wolf Trap Creek and Old Courthouse Spring Branch. Erosion is a serious problem.

From the 18th century until 1930 the area was a farm. Originally part of the McDaniel plantation, the land continued to be farmed after that plantation was subdivided into tracts in 1850.

There are some prehistoric resources documented at the confluence of the two creeks which run through the park. Although a 1979 assessment assumes that historical archeological resources have been disturbed, that assumption apparently was never tested. It is likely that there are further archeological resources, both prehistoric and historic, in the park.

There is no documentation for known sites within the park in the office of archeologist at the National Capital Area SSO.

Archeological Issues

It is important for the reader to understand that research topics are offered as examples only. There are myriad issues which could be investigated with the resources in the park.

A historic period issue to be addressed would be to document and explain the change in farm life which accompanied extensive economic changes after the subdivision of the plantation. What was the relationship of the occupants in this area with the growing federal city? What were the economic and social consequences for both black and white inhabitants of changing the structure of farming before the Civil War?

Table III.15. Chronological Listing of Work Done at WOTR.

DATE	REPORT AUTHOR(S)	LOCATION AND WORK ACCOMPLISHED
1979	Pousson, John F.	An Assessment of Archeological Resources

IV. REGIONWIDE STRATEGIES FOR ARCHEOLOGICAL INVENTORY

IV. REGIONWIDE STRATEGIES FOR ARCHEOLOGICAL INVENTORY

SCOPE OF PROJECTS

Archeological Overview and Assessment Projects

There are only a few formal Overview and Assessment documents for parks or sections of parks within the National Capital Area (see Table III.1). This plan is designed to serve as an archeological overview of the entire National Capital Area. It provides an overview of history and prehistory within the Potomac Basin (excluding the Shenandoah River Valley). It also provides data on site predictive models and predicted site locations. However, it does not provide the level of detail required at the park level. For example, this plan's overview does not provide historic maps of park areas or details about landforms which are essential for predicting and testing site locations.

An Archeological Overview and Assessment describes the known and potential archeological resources in a given area, such as a particular tract of land, a district within a park, or an entire park unit. The overview consists of a review and summary of existing archeological data and the assessment is an evaluation of these data. For this study, present knowledge is gathered, evaluated, and analyzed to make general statements regarding the nature, distribution, and significance of the resources. Recommendations for future research and predictions about potential impacts on the resource base are made.

The overview and assessment should contain the following information: an abstract, management summary (one to three pages), introduction and description of the study, description of the present natural and cultural environment as it affects both the archeological resources and the ability to conduct archeological research, research goals and strategy, methods of data collection and analysis, summary and evaluation of current knowledge (based on the culture history, ethnohistory, material culture, and archival collections pertinent to the study area), management recommendations, references, and appendices containing a listing of material culture collections, field records, and archives relevant to the archeology and ethnohistory of the study area.

In many instances, an overview and assessment is the first step in an Archeological Survey and Identification Study. As such, the overview and assessment also should contain a research design which spells out the Archeological Survey and Identification Study's theoretical and substantive goals, and the methods by which these are to be accomplished.

Archeological Survey and Inventory Projects

Archeological inventory projects traditionally have focused on single park units and, for the most part, projects proposed in this plan do so as well. No projects involving parks outside of the National Capital Area are proposed in this SAIP plan. While it would be possible to plan such projects, the anticipated difficulties in scheduling funding and sharing resources outweighed the advantages. It remains possible to design such projects if logistical problems can be addressed.

In some cases more than one unit are grouped for an inventory project. For example, the units of Greenbelt and the Baltimore-Washington Parkway, which were transferred from the superintendency of Catoctin Mountain Park to that of National Capital Parks - East in 1995, will be surveyed together. Similarly, portions of National Capital Parks - East (NACE) and the George Washington Memorial Parkway (GWMP) will be grouped together for practical reasons of location and access. The C & O Canal NHP and Harpers Ferry NHP will be split into sections. The C&O Canal, in particular, would be difficult logistically to do as one project, since the park stretches for 185 miles along the Potomac. Two proposed projects incorporate portions of more than one park under a particular theme. A survey of the archeological resources of the Civil War Defenses around Washington, D.C. includes portions of NACE, ROCR, and GWMP. A survey of shoreline changes of the Potomac and Anacostia Rivers includes portions of NACC, NACE, GWMP, and ROCR.

The purpose of an Archeological Survey is to discover and describe the locations, and some of the characteristics of all or a sample of archeological resources in a particular area. This task may be accomplished by an on-the-ground survey, shovel testing, limited excavations, geophysical prospecting, remote sensing, or any combination of the above. An Archeological Survey and Identification Study includes the following sections: an abstract, management summary, introduction and description of the study, research goals and strategy, methods of data collection and analysis, data description and analysis, evaluation and interpretation of the cultural resources, recommendations, and an appendix containing an inventory of the artifacts collected.

For each new archeological site identified during the survey, the appropriate state archeological site form and an NPS Archeological Sites Management Information System form (ASMIS) must be completed. All artifacts and documentation resulting from the archeological fieldwork must be processed according to the procedures outlined in the Regional Archeology Program Laboratory Manual.

Archeological Evaluation Projects and National Register Nominations

Archeological evaluation projects and National Register nominations often will cover just one site. However, in many cases it would be advantageous to complete a Multiple Property Listing nomination for a particular category of sites within a park or throughout parks within a cluster. With a Multiple Property Listing in place, several individual nominations may be prepared and placed in context. One advantage to such an approach is that, because the multiple listing compiles relevant information and explains the significance of many properties, it is readily adaptable to interpretive needs. For example, portions of Multiple Property Listings may be modified into pamphlets or brochures for the visiting public. Such documents also provide park interpreters with ready access to information about their park and neighboring parks.

When archeological survey and inventory has been completed for particular park units, it may be reasonable to prepare nominations of archeological districts. Of course, it is often appropriate to prepare individual nominations for sites which have been evaluated and determined eligible.

The purpose of an Archeological Evaluation Study is to collect and analyze sufficient information to determine whether or not an archeological site or property is eligible for listing on the National Register of Historic Places. Often, evaluation studies are linked to survey and identification studies.

Archeological properties are identified for nomination to the National Register of Historic Places by determining their integrity, research potential, and identifying the National Register criteria that apply to them. Evaluation within the framework of the National Register criteria defines which properties, or classes of properties, are significant, and which attributes of those properties make them significant. In addition to a report fully documenting the results of the fieldwork and analysis (following the general outline given for a Survey and Identification Study), this type of study includes the acceptable completion of the National Register Nomination form(s) for the particular site(s) identified in the Work Order, including original field notes, maps, photographs, figures, and any other data used in preparing the nomination (refer to National Register Bulletin 16A, "How to Complete the National Register Registration Form"). All artifacts and documentation resulting from the evaluation study must be processed according to the procedures outlined in the Regional Archeology Program Laboratory Manual.

INTERACTION WITH NON-NPS PARTIES

As required by NPS policy, implementation of survey and inventory projects will include interaction between the National Capital Area parks and System Support Office and the Historic Preservation Offices of Maryland, Virginia, West Virginia, and the District of Columbia. Survey efforts will be coordinated with the Historic Preservation Offices through the following: use of state site forms, completion and update of old forms, reference to state standards and guidelines, links with existing GIS systems, and progress reports and meetings.

Research designs which include Native American concerns will include consultation with appropriate Native American groups and organizations. Similarly, archeological research of possible interest to other constituencies and communities will involve consultation. An example of a case requiring consultation would be a project with concerns connected with the Native American Graves Protection and Repatriation Act (NAGPRA).

As appropriate, the ethnographic program of the National Park Service may be called upon to assist with consultation. Currently, the Native American groups with which parks in the National Capital Area would be most likely to consult are the factions of the Piscataway: The Maryland Indian Heritage Society, the Piscataway-Conoy & Subtribes, and the Piscataway Indian Nation (see Cissna 1994).

As appropriate for particular research designs and technical reports review will be requested of individual researchers outside of NPS. In some cases scholars based at colleges and universities may be able to obtain outside funding in order to pursue research on NPS property.

The System Support Office (SSO) of the National Capital Area currently holds a cooperative agreements with the University of Maryland, College Park (UMCP) History Department. The recent surveys of Manassas NBP and earlier studies at Harpers Ferry NHP were conducted through the cooperative agreement with the Anthropology Department which expired in January 1995. In addition to Anthropology and History, the American Studies Department provides a further source of talented graduate students who may pursue internships and Masters or Doctoral level research on park archeology issues. Graduate student internships have been coordinated through the Internship Office at UMCP.

The System Support Office of the National Capital Area currently administers an Indefinite Quantities contract (IQ) for all types of archeological services. IQ contracts are renewable for four years in addition to the base year. Greiner, Inc. was awarded an IQ in

FY94. Archeological services also are available through a subcontracted firm with the SSO's Architectural and Engineering IQ.

Harpers Ferry NHP holds a cooperative agreement with the University of West Virginia's Institute for the History of Technology and Industrial Archeology. It is recommended that other parks also pursue cooperative agreements. For example, Prince William Forest Park and Manassas National Battlefield Park could pursue agreements through Mary Washington College's historic preservation program.

Whether operating through a cooperative agreement or contracting for services, it is essential to insist on staffing with professionals. The Secretary of Interior Guidelines (rather than OPM standards) should be used to judge credentials. Professional standards should be strictly enforced for all phases of any project: background research and research design, field, laboratory, analysis and reporting, and collections management.

INTERACTION WITHIN NPS

The Archeology Program of the National Capital Area plans to coordinate with individual parks for the creation and maintenance of GIS data bases for archeological resources and the mapping of resource locations using GPS. Each park should include within its Resource Management Plan a project for GIS recording of cultural resources.

There is no doubt that carrying out projects in-house by hiring and supervising personnel directly is much more cost-effective than contracting for services. However, the difficulties of creating and filling non-permanent positions efficiently sometime seem insurmountable. The creation of a regional, interpark archeological survey team would be the most cost-effective strategy for fulfilling the survey needs of the region. Such a team, whether based at one park, successively at different parks with adequate physical plant, or at a central location, such as a Cultural Resource Center which would serve the National Capital Area, could efficiently carry out survey projects.

Because of the problems involved in hiring archeologists and spending SAIP funds within their allotted fiscal year, it is more reasonable for the present to undertake archeological survey contracting out for services. The SSO of the National Capital Area now has an Indefinite Quantities Contract with a firm to perform the full range of archeological services required for the SAIP projects as well as for other needs. The 5-year IQ which was awarded in FY94 is with Greiner, Inc.

If no internal archeological team can be organized, it is anticipated that the contracted firm will perform much, but not all, of the SAIP projects scheduled during FY94 and the following four years. However, it is recommended to hire personnel to carry out the survey projects for the C&O Canal so that this long-term project can realize the savings of performing work in-house.

SURVEY COVERAGE AND METHODS

> Survey data are not simply preliminary or supplementary to archeological excavation, but rather can provide a means of independently addressing critical research issues concerning the dynamics of regional social organization and structure.
>
> Hantman 1987:99

Systematic survey for archeological sites, therefore, may be structured as research and will contribute critical information for many questions. Such questions include the understanding of long term use of the landscape by many different groups of people, the development of territoriality by competing groups, and the different problem-solving approaches taken by people in different ecological settings.

Appropriate Survey Size

The acreage of National Parks in the National Capital Area comprises a sample, albeit a nonrandom sample, of land in the Potomac Basin. The river basin may be considered as an archeological region but it should be recognized that the scale of human use of any region will change over time. As stated in the section below, *The Argument for Full-coverage Survey*, cultural and ethnic boundaries vary greatly and therefore the scale of functional networks, or "behavioral regions" varies greatly.

The appropriate size of an archeological survey area will depend on the spatial scale of social organization being studied. Because this land has been used by low-density hunter-gatherers and densely packed town and city dwellers and everyone in between, initial archeological survey and inventory should be designed to address this range of variation.

Jeffrey Hantman (1987:99) emphasizes the "need to consider the size of a survey universe prior to drawing conclusions about the nature of regional social organization and demography." He notes (1987:104) that the "trend of the last century towards smaller survey areas is being reversed. This requires more long-term survey research projects which allow more contiguous area to be intensively surveyed or sampled.

Full-coverage survey is ideal, but is not immediately achievable, As discussed below under *Sites and Distributional Archeology*. Ebert recommends multistage surveys at increasing levels of intensity as an approach to ultimately achieving full coverage.

The Argument for Full-coverage Survey

There are strong arguments to be made in support of full-coverage survey, which may be defined as the "examination of large, contiguous blocks of terrain systematically, at a level of intensity commensurate with the research questions being asked" (Fish and Kowalewski 1990:261). Due to difficulties in funding and logistics, it is difficult to accomplish full-coverage surveys in non-research settings and, I would add, it is often as difficult to envision surveys as a research rather than a compliance process.

In their book on the archeology of regions, Suzanne Fish and Stephen Kowalewski (1990:262) argue that

> full-coverage regional survey generates rich data in great amounts, provides the appropriate framework for a broader range of anthropological issues that can be addressed with areal sampling methods, is less costly than commonly perceived, and in the long run is a better use of limited archeological resources.

Fish and Kowalewski argue for the interpretive potential of full-coverage survey, emphasizing that for any survey, the archeologist needs a clear concept of the scale of events under study and the set of techniques appropriate for that scale (1990:262). For example, Ebert's (1992) discussion of "distributional" rather than site-oriented material patterning points up the importance of full-coverage, high-intensity survey for the remains of highly mobile hunter-gatherers since their traces are likely to be difficult to identify with traditional survey techniques. Certainly there is long-term change in the scale and boundaries of regions in terms of common cultural or ethnic identity and therefore survey coverage must be sufficiently flexible and of a large enough area to address boundary variations. To address the issue of complexity, survey must target beyond the level of the site to see functional networks; Fish and Kowalewski (1990:272) term these targets "behavioral regions."

Keith Kintigh (1990:241) argues that to have any chance of recognizing critical patterning in a sample survey, an archeologist must work with quadrat sizes larger than the largest unit of spatial patterning. It is difficult to approach questions of group boundaries with sample survey. George Cowgill (1986) argues that no statistical scheme will make sample survey a good way to understand regional settlement patterns.

Although Fred Plog (1990) disagrees with most of Fish and Kowalewski's reasons for preferring full-coverage survey, he sees two convincing arguments. First, "when one intends a functional and paleoethnographic analysis of the network of relations that existed among the inhabitants of sites in an area, full-coverage data are essential." Second, archeologists need high quality, full-coverage data to understand the best ways to interpret sample data. That is, full-coverage data can act as a control for experimental comparisons of sample sizes and methods.

For the purposes of full-coverage survey, Cowgill (1990) defines a region as an area large enough to include all sites occupied by reasonably well-defined social units during periods of interest. The intensity, that is survey interval, and the sensitivity, that is the probability of detection of an occurrence, depend upon the following: 1) nature of the occurrence; 2) the nature of terrain; 3) the closeness of approach of the observer to the occurrence; 4) the extent to which observers are sensitized to types of occurrences; and 5) the extent to which special techniques are used, such as shovel tests, trenching, GPR, photographs,etc. He argues for high intensity survey if small sites are not to be missed. To gather good data on small sites one should 1) space closely, and 2) rethink and reclassify what are data, considering "non-sites."

Full-coverage survey requires a long-term commitment. Advantages include high quality of information and completeness while disadvantages include the time required and the difficulty of sustaining the commitment as well as the possibility that over time ideas will change about what are adequate data (Fish and Kowalewski 1990:265).

Fish and Kowalewski (1990:266) have some specific suggestions for strategies. Because archeological remains in temperate areas are seasonally observed, sparse and dispersed, archeologists must make repeated visits to the same sites, extending duration of survey as needed. The positive results of such continuous and repeated observation of large areas is supported by other researchers as well. It is also recommended to initially concentrate where the ground conditions are best, controlling for the bias caused by the concentration on accessible areas. There also must be very organized ways of keeping track of the terrain covered and ground conditions at the time of surveys. Locational data may be collected via Global Positioning Satellites (GPS) and data organized in a Geographic Information System (GIS) data base. There must also be flexible artifact inventories so that sequential collections can be merged or separated.

Cost considerations are always a limiting factor of archeological research. "Sample coverage will not produce the same full maps, rank-size graphs, measures of interaction, boundaries, functional hierarchies, or displays of rare and frequent artifact types." (Fish and Kowalewski 1990:275). Not only is full-coverage survey less costly per unit area due to start-up costs, but it is also less costly over the long run because the information gathered can be used for many questions not identified at the time of field work. Full-coverage data may be stratified in various ways according to different environmental and other factors. Jeffrey Parsons (1990:28) also emphasizes this flexibility:

> Full-coverage data are robust and can become relevant to many different questions. Sampling schemes certainly provide good information for some very specific kinds of questions. However, I suspect this information is likely to be increasingly less useful to different questions posed by future investigators.

Parsons (1990) believes that full-coverage is feasible where the main objective is to delineate distributions of large, dense concentrations and that non-site archeology requires its own methodology. Fish et al. (1990:213), however, emphasize that "non-sites," that is, dispersed but related remains, can be bounded by full-coverage but not by standard survey.

The reasons for regional survey have been clearly articulated in the archeological literature in discussions of settlements systems, site function and regional interaction (e.g., Parsons 1972). Full-coverage survey is one of the best ways to detect counter-intuitive settlement patterns (Parsons 1990).

Jeffrey Dean (1990) describes the intensive survey of a small valley in northeastern Arizona, and notes the kinds of information that would have been impossible without full coverage. More satisfactory investigation of his research design, focused on the relationship between settlement behavior and environmental variability, was possible because he was able to record low frequency sites and materials, low visibility sites, and a range of variability. Dean (1990:187) writes,

> However, in our intellectual fascination with the intricacies and apparent certitudes of sampling theory and method, we sometimes lose sight of the fact that our goal is understanding past human behavior, not just the statistical behavior of probabilistic samples. In eliminating the need to estimate site population parameters from statistical samples, complete survey allows us to confront directly the much more fundamental, more difficult, and ultimately more important issue of what kind of sample of past human behavior is represented by the archeological data.

The uncritical standard of 10 per cent or other of random sample limits the results of archeological survey (Whalen 1990). Michael Whalen (1990:222) lists some of the limitations of sampling: 1) for sampling of any sort, the greater the population variance, the less accurately that variance is reflected in a small sample from that population, therefore samples are unlikely to capture the extent of settlement system variability; 2) rare things are likely to be overlooked; 3) much sampling theory is based on parametric assumptions, but archeological sites are not normally distributed and therefore parametric statistics are inappropriate.

Estimates for the level of effort required for full-coverage survey vary. Paul Fish and Thomas Gresham (1990) report 640 person-days needed to survey 53 square km (13,064 acres) of the Wallace reservoir. They quote Kent Lightfoot's estimate that 80 person-days are needed to adequately characterize a 25-acre area using 10 m interval shovel test pits. The difference between an estimate of 20 acres per person-day versus 3.2 person-days per acre reflects the techniques used. Because the Wallace reservoir was totally stripped of vegetation, it was possible to survey the ground surface visually. In most areas, and certainly within the National Parks, there will be few such opportunities excepting following natural disasters such as major forest fires.

Because SAIP is a research-oriented program with a long-term commitment to documenting archeological resources, it is recommended here that full-coverage survey through a variety of methods be the target for each park unit to be surveyed within the National Capital Area. It is recognized that such an effort will require many years and an integrated, coherent program which tracks results effectively. Each park will need to begin with more limited testing which will create a data base to which information can be added indefinitely.

Sites and Distributional Archeology

The concept of a site, a place where there is archeological evidence of past human activity, has been a mainstay of archeological thought and writing. The inadequacy of the site concept has been pointed out occasionally by archaeologists who have attempted to supplement it with "non-site sites" (e.g., Dunnell and Dancey 1983; Lewarch and O'Brien 1981). The definition of what constitutes a site is problematic for archeologists, especially where there are but a few artifacts clustered together in an area of unspecified boundary. It is recognized that the archeological record often is not clustered.

One of the most compelling discussions of the shortcomings of looking at sites alone as evidence of past activity is by James Ebert. In his description of "distributional archaeology," Ebert (1992:7) declares that he is looking at "archaeology based not upon sites but upon the scales and distributions of the actual, definable physical items occurring in the surface archaeological record across large, contiguous landscapes." Ebert's focus on surface material rather than sealed sites lets him concentrate on mobility and human use of the whole landscape rather than on discrete, rare places. He points out that one of the major problems with sites as such is that they presuppose settlement of sufficient duration or repetition that occupants' discards accumulate into an observable archeological record.

While Ebert is probably too critical of the site concept, advocating dismantling it completely, he does have an important methodological contribution, particularly for the archeology of non-sedentary people. There is indeed a continuous archeological record, formed by the activity of people who used the landscape as a continuous whole. Archeology aimed at recovering mobility patterns and use of the landscape must make no a priori assumptions about boundaries or the integrity of clusters of artifacts or features.

Ebert is correct in pointing out that many survey strategies are self-fulfilling. He writes (1992:70) that "many 'meager,' simple behavioral episodes overlap to yield, in some places, a dense record comprised of hundreds of episodes that are not necessarily functionally related." While we cannot see whole systems, we must sample areas as large as possible. Multistage surveys conducted at decreasing intervals to locate sites and clusters are one technique for doing this.

The whole of the archeological record within large areas of landscape needs to be located and recorded. When one, in fact, looks for artifacts as if they might be anywhere, it turns out they are everywhere. The information yield is quite high compared to the definition and recording of "sites" alone. (Ebert 1992:166ff). Sites, in fact, are "but one component of what we really what to know about: systems of human organization" (Ebert 1992:245).

On-the-Ground Survey

Before any archeological field work is done there should be background research and an explicit research design. The purposes of the background research include the following:
a) to develop the property's appropriate historic and prehistoric contexts,
b) to provide background information necessary for predicting and interpreting the property's archeological resources, and
c) to refine and further develop the research questions that the archeological data will be used to address in following the project's research design.

It is also extremely helpful in designing archeological field work to have a geomorphological study done of the park or section of the park to by surveyed. Geomorphological study will help to identify areas in which the likelihood of archeological sites of different ages is high or low. For example, river terraces which are only 4000 years old will not contain sites older than that, nor would it be worth surveying by shovel test pits in floodplain areas where sites are expected to be deeply buried under alluvial deposits.

In the eastern United States, prehistoric sites characteristically have poor visibility (McManamon 1984). The most common constituents of the archeological record are 1) artifacts, 2) features, 3) anthropic soil horizons, 4) chemical anomalies, and 5) instrument anomalies, such as magnetic and electrical properties (McManamon 1984:228). Of these, artifacts are the most widespread and abundant as well as durable and recognizable. Therefore, techniques that detect artifacts are the most effective for site discovery. Techniques for detecting other site aspects are useful for analysis within a site.

Surface inspection and subsurface testing for artifacts have been the most effective methods for site discovery in the eastern woodlands, although remote sensing for soil horizons may prove effective given the right visibility (McManamon 1984).

Frank McManamon (1984) describes and assesses four types of subsurface probes, all of which are limited in depth and therefore useful only for sites close to the surface. 1) Soil cores of approximately 1-inch diameter are better for investigating known sites than discovering new ones. 2) Auger holes 4-6 inches wide can be useful in dense artifact concentrations but soil profiles are difficult to see. 3) Divots, which expose an area of surface, again are useful for dense concentrations. 4) Shovel test pits are the largest volume subsurface probes and may reveal not only artifacts, but features and soil horizons as well. "Screening is a crucial part of the shovel test technique" (McManamon 1984:261), a part not always practiced in the mid-Atlantic.

Archeologists have debated the effectiveness of shovel test pits (STP) for site discovery (e.g,, Kintigh 1988; Lightfoot 1989; McManamon 1984; Nance and Ball 1989; Shott 1985, 1989). Jack Nance and Bruce Ball (1989:411) advocate the use of STPs along with other techniques. Lightfoot (1989:416) declares that in spite of the shortcomings, STPs are the most effective survey method for discovering buried cultural remains on a regional scale.

The factors that affect site discovery using subsurface probes are 1) site size, 2) frequency and intrasite distribution of artifacts, 3) size of probe, and 4) number and spacing of probe (McManamon 1984). Given these factors and the thinly distributed remains on battlefields, it is no surprise that STPs do not usually work will to find artifacts scattered over very large areas. In such cases, particularly in the Civil War parks, the systematic use of metal detectors by archeologists is an effective survey technique which targets one type of resource.

Surface inspection is quick and effective if 1) at least part of the site is on the surface and 2) there is sufficient visibility for site contents to be recognized. In the east, visibility is available, for example, along eroding shorelines, roadway cuts, and in plowed fields. Surface visibility may be improved by plowing or raking,for example, but such disturbance will only improve site discovery if sites are detectable at the surface. Deeply buried sites generally will be detected only through deep trenching.

The following example illustrates how much more productive an archeological survey may be when visibility is extremely good.

Discussing the Wallace Reservoir studies in the Georgia Piedmont, Fish and Gresham (1990) contrast the recovery between subsurface transects spaced at 80 meters, which recovered 18 sites, and full-coverage survey after vegetation removal, which exposed over 3000 sites. Comparison of full-coverage data with that collected in earlier surveys revealed a number of differences: 1) There was an earlier underrepresentation of upland sites; over 8.5% of the full-coverage sites were on land with a slope of over 10%; 2) Very small sites of less than 10 artifacts often were missed in earlier survey; 3) A significant over-representation of Mississippian (large village) sites was apparent in the earlier work with no Paleoindian or Late Woodland Napier material, both of which were well-represented in the full-coverage survey; 4) an average of more artifacts per site was collected in the full-coverage survey.

Except in park areas which are scheduled for construction, there is no reason to anticipate the sort of vegetation removal which would provide such visibility as in the above example.

Remote Sensing and Geophysical Prospecting

For intrasite analysis, non-invasive or semi-invasive techniques are useful for initial characterization of a site or part of a site. Geophysical prospecting is the use of high-resolution geophysical methods for archeological site prospection (not sourcing or dating studies). These methods may also be called "archeological remote sensing," "archeogeophysics," or "archeological prospection" (the term mostly used in Europe). "Remote sensing" is often used by North American archeologists, but conveys to geophysicists the idea of air or space borne imagery only.

The purposes of remote sensing and geophysical techniques in archeology include site discovery, which is generally through aerial reconnaissance, and intrasite mapping. There are differences between traditional methods and geophysical methods for both site discovery and intrasite evaluation. Advantages to geophysical methods are that they are nondestructive and provide rapid reconnaissance. The major limitation to geophysical methods is due to the fact that geophysics is an indirect science using non-contact techniques. The best it can do is detect anomalies, which must be observed directly to be interpreted. Other limitations are that these techniques are instrument intensive, and therefore initially expensive; they detect nonanthropogenic sources for anomalies and noise; there are resolution and depth limitations; and features must be sufficiently different from surrounding terrain to be detected, while anthropogenic features are often quite subtle, creating weak signals.

It is recommended that geophysical prospecting be incorporated into most of the survey projects in the parks. Available techniques are listed and briefly described below. The selection of any particular technique will depend upon local geomorphological conditions as well as budgetary concerns.

Aerial Reconnaissance. Aerial reconnaissance and photography has a long history of use for archeological purposes. Photographs have been taken not only from airplanes, but also from model airplanes, kites, and balloons.

Aerial photographs may detect above-surface features such as structures or soil horizons, shadowmarks caused by structural remains, and plant or soil marks caused by subsurface features or soil horizons (McManamon 1984). Aerial photography is especially good for sites with widespread features and soil horizons.

In the Potomac Coastal Plain, Potter (1993:56) identifies some guidelines for aerial reconnaissance. The best time for low altitude aerial flights is late winter or early spring over a winter crop such as wheat, which grows denser, greener, and thicker over midden deposits. In plowed fields, damp soil marks are most visible right after disc-harrowing done for spring planting.

Electrical Resistivity and Conductivity, including Metal Detectors. Electrical Resistivity is the most flexible and most generally useful technique in the largest variety of sites and is the best method for control or adjustment of depth of investigation (Bruce Bevan, personal communication).

Resistance is measure of difficulty of pushing electricity through ground; more resistance requires more voltage. A map of electrical resistivity map is approximately a map of soil moisture. Because soil changes moisture content seasonally, a map may be missing readings of some major features if drainage and the season prevent productive resistivity work. Therefore, it is best to take readings at different seasons. Resistive structures include walls (stone is usually highly resistant electrically) and isolated structures such as graves. Conductive structures include pits and ditches excavated in resistant material such as limestone or alluvial sands.

Conductivity is the inverse of resistivity and there are other techniques to measure it. Electromagnetic (EM) surveys detect metals (ferrous and nonferrous) and changes in soil conductivity, which may be related to moisture or chemical content. Current is induced into the ground and electrical conductivity is measured. The advantage over resistivity is that resistivity meters must make contact with the ground, while EM meters do not need to. For example, ice and sand are highly resistant and it may be impossible to drive sufficient current into the ground to get resistivity readings. Conductivity is most easily read in saturated soils.

Although often used in illegal and unethical artifact prospecting, metal detectors do have legitimate archeological uses. Metal detectors are electromagnetic devices working at low frequencies. The depth to which they are effective is approximately the diameter of the search coil. Depth also depends on size and orientation of object and amount of corrosion, which increases the signal.

Ground Penetrating Radar. Ground Penetrating Radar (GPR) is commonly used in archeology. GPR works by transmitting high frequency electromagnetic waves into the earth via an antenna and recording the energy scattered back by reflecting objects. A computer calculates this transmission and return and produces a strip chart printout representing the profile of subsurface conditions under the antenna's path. Often results are very subtle. It is best to combine GPR with other methods such as EM (conductivity), resistivity, and magnetometry. A preliminary resistivity sounding will indicate type of soil and depth to which GPR will penetrate. Very clayey soil (low resistivity) will allow very shallow penetration; very sandy soil (high resistivity) will allow deep penetration.

In urban settings GPR, for the most part, is not worthwhile. In fact, most remote sensing is not very effective in urban settings because of interference from buildings, power lines, cars and other objects.

Magnetic Prospecting. Magnetic prospecting is very useful and fairly inexpensive. There are many types of magnetometers. The proton magnetometer is relatively rugged and provides simple, cheap, and accurate survey. Archaeological features may be magnetic or nonmagnetic. Either state can distort the magnetic field enough to be measured. Magnetic susceptibility or permeability is a measure of how easy the magnetic field can penetrate an object or feature. Soils themselves have magnetic properties. If an object, for example, a hearth, is more permeable than the soil, then the magnetic field will be stronger through that object. If an object is less permeable, then readings will reveal a weaker signal surrounded by a stronger signal. There also could be similar permeability of soil and object(s) which would result in very little difference of reading.

Site Data Bases and GIS

The results of all archeological surveys should be entered into a GIS data base. These results include site location and boundaries, isolated artifact finds, and the boundaries of the survey area. Data bases linked to the GIS spatial data base should include information about the intensity of survey and methodology used as well as extensive site information.

In all cases it is essential to protect locational information in all computer data bases so that unauthorized access is not possible.

A Geographic Information System (GIS) is a powerful analytic tool that can make regional data more useful archeologically. It provides for the storage, management, retrieval, display, and the creation of new geographically referenced data (Savage 1990). Landscape archeology theory, data derived from full-coverage regional surveys and the GIS tool may come together and redefine theory. Ezra Zubrow (1990) comments that new problems develop because new solutions are possible and he is sanguine about GIS's potential as a new tool to redefine theory. Crumley and Marquardt emphasize that a dynamic study of regions that incorporates concepts of landscape, scale, sociohistorical and physical structures and boundaries is practical now with the use of GIS.

SAIP projects within the National Capital Area should all be designed to produce GIS data bases and archeological base maps.

V. PROPOSED INVENTORY PROJECTS

V. PROPOSED INVENTORY PROJECTS

For each survey and inventory project the following, at a minimum, should be accomplished. These are detailed as Requirement #3 of SAIP (NPS 1992:6):

1) Consulting and coordinating projects with appropriate NPS and non-NPS projects;

2) Preparing or revising Archeological Overview and Assessments;

3) Preparing research designs for field studies;

4) Undertaking other appropriate studies and activities that are essential to successfully plan and implement archeological inventories; for example, consulting or conducting geomorphological studies; creation and maintenance of GIS and relational data bases, including survey boundaries and intensity and non-site artifact finds as well as site locations; and special studies such as pollen and phytolith analysis, which contribute valuable information to historic cultural landscape studies;

5) Preparing interim and final archeological reports;

6) Recording site locational data on Historical Base Maps;

7) Entering data about archeological resources into the NPS's computerized archeological site data base (ASMIS);

8) Cataloging archeological objects and specimens into the NPS's National Catalog of Museum Objects using the Automated National Catalog System (ANCS);

9) Stabilizing and preparing archeological collections for storage;

10) Preparing National Register of Historic Places nominations for eligible archeological resources (individual sites, Multiple Property Listings, Archeological Districts);

11) Making the projects' results available to park managers, planners, interpreters, and other appropriate NPS specialists; and

12) Making the project's results available to the professional community and to the public, as appropriate.

As stated earlier, this plan may serve as a basic archeological overview for the National Capital Area. Its scope is too broad, however, to provide the requisite level of detail for each park, particularly with regard to background research for the historic period.

Archeological Survey and Inventory Projects are defined for park units within the National Capital Area. The problem statements and project descriptions are reproduced below as they have been suggested or are included in each park's revised Resource Management Plan (RMP). Each park or portion of a park for which survey and inventory are proposed is listed below the first problem statement. There are 27 such projects. Portions of some areas have already been surveyed. Table III.1 and the chronological listing of work done in parks (Tables III.3 through III.15) should be consulted. There are two projects which include land in more than one park: one for the Civil War Defenses of Washington (Fort Circle Parks) and another to document the shoreline changes of the Potomac and Anacostia rivers.

For each of these three problem statements there is a rather generic, but useful, description of the recommended project or activity. The format for Problem Statement and Recommended Project is taken from the RMP format.

Following these three problem statements is a preliminary list of some Multiple Property Listing National Register nominations which could be prepared to provide a context for some of the archeological resources in the National Capital Area. Individual sites evaluations and site nominations to the National Register are not included in this section because decisions about site evaluations need to be made based on park needs and budgetary concerns.

During any annual update of a park's Resource Management Plans, the park may add projects to evaluate archeological properties under SAIP.

Nothing in this section or this plan is to be construed as minimizing the importance of site evaluation. Some reasonable level of survey and inventory, however, would seem to be desirable before focusing time and money on particular sites unless there is a pressing need to do so.

ARCHEOLOGICAL SURVEY AND INVENTORY
PROBLEM STATEMENT:
Archeological survey and inventory of [Park/tract - see below] is insufficient to ensure that archeological resources under NPS stewardship are conserved, protected, preserved <u>in situ</u> and managed for long-term scientific research and for appropriate public interpretation and education. Information about the location, characteristics and significance of the majority of archeological resources is lacking. This lack of information seriously impairs the ability of park managers, planners, interpreters, law enforcement officers and other specialists to carry out their responsibilities. The consequences of having insufficient reliable

information about archeological resources include: (1) Destruction or unacceptable damage to significant archeological sites/structures from development, operations, resources management, visitor use, vandalism or natural/human disasters; (2) loss of significant and scientifically valuable artifacts due to development, operations, resources management, visitor use, vandalism or natural/human disasters; and (3) loss of significant scientific knowledge due to destruction or damage to archeological properties.

Parks and Tracts for insertion above:

ANTI Antietam National Battlefield
CATO Catoctin Mountain Park
CHOH Chesapeake and Ohio Canal National Historical Park:
- Part A: Coastal Plain and Piedmont (50 miles) from Georgetown to Point of Rocks
- Part B: Blue Ridge and Great Valley (75 miles) from Point of Rocks to Hancock
- Part C: Ridge and Valley Province from Hancock to Cumberland

GWMP George Washington Memorial Parkway:
- Great Falls (GRFA)
- Glen Echo Park, Clara Barton National Historic Site
- Arlington House (ARHO)
- Parkway south of Alexandria
- Parkway north of Alexandria

HAFE Harpers Ferry National Historical Park:
- Bolivar Heights and Elk Run
- Short Hill
- Armory Canal
- Armory Grounds
- Camp Hill
- Halls Rifle Works

MANA Manassas National Battlefield Park
MONO Monocacy National Battlefield
NACC National Capital Parks - Central
NACE National Capital Parks - East:
- Greenbelt Park (GREE) and Baltimore-Washington Parkway
- Anacostia
- Piscataway (PISC)
- Fort Washington (FOWA) and Harmony Hall (HAHA)
- NACE (remainder)

PRWI Prince William Forest Park
ROCR Rock Creek Park
WOTR Wolf Trap Park

ARCHEOLOGICAL EVALUATION OF CIVIL WAR DEFENSES OF WASHINGTON
PROBLEM STATEMENT:
To protect the Federal capital against Confederate attack, a ring of fortifications was constructed on the heights around Washington

in the early 1860s. By the end of the war in 1865, there were 68 enclosed forts and batteries with emplacements for 1120 guns. Because the sites provide an elevated circle of greenery, some were acquired in the 1920s for a Fort Circle Drive park development that was never constructed. The National Capital Region maintains 17 Fort Circle sites in the District of Columbia, one in Maryland and one in Virginia. These sites are within the boundaries of three parks: ROCR, NACE, and GWMP.

Archeological survey and inventory of the Fort Circle Parks is insufficient to ensure that archeological resources under NPS stewardship are conserved, protected, preserved in situ and managed for long-term scientific research and for appropriate public interpretation and education. Information about the location, characteristics and significance of the majority of archeological resources is lacking. This lack of information seriously impairs the ability of park managers, planners, interpreters, law enforcement officers and other specialists to carry out their responsibilities.

EVALUATION OF THE SHORELINE CHANGES OF POTOMAC AND ANACOSTIA RIVERS
PROBLEM STATEMENT:
Since the establishment of the Federal City in the 1790s, there has been a great deal of alteration of the natural landscape. Infilling of marshlands and creation of artificial land in particular have altered the shoreline. Such changes affect the archeological potential of a great deal of land within the National Capital Area. The identification of land areas which, for example, could not have been occupied before they were created in the mid-19th-century, will be a valuable planning tool for siting park development needs and visitor services in several parks. Affected land is within the boundaries of four parks: NACC, NACE, GWMP, and ROCR.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY: [for any of above three types of Problems]
It is planned to conduct systematic scientific research to locate, evaluate, and document archeological resources. The project includes an overview and assessment of existing information on prehistoric and historic resources; a field survey and Phase II test excavations to locate, identify, evaluate, and document archeological resources using the criteria of significance established by the National Register of Historic Places; analysis of the data; artifact processing, cataloging, and stabilization; and report preparation; printing, and distribution. The documents produced as a result of this project include an Archeological Overview and Assessment and an Archeological Identification and Evaluation Study. These documents, including an archeological base map, will provide information needed by park managers, planners,

interpreters, law enforcement officers and other specialists to effectively carry out their responsibilities for the protection and interpretation of archeological resources.

Preliminary Suggestions for Multiple Property Listing nominations in the National Capital Area

Prehistoric Lithic Scatters (most parks but especially PRWI and MANA)

Contact Sites and historic period Native American sites (especially NACE, CHOH)

Late Woodland Native American village occupations (especially CHOH, MONO, NACE)

Rural Industrial Development (especially CHOH, CATO, HAFE)

Archeological Resource of the American Civil War (most of the area parks)

Archeological Resources of the Civilian Conservation Corps and Land Reclamation (CATO, PRWI)

VI. PROJECTS IN PRIORITY ORDER

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SYSTEMWIDE ARCHEOLOGICAL INVENTORY PROGRAM PRIORITIES

In the SAIP document (NPS 1992) Systemwide Program Priorities are listed by their factor numbers 1-7, which are intended to be non-hierarchical. These factors are given priorities in this plan and are listed in that order below. An additional regionwide factor for the National Capital Area has been added as the first priority factor.

Ranking of Priority Factor

1. Park units which are particularly visible for political or strategic reasons within the National Capital Area are assigned a high priority.

2. Schedules for archeological inventory projects are coordinated with schedules for development or revision of park planning documents, particularly General Management Plans, Resource Management Plans, Development Concept Plans, and interpretive Prospectuses. (Factor 1)

3. Park areas lacking virtually any information about the presence or absence of archeological resources should be assigned a high priority for preparation of an Archeological Overview and Assessment. (Factor 6)

4. Park areas that have suffered from, or are likely to be threatened by, the destructive effects of natural processes or human activities are assigned a high priority for archeological inventory. (Factor 2)

5. Development zones and special use zones within a park area should be assigned a high priority for archeological inventory. (Factor 3) [this factor seems to be a special case of factor 2.]

6. Archeological inventory projects that address research questions, problems, topics, or priorities of State, regional, or national importance should be assigned a high priority. (Factor 5)

7. The priority of an archeological inventory project should consider the potential for archeological resources being present and the likelihood of being

able to locate (or discover) archeological resources. (Factor 7)

8. Historic zones within parks and entire park units that, by statute, are automatically listed in the National Register of Historic Places because of their archeological or historic importance should be assigned a high priority for archeological inventory. (Factor 4)

Table VI.1 divides the SAIP projects for the National Capital Area into four priority categories. Within each category, parks are listed by the order in which they should be surveyed if funds for survey are limited. This ranking is based upon the above priority factors. It should be understood that these categories and priorities are suggestions based on currently available information as explained below. It is possible, indeed likely, that these priorities will change as park needs and circumstances change.

Table VI.1. Priority Categories for SAIP projects.

Priority #1	Priority #2	Priority #3	Priority #4
ANTI MANA FORT CIRCLE PARKS CHOH MONO ROCR PRWI Shoreline Study	CATO GWMP - GRFA GWMP, PARKWAY SOUTH OF ALEXANDRIA GWMP, PARKWAY NORTH OF ALEXANDRIA WOTR	GWMP - ARHO NACE - FOWA/HAHA NACE - GREE, BWPKWY NACE - ANACOSTIA	GWMP - GLEN ECHO, CBNHS NACE HAFE - several tracts NACE - PISC NACC, WHSE

Priority #1 Archeological Survey Projects

Survey projects in this category are in parks which combine several of the Systemwide and high priorities as listed above. They are highly visible, have major planning documents either being implemented or scheduled, have little archeological information but high research interest and high likelihood of data resulting from archeological survey.

ANTI. ANTI is in the process of implementing its GMP. There is very little archeological information for the park. Archeological resources are threatened by looting. The park holds high research interest for historical archeology in particular and there is a strong likelihood of gathering useful data.

MANA. A new GMP for MANA will be written beginning in FY95, providing a good opportunity to correlate some of the archeological research with the planning process. While there is some high quality archeological survey data for sections of the park, some areas have not been surveyed and some others have not been surveyed adequately. Archeological resources are threatened by looting. The park holds high research interest for historical archeology in particular and there is a strong likelihood of gathering useful data.

Fort Circle Parks. There are Fort Circle Parks in NACE, ROCR, and GWMP. A GMP is being planned for the Fort Circle Parks, providing a good opportunity to correlate some of the archeological research with the planning process. There is little archeological information for these areas. Archeological resources are threatened by looting. These parks hold high research interest for historical archeology in particular and there is a strong likelihood of gathering useful data.

CHOH. There are four DCPs called for in the GMP; each of these will be underway soon if not already nearing completion. These DCPs are for Cumberland, Hancock, Williamsport, and Brunswick. The archeological survey work on the C&O Canal is divided here into three sections. The first, from Georgetown to Point of Rocks, covers 50 miles in the Coastal Plain and Piedmont. Brunswick is in this easternmost section. The second, from Point of Rocks to Hancock, stretches for 75 miles in the Blue Ridge and Great Valley. Both Williamsport and Hancock are in this middle section. The third, from Hancock to Cumberland, covers 60 miles in the Ridge and Valley province. Cumberland is in this westernmost section.

There is some good archeological data for CHOH, particularly from site excavations. However, there has been very little systematic survey. Archeological resources are threatened by looting. This park holds high research interest for both prehistoric and historical archeology and there is a strong likelihood of gathering useful data. The CHOH is especially interesting archeologically because it passes through several physiographic regions and therefore provides good comparative data for floodplain use.

MONO. A DCP was recently completed for the Bush Tract at MONO and there is intended development for the planned move of the Williamsport Training Center to this area of the park. Population is increasing rapidly in Frederick County and, particularly with recent land acquisitions, MONO is becoming a more visible part of the area. The farms that make up and are adjacent to land owned in fee have long been favorites places for artifact collectors. Increased visitation, increased park visibility and looting combine to threaten archeological resources. There is little archeological information for the park. MONO holds high research interest for both prehistoric and historical archeology and there is a strong likelihood of gathering useful data.

ROCR. A GMP is scheduled for ROCR, providing a good opportunity to correlate some of the archeological research with the planning process. The work at Fort Circle parks will provide some information within ROCR. Some areas of the park have good archeological data, but there is relatively little archeological information for the remainder of the park. ROCR holds high research interest for both prehistoric and historical and there is a strong likelihood of gathering useful data.

PRWI. The GMP for PRWI should be approved in FY95 and then implementation will begin. Land transfers also are planned. There is an Overview and Assessment for this large park, providing good background historical research. There is a lack of field data, however.

Shoreline Study of Potomac and Anacostia Rivers. The planning information that this project will produce will benefit four National Capital Area parks. It will allow an informed assessment of erosional as well as developmental threats to cultural resources along the shorelines and will provide important detailed information on the development of the waterfront.

Priority #2 Archeological Survey Projects

The projects in this priority category are, for the most part, in parks without major planning currently scheduled. The areas covered have little archeological information but high research potential.

CATO. There is some archeological information for the immediate area but little for the park itself. The research potential is relatively good, in spite of the eroded condition of the land, which somewhat limits the likelihood of useful data for much of the land. The presence of rockshelters in the park, however, is promising for intact archeological deposits.

GWMP - GRFA. While this area has high research potential and the likelihood of good data recovery, portions have been surveyed, albeit not to current professional standards.

GWMP - Parkway south of Alexandria, including Mt Vernon Memorial Parkway, Jones Point, and Fort Hunt. There is some development planned for Dyke Marsh and Belle Haven. Portions of this part of GWMP have had some archeological reconnaissance. While the status of survey is inadequate and there is a likelihood of recovering good data, there is more information than for many of the Priority #1 project areas.

GWMP - Parkway north of Alexandria. Portions of this part of GWMP have had some archeological reconnaissance and there is an Overview and Assessment for the portion in Arlington County. While the status of survey is inadequate and there is a likelihood of recovering good data, there is more information than for many of the Priority #1 project areas.

WOTR. There is a GMP in process for WOTR. The archeological reconnaissance done for this park in 1978 called for a complete survey, which has never been done. Therefore, there is some information, although it is not complete enough to define the research potential of this park.

Priority #3 Archeological Survey Projects

Priority #3 projects are for areas which tend to have some archeological data, albeit insufficient for either management or research purposes. Due to extensive damage to the land, some of the areas are considered to have low potential to yield useful data.

GWMP - ARHO. While this area has relatively high research potential and the likelihood of good data recovery, it is under very little threat.

NACE - FOWA, HAHA. There is some archeological information available for both of these units. Much of the land within Harmony Hall, however, has yet to be surveyed. The plateau above Fort Washington is also in need of survey.

NACE - GREE, BWPKWY. An archeological reconnaissance was completed for a large portion of the Baltimore-Washington parkway. Although recent construction work has indicated that it was not particularly complete, the information in it is superior to that for many units. While Greenbelt Park has some research potential, it is under very little threat.

NACE - Anacostia. In comparison to many park units, Anacostia has relatively good information for planning provided by a recent assessment. The development of Management Objectives for Anacostia park and the transfer of some new lands to it from the District of Columbia place this park within Priority Group #3 rather than #4.

Priority #4 Archeological Survey Projects

GWMP - Glen Echo, CBNHS. There is little potential for intact archeological resources at Glen Echo. There has been some exploratory work already at the Clara Barton House. The resurvey of these units, therefore, is low priority.

NACE. These areas are included in this project: Capitol Hill Parks, Frederick Douglass NHS, Kenilworth and Aquatic Gardens, Oxon Cove Park and Oxon Hill Farm, Oxon Run Parkway, and Suitland Parkway. Except for the Frederick Douglass home, these areas have received little archeological attention. However, some areas have limited archeological potential and the areas are not under threat.

HAFE - Bolivar Heights and Elk Run, Short Hill, Armory Canal, Armory Grounds, Camp Hill, Halls Rifle Works. There has been a great deal of archeological work in the park, including two recent surveys of large sections. Some portions of the park remain to be surveyed. In comparison with other parks HAFE has had a great deal of archeological work done.

NACE - Piscataway. There has already been an archeological survey of Piscataway park. Resurvey of land currently held in fee will be necessary by the time projects in this category of priority are undertaken. It is hoped that lands held in scenic easement will be available for archeological survey as well.

NACC, WHSE.
The parks in NACC and the White House grounds are of very high visibility, but for the most part do not have high archeological potential due to the infilling of much of the land from swamp. The Shoreline Study under Priority category #1 will provide much needed information for the units within NACC.

VII. ESTIMATED COSTS FOR PROPOSED PROJECTS

VII. ESTIMATED COSTS FOR PROPOSED PROJECTS

For each archeological inventory project the estimated costs should include the full range of anticipated expenses. Because costs vary quite widely between in-house and contracted services, it is nearly impossible to provide realistic estimates without knowing the administrative structure of the project.

The SAIP document (NPS 1992:24) provides the following list of types of expenses. Each project will have special needs. In some cases, for example, required historical background research will be extensive, while in others such research will already have been carried out adequately. Some sites will require more costly field methods. Deep testing on the Potomac floodplain, for example, is more costly than metal detector survey on a Civil War battlefield. Surveys and site investigations will require different sorts of special studies. For example, a well-preserved prehistoric site may provide the opportunity for blood residue analysis of stone tools.

The broad categories which must be taken into account when planning a budget are as follows:

1) personnel (e.g., permanent and temporary positions, contractors, consultants, peer reviewers);
2) travel and per diem expenses;
3) equipment (e.g., computers, cameras, GIS, GPS, remote sensing devices) purchases and leases, and subsequent maintenance and repair;
4) supplies and materials;
5) special data acquisition (e.g., purchase of existing remote sensed or digitized data);
6) special studies (e.g., pollen analysis, radiocarbon dating, archeomagnetic studies, parasite, phytolith, macrofloral, thermoluminescent studies, artifact stabilization);
7) office, laboratory, and storage space;
8) publication costs (e.g., scientific reports and books, non-technical books and pamphlets);
9) attendance at professional meetings;
10) public outreach activities; and
11) any overhead costs.

Table VII.1 provides rough estimates for the cost of the SAIP projects proposed in this plan. These estimates are based on the long experience of the Regional Archeologist of the National Capital Region, now the National Capital Area.

All estimated costs are in current year (FY95) dollars.
Costs per project year are in thousands of dollars.

Table VII.1. Estimated Costs, in Thousands of Dollars, for SAIP Projects, in FY95 Dollars.

PROJECT	YEAR 1	YEAR 2	YEAR 3	YEAR 4
ANTI	60	150	100	100
MANA	50	100	100	100
FORT CIRCLE PARKS	50	50	50	
CHOH, PART A	50	100	150	100
CHOH, PART B	150	150	150	150
CHOH, PART C	100	150	150	100
MONO	100	150	100	100
ROCR	50	100	100	50
PRWI - phase I	50	150	150	150
PRWI - phase II	150	150	100	
SHORELINE STUDY	150	150	150	
CATO	100	150	150	150
GWMP - GRFA	100	150	150	150
GWMP - PARKWAY SOUTH OF ALEXANDRIA	150	150	150	
GWMP - PARKWAY NORTH OF ALEXANDRIA	150	150	150	
WOTR	30	30		
GWMP - ARHO	100	100		

Table VII.1. Estimated Costs, in Thousands of Dollars, for SAIP Projects, in FY95 Dollars.

PROJECT	YEAR 1	YEAR 2	YEAR 3	YEAR 4
NACE - FOWA, HAHA	150	100	150	150
CATO - GREE, BWPKY	100	100		
NACE - ANACOSTIA	60	60	60	
NACC	50	50		
GWMP - GLEN ECHO, CBNHS	60			
NACE - PISC	100	100	100	
NACE	150	150	150	
HAFE - SHORT HILL	110			
HAFE - ARMORY GROUNDS	200	120		
HAFE - ARMORY CANAL	100			
HAFE - CAMP HILL	40			
HAFE - BOLIVAR HTS AND ELK RUN	30			
HALLS RIFLE WORKS	25	30		

Table VII.2 is a fifteen year schedule for many of the priority #1 projects.

Table VII.2. Schedule for Priority #1 projects Fiscal Year 1994 through 2009.

FY94	95	96	97	98	99	00	01	02	03	03	05	06	07	08
ANTI 60	150	150	100											
		MANA 50	100	100	100									
			Ft Circle Parks 50	50	50									
				CHOH, part A 50	100	150	100							
						MONO 100	150	150	10 0					
								CHOH, part C 100	150	150	100			
									PRWI, phase I 50	150	150	150		
										ROCR 50	100	100	50	
												CHOH, part B 150	150	150->
													PRWI, phase II 150	150->

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APPENDIX: REPORTS ON FILE, BY PARK

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Reports on file at National Capital Area Archeology Program Office, by park (does not include documentation on most small-scale clearance projects or most monitoring).

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