

AN OVERVIEW OF ECONOMIC ARCHEOLOGY IN THE MIDDLE ATLANTIC. PART I: SUBSISTENCE¹

Barbara J. Little

Abstract

This is the first of a series of three articles on economic archeology in the Middle Atlantic region. A focus on the broadest definition of economy encourages archeologists to consider social organization, division of labor, and complexity as well as diet and the ecological setting. This overview summarizes issues and data concerning prehistoric and historic subsistence in the Middle Atlantic.

Introduction

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 as a whole 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, I suggest economy as the rubric under which subsistence, uses of the landscape, and human interaction function. This article addresses the first of these, subsistence.

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 (Shott 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 (1990:10) argues that in focusing on diet "archaeology surrenders its unique anthropological potential of documenting cultural organizations not represented in the ethnographic record."

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

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 anthropologist 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

Alain 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.

Testart thinks that storage rather than agriculture marks the turning point in human history. Some of the recent work on the variable complexity of hunter-gatherers (e.g., Price and Brown 1985) 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 Middle 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 found at the Shawnee-Minisink site in the Delaware Valley in a hearth date to $8,640 \pm 300$ B.C. Excavators found fish bones along with hawthorne plum pits, hackberry, blackberry,

grape, Chenopodium, Acalypha, Amaranth, Physalis, ragweed, and sedge (Dent and Kaufman 1985).

Carol 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" (Ebright 1992:410).

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:

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.

(Steele and Powell 1994:189)

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 Middle 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 [as envisioned by 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).

Most archeologists assume that, for most of the Middle Archaic period, people relied on deer, turkey, waterfowl, and anadromous fish for their sustenance. The greater variety of toolkits indicates a broader resource base than pre-bifurcate emphasis on hunting (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 Middle Atlantic prehistory, although it is admittedly far afield. 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 and his colleagues (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. Excavators discovered fruits, tubers, starchy seeds, nuts, shoots, and leaves which would have been seasonally available 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 B.C. - A.D. 1000), Jay 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 changes 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 men 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 oyster 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 B.P. and sunflower and sumpweed appear to be domesticated by 2,900-2,400 B.P. 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 (1978), 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 B.P. and why the Shell Mound Archaic peoples stopped shellfishing about 5,500-3,000 B.P. 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 B.P., 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 Middle 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 1991). Discussions of early gardening focus on data in the midwest (Smith 1992); there are only a few contexts in the Middle 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 Middle Atlantic. The clearance of floodplain forests and disturbance and enrichment of soils around camps were

some factors contributing to domestication (Smith 1992). In the Middle Atlantic the appearance of anadromous fishing camps during the Late Archaic initiated the process of floodplain clearing along interior streams (Mouer 1991). Comparisons between the region's 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.

At the time of European contact, Potomac area Algonquians were relying on a variety of foodstuff. Many of the species used were probably also used during the Woodland period. Algonquians planted corn, squash, gourds, beans, and pumpkin and harvested oysters and many kinds of fish. They gathered wild plant food such as tubers, walnuts, chestnuts, acorns, chinquapins, strawberries, blackberries, raspberries, huckleberries, and herbs (Potter 1993:40-43).

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 Middle Atlantic by A.D. 900/1000 and becomes intensively used by A.D. 1200/1300 (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 (Kavanagh 1984:38ff).

Table 1 provides radiocarbon dates from sites containing plant domesticates from the Potomac and James River basins and adjacent areas. Stephen Potter discusses this information thoroughly in his analysis of Algonquian culture in the Potomac valley (Potter 1993).

TABLE 1. Radiocarbon dates from sites containing plant domesticates from the Potomac and James River basins and adjacent areas (*Source: Potter 1993:144-145*).

<u>ARCHEOLOGICAL SITE</u>	<u>COMMENTS</u>	<u>UNCORRECTED DATES, YEARS A.D.</u>	<u>REFERENCES</u>
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 1983:146-148
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 lumps 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 main occupation	Curry and Kavanagh 1991:15; MacCord et al. 1957:22
Winslow, Md. (18MO9)	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 1987:221-223
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

Only recently could archeologists say that Eastern North America possesses 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 Bruce Smith (1989) points out in his synthesis of eastern North America, was a longer and far more complex process than once thought.

Smith's (1989, 1992) two 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 macro-botanical 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 B.P. (5,050 B.C.). 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 B.P. (5,050-2050 B.C.). 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 (1992:283) also notes, however, that sunflower was not indigenous to the region. During this period there is also a dramatic increase in hickory nuts after 7,500 B.P. 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 B.P. (2,050-1,050 B.C.).

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 B.P. (1050 B.C. to A.D. 250).

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 B.P. (A.D. 250-1150).

This period could be divided into two subperiods based on the rapid adoption of maize and technical innovations associated with it around A.D. 800. The period A.D. 200-800 is marked by a growing

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. 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 is included in the discussion of uses of the landscape (Part II of this overall discussion, forthcoming) 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 do not 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 indicate 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 landowning class to more land, and the documented hiring of Native Americans to hunt for wealthier households. Investigation of 17th-century Virginia faunal assemblages, however, concludes 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 in the upper Potomac, two assemblages from the first half of the 19th century were analyzed from the Master Armorer's 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 to a more urban, market-oriented way of life (Shackel 1994).

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. An 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.

Conclusion

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.

He warns against the tendency to equate subsistence 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 [and historic] livelihood (Tankersley and Isaac 1990:345-6).

Notes

1. This overview is drawn from the author's 1995 *National Capital Area Archeological Overview and Survey Plan*, written while employed by the National Park Service, National Capital Area. Two additional parts of this treatise on economic archeology are planned — uses of the landscape and human interaction function.

References Cited

- Barse, William P.
 1985 A Preliminary Archeological Reconnaissance Survey of the Naval Ordnance Station, Indian Head, Maryland. Manuscript on file, Maryland Historical Trust, Crownsville.
- Bender, Barbara
 1978 Gatherer-Hunter to Farmer: A Social Perspective. *World Archaeology* 10(2):204-221.
- Binford, Lewis R.
 1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45 (1):4-20.
- Boyce, Hettie, and Lori Frye
 1986 *Radiocarbon Dating of Archeological Samples from Maryland*. Maryland Geological Survey Archeological Studies No. 4. Baltimore.
- Braidwood, R.J.
 1960 The Agricultural Revolution. *Scientific American* 203:130-148.
- Claassen, Cheryl P.
 1991 Gender, Shellfishing, and the Shell Mound Archaic. In *Engendering Archaeology*, edited by J. Gero and M. Conkey, pp. 276-300. Blackwell, Oxford.
- Coleman, Gary N.
 1982 The Reedy Creek Site, 44Ha22, South Boston, Virginia. Archeological Society of Virginia *Quarterly Bulletin* 37(4):150-209.
- Crader, Diana C.
 1984 The Zooarchaeology of the Storehouse and the Dry Well at Monticello. *American Antiquity* 49(3):542-558.
 1990 Slave Diet at Monticello. *American Antiquity* 55(4):690-717.
- Cronin, L. Eugene
 1986 Chesapeake Fisheries and Resource Stress in the 19th Century. *Journal of the Washington Academy of Sciences* 76(3):188-198.
- Curry, Dennis C., and Maureen Kavanagh
 1991 The Middle to Late Woodland Transition in Maryland. *North American Archaeologist* 12(1):3-28.
- Custer, Jay F.
 1988 Coastal Adaptations in the Middle Atlantic Region. *Archaeology of Eastern North America* 16:121-135.
- Dent, Richard J., and Christine Jirikowic
 1990 Preliminary Report of Archaeological Investigations at the Hughes Site (18MO1). Manuscript on file, Maryland Historical Trust, Crownsville.
- Dent, R.J., and B.E. Kauffman
 1985 Aboriginal Subsistence and Site Ecology as Interpreted from Microfloral and Microfaunal Remains. In *Shawnee Minisink*, edited by C.W. McNett, Jr., pp. 123-164. Academic Press, Orlando, Florida.
- Ebright, Carol A.
 1992 *Early Native American Prehistory on the Maryland Western Shore: Archeological Investigations at the Higgins Site*. Maryland State Highway Administration, Project Planning Division, Environmental Evaluation Section, Archeological Report Number 1. Baltimore.
- Edwards, Andrew, William Pittman, Gregory Brown, Mary Ellen N. Hodges, Marley Brown III, and Eric Voigt
 1989 Hampton University Archaeological Project, Vol. 1: A Report on the Findings. The Department of Archaeological Research, Colonial Williamsburg Foundation. Report submitted to Hampton University, Virginia.
- George, Richard L.
 1983 The Gnagey Site and the Monongahela Occupation of the Somerset Plateau. *Pennsylvania Archaeologist* 53(4):1-97.
- Gleach, Frederic W.
 1987 The Reynolds-Alvis Site (44He470): A Summary Report. Archeological Society of Virginia *Quarterly Bulletin* 42(4):205-232.
- Halperin, Rhoda
 1989 Ecological versus Economic Anthropology: Changing "Place" versus Changing "Hands." *Research in Economic Anthropology* 11:15-41.
- Isaac, Barry L.
 1990 Economy, Ecology, and Analogy: The !Kung San and the Generalized Foraging Model. In *Early Paleoindian Economies of Eastern North America*, edited by K.B. Tankersley and B.L. Isaac, pp. 323-335. Research in Economic Anthropology,

- Supplement 5. JAI Press, Inc., Greenwich, CT.
- Jackson, Thomas L.
- 1991 Pounding Acorn: Women's Production as Social and Economic Focus. In *Engendering Archaeology*, edited by J. Gero and M. Conkey, pp. 301-325. Blackwell, Oxford.
- Kavanagh, Maureen
- 1984 Phase II Archeological Investigations at the Paw Paw Site (18AG144), Allegany County, Maryland. *Maryland Geological Survey, Division of Archeology File Report* 180, Baltimore.
- Keegan, William F., editor
- 1987 *Emergent Horticultural Economies of the Eastern Woodlands*. Occasional Paper No. 7, Southern Illinois University at Carbondale, Center for Archaeological Investigations.
- LeeDecker, Charles H., Cheryl A. Holt, Daniel P. Wagner, Grace S. Brush, and Margaret Newman
- 1991 *Excavation of the Indian Creek V Site (18PR94), Prince Georges County, Maryland*. Louis Berger & Associates, Prepared for Wallace Roberts & Todd, Philadelphia, and the Washington Metropolitan Area Transit Authority, Washington, D.C.
- MacCord, Howard A., Sr., Karl Schmitt, and Richard G. Slattery
- 1957 *The Shepard Site Study*. Archeological Society of Maryland Bulletin No. 1, Baltimore.
- Manning-Sterling, Elise H., and Stephen C. Atkins
- 1995 *The Role of Hunting in Food Procurement in Seventeenth-Century Virginia*. Paper presented at the Society for Historical Archaeology, Washington, D.C.
- Marquardt, William H., and Patty Jo Watson
- 1983 The Shell Mound Archaic of Western Kentucky. In *Archaic Hunters and Gatherers in the American Midwest*, edited by J.L. Phillips and J.A. Brown, pp. 323-339. Academic Press, New York.
- McKee, Larry
- 1988 *Plantation Food Supply in Nineteenth-Century Tidewater Virginia*. Ph.D. dissertation, Department of Anthropology, University of California, Berkeley. University Microfilms International, Ann Arbor, Michigan.
- Meltzer, David J., and Bruce D. Smith
- 1986 Paleoindian and Early Archaic Subsistence Strategies in Eastern North America. In *Foraging, Collecting, and Harvesting: Archaic Period Subsistence and Settlement in the Eastern Woodlands*, edited by S.W. Neusius, pp. 3-31. Southern Illinois University at Carbondale, Center for Archaeological Investigations, Occasional Paper No. 6.
- Middleton, Arthur Pierce
- 1953 *Tobacco Coast, A Maritime History of Chesapeake Bay in the Colonial Era*. Reprinted by Johns Hopkins University Press, Baltimore, Maryland, 1984.
- Miller, Henry M.
- 1984 *Colonization and Subsistence Change on the 17th-Century Chesapeake Frontier*. Ph.D. Dissertation, Department of Anthropology, Michigan State University.
- 1986 Transforming a "Splendid and Delightsome Land": Colonists and Ecological Change in the 17th and 18th-Century Chesapeake. *Journal of the Washington Academy of Sciences* 76(3):173-187.
- Mouer, L. Daniel
- 1991 Explaining the Formative Transition in Virginia: Concluding Remarks. In *Late Archaic and Early Woodland Research in Virginia: A Synthesis*, edited by T.R. Reinhart and M.E.N. Hodges, pp. 259-273. Special Publication No. 23 of the Archeological Society of Virginia. Deitz Press, Richmond.
- Potter, Stephen R.
- 1993 *Commoners, Tribute, and Chiefs: The Development of Algonquian Culture in the Potomac Valley*. University Press of Virginia, Charlottesville.
- Pousson, John F.
- 1983 Archeological Excavations at the Moore Village Site Chesapeake & Ohio Canal National Historical Park, Allegany County, Maryland. National Park Service, Denver Service Center.
- Prentice, Guy
- 1986 Origins of Plant Domestication in the Eastern United States: Promoting the Individual in Archeological Theory. *Southeastern Archaeology* 5:103-119.
- Price, T. Douglas, and James Brown, editors
- 1985 *Prehistoric Hunter-Gatherers: The Emergence of Cultural Complexity*. Academic Press, Orlando, Florida.
- Reitz, Elizabeth J.
- 1987 Vertebrate Fauna and Socioeconomic Status. In *Consumer Choice in Historical Archaeology*, edited by S.M. Spencer-Wood. Plenum Press, New York.
- 1989 Final Report on the Faunal Remains from the Calvert site. Calvert Interim Report No. 8. Historic Annapolis Foundation, Annapolis, Maryland.
- Riley, Thomas J., Richard Edging, and Jack Rossen
- 1990 Cultigens in Prehistoric Eastern North America: Changing Paradigms. *Current Anthropology* 31(5):525-545.
- Sassaman, Kenneth E.
- 1992 Gender and Technology at the Archaic-Woodland "Transition." In *Exploring Gender Through Archaeology, Selected Papers from the 1991 Boone*

- Conference, edited by C. Claassen. Monographs in World Archaeology No. 11. Prehistory Press, Madison, WI.
- Shackel, Paul A.
- 1994 Interdisciplinary Approaches to the Meanings and Uses of Material Goods in Lower Town Harpers Ferry. In *An Archaeology of Harpers Ferry Commercial and Residential District*, edited by P.A. Shackel and S.E. Winter. Thematic issue of *Historical Archaeology* 28(4):3-15.
- Shott, Michael J.
- 1990 Stone Tools and Economics: Great Lakes Paleoindian Examples. In *Early Paleoindian Economies of Eastern North America*, edited by K.B. Tankersley and B.L. Isaac, pp. 3-43. Research in Economic Anthropology, Supplement 5. JAI Press, Greenwich, Connecticut.
- Smith, Bruce D.
- 1987 The Independent Domestication of the Indigenous Seed-Bearing Plants in Eastern North America. In *Emergent Horticultural Economies of the Eastern Woodlands*, edited by W. Keegan, pp. 3-47. Center for Archaeological Investigations, Occasional Paper No. 7. Southern Illinois University, Carbondale.
- 1989 Origins of Agriculture in Eastern North America. *Science* 246:1566-1571.
- Smith, Bruce D. (with contributions by C. Wesley Cowan and Michael P. Hoffman)
- 1992 *Rivers of Change: Essays on Early Agriculture in Eastern North America*. Smithsonian Institution Press, Washington, D.C.
- Sonderman, Robert C., Matthew R. Virta, Marilyn W. Nickels, and Stephen R. Potter (with contributions by D.A. Hull-Walski, H.M. Miller, J.W. Ravenhorst, and M.H. Simon)
- 1993 Archeology at Harmony Hall: Exploring the Late Seventeenth-Century Frontier of Maryland. Occasional Report #9. National Park Service, National Capital Region.
- Steele, D. Gentry, and Joseph F. Powell
- 1994 Paleobiological Evidence of the Peopling of the Americas: A Morphometric View. In *Method and Theory for Investigating the Peopling of the Americas*, edited by R. Bonnichsen and D.G. Steele, pp. 141-163. Center for the Study of the First Americans, Oregon State University, Corvallis.
- Stevens, J. Sanderson
- 1991 A Story of Plants, Fire, and People: The Paleoecology and Subsistence of the Late Archaic and Early Woodland in Virginia. In *Late Archaic and Early Woodland Research in Virginia: A Synthesis*, edited by T.R. Reinhart and M.E.N. Hodges, pp. 185-220. Special Publication No. 23 of the Archeological Society of Virginia. Deitz Press, Richmond.
- Stewart, R. Michael
- 1993 Comparison of Late Woodland Cultures: Delaware, Potomac, and Susquehanna River Valleys, Middle Atlantic Region. *Archaeology of Eastern North America* 21:163-178.
- Stewart, Michael, and John Cavallo
- 1991 Delaware Valley Middle Archaic. *Journal of Middle Atlantic Archaeology* 7:19-42.
- Tankersley, Kenneth B., and Barry L. Isaac
- 1990 Concluding Remarks on Paleoecology and Paleo-economy. In *Early Paleoindian Economies of Eastern North America*, edited by K.B. Tankersley and B.L. Isaac, pp. 337-355. Research in Economic Anthropology, Supplement 5. JAI Press, Greenwich, Connecticut.
- Testart, Alain
- 1982 The Significance of Food Storage among Hunter-Gatherers: Residence Patterns, Population Densities, and Social Inequalities. *Current Anthropology* 23:523-537.
- Waselkov, Gregory A.
- 1982 *Shellfish Gathering and Shell Midden Archaeology*. Ph.D. dissertation, Department of Anthropology, University of North Carolina, Chapel Hill.
- Watson, Patty Jo, and Mary C. Kennedy
- 1991 The Development of Horticulture in the Eastern Woodlands of North America: Women's Role. In *Engendering Archaeology*, edited by J. Gero and M. Conkey, pp. 255-275. Blackwell, Oxford.
- Whyte, Thomas R.
- 1990 A Review of Evidence of Human Subsistence During the Early and Middle Archaic Periods in Virginia. In *Early and Middle Archaic Research in Virginia: A Synthesis*, edited by T.R. Reinhart and M.E.N. Hodges, pp. 119-132. Special Publication No. 22 of the Archeological Society of Virginia. Deitz Press, Richmond, Virginia.
- Yentsch, Anne Elizabeth
- 1994 *A Chesapeake Family and Their Slaves: A Study in Historical Archaeology*. Cambridge University Press, Cambridge.

Barbara J. Little
National Park Service
National Register, History and Education
P.O. Box 37127, Mail Stop 2280
Washington, DC 20013-7127
barbara_little@nps.gov