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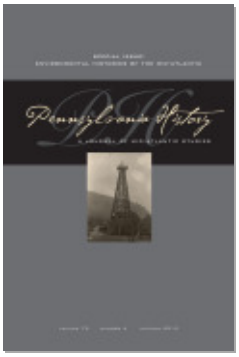

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ENVIRONMENTAL HISTORY OF THE SUSQUEHANNA VALLEY AROUND THE TIME OF EUROPEAN CONTACT

April M. Beisaw

Historical and prehistoric archaeology can contribute to an overall understanding of the environmental history of any region. Archaeological excavation often provides direct environmental data in the form of animal and plant remains (such as bones, pollen, seeds) and indirect data through the documentation of land-use patterns (evidence of agricultural and/or horticultural cultivation, hunting and fishing practices, style and extent of architectural constructions, and so on). These data allow archaeologists to study how past cultures and landscapes impacted each other, often leading to unexpected results.

The impacts of Native American habitation are an important component of environmental history, as Europeans moved into a landscape already modified by Native use. The environment encouraged contact between Natives and non-Natives as both groups sought to live in and pass through areas with easy access to fresh water and abundant plant and animal resources. When they came together, the two groups often traded environmental products, whether foodstuffs or animal skins. Environmental resources were modified and soil erosion accelerated as footpaths

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turned into roads and forests were felled for new villages and agricultural fields. The increased population and the demands of trade with Europe required more efficient hunting practices. Once-plentiful species became rare, while rare and sometimes exotic species moved in to take their place. Furthermore, all of this took place within the context of a major climatic shift known as the Little Ice Age.

The Contact Period (circa 1500–1763) was a time of dramatic environmental and cultural change, and this is exemplified here using the Susquehanna Valley of New York and Pennsylvania (Figure 1). The Native Americans inhabiting this region are now known as the Susquehannock, and history often depicts them as greedy and violent—willing and able to attack anyone from the Chesapeake Bay to the St. Lawrence River. But, does this accurately describe the Susquehannock, or is it merely another dehumanized

FIGURE 1: Map showing the extent of the Susquehanna Valley in white. The locations of sites and counties discussed in the text are also identified. (Adapted from Karl Musser, Susquehanna River Watershed, Wikimedia Commons, http://commons.wikimedia.org/wiki/File:Susq_sub_u.png [accessed March 3, 2010].)

narrative, where the destruction of a group is justified and explained by its unacceptable behavior? Such narratives of "Indian history" persisted until the early 1970s, when civil rights movements raised a general awareness to this form of turning Native Americans into radically different "others."[1] Yet many Native histories still await revision. Here, archaeology and environmental history are used to reconsider the Susquehannock as a people struggling to survive in a time of great change. By shifting away from stories of warfare and disease and towards an understanding of daily lives we can create a more humanized past for us all.

Archaeology and Contact-Period Environmental Change

Before contact, Native groups relied on a combination of agriculture, hunting, gathering, and fishing to provide them with food and raw materials. Overharvesting of resources was minimized by regular relocation, driven either by a conservation ethic or an economic strategy to minimize effort. In the Northeast and Mid-Atlantic, village sites appear to have been occupied for a period of ten to twenty-five years before a new location was sought. More frequent migration was discouraged by the positive impacts of harvesting local resources. For example, the collection of firewood and the regular burning of forests added nutrients to the soil, improving agricultural harvest yields and creating new browsing areas for deer.[2]

The adoption of horticulture and agriculture encouraged Native groups to remain in one place to tend their plants, and the reliability of such food fostered a population increase. According to one estimate, Native populations at contact were ten times their prehorticulture numbers. This can be seen archaeologically in the increased size of villages and in the numbers and types of burials associated with them. But agriculture also increased workloads within a group and increased warfare between groups. Both limited the population explosion. A greater division of labor was needed as some people had to remain with the crops while others traveled for hunting, trading, and raiding.[3] Archaeologically the division of labor can be seen through human remains: stress markers on bones suggest the repetitive tasks that men and women performed, and burial populations with relatively low numbers of young men suggest that they died away from the village.

Investing time and energy in agriculture did not always pay off. Weather, pests, and blights limited annual yields. Deficiencies were offset through

a prior year's surplus or by raiding those of other villages. Each village contained a number of pits dug into the ground to hold such surpluses and they are commonly encountered during archaeological excavation. The pits functioned much like a modern refrigerator, slowing food decomposition by reducing the amount of air exposure and keeping contents cool. They also provided a means of concealing surplus from outsiders. For example, members of Frontenac's 1696 French campaign against the Onondaga in New York spent two days looking for Native stores of food.[4]

Just as contact began, agricultural surpluses were strained by the "Little Ice Age," a period of cooler temperatures that lasted from 1550 until the early 1800s. This climate change reduced the length of the agricultural season, limiting yields but increasing the availability of certain fish.[5] Before contact, environmental shifts like this one were dealt with through an increase in hunting and fishing activities or by migration to a more hospitable environment, but these solutions were complicated by the arrivals of Europeans. The European concept of land ownership deterred migration and their lucrative trade for animal products transformed hunting from a subsistence to a market activity.

Archaeological data can attest to the environmental impacts of European trade. For example, beaver depopulation happened quickly, as unexpectedly low numbers are recovered from historic Native sites. The sudden loss of beaver communities likely impacted local biodiversity because ponds and wetlands rely on beavers for their formation and maintenance. The numbers of white-tailed deer also declined as new and more efficient hunting methods were adopted. Stalking of individual deer was replaced by communal drives, where up to 300 people encircled as many as fifteen deer, driven with the aid of intentionally set fires. Archaeological evidence for a stressed deer population can be seen in the types and numbers of deer bones recovered and estimations of the age and sex of the deer taken. Before contact, the meaty portions of a deer kill were most often brought back to the village. After contact the entire deer was needed for hide processing as deerskin was now more important than deer flesh. Deer were now taken year round, without regard to age or sex. The hides of immature deer were especially prized because of their chamois-like qualities.[6]

Overhunting was not the only reason that animal populations were in decline. The construction of new settlements, Native or European, with their associated agricultural fields increased the degree of forest fragmentation.[7] New settlements created a higher demand for deer as a source of food and

trade goods, while reducing suitable deer habitat. Hunting parties traveled some distance to obtain their prey and this encroachment onto the lands of neighboring groups increased the likelihood of conflict. Old alliances may or may not have mattered when people were faced with these new challenges.[8] Archaeological evidence for population dispersal or encroachment of one group onto the traditional territory of another is often based on distributions of certain pottery styles, although this may be evidence of trade as much as relocation.

To summarize, archaeological evidence of environmental and cultural changes can be seen in the size and location of village and campsites, in the size and density of subterranean storage pits within them, in the types and numbers of plant and animal remains they contain, and in the demographic (age and sex) profiles of humans buried at these sites. Using these data, a comprehensive study of the environmental history of the Contact Period Susquehanna Valley can be undertaken. Such research can provide us with a better understanding of how Native Americans dealt with the environmental and cultural changes that came upon them and can give context to the conflicts that plagued the period.

Environmental History of the Susquehannock

The history of Susquehannock is often a story of conflict without adequate context. According to the *Handbook of North American Indians*, the Susquehannocks are identifiable as a culturally distinct group of Iroquoians around AD 1550, just as the Little Ice Age began.[9] Is this a coincidence or are the Susquehannocks themselves the product of environmental change? The decrease in the growing season surely impacted some Native villages more than others. If local trade was limited by a lack of surplus goods, then conflict surely ensued, new alliances formed, and old alliances were severed. The conditions were perfect for the emergence of a new group, the Susquehannock.

Depending on what source is consulted, the Susquehannock are said to have been more similar to the Seneca, Onondaga, Cayuga, Mohawk, Erie, Wenro, Delaware, or Lenape.[10] This list includes just about every Contact Period Native group of the region. The Susquehannock are therefore somewhat distinct in their non-distinctiveness. They clearly interacted with many cultures and may have been multiethnic. Many Susquehannock archaeological sites also contain artifacts associated with an earlier Native group, the Shenks

Ferry, possibly because different cultures usually have similar criteria when it comes to selecting village sites. But we also have evidence of cohabitation; pottery that melds both Shenks Ferry and Susquehannock styles in one vessel have been explained through the marriage of a Susquehannock man to a Shenks Ferry woman.[11] An alternative explanation is that in response to environmental change and European contact, some Shenks Ferry became Susquehannock.[12]

The earliest Susquehannock sites are found along the North Branch of the Susquehanna River and archaeological studies provide us with an understanding of their reliance on horticulture and agriculture. Plant remains from several Susquehannock burials at the Engelbert site in New York include seeds from cherries and at least three berry varieties (raspberry/blackberry, elderberry, hackberry), showing that the site inhabitants considered these wild fruits important. Isotopic analysis of human bone from the same site show that the Susquehannocks were also established agriculturalists. Marsh-grass-lined storage pits at the nearby Blackman site in northern Pennsylvania suggest that Natives were successful as surplus corn was being stored for some period of time.[13]

Most narratives have the Susquehannocks abandoning the North Branch not long after their appearance there, migrating toward the Chesapeake Bay, and arriving in the region of Lancaster County, Pennsylvania, by 1580.[14] The reasons for this migration are commonly attributed to conflict with the Five Nations Iroquois to the north or European trade opportunities opening up to the south.[15] Environmental stress brought on by the Little Ice Age should be added to this list. Regardless of the motivation for the move, these southern Susquehannock sites have become the focus of Susquehannock archaeology. Data from these sites show that hunting was an important part of the Susquehannock economy.

Once in Lancaster, the Susquehannocks exploited a variety of habitats to obtain a range of animals. A study of the animal remains from the Eshelman site of southern Pennsylvania found butchery marks on the bones of wolf, gray fox, black bear, raccoon, bobcat, mountain lion, beaver, deer, elk, turkey, Canada goose, and bald eagle.[16] The placement of deer-bone cut marks shows that the Susquehannocks were maximizing hide recovery and doing so in a standardized way. Similar patterns of hide recovery were not seen on deer bones from the northern site of Engelbert (Figure 2).[17]

Another study combined southern Susquehannock animal bone data with population estimates and historical records of the fur trade to evaluate

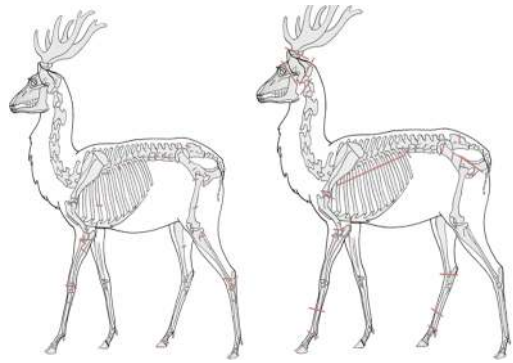

FIGURE 2: Locations of butchery cut marks on deer and elk bones from the Engelbert (*left*) and showing the absence of cut marks on the upper legs at Eshelman (*right*) archaeological sites.

changes in hunting techniques. The density of Susquehannock hunters in the Lancaster region is believed to have increased by 800 percent from 1575 to 1665 CE, while demands of the fur trade increased by 400 percent over the same period of time.[18] This fueled competition for animal resources as well as the demand for improved hunting technology (firearms). Susquehannock hunters had to exploit new habitats to meet the demand. This may explain the discovery of several Susquehannock sites in areas not known as their historic territory, such as the Upper Potomac Valley. One such example is the Pancake Island site in Hampshire County, West Virginia. This "intrusion" into the Potomac Valley put the Susquehannocks in Algonquian territory.[19]

A detailed comparative analysis of Susquehannock subterranean storage pits is needed to help assess their agricultural success through time. For example, only six storage pits were identified at Pancake Island, suggesting little need to store surpluses. This supports an interpretation that Upper Potomac settlements were focused on hunting for the fur trade, not general village sites.[20] A region-wide analysis of pits is hindered by the fact that many Susquehannock sites were built on, or developed out of, sites occupied by earlier cultures. Therefore it can be difficult to understand which storage features belong to the Susquehannock. Also needed is a critical analysis of the time gap between the Susquehannock and "earlier" occupations; if the time gap was insufficient for environmental recovery

to have occurred, then the Susquehannock were constantly moving into environmentally stressed areas.

Back in the Lancaster region, the Susquehannocks were experiencing a period of low fertility. A study of the human remains from six southern Susquehannock sites found that fertility was lowest during the period between 1625 and 1680, during their "war" with the Five Nations Iroquois.[21] The Susquehannock people were spread out and struggling to meet the demands of European trade in an already stressed environment, while at the same time managing conflict with their neighbors. Fewer Susquehannocks meant fewer mouths to feed but also fewer hunters and traders. The Susquehannock way of life was in decline.

History often cites 1763 as the end of the Susquehannocks, but we know that many Susquehannock joined other Native groups and some maintained a Susquehannock identity long after the infamous massacre by the Paxton Boys, by which time they were known as the Conestoga.[22] The Susquehannock vacated the Susquehanna Valley, but they left a lasting imprint on its environment. As Euro-Americans moved in, surveyors followed Indian trails to establish property boundaries. In doing so they recorded the species of prominent trees, known as witness trees. A study of eighteenth-century land records in the Lancaster area was used to compare trees near former Susquehannock sites to trees elsewhere in the region.[23] Areas with a history of Native occupation had elevated frequencies of hickory, walnut, and black locust, with depressed frequencies of white oak. The high frequency of walnut has been attributed to Susquehannock management of nut trees.[24] The low frequency of white oak is probably from years of construction use. As white oak is a key food source for game species (deer, turkey, rabbit, and squirrel), we can assume that the populations of these animals were depressed toward the end of the Susquehannock occupation and remained so for some time afterwards.

Contact with Europeans brought new diseases and warfare to the Susquehannock but these were not their only sources of stress. Their homeland, the Susquehanna Valley, had undergone many years of modification by human habitation, and it modified the cultures of those who lived within it. The Susquehannock were forced to deal with climate change, resource modification, and depletion, and the demands of European trade relations concurrently. These stresses reduced their birth rate and put their population numbers in decline. Many migrated out of the region, leaving behind a valley that was forever changed by their presence.

Conclusion

Around 1550 AD, the Susquehanna Valley was hit with three major changes: average temperatures fell enough to shorten the growing season of summer crops; the Susquehannock culture replaced the Shenks Ferry; and European explorers, traders, and settlers moved into the region. The Susquehannock dealt with climate change by migrating south to more productive agricultural lands, increasing their time spent on hunting, and trading with their new European neighbors.

Trade may have initially eased the stresses brought on by the reduced growing season, but it created its own environmental impact. Key species such as beaver and deer were overhunted as furs and hides became more important than the amount of meat they could provide. The loss of beaver communities and overharvesting of white oak were just two ways in which biodiversity and game species habitat were impacted. Some Susquehannock ventured out of the Susquehanna Valley and into other territories, such as the Upper Potomac Valley, for the hunt. Spread thin and unable to migrate in the new geopolitical landscape of Euro-America, the Susquehannock way of life was in jeopardy.

Historical documents suggest that the Susquehannock were strong until the mid-seventeenth century. From a military perspective, their decline appears sudden and without explanation. But from an environmental perspective, their decline is the result of a stressed population living in a stressed environment. The historic Susquehannock way of life, with its focus on the fur trade and the demands of managing simultaneous conflicts with a variety of groups, was unsustainable. Their population declined not only from losses on the battlefields but also from low fertility. The culture likely born out of its ability to adapt to natural environmental change failed to adapt to the environmental changes that they helped bring about.

Environmental histories such as this can provide a fresh perspective on the Contact Period throughout the Mid-Atlantic region and beyond. Historians, archaeologists, and environmental scientists should work together to rewrite the stories of Native groups who "disappeared" during this time. By shifting away from dehumanized stories of warfare and disease and toward stories of daily lives, we can create a more humanized, truthful, and compelling past. The Susquehannock were not enigmatic gigantic cannibals focused on warfare and the accumulation of wealth. They were people living during a time of great change and we can learn from their struggle.

NOTES

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11. Kent, *Susquehanna's Indians*. Six factors believed to be the most crucial for determining prehistoric settlement patterns are slope, drainage, proximity to potable water, aquatic food resources, terrestrial food resources, and good soil for agriculture; see Ritchie and Funk, *Aboriginal Settlement Patterns in the Northeast*, 80.

12. Ironically, archaeological attempts to understand both Susquehannock and Shenks Ferry history is hindered by continued site reuse. Moorehead's 1916 Susquehanna River expedition encountered this problem. "Towns are now built on the best Indian sites and it is therefore very difficult to locate places where one might excavate." See Moorehead, *A Report of the Susquehanna River Expedition*, 73. Many Susquehannock sites lie beneath the American villages and cities and most were destroyed by these newer constructions before archaeology became a regular precursor to construction.
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