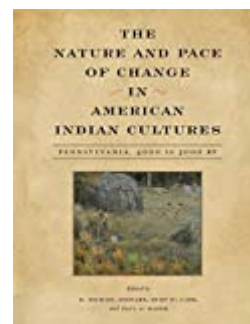


R. Michael Stewart, Kurt W. Carr, Paul A. Raber, eds. *The Nature and Pace of Change in American Indian Cultures: Pennsylvania, 4000 to 3000 BP*. University Park: Penn State University Press, 2016. 152 pp. \$24.95 (paper), ISBN 978-0-271-07095-7.



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This edited volume is the result of a symposium that was organized by two of the three co-editors, Kurt Carr and R. Michael Stewart at the 2009 Annual Meeting of the Society for Pennsylvania Archaeology. The editors have compiled a series of papers that seek to explain what environmental and societal factors may have been responsible for producing the Transitional Archaic period, one of the most enigmatic periods in the prehistory of Pennsylvania. This 1,800-year-long archaeological period from 4,500-2,700 years before the present (BP) straddles the earlier Middle and Late Archaic periods with the Early Woodland period and is characterized by a number of changes in the archaeological patterns of material culture that preceded and followed it. These included changes in settlement strategies, shifting away from upland valleys toward the larger river valleys, where resources of the bottomland forest were exploited by people wielding wide-bladed knives and projectile points known as broadspears, along with widespread use of fire-cracked rock pits, carved steatite (soapstone) bowls, and the first pottery. Authors in this book apply results from archaeological, geological (geomorphology, hydrology, and soils studies), and climatological (pollen studies) research conducted throughout the Middle Atlantic region for the past sixty years to arrive at answers to what led to such a sig-

nificant change in how people lived.

The book is organized into an introduction and seven chapter contributions from different authors. Co-editor R. Michael Stewart's introduction summarizes each succeeding chapter's principal contribution, and provides detailed theoretical background from previous research on causal explanations for the cultural changes that took place during the Transitional Archaic period. These explanations include interdependent factors of environmental change, demographic change, technological change, as well as societal changes in settlement, subsistence, and exchange interactions. It is in the context of these kinds of changes that the remainder of the book is organized.

Chapter 1, by Frank Vento, is focused on the role of climate change to warmer and drier conditions from 4,200-3,000 BP as a possible causal explanation for the cultural changes witnessed during the Transitional Archaic period. According to Vento, evidence for this warmer and drier climate comes from geomorphic, soils, and pollen studies. Vento argues that the upland region would have been less preferred for human settlement during this warmer and drier climatic episode when smaller streams would have been less likely to have con-

tinuous water flow, thus reducing the availability of animal and plant resources. Climatic evidence points to an increase in precipitation after 3,000 BP, which roughly corresponds to the end of the Transitional Archaic tradition.

In chapter 2, Robert Wall defines the Late Archaic Lamoka archaeological tradition that immediately preceded the Transitional Archaic period in terms of settlement and subsistence strategies and stone tool technology. Wall focuses on the Upper Susquehanna valley of northern Pennsylvania and southern New York, using the Lamoka Lake site in New York as the comparison site for this Late Archaic tradition. He describes Lamoka settlement patterns as having year-round occupation in the larger river valleys, with seasonal movement in the warmer months into the uplands. The presence of netsinkers at a number of these Lamoka sites in Pennsylvania suggests exploitation of fish spawns in the larger rivers. Finally, the projectile points are characterized by a Narrow-Stemmed tradition, which precedes the Broad-spear traditions of the Transitional Archaic period. There does, however, seem to be some significant overlap in the calibrated radiocarbon dates that Wall provides for the preceding Lamoka tradition in Pennsylvania with that of the Transitional Archaic period ranging from 4,450-3,350 BP, which clearly overlaps with the Early and Late Broad-spear phases from 4,300-3,200 BP presented by Carr in Chapter 3. Either the dates presented by Wall are not accurate, or the Lamoka Late Archaic tradition existed for a far longer period of time than it did in the southern Susquehanna and Delaware River valleys of eastern Pennsylvania.

Chapter 3, by Kurt Carr, is a thorough synopsis of the chronological changes that occurred in the material culture assemblages at sites during all three phases of the Transitional Archaic period: the Early Broad-spear (4,300-3,700 BP), Late Broad-spear (3,700-3,200 BP), and Fishtail (3,100-2,700 BP) phases. I would in fact recommend that Carr's chapter be read first to gain the necessary overview of the archaeological correlates for this period and to understand how and why it was different from what came before and afterward with regard to changes in the environment, technology, and society.

Carr's central premise is that some human populations in Pennsylvania developed a more successful adaptive response to the warmer, drier climate, which in turn produced an increased technological efficiency that resulted in the Transitional Archaic tradition. According to Carr, the Early Broad-spear phase (4,200-3,700 BP) was

an adaptive response to a less predictable natural environment in which people increased their settlement density in the larger river valley floodplain areas, constructed large fire-cracked, rock-filled features to mass-process food through roasting, stone boiling, or steaming, and developed a broad-bladed tool that could be mass-produced and easily modified into a knife, spear tip, drill, or hide scraper with very little effort. Narrow-stemmed point types continued in use from the earlier, Late Archaic period, but Carr notes that most of them were made from local, small chert cobbles that did not require the larger pieces of quarried stone necessary for the production of the broad-bladed, bifacially flaked spear points. The focus on quarrying activities for special, non-locally available toolstone of jasper, metarhyolite, and argillite suggests to Carr that human populations increased their interaction through trade and exchange to expand their support networks and reduce risk through uncertain times as populations increased in the river valleys. During the succeeding Late Broad-spear phase, broadspears become more regionally distinctive as a social marker of identity that might be used to identify trade partners. In addition, the phase witnesses a continuation of intensive use of floodplain sites associated with large, fire-cracked, rock-filled food-processing features along with the first appearance of steatite vessels. Starchy residues on steatite bowls reveal evidence for the cooking of wild tubers, nuts, and/or starchy seeds of wild and possibly domesticated grasses and leafy weeds like that of the *Chenopodium* plant. All of these plants became an important addition to the diet and suggests a move toward intensive harvesting, cultivation, and possible domestication of particular seed-bearing plants to feed growing numbers of people. Steatite quarries have been identified in southeastern Pennsylvania and therefore their widespread distribution during the latter part of the Transitional Archaic period marks their addition to the long-distance exchange relationships between different populations. The final Fishtail phase marks the first appearance of steatite-tempered pottery, which began to replace the heavier and harder to acquire steatite bowls that disappear by 3,000 BP. Also, the largest fire-cracked rock features appear along with a smaller and narrower bladed projectile point with a fishtail-stemmed base. Along with the plants exploited from the earlier phase, squash residue was recovered from one vessel from this final phase. By the end of this phase, the regionally socially distinctive projectile points were no longer being made and the long-distance exchange system considered necessary for reducing risk in an unpredictable environment was no longer in use as precipitation in-

creased and people began to rely again on locally available materials for their tool technology, as they had done during previous periods.

In chapter 4, Patricia Miller provides a contrasting viewpoint to that of Kurt Carr in arguing for far more continuity in the cultural adaptations from the Late Archaic through the Transitional Archaic and on into the Early Woodland period. Unlike Carr, Miller argues that broadspears were not a response to a changing environment, but instead were added to an existing tool assemblage and served a functional role as knives rather than spear points, while the narrow-stemmed varieties that had existed since the Late Archaic served the purpose as projectile weapons. In sum, Miller concludes that it was not a warmer, drier climate, but instead increasing population density that was the driving factor in intensifying plant harvesting and processing and in establishing long-distance exchange networks of rhyolite broadspears and steatite bowls.

In chapter 5, Joseph Blondino provides an excellent analysis of the Fishtail (called "Orient phase" in this region) phase in the Upper Delaware Valley using archaeological data recovered from surveys and excavations. Blondino notes that excavators at the Driftstone site identified a number of large, fire-cracked, rock-filled features like those found in other Fishtail phase sites throughout eastern Pennsylvania. Even though previous interpretations of these features have suggested their use for drying or smoking fish due to their close proximity to major rivers, neither fish bones, thermally altered sediments, ash, or identifiable charcoal have ever been recovered from these features. Blondino therefore interprets the features as being dumps where rocks were discarded from stone boiling, roasting, or steaming activities found elsewhere on the site. He then hypothesizes that perhaps the location of the Driftstone site on a small stream connecting the Delaware River to the adjacent uplands might provide a clue as to the rock-filled-pit feature's function. After conducting an extensive review of the Pennsylvania Cultural Resources Geographical Information System (CRGIS), he found that 72 percent of Orient phase sites in the Upper Delaware Valley were located along a small stream associated with a marshy wetland habitat as it entered the larger river valley floodplain. Blondino also found that over 80 percent of these site locations had earlier Broadspire components, suggesting that the association of settlement proximity to wetlands and fire-cracked rock-filled features was continuous throughout the Transitional Archaic period. He concludes that the wetland habitat would have provided an abundant va-

riety of aquatic plants and animal species that prehistoric people could have exploited. Given the presence of wild lily tuber residue on some steatite bowls mentioned in chapter 3 by Carr, it would appear that Blondino's aquatic plant-processing hypothesis for the function of fire-cracked rock features is quite plausible and needs to be tested with further residue analysis and flotation studies.

In chapter 6, Heather Wholey uses data from the Pennsylvania Archaeological Site Survey (PASS) files to calculate population density changes from the Broadspire to the Fishtail phases in the Susquehanna and Delaware Valleys. Wholey uses component density (number of Broadspire vs. number of Fishtail components per square kilometer) maps and data tables to illustrate her argument that a marked decrease in population density in the Fishtail phase reflects an organizational change from macrobands of the Broadspire tradition to that of smaller, more mobile microbands during the Fishtail phase. However, I would caution that the use of component density measures is not equivalent to a measure of population density. Wholey measures component density by the number of sites containing at least one diagnostic artifact (Broadspire or Fishtail projectile point) recorded in the site files without regard to site size or occupational duration, which is a necessity for estimating population density of groups of seasonally mobile hunter-gatherers. In fact, I would argue that if Fishtail phase populations did break up into a greater number of smaller microbands as Wholey contends, then, using her criteria for measuring population density, we should expect to see a higher component density, not a lower one as she records. I would argue that fewer components per square kilometer could be the result of populations concentrating into a few larger sites on the larger river floodplains, which is the opposite of the conclusion reached by Wholey. This pattern of population congregation, however, might better explain why Fishtail phase sites contain both a greater number and the largest fire-cracked rock features to meet the needs of larger groups of people occupying each site.

In the final chapter, Roger Moeller states in the abstract that his primary focus is to determine if the functional role of the large rock-filled features was to process fish, and if so, how such fish processing changed after the Transitional Archaic period, when these features disappear from the archaeological record. To address his primary research question, Moeller reviews his own experiences excavating Fishtail (Orient) phase sites in Pennsylvania. He then goes on to review the archaeo-

logical literature for the Transitional Archaic period from New York to Virginia in search of evidence for fish processing in association with these same rock-filled features, only to find some evidence of net sinkers, but no fish bones or artifacts directly related to fishing. This does not deter Moeller, however, from observing that when fire-cracked rock features are found in other archaeological periods they are associated with intensive fish-processing activities, leading him to assume that the rock-filled features of the Transitional Archaic therefore must also have been used for fish processing, regardless of any real confirmatory evidence in support. He notes a very clear inverse relationship between the presence of rock-filled features and the increased presence of pottery, such that his ultimate conclusion is that an increasing reliance on processing and cooking a variety of plant foods led to the proliferation of pottery and a decreased emphasis on large-scale fishing that would require cooperation among larger macroband groups. I would argue, however, that until adequate flotation studies reveal a greater presence of fish bones at the sites with these presumed fish-processing features, that this fish-processing hypothesis remains untested, leaving open the possibility that these features were instead used for processing

wild aquatic plants, as Blondino suggests in chapter 5.

Overall, this book is a valuable resource for those interested in understanding how environmental and archaeological evidence is used in different ways to support interpretations about what made the Transitional Archaic adaptation uniquely different from what came before and what came after. Essentially, each author is using the same archaeological data sets from survey and excavations from sites in the Middle Atlantic region, but their interpretations of these data sometimes differ, producing different conclusions. While the book is illustrated throughout with artifact photos, maps, tables, and charts, the presentations can be somewhat technical for a layperson. Despite the detailed presentation, I was surprised to find no photos comparing the diagnostic artifacts for each of the three phases of the archaeological period that was the primary focus of the book. Nevertheless, I would recommend this book for undergraduate- or graduate-level reading related to the archaeology of the Eastern Woodlands.

[Erratum: This review has been amended to correct an error in the first paragraph. The Transitional Archaic period was 1,800 years long, not 18,000.]

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