**Lithic Quarries in Pennsylvania: The Archaeology of Tool Stone Procurement**

**ABSTRACT**

The study of tool stone procurement and distribution has been a long-standing interest for archaeologists in Pennsylvania and surrounding regions. Despite this, there have been few systematic archaeological studies of quarries, outcrops and secondary sources. This symposium summarizes the available information on quarries and other tool stone sources and the exploitation of these resources by the prehistoric inhabitants of Pennsylvania, both hunter-gatherers and horticulturalists.

*The Geologic Origins and Distribution of Tool Stone in Pennsylvania.*
Frank J. Vento,

This paper will discuss the origin of various lithic raw materials including chert, jasper, quartzite, quartz, metarhyolite and argillite utilized by prehistoric populations in Pennsylvania and the types of analytic techniques (hand samples, thin sectioning; X-ray diffraction; X-ray fluorescence and neutron activation/REE) that are used to determine raw material provenance. Most of these analyses are time consuming, destructive and costly. Chert is the most commonly used material in Pennsylvania but also the most difficult to source. So what do we do?

*An Overview of the Recorded Tool Stone Quarries in Pennsylvania.*
Kurt W. Carr, Senior Curator of Archaeology, The State Museum of Pennsylvania

In Pennsylvania, the main lithic types for chipped stone tools are chert, jasper, quartzite, quartz, metarhyolite and argillite. This presentation will focus on the nature of bedrock quarries, specifically how the tool stone was extracted and the distribution of these types based on the PASS files. Chert is the most widespread of these although the package size varies and this affects the potential size of cores. Eastern Pennsylvania contains a variety of lithic types, some of which are reasonably distinctive and can be easily sourced (jasper, metarhyolite and argillite). The Upper Ohio basin contains a variety of chert types, unfortunately they are not accurately or consistently reported in the PASS files and sourcing studies are not as easily accomplished.

*Jefferson County Chert*
Kenneth Burkett, Executive Director of the Jefferson County History Center in Brookville, PA

Vanport Siliceous Shale (also known as Jefferson County Chert) is a poorly recognized lithic material that is found within the geologic context of northwestern Pennsylvania. This paper will help to identify the sourcing area and discuss a series of local quarry sites and its known utilization by prehistoric Native American populations.
The Exploitation of Quartzite in the Lower Juniata and Susquehanna Valleys: Outcrops and Cobble Sources  
Paul A. Raber, Heberling Associates, Inc.

Studies at 36Ju104 on the Juniata River and 36Da159 on Susquehanna River allow a comparison of the use of (ortho) quartzite outcrops and river cobble sources. Travelers through the Lewistown Narrows camped at 36Ju104 for over 8000 years and used Tuscarora quartzite from nearby outcrops mainly for expedient tools. At 36Da159 the inhabitants used easily obtainable stream cobbles of Tuscarora quartzite for both formal and expedient tools, although outcrops occur nearby. Quartzite use through time at the two sites is compared to examine variation in why and how quartzite was used.

Sourcing and Studying the Source: Bald Eagle Jasper Quarries and the Houserville Habitation Complex  
Barry Sheetz and Tim Murtha

Relying on excavated material from site the Tudek Quarry (36CE238) and the Houserville habitation complex in Centre County, Pennsylvania, we describe and analyze the spatial and temporal dynamics of the extraction and production of lithic material from this prospect site. In previous studies, we emphasized a technological approach towards studying these materials. In this paper we revisit and review the sourcing studies that accompanied artifact analysis, along with spatial analysis of artifact distribution and radiocarbon dates.

Chert Sourcing Studies in Western and Central Pennsylvania  
Beverly Chiarulli (IUP retired) and Gregory Katz (Louis Berger)

This paper compares prehistoric chert quarrying and use patterns in the Ridge and Valley and Appalachian Plateau provinces of Pennsylvania. In both cases a variety of raw materials were used to make stone tools. Twenty-five bedrock and float sources of Shriver Chert from Snyder County in the Ridge and Valley were identified, of which only three showed unequivocal evidence of prehistoric use as quarries or extraction sites. More types of chert are found in Indiana County on the Appalachian Plateau, although chert outcrops are less common, with chert occurring as massive bedded deposits or dense accumulations of river cobbles. The results of geochemical and mineralogical approaches to chert sourcing are discussed.

The Southeastern Pennsylvania Steatite Quarries  
Heather A. Wholey, West Chester University

Significant portions of the Baltimore-Liberty steatite complex outcrop across southeastern Pennsylvania. Survey and geo-chemical analysis of the eleven recorded prehistoric quarries associated with the outcroppings and artifacts held in collections throughout the region have revealed that there are distinguishing signatures for the outcroppings within the complex, and that the material was often transported great distances from source locations. There is some
discussion over the mechanisms through which materials, in either raw or finished form, were transported from source to use location, but little conversation on how the material was actually procured and processed. This presentation reviews the dialogue on materials transport, and describes a possible quarry site complex scenario based on survey and limited excavations near the Christiana Quarry.

Digging into Quarry Sites: Theoretical Approaches and New Analytical Methods for Understanding Mined Landscapes.
Brian L. Fritz, M.S., RPA, GISP, Principal Investigator, Quemahoning LLC

Prehistoric lithic quarry sites often contain large quantities of broken and fractured rock fragments that generally lack morphological attributes commonly used for lithic debitage analysis. Quarry pits often converge to form large-scale cultural features that are complex and difficult to understand. Proposed is a new theoretical approach to understanding quarry site development that takes into account both cultural factors and geological factors. Included is a quarry site classification model and new methods for analyzing large quantities of quarry debris.