A 2005 View of Ohio's Archaic Absolute Date Inventory: Trends and Prospects

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Although often viewed as simple "temporal markers," an understanding that absolute dates[1] contain interpretative information at various scales is gaining recognition among archaeologists. Examination of large absolute date inventories have resulted in new avenues for exploring perennial archaeological problems such as prehistoric population densities and settlement trends (e.g., Berry 1982; Greber 2003; Milner 2004; Rick 1987; Purtill 2005, 2006). In one of the earliest studies to examine absolute dates (specifically radiocarbon dates in this case) as 'self dated artifacts,' John Rick (1987:55-56) argued that:

> ...more occupation should lead to the production and deposition of more cultural carbon; better preservation of the deposited carbon will allow a greater recovery of carbon by archaeologists, and more archaeological investigations will cause the recovery and dating of more samples.

Such studies are increasingly common today due to the continued growth in frequency of absolute dates. This includes not only an increase in the total number of dates, but also in the increased number of dates processed in each succeeding 10-year subperiod (Maslowski et al. 1995:2, Table 1). Ohio's absolute date inventory is especially robust boasting well over 1,000 processed assays.

Beginning in 2004, a database consisting of all known absolute dates for Ohio's Archaic period (10,950 – 2650 B.P. [9000 – 700 B.C.]) was compiled as part of an updated review of Archaic societies within the state (Purtill 2006). The purpose of this inventory was to serve as an aid for developing temporal models of settlement patterning, site distribution, and demographic estimates for this poorly known cultural period. To further the interpretative potential of such a dataset, contextual information for each date was recorded (when available). This included information on the context of the sample (e.g., feature number and type), material dated (e.g., nutshell), and any associated materials (e.g., projectile points, pottery, domesticates). As of July 2005, 213 Ohio dates associated with the Archaic period had been identified and added to the inventory.

Although the main purpose of this inventory was to assist in the development of an updated review of the Ohio Archaic, it became obvious that the database would have a broad appeal to the archaeological community, especially CRM practitioners. Although a summary of the inventory will be published in 2006 (Purtill 2006), the majority of the contextual information will not be contained in the published paper due to space restrictions. Accordingly, this article, and associated database, is being provided to the OAC membership for use.

The Database

The database is provided as a downloadable Microsoft Excel Worksheet file (2000 version). As a starting point, the West Virginia, Kentucky, and Ohio radiocarbon database published in 1995 (Maslowski et al. 1995) was consulted. After the database was vetted of errors, 138 dates assignable to the Archaic period (as defined in this report) remained. Since 1995, an additional 75 dates from Ohio sites have been added.

The 2005 inventory was constructed to provide a range of temporal, spatial, and descriptive data for each assay. No attempt was made to "evaluate" (i.e., reject or accept) reported dates, instead all processed dates are provided. All together, 28 distinct variables or data fields are included in the 2005 inventory (Table 1).

Table 1. Variable Fields and Definitions for the Database

Variable Name	Variable Description
Site #	Trinomial state site number
Site Name	Published or common name
Site Type	open; cemetery; mound; rockshelter/cave; isolated burial; shell midden; cache site
County	County (e.g., Holmes)
Physiographic Region	Till Plains, Lake Plains, Unglaciated Plateau, Glaciated Plateau
Method	C14 = radiocarbon; OCR = Oxidizable Carbon Ratio; TL = thermoluminescence
Lab #	Assay lab number
Context	Context of the submitted sample (e.g., Feature 22; Strata II)
RCYBP (uncalibrated)	Uncalibrated radiocarbon years
Sigma +/-	Standard deviation, or sigma, of submitted assay.
Uncal. B.C. date	Uncalibrated date in B.C.
cal Date Range B.C. (1 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.C. High (1 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.C. Low (1 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.P. (Median probability)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.P. – High (1 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.P. - Low (1 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal Date Range B.P. (1 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.P. – High (2 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
cal B.P. – Low (2 sigma)	Calibration based on Intcal98.c14 (Stuiver et al. 1998), Calib Version 4.4.
Time Period	Early Archaic (10,950 – 8450 B.P.); Middle Archaic (8450 – 5950 B.P.); Late Archaic (5950 – 700 B.P.). Date ranges after Purtill 2006.
Material Dated	Material submitted for dating (e.g., wood charcoal, nutshell)
Recovered Context	Context from which the material submitted for dating was obtained (e.g., feature, strata)
Special Contents	List of "special" artifacts such as diagnostic points, pottery, domesticates, etc.
References	Primary reference for the date
"new" date	"N" means date originally listed in Maslowski et al. 1995. "Y" means that the date was not included in Maslowski et al. 1995.
Comments	Additional comments about the date or the parent site
Count	Always 1, used for pivot table queries

Some General Trends and Thoughts

Although a full analysis of the database is not the intent of this article, an example of its interpretative potential is provided. As of this writing, 213 dates from 107 sites are included in the database. This includes dates from all three Archaic subperiods (Early, Middle, and Late) (Table 2).

Table 2. Breakdown by Time Period

Time Period	Frequency
Early Archaic	5
Middle Archaic	5
Late Archaic	203

The distribution of absolute dates is not uniform across the state, however. Figure 1 displays the frequency of dates by physiographic region. Overall, a disproportionately high number of dates derive from southern Ohio sites, particularly ones located in the southern Till Plains and Unglaciated Plateau regions. Although sampling bias or geomorphological processes may account for this variation, I have argued elsewhere that cultural factors, primarily inter-regional differences in population density and settlement/subsistence systems, better account for such disparity (Purtill 2006).

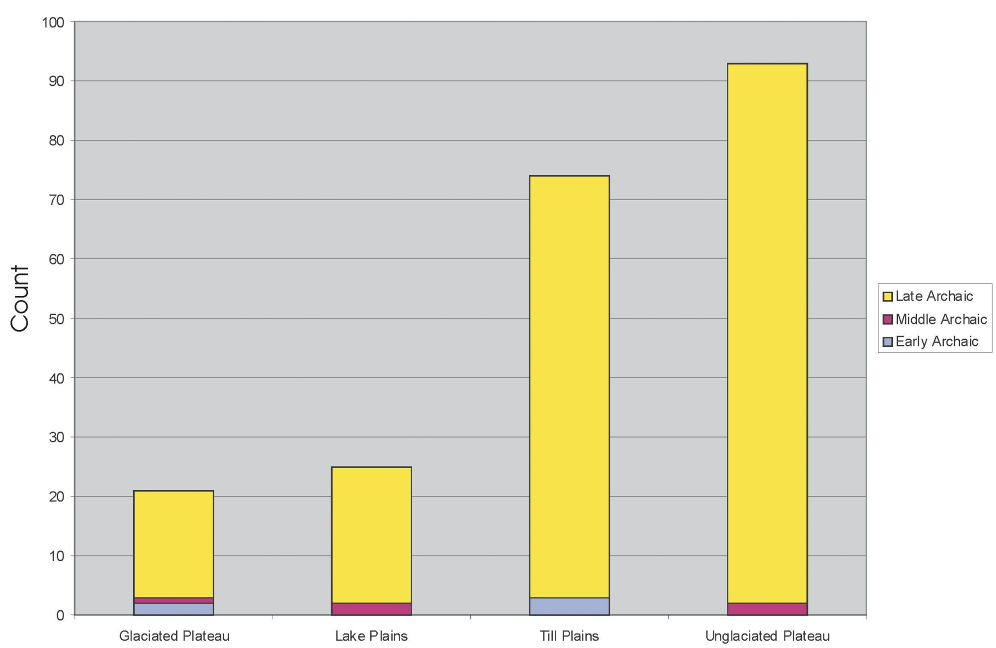

Figure 1. Distribution of Absolute Dates by Time Period and Physiographic Region

Although Table 2 suggests that occupational intensity (as measured through absolute date samples) during the Early and Middle Archaic periods was relatively stable (5 dates per each period), Figures 2 and 3 suggest a different trend. To investigate if occupation densities were uniform during the entire Archaic period, all C14 and TL assays (n=208) were plotted on Figure 2. The resulting graph demonstrates that Ohio's absolute date record is not characterized by a continuous, uninterrupted series of date ranges spanning the entire period. Notably, the period between ca. 7900 and 6300 B.P., usually defined as the Middle Archaic, is devoid of dates. This 1600 year "gap" is magnified by the fact that several dates are known for pre-7900 B.P. components across the state (including a robust Paleoindian database). Elsewhere, I have interpreted the lack of dates between 7900 and 6300 B.P. as a result of substantial population reduction and/or out-migration (Purtill 2005, 2006). Although some may question my interpretation, most would agree that such a data "gap" is unexpected and needs better explanation and consideration.

In order to see if sampling bias played a role in the distribution seen in Figure 2, a second high-low chart was generated that standardized the data to control for the possibility of over-representation of sites with abundant assays (Figure 3). This was accomplished by treating all overlapping date ranges from a single site as representing a single "component." The high-low date range of each component was then plotted in Figure 3. Dates were considered to belong to a single component if their date ranges (at 1 sigma) either overlapped or were within 200 years of each other. For samples separated by more than 200 years, the site was recorded has having two (or more) components (thus two entries). For example, the Maderia Brown site in Pike County

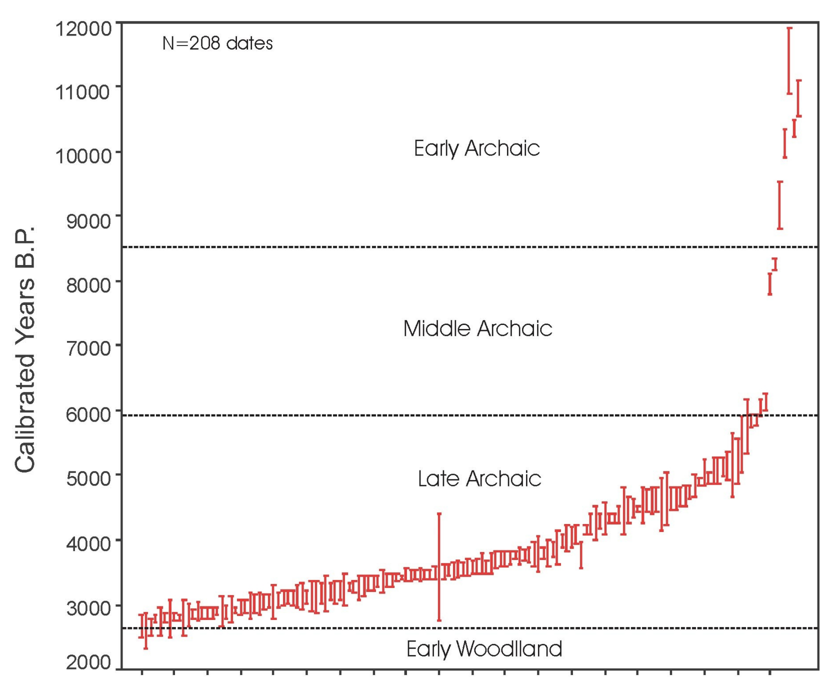

Figure 2. Absolute Date Ranges for the Ohio Archaic (at 1 Sigma)

yielded 20 absolute dates, yet the entire assemblage either overlapped or was within 200 years of each succeeding date. Thus, in Figure 3, Maderia Brown was treated as a single component with a combined date range between 4233 – 3004 B.P. Such an approach resulted in definition of 123 dated Archaic components for Ohio. When compared, no significant variation in the overall distribution is observed between Figures 2 and 3 suggesting that sampling bias was not a factor in these distributions.

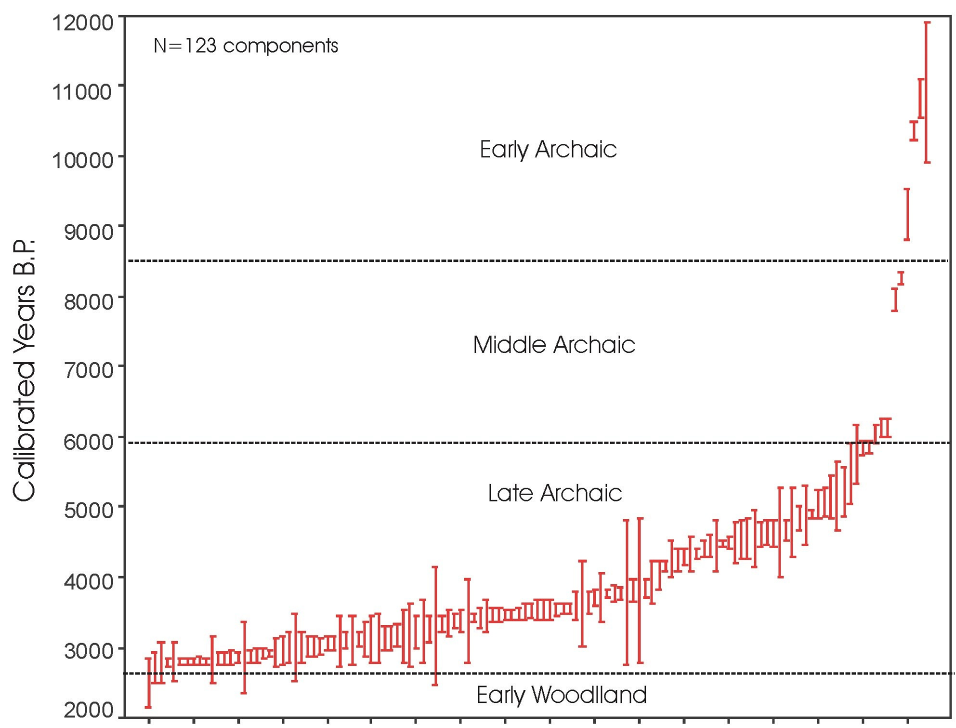

Figure 3. Distribution of dated "components" for Ohio Archaic Sites (at 1 Sigma)

Future Plans and a Petition for Involvement

In 2004 when I contacted Charles Niquette about acquiring an electronic version of the 1995 radiocarbon dataset, I inquired about the health of the database. Specifically, I asked if the database was continuing to grow with new submissions from area archaeologists, as was the hope at the projects commencement (Maslowski et al. 1995:5). Unfortunately, he stated that since its inception, not a single new submission had been forwarded to him. I think that most readers would agree that this lack of interest is unfortunate and represents a missed opportunity to expand an innovative project.

In hopes of rectifying this situation, the author and fellow OAC member Jarrod Burks are in the process of compiling an updated absolute date inventory for Ohio. Our database will be structured in a similar fashion as the one presented in this article with a focus on contextual and environmental information in addition to temporal data. We feel that this approach will broaden the interpretative potential of the database by allowing archaeologists an opportunity to investigate a range of issues from artifact date ranges (e.g., pottery, projectile points, etc.), to population density studies, to site organizational variation between regions.

Within the next couple of years, our plans are to publish the updated database on the internet so it will be widely available to interested parties. The resulting website will be designed so that archaeologists will be able to update the list themselves through the internet. In this way, our hopes are to create a "living" project that will continue to grow through new submissions. To our knowledge, this will be the first such database of its kind and we feel that it offers unparalleled opportunities for Ohio archaeologists to explore old problems in new ways. We will keep OAC members informed of our progress through future project updates and invite all to participate upon its publication. In the meantime, I ask Ohio archaeologists to review the inventory presented here, point out errors, fill in blanks, and submit new dates.

Endnotes

[1] The term *absolute date* is used in this paper to denote dates obtained from one of three chronometric measures: radiocarbon (c14), Oxidizable Carbon Ratio (OCR), or thermoluminescence (TL).

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