Supplemental Text 3. Descriptive Guide to OxCal Calibration and Modeling Inputs and Outputs

All radiocarbon calibration for this analysis was conducted in OxCal v4.4.4 (Bronk Ramsey 2021) using the atmospheric calibration data for IntCal20 (Reimer et al. 2020). For all sites in the analysis as a composite “Ohio Hopewell” sample, and for each site individually, all dates were calibrated, and then modeled with OxCal’s Bayesian modeling functions (Bronk Ramsey 2009a) as a single, unstructured Phase. The Amodel and Aoverall indices for each are reported in the main article. Where the indices were below the Ac = 60, dates with poor agreement scores were evaluated and modeled with OxCal’s Outlier modeling functions (Bronk Ramsey 2009b). At least two types of outliers are possible on large Hopewell ceremonial sites: “Charcoal” and “Palimpsest” outliers. Charcoal outliers were modeled following directly from Bronk Ramsey’s (2009b) example parameters. Palimpsest outliers were modeled as outliers with a simple normal distribution with a mean of 0 and a standard deviation of 1 (N(0,1)), allowing for it to be either older or younger than the true age of the deposit of interest. Charcoal outlier modeling was used on Class 2 or Class 3 dates of wood samples. Palimpsest modeling was used when the lack of agreement could not be assigned. In practice, this was only used for the model reported in the main text for the Liberty site. One assay (Beta-145873) was modeled as a Charcoal outlier, and one assay (UGA-2419) was modeled as a Palimpsest outlier.

For our purposes, each assay was associated with a site, a within site context (where applicable), and a consecutive number for all assays from the site. In OxCal outputs, this makes the results more readily interpretable in archaeological context than simply using laboratory ID numbers. The relationship between laboratory ID and composite context label is contained in Supplemental Table 3. Supplemental files (available here: <https://github.com/kcnolanAAL/Seeman-Nolan_HopewellChronology>) are included for the code of all Bayesian models used in this analysis (ModelCodes subfolder), model plots (ModelPlots subfolder), and tables (Tables subfolder). Naming conventions for files are as follows:

1. [Date][site][class(es)]([model])([variable])

2. Where:

dates are “22\_3” or “22\_7” for March or July 2022.

Sites are “Lib” = Liberty, “MdCty” = Mound City, “Sp” = Seip, “Trmp” = Tremper, “Trnr” = Turner, “HMG” = Hopewell Mound Group, “OhHpwllBg6” = all Big Six sites.

3. Class(es): are the chronometric hygiene classes defined in the main text included. In all cases reported here, they are Classes 1 through 3.

4. Model: when applicable is either “Phs” = Phase, or “PhsOut” = Phase with Outlier modeling.\

5 Variable: when applicable are: “Crv” = curve plot with probability distributions; “Crv2” = curve plot without probability distributions; “Strt” = modeled start of phase boundary; “End” = modeled end of phase boundary; “Spn” = modeled span of dates, “Chrcl” = properties of the Charcoal outlier model offset; “Plmp” = properties of the Palimpsest outlier model offset (e.g., 22\_3LibClass1\_3Crv is the curve (variable) plot with probability distributions for Liberty Class 1 through Class 3 assays run in March 2022; e.g., 22\_7OhHpwllBg6Class1\_3PhsCrv2 is the curve plot without probability distributions for all Big Six sites modeled as a single Phase (model) for all Class 1 through 3 assays run in July 2022.

Note: “SpnR” is a revised version of the exported graph for the span of dates variable.

All tables are exported directly from OxCal as .csv files. The plots are exported directly from OxCal as .svg files. The model code texts were copied from OxCal and pasted into a .txt file.