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Dendrochronological Analysis of Oak (*Quercus*) Tree cores from the Wilsford Barn, Shreve, Wayne County, Ohio

June 4, 2007

Report submitted to Marge Wilsford.

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Six cores were extracted from the Wilsford barn in Shreve, Wayne County, Ohio. The cores were processed and crossdated at the Wooster Tree Ring Lab using standard dendrochronological techniques (Stokes and Smiley, 1968). These include preparing the core surfaces by sanding, counting, and measuring ring-widths to the nearest 0.001 mm. Crossdating was performed visually and using the computer routine COFECHA (Holmes, 1983).

Four cores (Table 1) were internally crossdated with one another to construct a floating 150 year-long, ring-width series. Two cores that contained 172 and 184 rings did not crossdate with the others. The floating chronology was then absolutely dated against calendar-dated, living, ring-width chronologies from the region (ITRDB, 2005: Wooster Tree Ring Lab, unpublished data, 2005). Calendar dates range from AD 1741-1891.

Table 1: Calendar-dated tree-ring series from the 1900 Barn in Wayne County, Ohio.

Sample number	First Year of Growth	Last Year of Growth	Total Years	Outer ring Present
19BN1A	1778	1891	113 years	Bark and the outermost ring are not present.
19BN2A	1747	1891	144 years	Bark is present therefore it is likely that the last ring on the core is the outermost ring.
19BN3A	1763	1890	127 years	Bark and the outermost ring

				are not present.
19BN5A	1741	1891	150 years	Bark and the outermost ring are not present.

Samples 19BN1A, 19BN2A and 19BN5A of the calendar-dated samples have outermost rings of 1891. Therefore 1891 is most likely the year when the trees were cut down and the barn was built. The two cores that could not be dated may have been derived from wood transported into the Shreve area and not cut from the woods in the region.

The last year of growth helps to determine when the structure was built. The presence of an outer ring or bark suggests that the sample is not missing any outer rings and the last ring of growth is really the calendar dated last year of growth.

The pith or center of the sample is used in order to determine when the trees for these logs first started growing. If the pith or center is present it suggests that the sample doesn't have any missing rings and the first year is the same as the first year of growth. Since none of these samples had the pith or center present, the sample could be missing an unknown number of rings suggesting that the first year of growth or when the tree first started growing could be further back in time. Using the data gathered, the first year of growth for the 1900 Barn could be 1778, 1747, 1763 and 1741 AD.

The total range of time represented by the logs sampled at the 1900 Barn site is from 1741 to 1891 AD. In comparison to other old growth sites, the last year of growth (1891) is later than many of the other sites which seem to date to around the 1830s. This suggests that this barn was made after the initial settlements in Ohio.

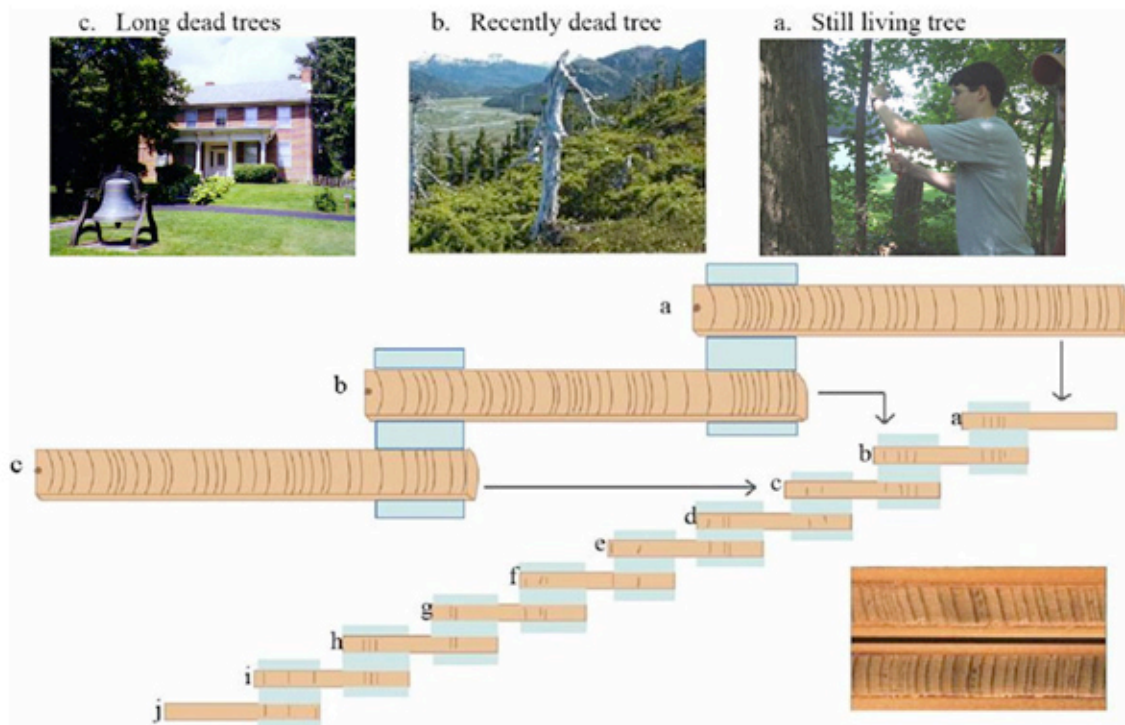


Figure 1: Tree-ring crossdating relies on matching overlapping ring-width patterns. If matches are made to living tree then calendar dates can be assigned to the outer rings of the tree.

References:

- Holmes, R.L. 1983. Computer-assisted quality control in tree-ring dating and measurement. *Tree Ring Bulletin*, **43** (1), 69-78.
- Stokes, M. A., and Smiley, T. L., 1968: *An Introduction to Tree-Ring Dating*. Chicago: University of Chicago Press. 73 pp.
- International Tree-Ring Data Base (ITRDB), 2005, www.ncdc.noaa.gov/paleo/paleo.html.