

A Dendrochronological Analysis of the Gingery Barn, Wooster, Ohio

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Introduction:

This is the final report on the dendrochronological analysis of Gingery Barn in Wooster, Ohio. Dendrochronology is the science of analyzing and dating annual growth rings in trees. This process can be used to assign calendar dates to timber felled for historical structures across Ohio (Figure 1).

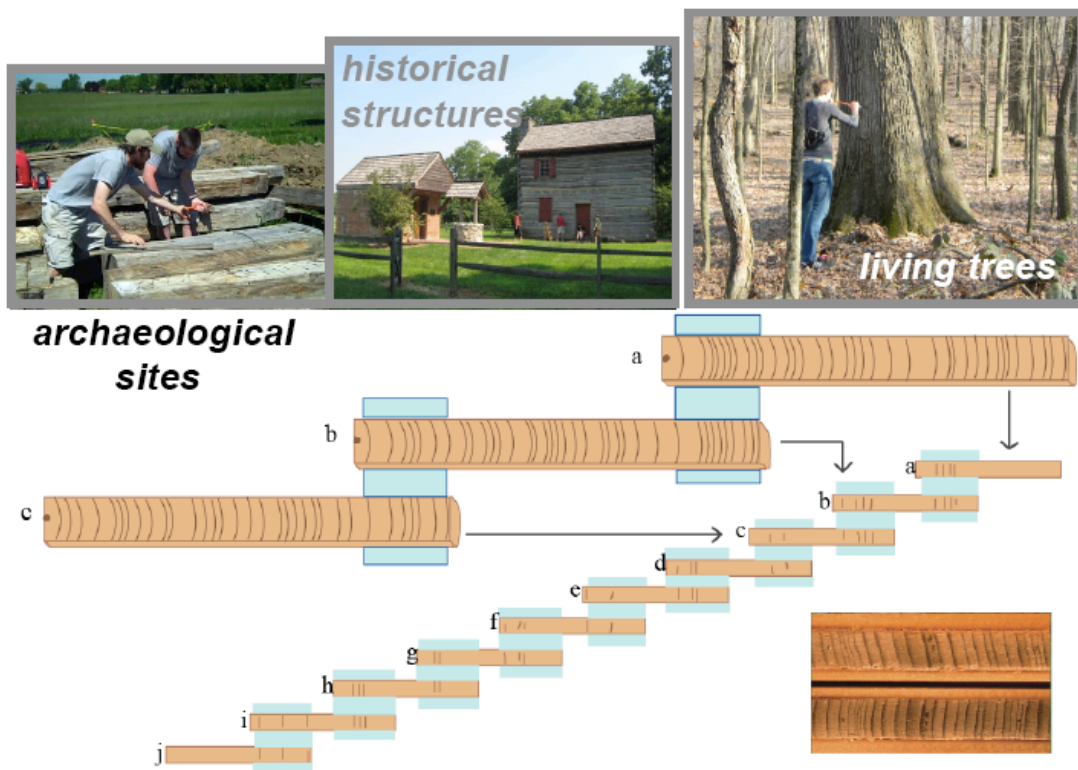


Figure 1. Diagram illustrating tree ring cross-dating of a historic house or barn. Patterns of wide and narrow ring-widths from historic structures and wood associated with archaeological sites are matched to living tree ring chronologies and calendar dates are assigned to each ring.

Methods:

Mr. Don Gingery, brought two oak beam samples into the lab for determining the calendar date of the outer rings. After meeting with the client and determining that the samples were acceptable for dating, members of the Tree Ring Lab polished the oak cross-section and drilled into the other beam sample with an electric drill to extract cores. These cores were mounted and then sanded and polished. Ring widths were measured under the microscope to the nearest 0.001mm and we used a computer program called COFECHA (Grissino-Mayer, 2001), which aids in cross-dating the cores with one another. Ring widths were compared to the Johnson Woods chronology from Orrville, Ohio and the Stebbin's Gulch chronology from the Holden Arboretum, Kirtland, Ohio.

Results and Analysis:

Results from this analysis determined the calendar year in which the trees in the barn were felled. It is likely that the barn was constructed shortly after the felling of the timber. Table 1 lists each sample and its span in calendar years CE (Common Era). The total number of rings is recorded along with the first and last years of tree growth. The last full ring represents the last year of each tree's growth.

Table 1. Results of the tree-ring dating of the Gingery Barn.

Sample ID	Rings	First year	Last year	Additional notes
GNG1	67	1815	1882	Beam with bark
GNG2	200	1683	1883	Large cross-section, broken

The data was unambiguous, and we have concluded that the logs were felled after the growing seasons of **1882** and **1883**. The largest sample from the big beam in the barn had the most rings and therefore contained the most. This beam matched well with the Johnson Woods and Stebbin's Gulch chronologies to give us a confident date of 1883. Sample GNG1 came from a beam that was much smaller than the GNG2 sample. For this reason, it was more difficult to match this sample to the chronologies since it had very few rings. However, with each chronology that we matched it to, we obtained a date of 1882 for the outermost ring.

Both beams had a full outer ring. This means that the outer ring had both the early wood and the late wood, indicating that they were felled after the growing season of the year the outer ring dated. Therefore, sample GNG1 was felled after the growing season of 1882 and sample GNG2 was felled after the growing season of 1883 (Figure 2).

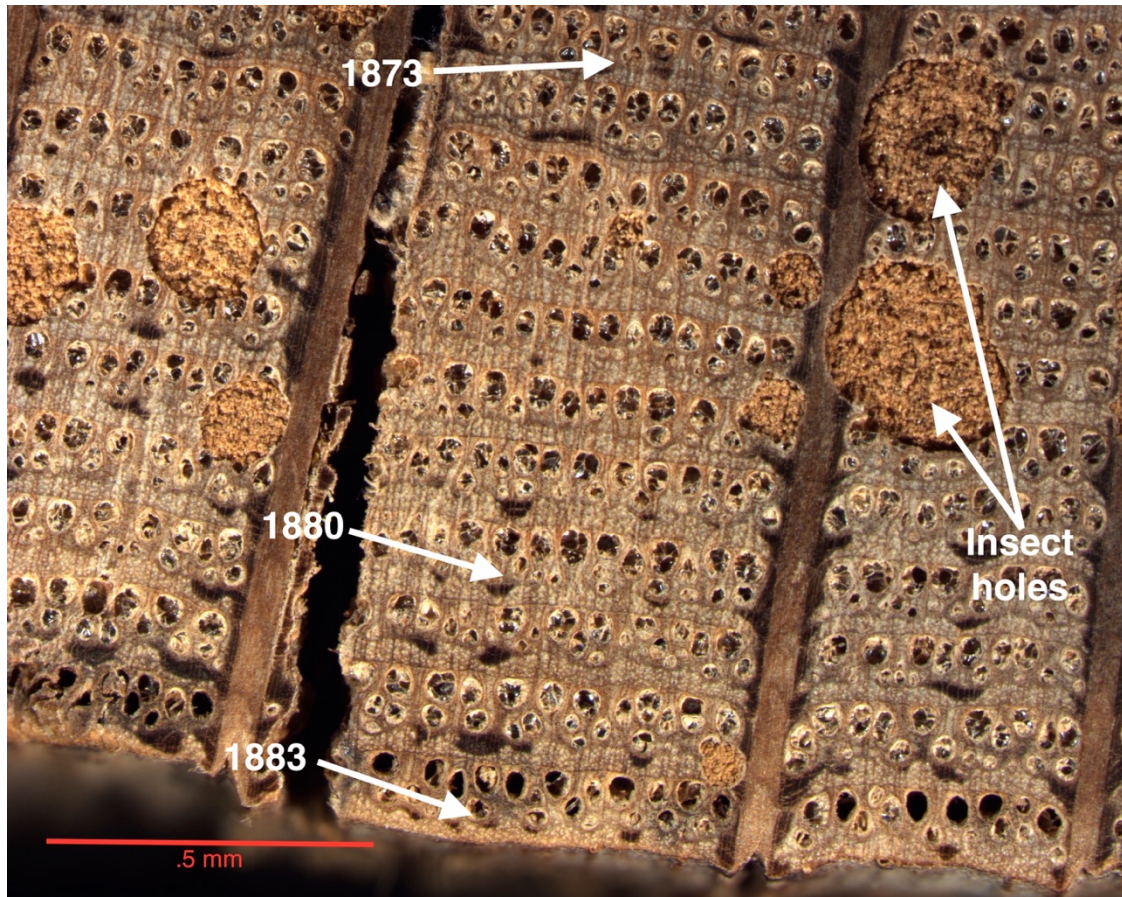


Figure 2. Photomicrograph picture showing the outermost 10 rings of sample GNG2. Ring labeled 1883 (the outer ring) shows both early wood and late wood, indicating that the tree was felled after the growing season of CE 1883.

References:

Grissino-Mayer, H., 2001, Evaluating crossdating accuracy: A manual and tutorial for the computer program COFECHA: *Tree-Ring Research*, v. 57, p. 205-221.