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Sampled: September 27th 2010

Jon Theisen and Greg Wiles
Wooster Tree Ring Lab
Department of Geology
The College of Wooster
Wooster, OH 44691
Tel: 330-263-2298, gwiles@wooster.edu

http://www.wooster.edu/treering/dendrochronology/

Objective:
To provide a calendar date for the felling of timber from the historical Lehman Spring House structure using dendrochronology and to develop a ring-width tree-ring chronology from the timber used in the construction of the structure. The ring-width data will be added to the northeastern Ohio database. Data will contribute to the understanding of past climate variability over the past six centuries. All logs are archived at the Wooster Tree Ring Lab, housed in the Department of Geology, at The College of Wooster. Tree-ring crossdating shows that the beams for the Lehman Spring House were cut in 1865.

Methods and Analyses:
Core taken from beams in the Lehman Spring House were prepared and crossdated using standard dendrochronological techniques. Rings were measured to the nearest 0.001 mm (Fig. 1) and then crossdated against each other, developing a "floating" site chronology before matching ring-widths with the calendar dated northeastern Ohio regional series (Table 1, Figures 1 and 2). Individual ring-width data from cores extracted from beams of the Lehman Spring House were matched into the master chronology of Northeast Ohio (Fig. 2).

All three oak series were successfully calendar dated but only two of the series, (SH01S and SH02si; Table 1) and two had what appears to be the true outer ring (cut dates of 1865). These outer rings show that the timber was felled in 1865 or shortly after fall of 1865 perhaps into 1866.

The cores dated together span 213 years from AD 1651 – 1865. The data from the structure is instrumental in expanding our knowledge of the chronology of the Sonnenberg village, but also of the greater Northeastern Ohio region.

Table 1: Table of the inner and outer calendar dates for the three Spring House cores that were dated. The asterisk on the outer ring year denotes the presence of the bark year.

Core	Inner Year	Outer Year	Total Years
SH01s	1765	1865*	100
SH02Si	1729	1865*	137
SH03ES	1651	1835	185

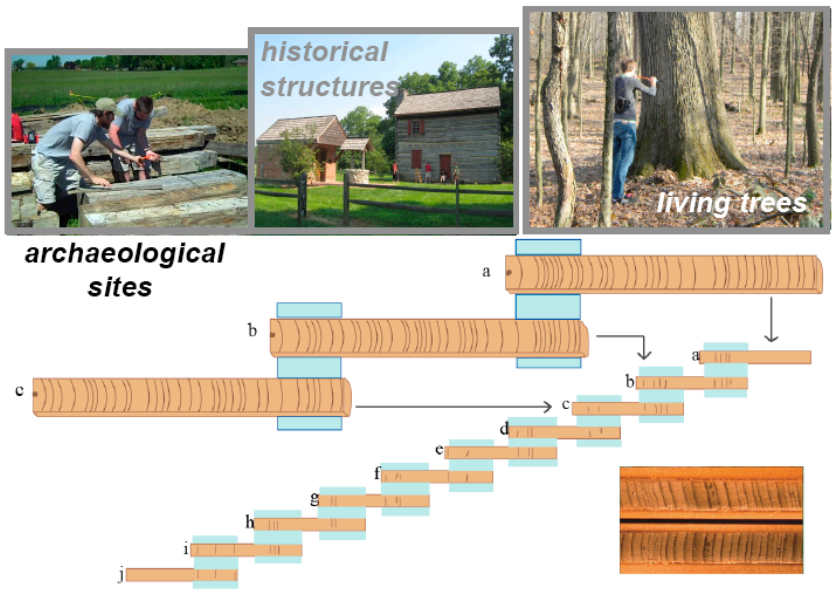

Figure 1. Diagram illustrating tree-ring crossdating. Patterns in ring widths from historic structures and wood associated with archeological sites are matched to living tree-ring chronologies and thus calendar dates can be assigned to each ring.

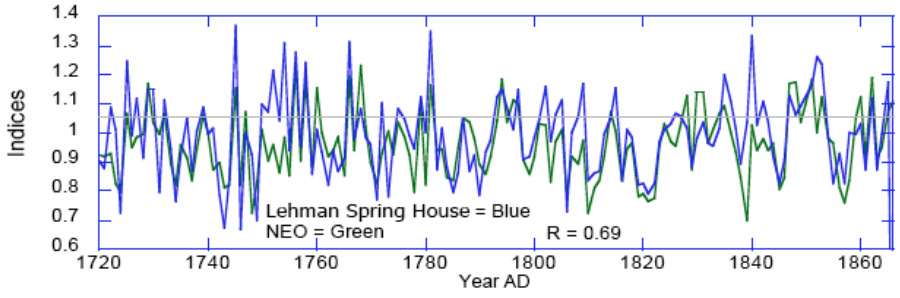

Figure 2. Graph showing the over lap in ring-width series from the Living Trees from Northeast Ohio (green) and the series measured from beams in the Lehman Spring House (blue). The correlation coefficient for the 145 year over lap is 0.69. The living tree-ring record is taken from Johnson Woods, Sigrist Woods, Kline Farm, Browns Bog and The College of Wooster Campus.

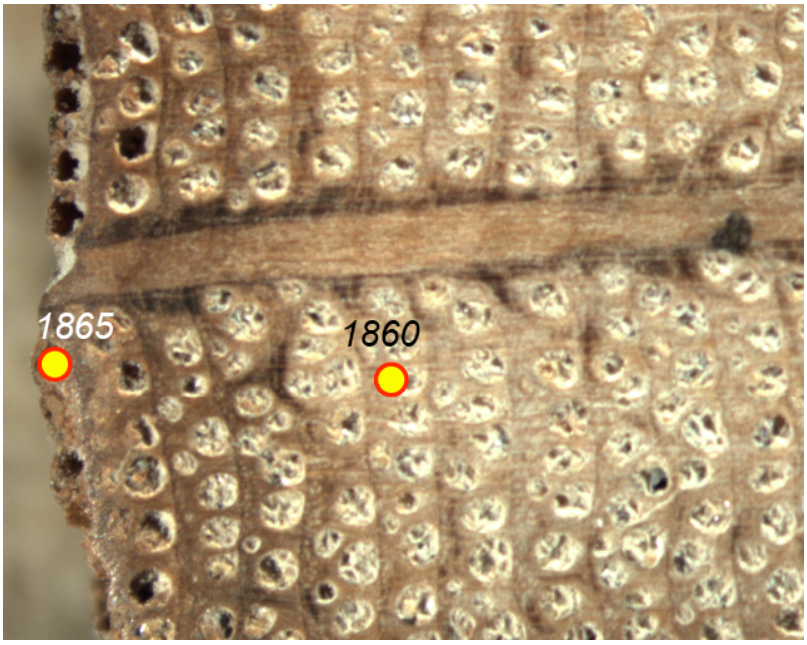

Figure 3: Sample SH01s. Note that the outer ring labeled 1865 is not fully formed showing that the tree was cut early in the growing season of that year. This beam was cut from a white oak.

References:

Belding, E. & Wiles, G. 2007. Dendrochronological Analysis of the Kline Farm Woods Tree Ring Site, Wayne County, Ohio. 1-3.

Holmes, R. L. 1983. Computer-assisted quality control in tree-ring dating and measurement. *Tree Ring Bulletin*, **43** (1), 69-78.