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May Update on the Friends of Neill Log House (FONLH): Dendrochronology

A Layman's Primer on Dendrochronology: Dating the Neill Log House

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Mission Statement for the Friends of the Neill Log House (FONLH Inc.)

Adopted February 2022

"We secure funds to restore and maintain the Neill Log House, foster knowledge of its historic significance, and work with interested parties to ensure the continued educational use of the structure and its site for future generations."

Individual support for the FONLH restoration effort will always be needed. Details about how to make individual contributions to FONLH by check can be found on the SHHS website by clicking on "Neill Log House" and then clicking on the (Quiet Giving Campaign) link. To make online donations by credit card or PayPal, go to the SHUC website, shuc.org, and click on the "Projects" link in the black menu bar at the top of the page. A pull-down menu will appear. Select "Friends of the Neill Log House."

What We Believed We Knew About When the Neill Log House Was Built

We have no historical records to date the construction of the Neill Log House and have only been able to approximate a date or range of dates based on conjecture. We have evidence showing that Robert Neill was "granted a patent for the consideration of 34 pounds, 8 shillings," as recorded on December 10, 1787, so we speculated that the structure could have been built a few years later than 1787, or perhaps much earlier if we believed he squatted on the land before ownership. It is also believed he built the structure that bears his name because of the "handsome profit" he realized when the property was sold in 1795. In our "Working Copy of the Brief History of the Neill Log House," we state that the log house is "believed to be Pittsburgh's oldest domestic structure and one of only a few existing buildings in the city from the 18th century." We may now have to tweak the wording of our Working Copy some to reflect new evidence due to the "Results of Dendrochronology Testing to date the Neill Log House," as explained in the next section.



What the Dendrochronology Test Showed

A few months ago, our Senator John Heinz History Center FONLH board representative Dave Scofield, Director of Meadowcroft Rock Shelter and Historic Village, recommended turning to science and the field of dendrochronology to definitively date construction of the Neill Log House. Dave referred us to a respected laboratory in our region to conduct this testing, and FONLH agreed to make a small donation for travel and time to accomplish this testing. The test was performed at the log house last month by Nick Wiesenbergh, the chief technician of the Wooster Tree Ring Lab,

from the Department of Geology at the College of Wooster, Ohio. As described on its website, this lab specializes "in the geological and archaeological applications of tree-rings [and are] skilled in sampling and retrieving data from wood and living trees [to] calendar-date beams in structures of historical significance to the last year of growth. ... Using tree-rings [the lab

is] often able to determine the exact date a tree was cut."

(Left) Modern dendrochronologists seldom cut down a tree to analyze its rings. Instead, core samples are extracted using a borer that is screwed into the log or tree and pulled out, bringing with it a straw-sized sample of wood about 4 millimeters in diameter.



With the accumulation of data from all the tree-ring testing they've conducted, the Wooster Tree Ring Lab has created a database of information from which to date samples from a "550-year tree-ring width chronology," which is continuously expanded as new testing occurs in the region. The illustration to the right shows a graph displaying the database of information used for dating.

A Layman's Primer on Dendrochronology

*Definition of **dendrochronology**: the science or technique of dating events, environmental change, and archaeological artifacts by using the characteristic patterns of annual growth rings in timber and tree trunks.*

The science originated with an American astronomer named Andrew Ellicott Douglass in the early 1900s. From his observatory in Arizona, Douglass was trying to establish a connection between sunspot activity and drought through vegetation records. Sensitivity to water is the key to dendrochronology testing, resulting in variation in the width of growth rings and a distinctive pattern or sensitive series of rings. Trees that have a consistent abundance of water, for example, are considered to be "complacent," with equal width growth rings, and are not good samples for comparison. Availability of water, or the hydrologic cycle, allows us to reconstruct regional patterns of drought and climatic change by tree-ring patterns. Other technical considerations include replication, sample depth and reliable chronologies. Good chronologies have been developed with as few as 10 trees sampled. And, although other paleorecords exist from natural phenomena such as pollen, lake sediment, coral layers, and dripstones in caves, the science of dendrochronology is much more precise and accurate.

The most basic principle of dendrochronology is crossdating, a technique allowing each individual tree ring to be assigned an exact year of formation from climate records. In the example to the right, ALL the rings in a specific pattern of wide and narrow rings are matched between cores from the same tree and between trees from different locations. This might be imagined as similar to sliding one barcode over another to get an exact match.

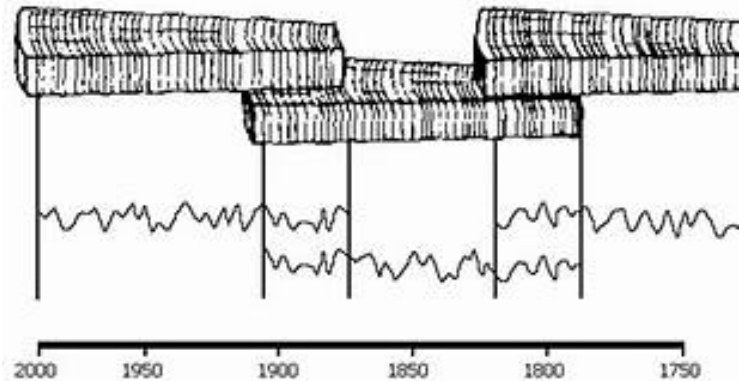
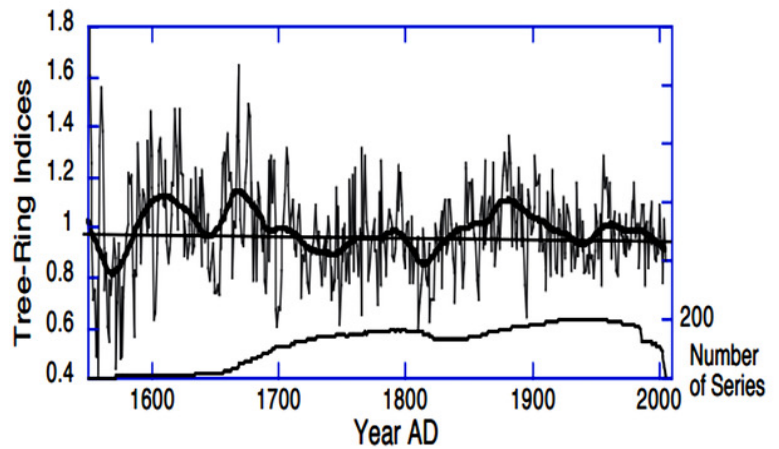
Any object made of wood that has enough rings in a "sensitive" series can potentially be dated using tree rings. In an unusual example, the Stradivarius Messiah

Violin, with an authentic value of up to \$20 million, was dated by dendrochronology testing using European tree-ring chronologies and other known Stradivari instruments. The Messiah violin was dated to 1687, consistent with other instruments made by Stradivari as opposed to known replicas from the 18th century.

Results of Dendrochronology Testing to Date the Neill Log House

At our April 2022 meeting of the Friends of the Neill Log House, Dave Scofield reported the following preliminary results received from Nick Wiesenbergs testing, which will be incorporated into their formal report: both the lintel above the fireplace and the salvaged doorframe were dated to 1795—a conclusive match. Dave's report says in part: "The College of Wooster made their site visit two weeks ago and took samples from five different elements of the building: 1) an old growth log on West elevation of building (log harvested in 1851)—either a historic replacement or log salvaged from some other structure; 2) the lintel above fireplace (harvested in 1795); 3) salvaged doorframe upstairs that appears to be original doorframe (dated to 1795); 4) sampled two logs from rear wall believed to be from reconstruction (1967 and 1968)."

Given that two samples have been dated to the same year by the scientific results of a trusted dendrochronology lab, we will now date the construction of the Neill Log House to 1795. The conclusions to be drawn from these results would suggest that the Neill family occupied a different, less permanent log structure for the years they lived on their land, and that the present log house structure was one of the improvements Robert Neill "presumably" made on



the land to realize the “handsome profit” he made when he sold his property. In the absence of historical evidence, much is left to conjecture about the log house from Robert Neill’s time through its various uses into the 20th century. Although the Neill Log House will continue to be “one of only a few existing buildings in the city from the 18th century,” there are two other residential structures in the city that may pre-date 1795. These are the John Frew House in the Westwood neighborhood of Pittsburgh, built as early as 1790, and the Woods House in neighboring Hazelwood, built in 1792. Both of these are totally or partially stone structures, which may allow us to claim the Neill Log House as the oldest log house domestic structure in the city of Pittsburgh.

References:

Brochure and Website, The Department of Geology, Wooster Tree Ring Lab, The College of Wooster.

Teacher Guide on Dendrochronology, Oregon State University.

Crossdating—The Basic Principle of Dendrochronology, <https://www.ltrr.arizona.edu/lorim/basic.html>.

Fundamentals of Tree-Ring Research. James H. Speer, Associate Professor of Geography and Geology, Indiana State University, Terre Haute, IN 47809. August 3, 2009.

“A Working Copy of the Brief History of the Neill Log House,” The Friends of the Neill Log House, Tony Indovina, 2022.



Dave Scofield prepares to take a core sample from a log at the Neill house.

The Allegheny Arsenal Handbook— A New Book by Tom Powers and Jim Wudarczyk, Lawrenceville Historians and SHHS Members

The Allegheny Arsenal long played a pivotal role in the nation’s military history until the tragic explosion in 1862. Lawrenceville historians Tom Powers and Jim Wudarczyk trace that history in their new book, which will be launched on May 14 at 1 p.m. at the Lawrenceville Carnegie Library, 279 Fisk Street.

Tom and Jim will present a program for the SHHS about their book on October 11, 2022. Books will be available for purchase.



Meanwhile, don’t forget to support PRINT, Pittsburgh’s East End Newspaper.

This local newspaper is published monthly and can be purchased at local newsstands, the Giant Eagle, and by subscription. Go to its website, eastendprint.com, for details. This month’s issue has an article about the Neill Log House restoration project.

TOM POWERS & JAMES WUDARCZYK

THE ALLEGHENY ARSENAL

HANDBOOK

“This book, for the first time, pulls together the complete history from 1814 to the present with well researched text and copious illustrations.”

Michael G. Kraus
Curator/Historian
Soldiers & Sailors Memorial Hall & Museum

The Allegheny Arsenal served the nation through 5 wars between 1814 and 1926. It suffered a tragedy on September 17, 1862, that was the greatest single day loss of civilian life during the Civil War. Inside this guidebook is the history of Pittsburgh’s last military facility in stories, illustrations, maps, and photographs.

For more information or to schedule an interview, e-mail Tom Powers at foster15201@gmail.com. The book will debut on **Saturday at 1pm, May 14, 2022**, at the Carnegie Library, 279 Fisk street in Pittsburgh’s Lawrenceville neighborhood.

