

Dendrochronology of the Griffin Barn plus a demolished barn near Saratoga National Historic Park, Stillwater, New York

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Christine R Valosin, Curator, called us to assist the Saratoga National Historic Park service in finding out whether the Griffin barn, currently located close to the park, could be a barn that was converted to a hospital during the Battles of Saratoga in 1777 according to historic records. This barn was transported from a different site (where, when?) to its present location, perhaps when the original barn had been demolished. We took cores from four vertical posts in the east, west, and south walls and from one horizontal beam across the center to the south of the main door. Cross-sections were sawn off two boards in the hayloft floor. An additional cross-section was taken from a large beam lying in the back of the Griffin barn along with several others; the owner indicated that these beams were from the original barn behind this barn that had been demolished. Photographs of the site in 1927 show two barns, side by side.

The beams in both the Griffin and the demolished barns are hand-hewn (Figure 1) from pitch pine (*Pinus rigida*); the hayloft floorboards are white pine (*Pinus strobus*). See sample list on last page for descriptions and dates of each sample. Sample SPB-1 is from the outer post on the middle of the west wall; SPB-2 is from the horizontal beam in Figure 1; SPB-3 and 4 are the cross-sections from two floorboards in the hayloft; SPB-5 and 6 are from two posts on the south wall - SPB-6 from the post on the north end of the hayloft and SPB-5 from the center beam which unfortunately had rotted on the inside; SPB-7 was taken from the center post on the east wall. SPB-8, the cross-section, was taken from the largest beam (with waney edge) of several that were lying in a heap below the hayloft. We were told that these beams were from the



original barn at this site which had been demolished; no more details were given during our visit.

Figure 1. The surface of this beam clearly indicates that it was hand-hewn rather than sawn.

The cores were glued and mounted onto core holders at the lab. The cores and at least one transverse surface of each cross-section were prepared by sanding and polishing; the ring-widths were measured to 0.01mm under a binocular microscope using a measuring table. At least two radii were measured from the cross-sections, with the measurements averaged together for each sample. The ring-widths of the four measured Griffin Barn cores (SPB-1, 2, 6, and 7) were crossdated with each other to find their relative placement, then combined into a chronology. The sequence of the tree-ring measurements of the other barn sample, SPB-8, was compared to that chronology (Figure 2, top). Similarly, the sequences from the two eastern white pine floorboards were compared to each other. Each species' sequence was then compared to established historic and forest chronologies of the same species to determine the calendar years represented by their tree rings.

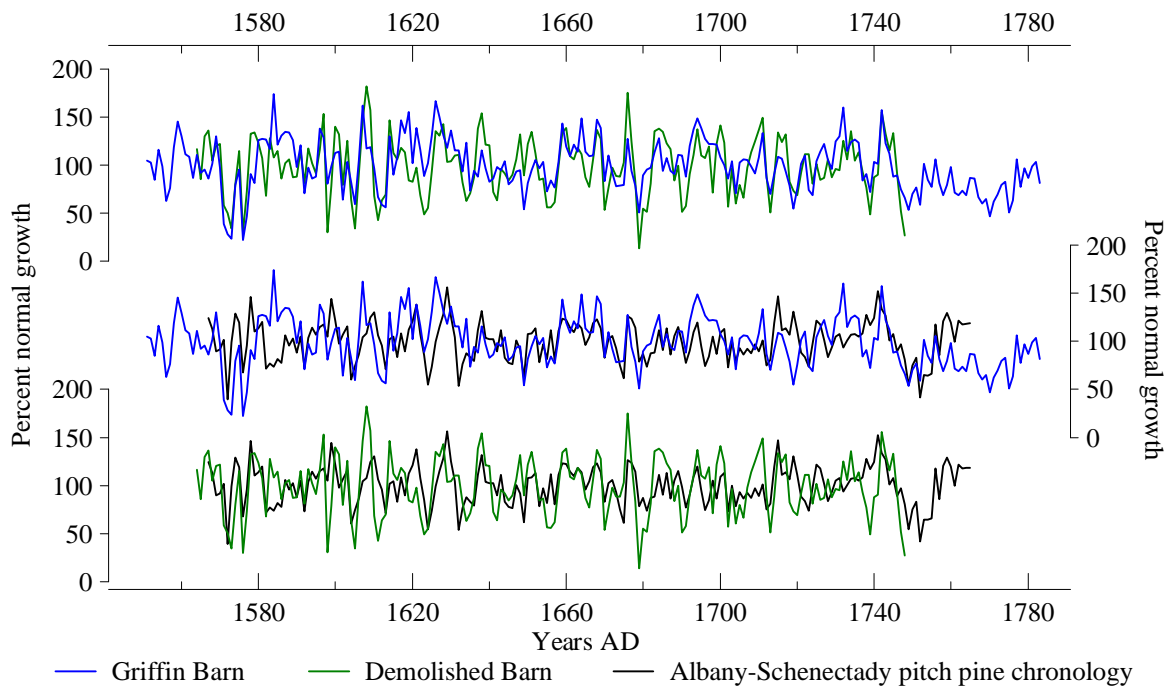


Figure 2. The pitch pine chronology from the Griffin Barn and the sequence from the demolished barn are here compared to each other (top graph), and each to our Albany-Schenectady pitch pine chronology. The data sets have been detrended, with an average ring width being “100 percent normal growth.” Statistical scores are: between the two barns - Student's t -score = 13.03, correlation coefficient = 0.69, trend coefficient = 0.68 with 185 years overlap; between the Griffin Barn and the A-S chronology: Student's t -score = 8.15, correlation coefficient = 0.50, trend coefficient = 0.61 with 199 years overlap; between the demolished barn samples and the A-S chronology - Student's t -score = 6.05, correlation coefficient = 0.41, trend coefficient = 0.64 with 182 years overlap. All are statistically significant in the 95% percentile level.

The pitch pine sequence was compared with our established Albany-Schenectady (A-S) historic pitch pine chronologies, built by the Cornell Tree-Ring Lab and securely dated by other chronologies constructed by Ed Cook (Tree-Ring Lab, Lamont-Doherty Earth Observatory, Palisades, NY), and Bill Flynt (Deerfield Historic Society, Deerfield, MA) to place them in calendar time (Figure 2). The bars in Figure 3 indicate the years covered by each sample's tree-rings.

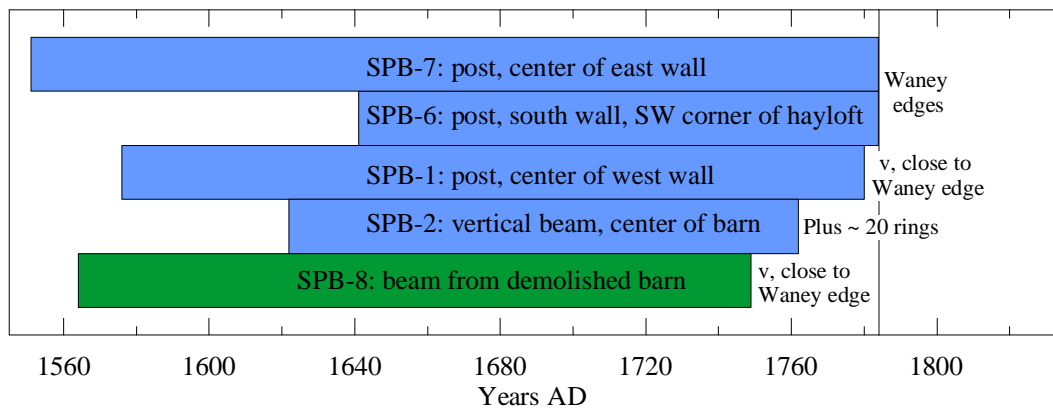


Figure 3. The bars indicate the years covered by the tree-rings in each measured pitch pine sample. See Appendix for list of samples and the years covered by their tree-rings.

The white pine floorboard samples were measured, but although both contain the outer rings of their parent trees, they are relatively short sequences (86 and 69 years) and their patterns do not crossdate well with each other. Neither do they crossdate particularly well with the regional white pine chronologies, a normal problem for the measurements of single white pine samples since the species has very variable tree-ring patterns even within trees, and the measurements of a large number of samples are necessary for averaging data to remove individual idiosyncrasies. The best I can report here about the white pines is that the trees were not felled at the same time; either of them could have been added at least 50 years after the other; and both could have been later additions.

From the end date of the pitch pine chronology, the Griffin Barn would have been built in 1784, following the revolution, thus it was not used as a hospital in 1777. Of intrigue here is the earlier building date of the demolished barn, 1749 to early 1750s, at that location. Certainly the barn was built by 1777, but historic records indicate that all the buildings at the location were burnt in during the engagement; and perhaps used for hospital care or merely for shelter during the war.

Appendix

The samples consist of:

C-NY- SPB-1	Core from partially squared post at center of west wall. Pitch pine (<i>Pinus rigida</i>). A = 1 + 203 +1v	1576 – 1780+v
SPB-2	Core from horizontal beam, partially squared. Pitch pine (<i>Pinus rigida</i>). Core was broken at outer end, impossible to recover. A = 1 + 120 +~20vv	1622 -1762++vv
SPB-3	Cross-section of floorboard from hayloft. Eastern white pine (<i>Pinus strobus</i>). A = 1 + 69 +1v	Not dated
SPB-4	Cross-section of floorboard from hayloft. Eastern white pine (<i>Pinus strobus</i>). A = 1 + 86+1v	Not dated
SPB-5	Core of partially squared post on south wall, east side of door. Pitch pine (<i>Pinus rigida</i>). Inner rings rotten. Too few rings to date	Not measured
SPB-6	Core of partially squared post on south wall, SW corner of hayloft. Pitch pine (<i>Pinus rigida</i>). A = 1+142+1W	1641 – 1784+W
SPB-7	Core of partially squared post, center of east wall. Pitch pine (<i>Pinus rigida</i>). A = 1+ 233+1W	1550 - 1784+W
SPB-8	Sawn cross-section from loose beam of demolished barn, partially squared, 21 x 29cm. Pitch pine (<i>Pinus rigida</i>). The condition of the outer rings is very poor, so the date of its waney edge, thus the building date, may be a few more years (but less than 5) after its ending year. A = p + 185 +1v	1563p -1749v

Notations used above: “p” – pith (center of tree) present; “±p” – inner ring is not far from pith; “+n” – incomplete or unmeasured ring(s) before or after the measured sequence; “vv” - unknown number of rings between outer ring of sample and bark; “v” – outer ring of sample was close to the bark when felled; “W” – Waney edge, the outer ring was directly under the bark when the tree was felled.