The dendrochronology of a pitch pine post from Fort Frederick, Albany, NY

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This paper reports the results of a dendrochronological analysis of a cross-section of the remains of one stockade post, part of the historic Fort Frederick in Albany, NY. It was sent to our lab under the direction of Hope Luhman, Cultural Resources, The Louis Berger Group, Inc., in Albany, NY, by R. Brodeur, Field Supervisor at the site. The fort was located on the west side of the Hudson River, to the west of Lodge Street where it intersects with State Street. The history of the site indicates that the original wooden fort and stockade were built in 1676, with the fort being converted to stone starting in 1702, but not completed until 1735 (from website http://dmna.state.ny.us/forts/fortsE_L/frederickFort.htm). The stockade post sample represents a complete trunk of a pitch pine tree (*Pinus rigida*), including pith and bark, with a diameter of 16.5cm. The pitch pine is common to the sandy landscape between the Hudson River and Schenectady, NY, and was used extensively for building construction in the European settlements of the 17th and 18th centuries AD.

Upon arrival at the lab, a 1? thick cross-section was cut from the center of the section, its surface prepared with a razor, and the rings examined and measured under a stereomicroscope with the sample on a moving table. Unfortunately, the ring count is relatively small, with only 23 complete rings plus a partial ring from pith to bark. The ring count is too small for the pattern of wide and narrow rings to be securely crossdated by matching its patterns to those in any other pitch pine chronology; the general rule for a secure tree-ring date is a sample containing a minimum of 70 rings. However, we took a quick look at the pattern against several historic building and regional pitch pine chronologies from the immediate Albany-Schenectady-Saratoga area, including one made from three tree-ring sequences from Albany stockade posts, sent by Walter Wheeler of Hartgen Associates. The outer ring of two of those Albany stockade post dates definitively to 1702; the outer ring of the other post is not yet securely dated. Comparing the 23-year sequence to that of the securely-dated Albany posts indicates a possible date of 1677 for the incomplete outer ring (see Figure 1A) of the Fort Frederick sample, which indicates that 1677 could be the date when the tree was felled and used in construction. This date certainly corroborates nicely with the historic record. However, two very similar patterns in a chronology built from the pines used in the construction of historic Johannes Radliff House in Albany (E.R. Cook, personal communication) can equally place the building date at 1690 or 1711 (see Figure 1B). Thus extreme caution must be taken in claiming that 1677 is the felling and building date. The only statement we can say at this time is that it is possible that this log was used in the original construction. Dendrochronological analysis of other Fort Frederick samples that contain higher ring counts is necessary to confirm or refute 1677 as the building date.

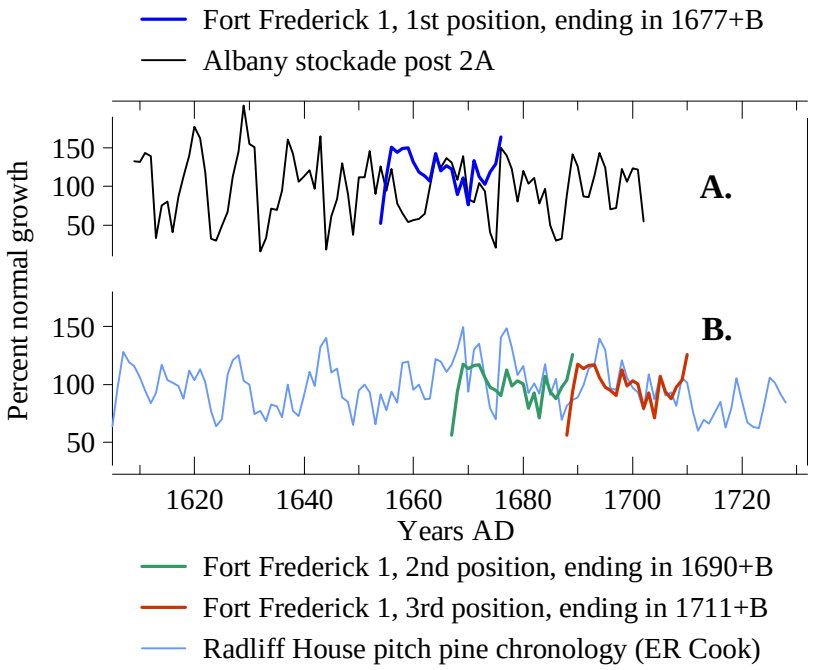

Figure 1. **A.** The sequence of detrended* ring-width measurements of the Fort Frederick sample is placed here with its outermost complete ring at 1676 (the incomplete ring and Bark/felling date is 1677), showing its similar growth patterns with a securely-dated sequence of another stockade post of pitch pine from the Albany region. **B.** However, when the Fort Frederick sequence is compared to other pitch pine sequences, including the Radliff House** pitch pine chronology shown here, there are equally good matches in at least these two other positions, both visually and with the standard statistical tests (Student's *t*-scores, correlation coefficients, and trend coefficients). The length of this sequence is too short to securely date this sample.

*Detrending removes the normal reduction in ring widths through the life of the tree.

** The Johannes Radliff House of Albany, NY, was sampled and dated by ER Cook and P Krusic of the Tree-Ring Lab at the Lamont-Doherty Observatory, Palisades, NY.