Dendrochronology of the Gregoire House, Carriage House, and Barn in Burdett, NY

Carol Griggs, Cornell Tree-Ring Laboratory
cbg4@cornell.edu

John and Sue Gregoire asked for a date of the building of their house, carriage house, and barn. They had looked into the history of the land and its ownership, and thought that the house was built in at least two sections, and possibly built as a dowry gift for the owner's youngest daughter. They estimated the house could have been built prior to 1830, with the additions post-1830, with the barn date unknown, but possibly equally as early as the original house.

We (Tomasz Wazny, Sarah Cain, and I) visited the house in November 2009 and collected 10 samples. Three cores were taken from the basement of the house, one from a joist with the waney edge (= only bark was removed) in the original basement, and two from the corners of two squared beams that are in the ceiling on the west side of the basement, on the east side of the cellar stairwell. We tried to core another beam in the original section, but it was too decayed to drill. Of the stairwell beams, the inner beam, farthest from the stairs, could have been part of the original house or a later addition, and the outer beam, closest to the stairs, could have been added at the same time as the inner beam, or later. In the carriage house, cores were taken from two beams - from the major horizontal beam running E-W in the center ceiling, and from a sill plate beam on the north side of the west doorway. In the barn, two cores were taken, one from a very large beam on the edge of the hayloft in the south section of the barn, and one from a beam at ground level on the south side of the center section of the barn. Also cross-sections were cut off from the ends of two intact timbers, one from a horizontal beam along the west wall of the center section, and one from the west end of a board at ground level in the north side of the center barn. Of these nine samples, 4 (the large beam in the carriage house, the joist in the basement, and the large beam and board in the barn) are eastern white pine (*Pinus strobus*) and the other 5 are of oak (*Quercus* spp.)

We also were given one small section, found loose on the barn floor, which was distinctive due to its brown weathered color, quite different than the gray colors of the sampled beams. This same color is evident in several other timbers throughout the barn, mainly in the vertical posts in the outer walls. The Gregoires thought these were chestnut; my experience with chestnut beams is that they generally do not contain enough rings to date securely. Also, while some of the other

barn posts may be chestnut, the one section that we were given is of white ash (*Fraxinus americana*), a species that looks like chestnut to the naked eye. The exposed wood of both species does weather into a brown color over time.

In order to determine a date of construction, only the dates of the outer rings of samples from beams with a waney edge (the pine joist and one oak beam from the basement), or sapwood and bark (the other basement oak beam) can tell each tree's felling date, which is then extrapolated to a building date. The samples from these buildings corroborate with the historic record and structure of the house and barn. The earliest felling date is indicated by the date of the incomplete outer ring, 1827. This tree was felled in the summer of 1827 and the original house would have been built soon after it was felled. The two beams below the stairway are of oak, and show two additions: the inner beam (away from the stairs, closest to the original basement) has an outer complete ring that dates to 1833 with 15 sapwood rings and a waney edge (but no bark). This was put in sometime between late summer 1833 to winter 1834, although whether it was part of an actual addition or perhaps added due to the original building needing extra support or as a repair is unknown. The outer beam has a bark date of 1848, with only earlywood vessels in the 1848 ring, indicating that the tree was felled in April of 1848, and there was some addition to the house at that time. These timbers, then, give the original building date of 1827 with two possible additions or repairs, at 1833 and 1848.

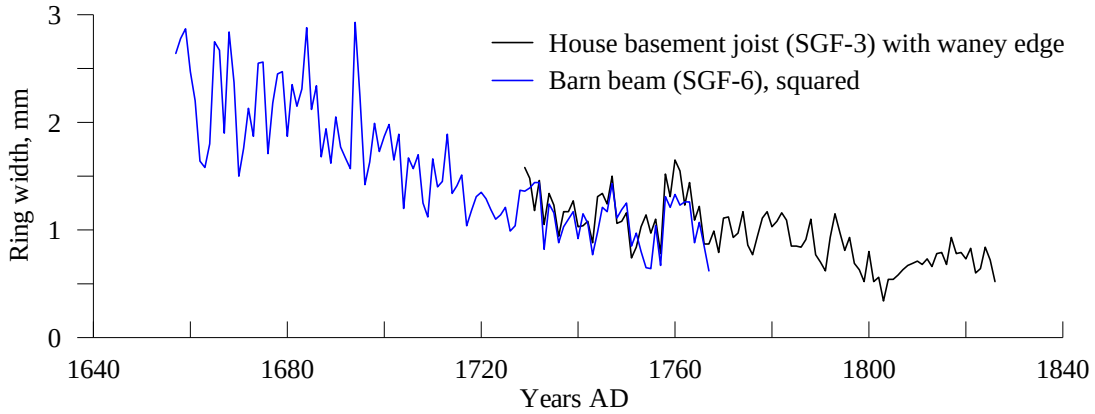

Figure 1. The similarity of the ring-widths in these two samples indicates that they most likely came from the same tree. The visual agreement is corroborated by the statistics.

Unfortunately the samples from the barn and carriage house do not contain the requisite waney edges or bark to determine their felling dates. However, for the barn, the marked similarity

between the patterns and ring widths in the big beam and the joist from the house basement clearly indicate that the two timbers came from the same tree (Figure 1). The wood in the large barn beam came from the center of a very big pine log. It appears that the outer slabs of that log, cut off in the squaring process, were sawn up and used for the joists in the original basement. That indicates that at least that part of the barn (south section) was built at the same time as the original part of the house, in 1827.

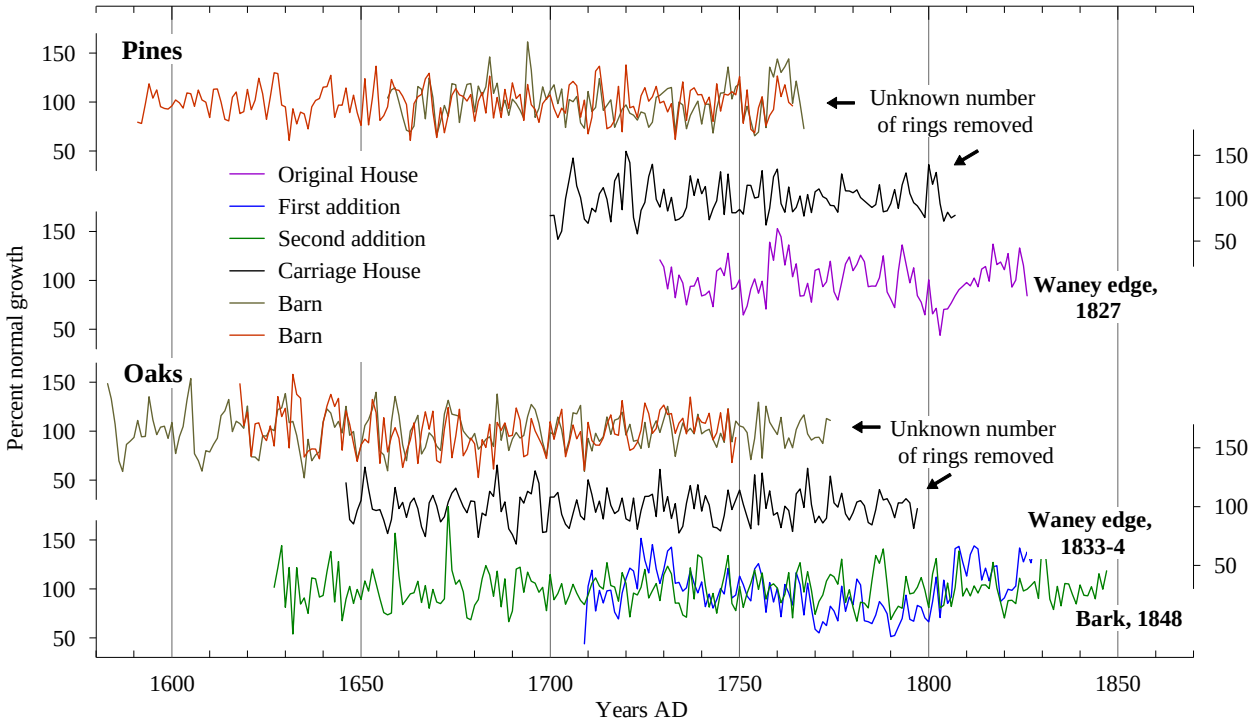

Figure 2. The ring width patterns of the samples are shown above: Top half of the graph are the pine samples; bottom half contains the oak patterns. The Ad dates were assigned only after we looked at the similarities in patterns with the regional chronologies (Figure 3).

From a dendrochronological perspective, the samples from this site are a very nice example of primary forest growth, with their origins dating before the European settlement of this region. The range of ring count goes from 98 to 221, and ring widths from 0.33 to 4.5 mm. From the detrended ring-widths of the 9 samples, two chronologies were constructed, one of the 4 pine samples, the other of the 5 oak samples, and both are over 230 years long (Figure 2). The oak chronology ends in 1847 (the outer 1848 ring in the two samples is partial, so there is no measurement for that year), and the pine chronology in 1826 (partial ring in 1827) and their constituents are listed in the Appendix and shown in Figure 2. The two chronologies are shown in Figure 3, compared to the regional pine and oak chronologies that were used to place these

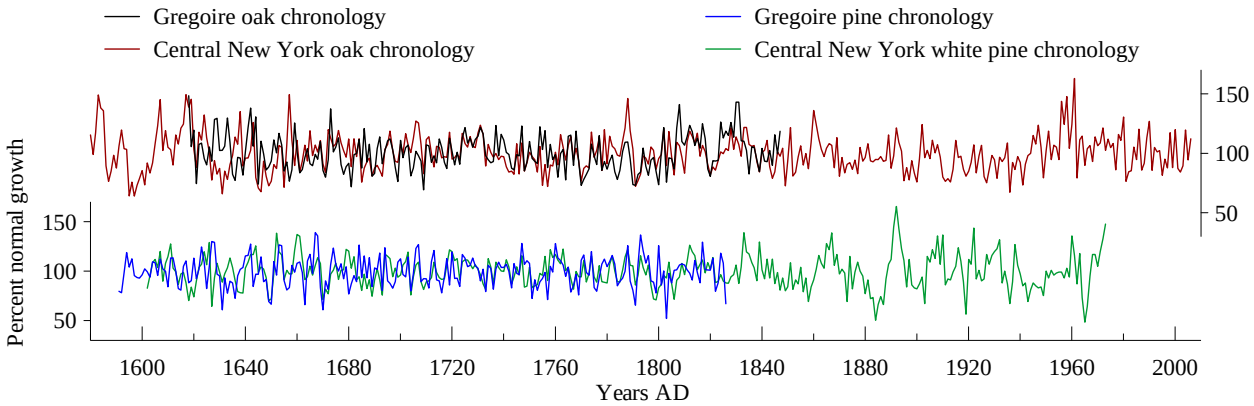

Figure 3. The two chronologies are her compared to our regional chronologies of the same genus or species. The statistical tests are all statistically significant, and the visual similarity indicates that the dates are secure.

sequences in time. The closeness of their ring-width patterns indicates how the dates were determined. Our two regional chronologies consist of forest and historic samples from around central New York. The collections closest to this site came from Burdett, Ithaca, and Corning for the pines; and from Cayutaville, Ithaca, Corning, and Phelps for the oaks.

The pine chronology:
SGF-1 (carriage house beam), 3 (joist in basement), 6 (barn beam), 8 (barn board)
N = 236 1591-1826

The oak chronology
SGF-2 (carriage house sill plate), 4 and 5 (basement beams), 7 and 10 (barn beams)
N = 265 1583-1847

The three building dates indicated by the tree-ring record are compatible with the structure of the house as was thought by the Gregoires. The rooms in the house are of relatively small size, and the many dates indicated by the basement joist and beams indicate at least one, possibly two, additions to expand the house. The outer rings of the squared pine and barn oak samples also show that the normal practice for squaring logs at that time was to square a sizeable log into one major beam (pith at center) by cutting substantial slabs off from four sides, then cutting the slabs into boards and joists. This corroborates with other collections of pine from around northeastern North America in the 18th and 19th centuries; I have never seen quartered beams of pine, but that was a common practice with oaks.

Appendix

Dated: House, Carriage House, and Barn samples, estimated to be from 1830-1850
Site: Kestrel Haven Avian Migration Observatory, 5373 Fitzgerald Road, Burdett, NY 14818
Owners: John and Sue Gregoire (khmo@empacc.net)

SGF-	Sample description and length	AD Dates
1	Squared support beam in center of carriage house. *Pinus strobus*. A = 1+107+1vv	1699- 1808+vv
2	Squared post, north part of frame for west doorway to carriage house. *Quercus* sp., no sapwood. A = +p+1+152+1vv	1645- 1798+vv
3	Floor joist in original basement, with waney edge. *Pinus strobus*. A = 1+ 98+1W	1728- 1828+W
4	Inner N-S beam at edge of west stairwell. *Quercus* sp., contains 15 sapwood rings with waney edge. A = +p+1+125W	1707- 1833W
5	Outer N-S beam at edge of west stairwell. *Quercus* sp., contains 23 sapwood rings plus bark. A = p+1+221+1B	1625p-1848B
6	Large horizontal support beam above hayloft in barn. *Pinus strobus.* The joist in the original house basement probably was cut from the same log. A = 1+111+1vv	1656- 1768+vv
7	Section cut from the south end of a N-S squared beam at floor level on west side of central section of barn. *Quercus* sp., contains no sapwood. A = 1+192+1vv	1582- 1775+vv
8	Section cut from E-W board in N wall, taken at NW corner of middle section of barn. *Pinus strobus.* 35cm wide x 5cm thick (14”x2”). A = 1+174+1	1590- 1765+vv
9	Section cut from small loose beam, light brown color. *Fraxinus americana*, contains sapwood. A = p+149+1	Not dated
10	Core from easternmost point of E-W beam, floor level, near barn door. *Quercus* sp., no sapwood. A = 1+132+1vv	1617- 1750+vv

[B = Bark; W = Waney edge; + = 1 unmeasured ring, vv = unknown no. of rings removed.]