

Dendroarchaeological Analysis of Three Cape-style Houses

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Research Summary by Jeff Benjamin, November 2015.

Introduction

This report is a summary of a dendroarchaeological survey of three historic Cape houses on two islands off the Maine coast. The Rice House, the Dowling-Meyers House, and the Carroll House. The first two houses are situated on Great Cranberry Island and the Carroll House is located in Southwest Harbor on Mount Desert Island. A detailed draft report of this research was written by Paul Krusic, and this present report builds upon the Krusic report. This also draws upon a report drafted by Anne Grulich of the Great Cranberry Island Historical Society. In this report I hope to offer some of my own interpretation and research, with the goal of eventually compiling all of this research into an article for publication.

For the purposes of putting together a project at this year's North American Dendroecological Fieldweek and in the interest of furthering research into historic structures, Bill Flynt (historic preservationist at Historic Deerfield, Massachusetts), one of our group leaders, contacted Rebecca Cole-Will, Cultural Resources Manager of Acadia National Park with an inquiry regarding any structures that might have any unresolved questions about their date and origin of construction. With the assistance of Ms. Cole-Will, the Carroll house, property of Acadia National Park, was retained for analysis. Bill continued to search for any other nearby structures that might be suitable, and was directed to Ms. Anne Grulich of the Great Cranberry Island Historical Society, who provided the project two additional privately owned houses for analysis on Great Cranberry Island: the Rice house and the Dowling-Meyers House. The subsequent dendroarchaeological analysis of these three structures was led by Paul Krusic (one of the founders of NADEF) and Bill

Flynt, with the assistance of fieldweek participants Meghan LaDolcetta, Gary Macadaeg, and Jeff Benjamin.

Many dendroarchaeological projects are prompted by questions of an historical nature. Since dendrochronologists have been compiling sequential chronologies of many species over vast time periods (stretching back thousands of years to the present), cross-sectional analysis of wood samples can be used to pinpoint the last year of a tree's life. Master tree ring chronologies provide a clue to climatic variability of specific regions, and this variability is reflected in the width of tree ring growth. Patterns can be detected between trees of similar species (as well as across species). Most often, the limiting factor in this growth is precipitation, but many other factors can cause growth variability (Stokes and Smiley 1968, 3). The underlying theoretical assumption justifying this research is the principle of uniformitarianism, which posits that geophysical and meteorological processes are consistent through time (Speer 2010, 10).

Dendroarchaeology is a natural complementary discipline to historical archaeology, because both are located in a place of tension “between artifact and text” (Andren 1998). Dendroarchaeological evidence corroborates or refutes historical information through attentiveness to natural growth patterns. One of the more familiar uses for dendroarchaeology is the accurate dating of historic structures and objects, but dendroarchaeology can also offer counterintuitive insights regarding the location of harvest, and can serve to piece together a more nuanced 'life-history' of a structure. The structural timbers analyzed during the field week were chosen for their initial use by human beings, they did not grow in their location. They were handled and hewn nearly two centuries ago, so dendroarchaeological practice is one that out of necessity takes into account a host of cultural information and must therefore contend with cultural influences. This information can be used to build an argument for the date of construction. There are complications, as in all archaeological sites, due to loss of association (movement and relocation of materials and modifications of structures over time). Therefore, conclusions built upon dendroarchaeological analysis must rely upon a large data set to form a plausible argument. This archaeometric analysis is then corroborated with the historical information. The outermost ring date that we seek in timbers from historical structures is not necessarily the date of construction. It is simply the final dated year of the tree's life. A house can go through a host of changes over the course of its existence, and can often incorporate wood from nearby structures, barns and other sources that might date from a much different period than the house itself. Dendroarchaeology is by necessity interdisciplinary: a region's

broader environmental history must be understood as well as construction techniques and economic factors, the flow of goods and commodities.

The Carroll House: Southwest Harbor, Mount Desert Island, Maine

As a preserved structure, the Carroll House is an anomaly in many ways. It was never electrified, and it never had running water. It became a summer residence in 1912 (Morrison 2007, 41). Because the Carroll family maintained it as a summer home, and then sold it to another family for the same purpose, the Carroll house avoided the fate of so many other structures of the time. The author of the Carroll House report, Peter Morrison, has observed that by the 1850's, family farms were in the process of being divided into two broad categories: farms that managed to mechanize and survive the industrial revolution and farms that were in the process of becoming archaeological sites (27).

John Carroll came to the Maine coast in 1820, and although a mason by training, he worked as a logger. He was wounded in a logging accident in Maine and while recuperating at the home of the Lurvey's at Southwest Harbor, he met Rachel Lurvey and the two were married in 1822 (Morrison 39). Much of the narrative of the early years of the Carroll family coincides with what is known about the social history of early American settlement. The more we learn about this time period, the more evidence builds for a debunking of what Ruth Schwartz Cowan has termed "The Myth of Self-Sufficiency" (Cowan 1997), the fantastical notion of rugged individualism, or the Yankee do-it-yourself mentality. Early settlers occupied themselves in numerous occupations that changed seasonally, and they shared tools and skills to help each other survive. In 1828, John Carroll bought 50 acres of land for 50 dollars (Morrison 40), but it is important to note that John and Rachel Carroll's new property was directly adjacent to Rachel Carroll's parents home. They received a great deal of assistance from the Lurvey's during their early years at this location.

Historical research as related by the Morrison report suggests that the Carroll house was built not long after the purchase of the land, which is specified in a deed as 1828. Carroll purchased the land from Ward Nicholas Boylston from Princeton, Massachusetts. Over the course of its existence, the house saw numerous renovations, the most dramatic of which occurred in 1845 according the Morrison report, when a large addition was added on to the existing structure. This extension lengthened the house by 15'6" (Morrison 64). In 1982 Acadia National Park acquired the

property and restoration efforts ensued to "stabilize the house to its early 1970's condition" (46). It would seem that the primary purpose for dendroarchaeological research at the Carroll house would be to establish "a terminus post quem (earliest possible) date of construction" (Krusic 2015, 2), and this of course applies for determining the different phases of construction as well. As formulated by Grulich's report "Early 19th - century Concealed Shoes and Cape-style houses on Great Cranberry Island, Maine," there are also some questions about the working relationship of John Carroll and Michael Bulger, who traveled together from Ireland to Mount Desert Island by way of Newfoundland, arriving around 1820 (Grulich 2015, 9). A consideration of this relationship leads to consideration of two more houses examined at Great Cranberry Island.

The Rice and Dowling Meyers House: Great Cranberry Island, Maine.

As stated earlier, an interesting object of historical archaeological investigation as well as material culture studies in general is the manner in which 'things' can initiate, redirect or even overthrow historical narrative. The propensity of objects and things to exert influence over social forms has led to disciplinary constructs such as 'material agency' and 'thing theory.'. This capacity for things to 'act back' upon human beings is certainly illustrated when one reflects upon the origin of this present research project. As related by Grulich in her report, in the course of a renovation of the Great Cranberry Congregational Church parsonage house, a contractor, Gerry Brache found four pair of shoes buried in a wall of the structure that was under demolition: "Research revealed that the concealed shoes date stylistically to the 1820-1830's; the house is a good deal older than expected; and it is one of several Cape-style homes that may have been built by neighbor Michael Bulger ca. 1835" (Grulich 2). The shift of even just a few years in the dating of an historic structure can have profound ramifications for present stakeholders, so this discovery quite naturally prompts a desire for corroboration. One could safely posit that it was the discovery of these shoes that led to a series of events culminating in the present study (and presumably to be continued).

Documentary evidence states that Michael Bulger built a Cape-style house in Southwest Harbor, perhaps while living on Great Cranberry Island. As with the Carroll House, the Rice and Dowling Meyers houses are all of a similar Cape Style. As stated by Grulich in her report, establishing dates of construction could possibly assist in answering the following questions: Did

Bulger build the Carroll house? Did Carroll supply masonry work for any of the houses on Great Cranberry Island (i.e. were they working partners)? Were the Rice and Dowling Meyers houses built by Bulger?

A Brief Foray in the History of Logging in Maine

Logging in the region now known as Maine began in the mid 1600's and has continued to the present day. As a province of Massachusetts until 1820, Maine was a source of wood for masts shipped to England as well as squared lumber of varying species shipped to the West Indies for use in the sugar plantations (Hindle 35) where it was exchanged for gold, molasses and rum (Wood 1935, 200). The primary species during the early phase of timber exploitation was *Pinus strobus*, or white pine, and it was estimated that by 1850 Maine provided approximately 75% of the pine exports from the United States (ibid). Several sources (Wood 1935, Coolidge 1963) are careful to note that *Picea rubra*, or red spruce, was not harvested until the middle of the 1800's, and that the emergence of spruce was accompanied by a decline in trade with the West Indies (Wood 200). After 1863, more spruce than any other species was harvested at least through 1905 (Smith 1972, 13). This is particularly interesting, because in the core sample analysis of the structures, the species that offered the strongest chronological evidence was red spruce. Many historical accounts suggest that before 1840 spruce was hardly considered worth cutting: "The men who went into the spruce business were considered little better than crazy, for that kind of lumber was despised in the good old piny days and few had any use for it" (Wood, quoting Defebaugh 23), however, records from Calais, Maine indicate that spruce was a significant export and possibly exceeded pine by as early as 1841 (Wood 202). Krusic notes that the structural timbers in all three of the houses examined were either *Pinus strobus* or *Picea rubra*, with the former predominant as the larger beams and posts (Krusic 2015, 5).

Methods and Results

With the guidance and expertise of team leaders Paul Krusic and Bill Flynt and the guidance of Anne Grulich of the Great Cranberry Historical Society, dendroarchaeology students

Gary Macadeag, Meghan Ladolcetta and Jeff Benjamin embarked upon an intensive one week dendroarchaeological investigation of these three Cape-style houses. The following is a compilation of my notes of this process as well as the Krusic report, which far exceeds this present report in detail and understanding of statistical analysis. The following is simply my attempt to understand and synthesize some of this process, the majority of which was accomplished by a collaboration between Krusic and Flynt.

To avoid the risk of 'losing the forest for the trees,' it should be noted from the outset that at the heart of dendroarchaeology is pattern recognition, whether in the form of values, numbers, line width, spaces between lines, gaps, omissions, densities, colors, etc. While all of the steps in the process are equally important towards the attainment of clear results, the most important component in the goal of pattern recognition is the wood sample itself. All of the structural members were chosen for their likelihood of original construction (the basements of the Rice and Dowling Meyers houses and the attic of the Carroll house) as well as the presence of wane, or bark edge, because "The first ring behind the wane-edge is the last ring growth before the tree was felled for building" (Krusic 3). This presents a possible challenge for structural members that were logged in the mid 1800's in Maine, since one of the primary workers on a winter logging team was a *barker*: "Since the logs were dragged, the barker cut off strips of bark to reduce friction" (Wood 88). Nevertheless, many timbers appropriate for sampling were found, amounting to 68 samples in total (Rice house: 19, Dowling Meyers house: 15, Carroll house: 34).

Because the process of ring width measurement is highly accurate (to .001 mm) a clear visual delineation of form must be accomplished on a small scale. This was done by sanding the samples to 600 grit "until a mirror-like smooth finish was attained" (Krusic 4). The next stage in the process of sample analysis was the creation of skeleton plots (Stokes and Smiley 1968). Even with the present digital and computer technology, the practice of creating skeleton plots is invaluable because it provides a way of comparing each individual sample's internal ring width proportions with all of the other samples of a given location. Aligning these skeleton plots can allow patterns that were not discernible from looking at the wood itself to emerge into view. Once the skeleton plots were completed, some of our group members began measuring each sample on a stage micrometer, while others continued working on detecting patterns in the skeleton plots. As soon as the ring width measurement data was available, it was compiled to create a 'floating chronology' for each structure.

Krusic notes that "of the 45 spruce samples collected from the three homes, 32 correlated with each other" (Krusic 5).

The next stage in the process of dating the samples was to correlate these samples and floating chronologies with existing master chronologies of *Picea rubra*. This proved difficult, until another member of the fieldweek, Dr. Shawn Fraver of the University of Maine provided our team "an unpublished red spruce chronology from northern Maine" (Krusic 7, Fraver et.al. 2007). The resulting correlation between selected spruce samples from our research and the Fraver chronology was greater than 99% (Krusic 7).

In their article "Dendrochronological reconstruction of spruce budworm outbreaks in northern Maine, USA" (2007), Fraver, Seymour, Speer, and White state that they assembled a red spruce chronology from 772 trees from Big Reed Forest Preserve in northern Maine. This is a sizable sampling group. The correlation found between the floating chronologies produced in our study and the master chronology produced from this study suggests one of two possible conclusions: either the spruce used in the construction of these houses was harvested within the region of this master chronology and transported to the site of construction, or it was harvested in another location which saw a sequential series of environmental conditions and growth limiting factors that exactly match the master chronology year for year. The second possibility seems remote, and my own personal experience with dendrochronology is too limited to know if this possibility is even worth mentioning.

Discussion

The results of this research confirm historic data regarding probable dates of construction of the houses. The documented evidence that Carroll and Bulger worked together to build the Newman house in Southwest Harbor in 1830 (Grulich 10) does not preclude the possibility that they also worked together to build the Rice and Dowling Meyers houses, whose red spruce structural members have "last year of growth" dates ranging from 1837-1842. Therefore the hypothesis that they possibly worked on these houses still stands. Moreover, it has been established that the work of earning a living during this time required frequent movement to where ever work could be found. The likelihood that the spruce for these houses was harvested in northern Maine does not preclude

the possibility that Carroll and/or Bulger harvested it themselves. In his "History of Lumbering in Maine, 1820-1861," Wood stresses the fact that seasonal lumbering work drew heavily from farming in the winter, stating "The farmer-logger occasionally devoted so much time to logging that the farm would be neglected" (Wood 196).

In keeping with the tension 'between artifact and text,' one particular discrepancy is intriguing. The last years of growth among the red spruce timbers as dated in the original structure of the Carroll house range from 1819-1822. This is significantly earlier than the historical accounts suggest for any significant exploitation of red spruce in Maine. Figures for spruce do not occur at all in Bangor surveys until either 1846 (Wilson 2005, 221) or 1851 (Smith 12). The location of Bangor is significant because if the spruce was harvested in the vicinity of Big Reed Preserve, it was most likely floated down the Penobscot and passed through Bangor. Coolidge notes that 30-40% of lumber production occurred along the Penobscot by 1839 (Coolidge 48).

Coolidge provides a hint as to how the spruce from northern Maine arrived to Mount Desert Island and was incorporated into the Carroll house, since historical documentation suggests that spruce harvesting was not cost effective at the time: "As to spruce, cutting of sawlogs for market had scarcely begun in 1840, although much spruce had been cut to bed down and break the fall of the large pines" (Coolidge 50). Perhaps these smaller spruce logs were rafted together with the larger pine timbers or logs which, it has been established, were being moved in large quantities in the early 1800's.

Krusic observes "Beyond dating structures, dendroarchaeology can help elucidate environmental, behavioral, and cultural factors relevant to the time period" (Krusic 10). This certainly seems to be the case with the present study, whose results simultaneously confirm and complicate historical narrative. As archaeological and documentary research continues, perhaps the story of these three houses will broaden and deepen as serve as an entry toward understanding of the human lives intermingled with them and the lives of the trees themselves.

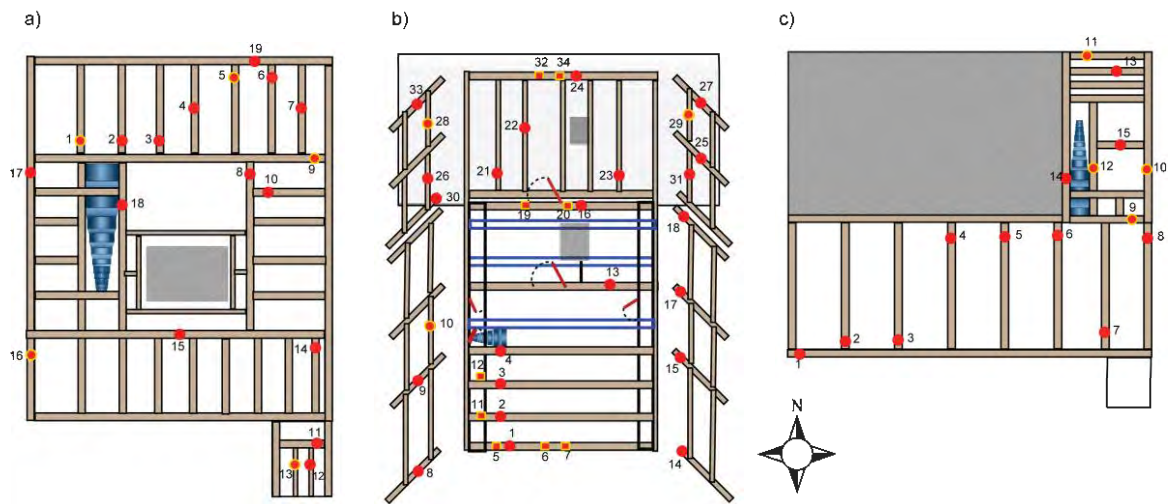


Figure One (from Krusic 2015, 4): a) Rice House sampling locations (basement). b) Carroll House sampling locations in attic. c) Dowling Meyers House sampling locations (basement).

Rice House			
Sample ID	Wane	Fyog	Lyog
GCIR-01	Y	1720	1840
GCIR-02	Y	1722	1840
GCIR-03	Y	1703	1837
GCIR-04	Y	1710	1840
GCIR-05	Y	1744	1840
GCIR-06	Y	1755	1840
GCIR-07	Y	1750	1840
GCIR-09	Y	1716	1837
GCIR-11	Y	1726	1840
GCIR-13	Y	1715	1840
GCIR-14	Y	1750	1840
GCIR-16	N	1771	1839

Dowling House			
Sample ID	Wane	Fyog	Lyog
GCID-01	Y	1699	1839
GCID-03	Y	1740	1841
GCID-06	Y	1750	1842
GCID-07	Y	1710	1842
GCID-09	Y	1763	1839
GCID-10	Y	1745	1839
GCID-11	Y	1758	1839
GCID-12	Y	1730	1842

Carroll House			
Sample ID	Wane	Fyog	Lyog
Phase I			
MDIC-05	Y	1753	1819
MDIC-06	Y	1742	1819
MDIC-07	Y	1753	1819
MDIC-10	Y	1741	1822
MDIC-19	Y	1761	1822
MDIC-20	Y	1769	1822
Phase Ib			
MDIC-11	Y	1744	1828
MDIC-12	Y	1769	1833
Phase II			
MDIC-28	Y	1745	1841
MDIC-29	Y	1750	1840
MDIC-32	Y	1754	1836
MDIC-34	Y	1745	1839

Table One: Final dating results (from Krusic 2015, 10)

a)

Rice House				
Sample ID	Location	Species	Wane	# rings
GCIR-01	north bay, 1 st joist from west wall	PCRU	Y	131
GCIR-02	north bay, 2 nd joist from west wall	PCRU	Y	119
GCIR-03	north bay, 3 rd joist from west wall	PCRU	Y	135
GCIR-04	north bay, 4 th joist from west wall	PCRU	Y	140
GCIR-05	north bay, 5 th joist from west wall	PCRU	Y	97
GCIR-06	north bay, 6 th joist from west wall	PCRU	Y	86
GCIR-07	north bay, 7 th joist from west wall	PCRU	Y	153
GCIR-08	central bay, n-s chimney girt, east, reuse	PIST	Y	99
GCIR-09	North e-w chimney girt	PCRU	Y	81
GCIR-10	chimney bay east bay joist, 1 st south of -09	PCRU	Y	68
GCIR-11	south ell, north east/west sill	PCRU	Y	115
GCIR-12	south ell, east joist	PCRU	Y	134
GCIR-13	south ell, west joist	PCRU	Y	126
GCIR-14	south bay, east inner sill	PCRU	Y	91
GCIR-15	south e-w chimney girt	PCRU	Y	167
GCIR-16	south bay, west inner sill	PCRU	N	69
GCIR-17	chimney bay, west inner sill	PCRU	Y	113
GCIR-18	central bay, n-s chimney girt, west, re-use?	PIST	Y	115
GCIR-19	north sill	PCRU	Y	178

c)

Dowling House				
Sample ID	Location	Species	Wane	#rings
GCID-01	south sill	PCRU	Y	141
GCID-02	south bay, 1 st joist from west wall	PCRU	Y	135
GCID-03	south bay, 2 nd joist from west wall	PCRU	Y	102
GCID-04	south bay, 3 rd joist from west wall	PCRU	Y	145
GCID-05	south bay, 4 th joist from west wall	PCRU	Y	120
GCID-06	south bay, 5 th joist from west wall	PCRU	Y	93
GCID-07	south bay, 6 th joist from west wall	PCRU	Y	133
GCID-08	south bay, east sill	PCRU	Y	99
GCID-09	south bay, e-w girt, between n & s bay	PCRU	Y	77
GCID-10	north bay, east sill	PCRU	Y	95
GCID-11	north bay, north sill	PCRU	Y	82
GCID-12	north bay, e-w girt at stairway	PCRU	Y	113
GCID-13	north bay, 1 st joist south of north sill	PCRU	Y	186
GCID-14	north bay, west girt	PCRU	Y	91
GCID-15	north bay, 4 th e-w joist from north sill	PCRU	Y	91

b)

Carroll House				
Sample ID	Location	Species	Wane	# rings
Phase 1				
MDIC-01	south wall tie girt	PIST	Y	n/m
MDIC-02	1 st joist north of south gabled end	PIST	Y	n/m
MDIC-03	2 nd joist north of south gabled end	PIST	Y	n/m
MDIC-04	3 rd joist north of south gabled end	PIST	Y	95
MDIC-05	south gable stud, sw corner of room	PCRU	Y	67
MDIC-06	south gable stud, west side of window	PCRU	Y	78
MDIC-07	south gable stud, east side of window	PCRU	Y	67
MDIC-08	south west gable rafter	PIST	N	46
MDIC-09	west side, 1 st rafter north of south gable	PIST	N	51
MDIC-10	west side, knee wall purlin	PCRU	Y	82
MDIC-11	west side, 2 nd knee wall stud south gable	PCRU	Y	85
MDIC-12	west side, knee wall stud north of MDIC11	PCRU	Y	65
MDIC-13	south chimney bay girt	PIST	Y	61
MDIC-14	south east gable rafter	PIST	Y	73
MDIC-15	east side, 1 st rafter north of south gable	PIST	Y	n/m
MDIC-16	north end tie girt	PIST	?	81
MDIC-17	east side, 2 nd rafter from south gable	PIST	Y	80
MDIC-18	northeast gable rafter	PIST	Y	77
MDIC-19	north gabled door, west stud	PCRU	Y	62
MDIC-20	north gabled door, east stud	PCRU	Y	54
PHASE 2				
MDIC-21	1 st joist from west eave	PIST	Y	n/m
MDIC-22	2 nd joist from west eave	PIST	Y	80
MDIC-23	1 st joist from east eave	PIST	Y	161
MDIC-24	north end tie girt	PIST	Y	n/m
MDIC-25	east side, middle rafter	PIST	Y	n/m
MDIC-26	west side, 1 st purlin from eave – south bay	PIST	Y	n/m
MDIC-27	east side, north rafter	PIST	Y	69
MDIC-28	west side, 1 st purlin from eave- north bay	PCRU	Y	97
MDIC-29	east side, 1 st purlin from eave – north bay	PCRU	Y	107
MDIC-30	west side, south rafter	PIST	Y	61
MDIC-31	east side, 1 st purlin from eave, south bay	PCRU	Y	96
MDIC-32	north gable end window west stud	PCRU	Y	83
MDIC-33	west side, north rafter	PIST	Y	45
MDIC-34	north gable end window east stud	PCRU	Y	95

Table Two (from Krusic 2015, 3): List of samples from each house with description of location, species, wane edge and number of rings.

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