Dans les forêts d'Acadie: Dendroarchaeological investigation of Acadian buildings from the Village Historique Acadien

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Abstract
This research project was carried out to determine the date of construction of Acadian structures located in the Village Historique Acadien (VHA), near the town of Caraquet, New Brunswick, eastern Canada. The structures were of various ages and originally came from different locations throughout the province. One hundred and eighty two wood cores were taken from timbers in seven buildings at the VHA. The annual growth rings of the wood were measured to 0.001 mm precision at the Mount Allison Dendrochronology Laboratory (MAD Lab), using WinDENDRO and Velmex measurement systems. The pattern of annual variation of each sample was matched against existing growth records from the region to determine the date at which the timber was felled. Confident terminal dates were found for timbers from all seven sites, and dates of construction were extrapolated from this information. Constructions dates ranged from 1773 to modern (c. 1970). Some of these dates confirmed estimates made by VHA historians, while others were older or younger than originally expected, allowing a more informed appraisal of the historical value of each building. Data from the analysis was also incorporated into existing MAD Lab data sets, thereby strengthening and extending local red spruce (*Picea rubens*), eastern white cedar (*Thuja occidentalis*) and eastern white pine (*Pinus strobus*) chronologies.

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Introduction

The year 1755 witnessed the scene of one of Canada's most dramatic and distressing historical events: the deportation of the French-speaking Acadian people from the Maritime Provinces. As Britain began to establish greater control over the area, the determined neutrality of the settled Acadians, and particularly their refusal to bear arms for the sovereign of England, became a source of increasing suspicion and animosity. The British' doubts regarding the loyalty of their Acadian subjects finally came to a head in a stand-off between French and English forces near the present-day New Brunswick/Nova Scotia border. The fall of the French Fort Beauséjour marked the beginning a period known today as "le Grand Dérangement": the deportation of Acadian settlers and their dispersal throughout the eastern US, back to France, and even farther afield.

After a period of eight years the Deportation came to an end. An amnesty was signed allowing the exiled Acadians to return home. Many came back, settling this time in New Brunswick, where little colonization had taken place previously. British expansion and the arrival of loyalist refugees from the American Revolution pushed the Acadians deeper and deeper into the uncharted region, shaping New Brunswick as we know it today. New settlements were founded, land broken, and for the first time Acadian families were officially granted the land they worked and built on. Using locally abundant timbres, these pioneers built houses of solid wood. Modest but sturdy, many of these structured have survived into the modern day, hiding centuries of history beneath new siding, sprawling additions and the occasional skylight or solar panel.

In the early 1970s, efforts were begun to uncover some of this rich history and preserve it for present and future generations. The Village Historique Acadien (VHA; website: http://www.villagehistoriqueacadien.com) was established near Caraquet, in northern NB, as a living museum depicting Acadian life. Historical buildings from around the province were researched for their value as cultural artifacts; some were then donated or purchased by the VHA and moved to the Village site (Godin and Richard, 2005). At the VHA these buildings were restored to what was concluded to be their original condition. The variety of buildings – houses, shops, outbuildings, and even a church – at the VHA today reflect the evolution of Acadian lifestyles from the late 1700s to the early 1900s.

While research has been done to age these buildings, it remains difficult to confirm a supposed date of construction. Few written records exist regarding the construction of residences and other private building, and oral histories are difficult to assess without additional information. Architectural styles can also be poor indicators, as construction techniques often outlived their time period in remote, isolated villages. Size of buildings, parish records, government censuses and correspondence can help shed light on the lives of past inhabitants, but offer limited aid in fixing the buildings into time.

In 2005, the VHA administration approached the Mount Allison Dendrochronology Laboratory (MAD Lab; http://www.mta.ca/madlab) in the hopes of finding or confirming construction dates for a number of buildings which are presently part of the VHA. Dendroarchaeology can assist such an investigation by determining when a given log

timber was felled (Schweingruber, 1992). Analysis of individual timbers in an old building can provide precise information regarding the timeline of construction. This new information can lead to a more confident estimate of a building's construction date, at the same time ruling out any dates before the last tree was felled. Accurate information allows the VHA to improve and adjust the display they offer to the many visitors who learn about Acadian history at the Village every summer.

Buildings eventually wear out and are torn down. Much of New Brunswick's wealth of historical structures is hidden today in garden sheds, garages or expanded houses. Like the province itself, these buildings have been transformed time and again, housed different people in different circumstances, and stand today shrouded with untold stories and mysterious origins. Not all old buildings warrant costly restoration, but preserving a record of this truly Canadian culture is an important responsibility. Careful research, including accurate dating of interesting structures, is an important step in protecting the remaining relics of New Brunswick's early Acadian people.

Methods

Research was carried out in the summer of 2005 in a number of steps: sample collection, preparation, SEM identification, measurement and analysis.

Sample collection

Cores samples were taken from 7 buildings in the Village Historique Acadien using manual increment core-boring tools. A team of 3 researchers from the MAD Lab, accompanied by Robert Richard from the VHA, sampled the building between the 25th and 27th of May, 2005.

The buildings in the VHA are primarily original historical structures selected and restored to illustrate Acadian lifestyles from the late 18th century to the early 20th century. Most of the structures were collected from around New Brunswick in the early 1970s, and moved to the VHA site near Caraquet, NB. The buildings were restored to what was ascertained to be their original condition, based on research conducted on the history of each building. Research included archival documents, family histories and architecture. Some outbuildings (barns, granaries, etc.) were also brought to the village, though in most cases these were not as thoroughly researched as the main buildings and houses in each complex. Some VHA complexes were augmented with new outbuildings constructed in the style of the period.

The sites to be sampled were chosen in consultation between the VHA and the MAD Lab, in order to answer the most pressing question and provide the most valuable data given the limited scope of the project. Five main buildings were selected by the VHA: Martin House, Mazerolle House, Robichaud House, Cyr House and Babineau House. VHA dates for these buildings ranged from 1783 to 1851. During a preliminary visit to the site, two additional structures were found which might fill in gaps or weak areas in existing MAD

Lab reference chronologies: the Robichaud [Léger] Barn and the Cyr Pig Barn. The barn on the Robichaud site (known as the Léger Barn by the VHA, but referred to in this report as the Robichaud Barn because of its present association with that house) is an old structure which was moved to the VHA from nearby Paquetville, NB. The origins of the pig barn are unknown, but VHA administrators believe it was constructed on-site in the mid 1970s.

Sampling was done over the course of three days. Between 20 and 25 timbers were cored at each site except for the pig barn, where only 14 logs were sampled. To minimize the visual impact of coring in the carefully restored houses, generally only one sample was taken per timber. An exception to this is the Robichaud Barn from which two samples were taken per log, due to its value to the MAD Lab as a "standing forest" of whole timbers, and the minor aesthetic impact of coring in an unfinished structure. Cores were labeled and stored in plastic tubes or aluminum foil for transportation back to the MAD Lab. Notes were taken regarding the condition of the wood, location of the timbre, and presence of terminal ring indicators such as bark or wormwood.

Sample preparation

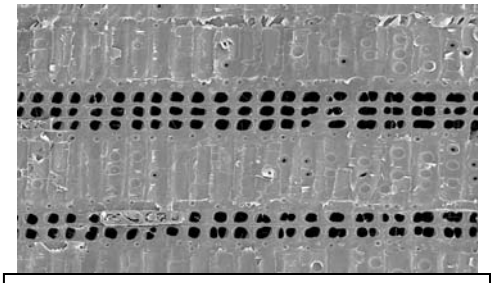
Sample preparation took place in June and July 2005 at the MAD Lab in Sackville, NB. Individual samples were glued onto grooved 1" x 3" boards using carpenter's glue. At this time some samples were removed from the analysis because of their condition. Pieces of some cores (or an entire core, where an extra one was taken) were set aside for identification using a Scanning Electron Microscope (SEM). Some visible characteristics were recorded at this time, where they were clearly evident. The samples were held down with masking tape and pressed with elastics against a second board until dry. Carpenter's glue was applied a second time to minimize the risks of power-sanding the cores. When the glue was fully dry, the boards were sanded using belt sanders and a series of 4 or 5 progressively finer grits ranging from 80 to 400.

SEM identification

Representative samples were chosen for SEM identification based on visual characteristics and the functional location of timbres in the structure (between four and eight samples per building). Where colour variation was present a light and a dark core were selected; in other cases a wall timbre, a ceiling timbre and a roof timbre were chosen. Sometimes an entire core was available for SEM preparation, otherwise several rings were broken off the pith-side of a core which was glued and later measured. Small pieces of sample were cut with a razor blade under a dissecting microscope to reveal radial and tangential views of the grain. These thin wafers of wood were placed on a metal stub and brought to Jim Erhman at Mount Allison University's Digital Microscopy Facility (http://www.mta.ca/dmf/index.htm).

At the Scanning Electron Microscopy facility, the sample stubs were coated in a fine layer of gold and placed in the SEM. Wood samples were examined at high magnifications and identified according to species by Dr. André Robichaud. The

presence or absence of resin ducts, ray features, regularity and shape of bordered pits were among the characteristics used to distinguish between locally available wood species. Once identification of representative samples using the SEM was complete, the remaining samples were examined by eye and under a dissecting microscope to match them visually with the identified samples.



SEM image showing anatomical features of a white pine.

Measurement

Sanded prepared samples were measured using the WinDENDRO program and the Velmex system, used separately or in conjunction. WinDENDRO measurement involved scanning a sample board using a flatbed scanner at a resolution between 300 to 1200 dpi. Measurement paths were drawn manually on the scanned image, and the program detected rings automatically using the annual variation in wood colour. Adjustments were made manually to the program's initial ring detection. Finally, the distance between ring boundaries was measured by the WinDENDRO program and saved as a text file. Velmex measurement was done with the sample board resting on a calibrated trolley under a light microscope. As the sample was advanced along the track, rings were identified visually and the measurement was entered into the computer at the press of a button. Velmex measurement was used for cores with very tight growth rings in order to minimize the chance of missing rings. In some cases both systems were used in conjunction.

Analysis

Ring measurements from the WinDENDRO system were converted into Tucson (decadal) format using the Convert program. Any Velmex measurements were then added to the file for each building. Individual cores were sorted according to wood species, and processed through the COFECHA statistical program. Corrections were made at this time to "clean" the data. Notes made during measurement, gluing and sampling were reviewed, and the samples were re-examined under a light microscope. Broken sections of a sample which were recognized as backwards were reversed using the editing program EDRM. Gaps and breaks were checked against a master series for each data set to look for possible missing sections. Samples which did not fit well with the master were checked closely for problem areas. Some samples which were in unworkable condition were removed at this time.

Clean data files were then re-processed through COFECHA until a consistent master chronology was developed. A few high-quality samples, either cores without breaks or series with high statistical correlation in early COFECHA runs, were selected and processed through COFECHA as undated series. These cores were then adjusted to each other by resetting the last date of growth in EDRM. Remaining cores were then run against this master list in small batches, adjusted, then added to the master. Series which could not be adjusted to fit with the master were removed.

Master data files for each building were run through COFECHA against existing MAD Lab chronologies from New Brunswick. Suggested adjustments allowed the floating series to be dated according to known information, and then worked into the MAD Lab data sets. In this way the data sets were strengthened as the samples from each structure were locked into time.

Results and Discussion

General results are presented in table 1 below. The results are based on the most **reliable dates (see appendix)** from the crossdating process and were delivered from samples that fostered no difficulties of interpretation: they had the last growing ring (i.e. under bark, etc.) and had a significant correlation with the master chronology.

Building [Site ID]	**VHA date**	**Range of terminal dates (all samples)**	**Range of reliable dates (range/total reliable dates)**	**Estimated date of construction**
Robichaud House [05JS]	1825	1804-1853	1842-6 (8/10) 1852-3 (2/10)	1846* (1854)**
Robichaud Barn [05KS]	1850-1900	1797-1890	1888-90 (14/14)	1891
Martin House [05LS]	1783	1767-1772	1772 (4/9)	1773
Cyr Pig Barn [05MS]	1974-75	1927-1964	1942-73 (5/5)	1973
Cyr House [05NS]	1831	1818(09?)-1866	1850-52 (10/10)	1852
Babineau House [05OS]	1851	1802-1847	1842-47 (13/16)* 1831-3 (3/16)***	1848
Mazerolle House [05PS]	1842	1766-1798	1795 (6/8) 1796-8 (2/8)	1795* (1798)**

Table 1: Dendrochronologicaly estimated construction dates from the seven buildings sampled at the VHA. (For complete data sets and site profiles, see Appendix 1.)
* Main structure.
** Ceiling.
*** Probably recycled wood.

Robichaud House [05JS]
Of the 24 core samples taken from the building, 12 were dated with a significant statistical correlation, and 7 others were dated with a slightly lower correlation value. The terminal dates found for these 19 cores ranged from 1804 to 1853, with a mode of 1842. Constructed of spruce and cedar, chronologies of both species were used to date the

samples. The youngest two samples, terminal at 1852 (bark recorded) and 1853, were taken from the ceiling of the main level. Both were spruce species, and were found to be several years younger than the youngest wall or roof timber sampled. The two roof samples were also spruce, while the 19 (15 dated) wall timbres sampled were primarily cedar. Wall samples included a cluster of cores dated in the mid 1840's, with the youngest dated to 1846.

The Robichaud House was estimated by VHA researchers to be built in 1825, with siding added about ten years later (Lebreton, 1975). It has been restored to this time period. Terminal ring data would suggest a construction date not before 1854 for the ceiling, with a possibility that the main frame was constructed as early as 1846.

Robichaud Barn [05KS]

Forty one core samples were taken from the Robichaud Barn, from 21 different timbres. A total of 37 were dated, 31 with a significant statistical correlation. All but four of the sampled timbers were cedar, for a total of 33 cores. The range of the 14 reliable dates was 1888-1890.

The VHA does not have extensive historical data on this building, but Godin (2005) supposed it was from the second half of the 19th century. Terminal ring data suggest intensive timber harvesting in the late 1880's, with a construction date no earlier than 1891.

Martin House [05LS]

Twenty four cores samples were taken from the Martin House. Nine of these were successfully dated, eight samples with a statistical significant correlation, and six with reliable dates. Wood species found in the Martin House include spruce, cedar and possibly pine and fir as well. Red spruce was the only species used to date this site. The range of reliable terminal dates for these samples was from 1768 to 1772. With the shortest range of all the sites studied, the Martin House is also unique in having the greatest concentration of terminal dates at the most recent date: 1772.

The VHA has attributed a construction date of 1783 to this building, based on a report by Major Studholm confirming the building's existence in that year (Blanchard, 1976). Terminal ring data would suggest that Maison Martin was built as early as 1773.

Cyr Pig Barn [05MS]

Due to its small size, only 15 core samples were taken from the Cyr Pig Barn, from 14 different timbers. All the samples were cedar, and all but one were dated, nine of the 14 to a statistically significant correlation. The terminal dates of all samples ranged from 1927 to 1964, with poorly correlated samples dating at 1862 and 1999.

The VHA has no records regarding the origin of the Cyr Pig Barn. It is believed that the building was constructed when the VHA was established, in the mid 1970s (Godin, 2005, and Richard, 2005, personal discussion). Terminal ring data support that hypothesis, with the large range of terminal dates suggesting that the structure was built from scrap wood or old remnants not before 1965, most likely as the VHA was being developed in the mid 1970's.

Cyr House [05NS]

Twenty seven core samples were taken from the Cyr House, 19 of which were dated. Six of the undated samples were larch "ship's knee" supports from the upper level. The other samples were spruce and cedar. With the omission of one problematic core (05NS020 had significant correlation functions terminal at both 1866 and 1809), the range of statistically significant terminal dates was from 1810 to 1855. A large concentration of reliable dates occurred in the early 1850s, with eight samples dated to 1851.

The VHA date for this building was 1831, based on a report that Michel Cyr had a house at that time (Surette, 1975). Terminal ring data suggest an intensive timber gathering period in the early 1850s, with a few pieces of lumber gathered slightly later. These later timbers could be additions to a building dated around 1853.

Babineau House [05OS]

Twenty seven cores were taken from the Babineau house, all of white pine. All but two of these were dated, 21 samples with statistically significant correlations. Terminal dates range from 1802 (beetle galleries recorded) to 1847 (bark present), with a concentration of reliable dates in the 1840s and a mode of five samples at 1845. The three ceiling beams sampled tended to be younger than average at this site (1831, 1831 and 1833).

The oral records of the Babineau family suggest that this house was built around 1851-1852 (Cormier, 1976). The VHA has adopted 1851 as the estimated date. Terminal ring data suggest a date not before 1848, which could well be 1851 or even a little earlier. The ceiling beams might be recycled wood as they are older than the main structure.

Mazerolle House [05PS]

From the Mazerolle House, 23 spruce samples were taken from 20 different timbers. Fifteen of these were dated, ten to a statistically significant correlation. The reliable terminal dates ranged from 1795 to 1798, with a mode of 1795. In this structure, ceiling beams account for the two youngest samples (1798 and 1796), while the six samples dated to 1795 are from the roof.

The VHA date for this structure was 1842, based on documented records of Pierre Mazerolle's acquisition of the land around that time. Terminal ring data suggest that the structure existed long before then. If the second floor division was a later addition, the structure could be as old as 1796; if it was built all at once it could date to 1799.

Conclusion

The data generated by this study can help historians at the VHA paint a more complete and confident picture of Acadian life over the past several centuries. The project also has implications which stretch beyond these few preserved buildings. By strengthening and extending MAD Lab chronologies of red spruce (*Picea rubens*), eastern white cedar (*Thuja occidentalis*) and eastern white pine (*Pinus strobus*), this research helps to pave the way for future investigations. The successful aging of structures of diverse origin using one regional master chronology opens up new areas of the province previously not covered by MAD Lab data. An expanded range and more extensive chronologies put MAD Lab researchers in a better position to continue aging buildings throughout New Brunswick.

Dendroarchaeology is only one step in the investigation of old buildings. The data generated in this study can be of most service to those who have a well-studied understanding of how Acadians built and interacted with their houses hundreds of years ago. Terminal ring dates do not tell you when a house was built; further research must consider practices of aging lumber, construction timelines and extended family living arrangements. At best, dendroarchaeological data can suggest a *built after* date.

A number of difficulties arose during this study which could result in inaccuracies in the data set. In any given building, only a subset of the construction timbers was sampled. Time constraints aside, not all beams had accessible areas of bark or wormwood. However, because most sites displayed a strong mode and a short range of dates, such concerns appear of less importance. Sampling old wood also added a level of imprecision, as many cores were broken or crumbly, and some were unusable all together. Under these circumstances there is increased risk of missing rings, misplaced sections and other hazardous permutations of the raw data. That is why we used only the reliable dates in our assessment.

Nevertheless, the success of this study is encouraging for future projects of this type in the area. As available data and field techniques improve, the accurate dating of New Brunswick's architectural legacy becomes a feasible undertaking.

Appendix 1

Robichaud Farm House [05JS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
Inkerman, NB	1825	Cedar, Red Spruce, (White Spruce?)	23′ x 31′

b) Site description

original:

Upon its acquisition by the VHA, the Robichaud House was moved from what is assumed to be its original location near Inkerman, in North-Eastern New Brunswick. The house was found in the middle of a land lot initially granted to Jean Robichaud in 1809. The eastern extremity of the long, slender lot borders the Pokemouche Lagoon, a nearly landlocked body of water off the Gulf of the St. Lawrence, north of the Northumberland Strait. Other properties make up the remaining three boundaries.

Robichaud Complex at the VHA
source: VHA website

current:
At the VHA, the Robichaud House has been restored to it supposed original (1825) condition on the inside, and a later (1835) condition on the outside. The house is one of several buildings which make up the Robichaud Complex. The site also includes a barn (Grange Léger – MAD Lab site 05KS), an outdoor seller, a granary and a well.

c) Structure description

The Robichaud House is a pièce-sur-pièce rectangle measuring 23' x 31'. Believed to have stood for 10-15 years with no exterior siding, the house is now shingled to reflect a later exterior condition. Four corner and two intermediate beams support the structure. The house includes one door and five windows: four on the main floor and one in the attic. The structure is built on a shallow fieldstone foundation. At some unknown time, perhaps when it was used as a farm garage, the roof beams were raised four or five inches.

d) Tree ring dating results

abbreviations:
SEM – Scanning Electron Microscope ww – wormwood (beetle galleries) present
Ind. – indicator at log perimeter bp – bark present nd – core not dated
* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05JS001	*cedar*	visual	ww	wall			nd
05JS002	*cedar*	SEM	ww	wall	.339*	130	1839
05JS003	*cedar*	Visual		wall	.480*	164	**1845**
05JS004	*cedar*	Visual		wall	.370*	187	1840
05JS005	*cedar*	Visual		wall	.487*	148	**1844**
05JS006	*cedar*	SEM		wall	.318	161	1804
05JS007	spruce	SEM		wall	.350*	144	1829
05JS008	*cedar*	Visual		wall	.527*	178	**1842**
05JS009	*cedar*	Visual		wall	.503*	112	**1842**
05JS010	*cedar*	Visual		wall	.473*	100	**1842**
05JS011	*cedar*	Visual		wall	.601*	150	**1842**
05JS012	*cedar*	Visual		wall	.304	134	1840
05JS013	*cedar*	Visual		wall			nd
05JS014	*cedar*	Visual		wall	.421*	158	**1842**
05JS015	*cedar*	Visual		wall	.389*	131	1817
05JS016A	spruce	SEM		wall			nd
05JS016B	spruce	SEM		wall	.348	86	1849
05JS017	*cedar*	Visual		wall	.313	117	1841
05JS018	spruce	Visual	ww	wall			nd
05JS019	spruce	Visual	ww	roof	.273	57	**1846**
05JS020	spruce	SEM	ww	roof	.305	47	1835

05JS021A	spruce	visual	bp	ceiling			nd
05JS021B	spruce	visual	bp	ceiling	.313	80	**1852**
05JS022	spruce	SEM		ceiling	.358*	123	**1853**

Robichaud Barn (Grange Léger) [05KS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
Paquetville, NB	?	Cedar, Spruce	?

b) Site description

original

The Robichaud Barn reported to have come from Paquetville, near Inkerman, NB.

current

At present, the Robichaud Barn is part of the Robichaud Complex at the VHA. The complex includes the Robichaud House (MAD Lab site 05JS), and has been recreated to c. 1825 condition. The site also includes an outdoor seller, a granary and a well.

c) Structure description

The Robichaud Barn is a large, two-level structure built of whole log timbers. Large double doors in the center of the front of the barn open into a central area. On either side of this large hallway on the main level are enclosed pens, while the upper level of each pen is an open hay loft. Four upright posts support the second level floors, two on each side. Access to the pens is through small doors near the front of the central area. Single doors also open out of each pen on the front of the barn, one in each corner.

d) Tree ring dating results

abbreviations:

SEM – Scanning Electron Microscope ww – wormwood (beetle galleries) present

Ind. – indicator at log perimeter bp – bark present nd – core not dated

* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05KS001A	spruce	visual	bp	ceiling	.241	106	**1889**
05KS001B	spruce	visual	bp	ceiling	.277	102	1885
05KS002A	spruce	visual	ww	ceiling	.334*	72	1857
05KS002B	spruce	visual	ww	ceiling	.373*	115	**1889**
05KS003A	cedar	visual	ww	wall	.558*	134	1887
05KS003B	cedar	visual	ww	wall	.636*	131	**1888**
05KS004A	cedar	SEM	ww	wall	.322	190	1860
05KS004B	cedar	SEM	ww	wall	.465*	174	1864
05KS005	cedar	visual	bp	wall			nd
05KS006A	cedar	visual		wall	.320	154	1883
05KS006B	cedar	visual		wall	.371*	145	1881
05KS007A	spruce	SEM	ww	ceiling	.378*	92	**1888**
05KS007B	spruce	SEM	ww	ceiling	.433*	81	1887
05KS008A	cedar	visual	bp	wall	.265	170	1797
05KS008B	cedar	visual	bp	wall	.599*	143	1798
05KS009A	cedar	visual	ww	wall	.455*	104	1888
05KS009B	cedar	visual	ww	wall	.375*	117	**1889**
05KS010A	cedar	visual	ww	wall	.672*	147	**1889**
05KS010B	cedar	visual	ww	wall	.702*	120	1888
05KS011A	cedar	visual	ww	wall	.689*	124	**1890**
05KS011B	cedar	visual	ww	wall	.648*	82	1839
05KS012A	cedar	visual	bp		.506*	164	1819
05KS012B	cedar	visual	bp		.333*	164	1843
05KS013A	cedar	visual	bp	wall			nd
05KS013B	cedar	visual	bp	wall			nd
05KS014A	cedar	SEM	ww	vertical beam	.455*	175	**1888**
05KS014B	cedar	SEM	ww	vertical beam	.504*	119	**1888**
05KS015A	cedar	visual	ww	vertical beam	.540*	127	1856
05KS015B	cedar	visual	ww	vertical beam			nd
05KS016A	cedar	visual		post	.492*	175	**1889**
05KS016B	cedar	visual		post	.468*	163	1888
05KS017A	cedar	visual		wall	.360*	184	1886

05KS017B	cedar	visual		wall	.409*	186	**1889**
05KS018A	cedar	SEM		wall	.526*	104	**1890**
05KS018B	cedar	SEM		wall	.401*	115	**1890**
05KS019A	cedar	visual		wall	.548*	119	1888
05KS019B	cedar	visual		wall	.312	112	1888
05KS020A	cedar	visual	ww	vertical beam	.728*	166	**1888**
05KS020B	cedar	visual	ww	vertical beam	.689*	166	**1888**
05KS021A	spruce	SEM	ww	horizontal beam	.440*	91	1878
05KS021B	spruce	SEM	ww	horizontal beam	.480*	84	1866

Martin House [05LS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
French Village, NB	1783	Spruce, Fir, Cedar, (White pine?)	18′ x 25′

b) Site description

original

The Martin House originally stood on land which was granted to John (Jean) Martin as Lot 39 in 1799, in the district of Kingsclear, near Fredricton. Lot 39 is a

long, narrow plot of land totaling about 145 acres. To either side of Jean Martin's grant were the substantial lands of John Esty and the "Heirs of the late John Biddle" (from the concessions map in Blanchard, 1976). Today, the Trans-Canada Highway runs close to the site (site map, Blanchard, 1976).

current

At its new home in the VHA, the Martin House is set off on its own in the woods. Located near a stream, the yard includes a privy and a vertical timber fence.

c) Structure description

The Martin House is believed to be the oldest building at the VHA. The house is a solid 18' x 25' frame of roughly hewn logs, fixed at the corners with a dovetail joint. The house has one door and one window in the front wall, and two windows in the back wall. An unfinished loft provides a rough attic space. The house has no foundation and is assumed to have originally sported an earthen floor. A stone hearth and chimney in the west wall heats the small house (Boucher, 1978). Martin House is constructed mostly of spruce, with some white pine, cedar, and possibly fir timbres as well.

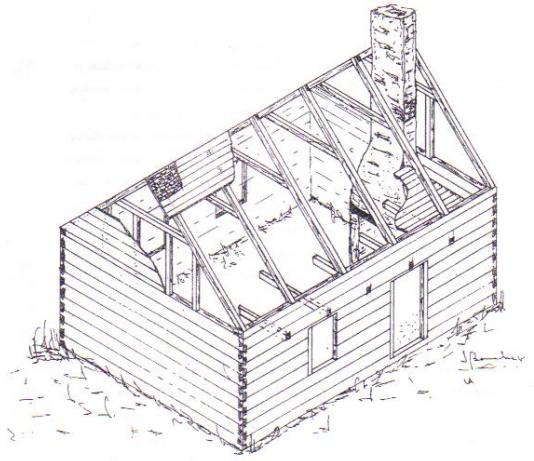


plate A1.1 : Sketch of Maison Martin
source: Blanchard, 1976

d) Tree ring dating results

abbreviations:

SEM – Scanning Electron Microscope ww – wormwood (beetle galleries)
Ind. – indicator at log perimeter bp – bark present nd – core not dated
* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05LS001	white pine?	visual	bp	wall			nd
05LS002	spruce	SEM	ww	roof			nd
05LS003	spruce	visual	ww	roof			nd
05LS004	white pine?	visual	bp	wall			nd
05LS005	spruce	visual	bp	roof	.405*	75	**1772**
05LS006	white pine?	visual	bp	roof			nd

05LS007	fir?	visual		wall			nd
05LS008	spruce	visual	bp	wall			nd
05LS009	spruce	SEM	none	wall upright			nd
05LS010	cedar	visual	bp	wall			nd
05LS011	spruce	visual	ww	wall			nd
05LS012	spruce	visual		wall	.505*	86	**1772**
05LS013	spruce	visual	ww	wall	.509*	52	1767
05LS014	cedar	visual	ww	wall			nd
05LS015	fir?	SEM		wall upright			nd
05LS016	spruce	SEM		wall	.321	106	1770
05LS017	spruce	SEM	bp	roof	.402*	97	**1772**
05LS018	spruce	SEM	bp	wall	.502*	74	1771
05LS019	spruce	SEM	ww	roof	.559*	58	**1772**
05LS020	spruce	SEM	bp	roof			nd
05LS021	spruce	visual	bp	wall upright	.443*	67	**1768**
05LS022	spruce	visual	bp	wall upright	.487*	77	**1770**
05LS023	spruce	visual	ww	wall			nd
05LS024	spruce	visual		wall			nd

Cyr Pig Barn [05MS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
?	?	Cedar	?

b) Site description

original

The Cyr Pig Barn is believed to be original to the VHA itself, having been built in the style of the period when the Village was established.

current

The Pig Barn is part of the Cyr Complex, recreated to c. 1831 style. Located behind the house, this outbuilding makes up one corner of a timber-fenced pig pen. No pigs were present at the time of sampling, however it is reported that the pen is functional during the summer visitor season. The Cyr Complex includes the Cyr House (MAD Lab site 05NS), an outdoor oven, and two barns.

c) Structure description

The Cyr Pig Barn is a squat, sturdy structure constructed of large cedar logs stacked three or four high. Covered with a wooden roof, the barn has an opening cut two logs high for the pigs to get in. Two walls of the structure make up a corner of the wooden pen fence.

d) Tree ring dating results

abbreviations:

SEM – Scanning Electron Microscope ww – wormwood (beetle galleries) present

Ind. – indicator at log perimeter bp – bark present nd – core not dated

* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05MS001A	cedar	SEM		wall - E	.443*	108	1927
05MS001B	cedar	SEM		wall - E	.528*	180	**1964**
05MS002	cedar	visual		wall - E	.420*	146	1953
05MS003	cedar	visual		wall -E	.430*	116	1951
05MS004	cedar	visual		wall - N	.407*	125	1942
05MS005	cedar	visual		wall - N	.311	105	1999?
05MS006	cedar	SEM		wall - W	.387*	167	1955
05MS007	cedar	visual		wall - E			nd
05MS008	cedar	visual		wall - W	.258	188	1946
05MS009	cedar	visual		wall - W	.460*	127	1954
05MS010	cedar	visual		wall - W	.228	119	**1962**
05MS011	cedar	visual		wall - W	.535*	148	**1952**
05MS012	cedar	visual		wall - S	.319	64	**1973**
05MS013	cedar	SEM		wall - S	.296	150	**1956**
05MS014	cedar	visual		wall - S	.429*	79	**1942**

Cyr House [05NS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
St Basile, NB	1831	Spruce, Cedar, Larch	33′ 2.5″ x 24′ 11″

b) Site description

original

The Cyr House originally comes from St. Basile, Madawaska area, where it was a prominent building. It is said to have been built by Laurent Cyr (Boucher, 1978).

current

At the VHA the Cyr House is the centerpiece of the Cyr Complex. Overlooking fields and a well-furnished yard, the Cyr House has the appearance of a well-established farmhouse. In addition to the house, the Cyr Complex includes the Cyr Pig Barn (MAD Lab site 05MS), an outdoor oven, and two barns.

c) Structure description

The Cyr House is a two-storey rectangle, roughly 33′ x 25′. It is built of timbres roughly hewn then cut in half lengthwise with a saw, resulting in wide boards which are not as thick as they appear. It looks as if the frame stood for some time without any siding (Boucher, 1978). The house includes 16 windows and a front

a back door. An interesting feature of the Cyr House is the presence of three supporting structures on the second level, similar to what is known as a "ship's knee." Made of larch, these strong reinforcements are cut from the right angle formed by the tree trunk and largest root. One arm is attached to the wall, while the other is fastened to the floor.

d) Tree ring dating results

abbreviations:
SEM – Scanning Electron Microscope ww – wormwood (beetle galleries) present
Ind. – indicator at log perimeter bp – bark present nd – core not dated
* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05NS001	cedar	visual	bp	wall	.243	111	1851
05NS002A	spruce	visual	bp	wall	.374*	55	1818
05NS002B	spruce	visual	bp	wall	.372*	53	1819
05NS003A	larch	SEM	ww	ship's knee			nd
05NS003B	larch	SEM	ww	ship's knee			nd
05NS004	cedar	visual	bp	wall	.331	95	**1851**
05NS005A	larch	SEM	ww	ship's knee			nd
05NS005B	larch	SEM	ww	ship's knee			nd
05NS006	cedar	visual	bp	corner post	.262	130	**1851**
05NS007	cedar	visual	bp	wall			nd
05NS008	cedar	visual	bp	wall	.358*	113	**1850**
05NS009	cedar	SEM	bp	wall	.349*	117	**1852**
05NS010A	larch	SEM	bp	ship's knee			nd
05NS010B	larch	SEM	bp	ship's knee			nd
05NS011	spruce	SEM	bp	corner post	.220	100	1856
05NS013	spruce	visual	ww	roof	.381*	77	**1851**
05NS014	spruce	visual	ww	roof	.318	68	1842
05NS015	spruce	SEM	bp	wall			nd
05NS016	spruce	SEM	ww	roof	.434*	35	1810
05NS017	spruce	visual	ww	roof	.495*	56	**1851**
05NS018	spruce	SEM	ww		.308	71	**1851**
05NS019	cedar	visual	bp	wall	.360*	88	**1851**
05NS020	spruce	visual	ww	roof	.428* .418*	47	1866 1809
05NS021	spruce	visual	ww	roof	.470*	35	1830
05NS022	cedar	visual		wall	.451*	93	1855
05NS023	cedar	visual	ww	roof	.268	65	**1851**
05NS024	cedar	visual	bp	wall	.343*	91	**1851**

Babineau House [05OS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
Bédec, NB	1851	White pine	25′ 6.5″ x 32′ 6.25″

b) Site description

original

The original site of the Babineau House was on what was known as Lot no. 3 in Richibouctou Village. This was land owned by Jean Babineau Sr., the man who built the house (Cormier, 1976).

current

The Babineau House is the main feature of the Babineau Complex at the VHA. Other buildings in the yard include a barn and an elaborate, fenced chicken coop. Near the river and the fields, the house is situated at a short distance from the main road.

c) Structure description

According to the VHA architect, the construction technique used for the Babineau House is very old (Cormier, 1976). The house is built of relatively thin vertical posts, reaching from the ground all the way to a partial second storey. Built entirely of white pine, it is a fairly large building, divided into three rooms

on the main level. The Babineau House includes three doors and ten windows. A stone fireplace in one wall is flanked on the right side by a staircase leading to the second floor attic.

d) Tree ring dating results

abbreviations:
SEM – Scanning Electron Microscope ww – wormwood (beetle galleries) present
Ind. – indicator at log perimeter bp – bark present nd – core not dated
* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05OS001	white pine	visual	ww	wall	.388*	70	1802
05OS002	white pine	visual	bp	wall	.615*	34	1843
05OS003	white pine	visual	ww	roof (?)	.335*	96	1830
05OS004	white pine	SEM	bp	wall	.635*	37	**1842**
05OS005	white pine	visual		wall	.761*	52	1845
05OS006	white pine	visual	bp	roof	.259	109	1839
05OS007	white pine	visual	bp	wall	.462*	62	**1845**
05OS008	white pine	visual	bp	wall	.714*	61	**1844**
05OS009	white pine	visual	ww	wall	.399*	50	**1844**
05OS010	white pine	SEM	bp; ww	roof	.383*	78	1837
05OS011	white pine	visual	bp	wall	.527*	86	**1845**
05OS012	white pine	SEM		wall	.405*	54	**1847**
05OS013	white pine	visual	bp	wall	.627*	40	**1845**
05OS014	white pine	visual	ww	roof			nd
05OS015	white pine	visual	bp	wall	.612*	53	**1845**
05OS016	white pine	visual	bp	wall	.392*	55	1843
05OS017	white pine	visual			.286	75	**1846**
05OS018	white pine	visual		wall	.569*	31	1836
05OS019	white pine	visual	bp	wall	.433*	47	**1847**
05OS020	white pine	visual		roof	.522*	80	1841
05OS021	white pine	visual		wall	.360*	53	1834
05OS022	white pine	visual	bp	ceiling	.254	93	**1831**
05OS023A	white pine	SEM	bp; ww	roof			nd
05OS023B	white pine	SEM	bp; ww	roof	.541*	67	1844
05OS023C	white pine	SEM	bp; ww	roof	.670*	60	**1846**
05OS024	white pine	SEM	bp	ceiling	.320	83	**1833**
05OS025	white pine	visual	bp	ceiling	.490*	94	**1831**

Mazerolle House [05PS]

a) General description

ORIGIN	ESTIMATED DATE	WOOD SPECIES	DIMENSIONS
Mazerolle Settlement, NB	1842	Spruce	26′ 4″ x 20′ 2″

b) Site description

original

The VHA attributes the Mazerolle House to Pierre Mazerolle, one of the first Mazerolles of Mazerolle Settlement. While Lebreton cites W. F. Ganong's suggestion that the village was founded in 1768, he makes the assumption that the land Pierre Mazerolle settled in 1842 was untouched (1976). In either case, the area was in the once known as Hanwell Settlement, in Kingclear parish. The house was taken from lot G, a 100 acre plot of land in that region. When the building was collected by the VHA it was being used for a storage shed (Lebreton, 1976).

current

Mazerolle House in the VHA is surrounded by an elaborate collection of outbuildings. Along with Cyr House (MAD Lab site 05NS), it is one of two VHA

houses equipped with an outdoor oven. The yard also includes a barn, a shed, and an outhouse.

c) Structure description

Mazerolle House is build of spruce, with outside dimension of approximately 26' x 20'. Inside and out, the unevenness of the roughly planed wall logs is plastered over, exposing only the cut surface of the wood. One room on the main floor leads up a steep flight of stairs to a dark partial attic. The house includes four windows on the main floor and one in the attic.

d) Tree ring dating results

abbreviations:
SEM – Scanning Electron Microscope ww – wormwood (beetle galleries) present
Ind. – indicator at log perimeter bp – bark present nd – core not dated
* indicates statistically significant correlation with master (99% certainty, 50 year segments with 25 year lag) **bold** indicates **reliable dates**

Sample ID	*species*	*ID method*	*Ind.*	*Sample location*	*r-value*	*No. of years*	*Perimeter year*
05PS001	spruce	visual	ww	roof	.340*	83	1775
05PS002	spruce	visual	bp	roof			nd
05PS003	spruce	visual	bp	ceiling			nd
05PS004	spruce	SEM		ceiling	.467*	98	1793
05PS005	spruce	visual		ceiling	.348*	66	**1796**
05PS006	spruce	visual		ceiling	.356*	128	**1798**
05PS007	spruce	visual		wall	.290	131	1794
05PS008	spruce	visual	bp	roof			nd
05PS009	spruce	visual	ww	roof	.324*	101	**1795**
05PS010A	spruce	visual		wall			nd
05PS010B	spruce	visual		wall	.431*	101	1792
05PS011	spruce	SEM	ww	roof	.340*	129	**1795**
05PS012	spruce	visual	ww	roof	.334*	88	**1795**
05PS013	spruce	visual	ww	roof	.272	123	**1795**
05PS014	spruce	visual	ww	roof	.270	74	**1795**
05PS015	spruce	visual	ww	roof			nd
05PS016A	spruce	SEM	bp	wall			nd
05PS016B	spruce	SEM	bp	wall	.363*	79	1789
05PS017	spruce	SEM	bp	roof	.277	83	**1795**
05PS018A	spruce	visual		wall	.393*	56	1766
05PS018B	spruce	visual		wall	.303	75	1767
05PS019	spruce	visual	ww	wall			nd
05PS020	spruce	SEM	ww	wall			nd

Works Cited

Blanchard, Raymonde. *Etude sur la maison Martin* (R-8). Presented to the Département des Ressources Historiques of Nouveau-Brunswick and to l'Administration du Village Historique Acadien : 1976.

Boucher, Jacques. *Les éléments du V. H. A.* Bathurst, NB : 1978.

Cormier, Rosemonde. *Étude sur la Maison Babineau*. Presented to the Département des Ressources Historiques of Nouveau-Brunswick and to l'Administration du Village Historique Acadien : 1976.

Ennals, Peter. "Acadians in Maritime Canada." In *To Build in a New Land,* ed. Allen G. Noble. The Johns Hopkins University Press, Baltimore: 1992.

Godin, Sylvain (Administration du Village Historique Acadien). *Personal discussions.* Caraquet, NB : May, 2005.

Lebreton, Clarence. *Histoire d'une famille acadienne et de son environnement.* Presented to the Département des Ressources Historiques of Nouveau-Brunswick and to l'Administration du Village Historique Acadien : 1975.

Lebreton, Clarence. *Les Mazerolle à la Rivière St-Jean*. Presented to the Département des Ressources Historiques of Nouveau-Brunswick and to l'Administration du Village Historique Acadien : 1976.

Richard, Robert (Village Historique Acadien). *Personal discussions.* Caraquet, NB : May, 2005.

Surette, Paul. *Rapport historique fait au sujet de la Maison Camille Thibodeau (Laurent Cyr) de Saint Basile au Madawaska.* Ressources Historiques du Nouveau-Brunswick : 1975.

Schweingruber, Fritz Hans. *Tree rings - Basics and applications of dendrochronology*, Kluwer Academic Publishers, Dordrecht : 1992.

Village Historique Acadien Website. http://www.villagehistoriqueacadien.com. Visited Sept 9, 2005.