

TREE-RING STUDIES
of the
PUEBLO de ACOMA
A Preliminary Report

by

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INTRODUCTION

In the spring of 1986, the Laboratory of Tree-Ring Research was contacted by the Laboratory of Anthropology, Museum of New Mexico regarding participation in archaeological clearance of the Pueblo de Acoma (Sky City) Rehabilitation Project. This project, funded by a Department of Housing and Urban Development (HUD) Community Development Block Grant, had been ongoing since 1982 but only recently had considered compliance with the National Historic Preservation Act of 1966 (Section 106).

A meeting and field inspection was held at Acoma in September 1987 with representatives of the Sky City Rehabilitation Project (Vallo), the Museum of New Mexico (Ware, Adams, Ladd), and the Laboratory of Tree-Ring Research (Robinson, Dean). This meeting resulted in, among other things, a commitment from the Laboratory of Tree-Ring Research to participate in the archaeological clearance and to seek its own funds to do so. As a consequence, a proposal and a budget covering the field work was submitted to a local Tucson foundation and funding was obtained. In the meantime, the Museum of New Mexico continued to work with the Pueblo de Acoma and HUD in developing an application for a new Block Grant.

A second meeting was held at Acoma in January 1987 to discuss implementation of the cooperative agreement. In addition to the previous representatives, the Rehabilitation Project consulting architect (McHenry) and the Bureau of Indian Affairs archeologist (Harrill) were present. Specific clearance of Area H was discussed

and it was agreed that the Laboratory of Tree-Ring Research project should be implemented in advance of construction and that some sampling in Area C would be possible in late April of 1987.

A final meeting was held in the council chambers of the Pueblo de Acoma on April 21, 1987 with homeowners in Area H whose houses were targeted for rehabilitation in 1987. In addition, the meeting was attended by First Lt. Governor Ray Histia, Mr. Greg Histia of the Acoma Development Authority, Mr. Dennis Vallo and Mr. Marvin Garcia of the Rehabilitation Project, and Dr. John Ware and Mr. Tom Livesly of the Museum of New Mexico as well as the Laboratory of Tree-Ring Research crew. Discussions were held regarding scheduling and coordination of the Laboratory's work and the concerns of the homeowners. Many homeowners asked questions about how vigas were sampled, how much time it would take, and whether any disturbance would occur. At the conclusion, all homeowners expressed satisfaction and real interest in the project.

DESCRIPTION AND HISTORY

The Pueblo de Acoma (Sky City) stands on an isolated mesa of upper Jurassic sandstone some 60 miles west-southwest of Albuquerque in Valencia County, New Mexico. The mesa rises 350 feet above the level drainage of Acoma Creek which heads in Cebolleta Mesa and flows northeast to join the Rio San Jose, the Rio Puerco, and, ultimately, the Rio Grande. The immediate environment is an undulating grassland with steep scarps on the

east and west bordering the valley. Uplands to the south of the pueblo on Cebolleta Mesa support a fairly dense growth of juniper and pinyon and, in the higher sections, ponderosa pine (Broster and Harrill 1982). Elevation at the pueblo is approximately 6600 feet; Cebolleta Mesa reaches in excess of 8700 feet. The entire northern skyline of the pueblo is dominated by Mount Taylor which soars to 11,300 feet.

Approximately 100 houses stand (in 1934) on the mesa, arranged in three parallel rows of roomblocks trending east to west and facing south. Each row contains three distinct, but unequally-sized, roomblocks separated by narrow streets or plazas. Even in 1934 (Nabokov 1986: 31), some infilling of the general village plan had occurred and it is even more obvious today. Construction materials are mainly adobe brick with some dressed sandstone - the latter thought to be recent - with traditional flat mud roofs supported by vigas and latillas. Traditionally, the pueblo stair-stepped up from south to north with the north wall reaching three stories and the south-facing rooftops serving as living and working areas in benign weather.

Each house at the pueblo consists, generally, of a series of contiguous rooms, transecting the roomblock north to south. Although there has been substantial alteration in this century with rooms removed, added, and combined, each house contains an average of seven to eight individually roofed units or rooms. Thus a conservative total room count for the Pueblo de Acoma must be

placed at approximately 750. In addition, the pueblo has seven kivas and associated rooms within the roomblocks.

South of the pueblo, and separated from it by 200 feet or more (originally) stands the 17th century Spanish mission of San Estevan. The church is built in a continuous-nave style without transepts and faces east. An enclosed convento is attached to the north side of the church with its porter's lodge also facing east (Kubler 1940). Both church and convento are built of adobe brick and have flat roofs with massive vigas.

Although there is both local myth and archaeological evidence (Dittert 1959) of occupation on the mesa as early as the 11th century, it is likely that the present structure of the pueblo dates to the 17th century. In early 1599, after a fierce three day battle, Acoma was completely destroyed by soldiers under the command of Don Juan de Onate (Hammond and Rey 1953). Somewhat later, Father Juan Ramirez was assigned to Acoma and, between 1629 and 1646, he undertook conversion of the pueblo and construction of the church. The church was evidently not seriously damaged during the Pueblo Revolt of 1680, but major reroofing of the convento (Laboratory of Tree-Ring Research files) around 1701 may indicate either destruction of or robbing from parts of the convento during that period of freedom from Spanish presence.

DENDROCHRONOLOGY

Dendrochronology refers both to the method of using tree rings as a measurement of time and to the process of inferring past environmental conditions that existed when the rings were being formed.

The basic principles involved in dendrochronology are deceptively simple. Tree rings, which are so obvious on the cross sections of most trees, can be more accurately described as the transverse sections of successive layers of xylem growth - each layer having been formed by the tree in response to some environmental fluctuation, normally of an annual nature in seasonal climates. In conifers such as ponderosa and pinyon, the annual ring is composed of two parts; an inner band of large light-colored cells that merges, sometimes very gradually, with an outer band of thicker-walled, dark-colored cells which terminate abruptly, leaving a sharply defined outer edge.

There are basically two types of tree-ring series commonly found; or perhaps the two should be best defined as end points along a continuum of variation. In the first type, the rings are of relatively uniform thickness and often exhibit a slow decrease in width as the tree ages. These series are termed complacent. In contrast, the second type of ring series is distinguished by variability of individual ring widths, even though there may be also a gradual decrease in ring size with age. These latter series

are termed sensitive and are far more suitable for tree-ring analysis.

Under certain conditions, contemporaneous ring series formed by sensitive trees show a remarkable similarity when compared with each other. The patterns of narrow and wide rings in one tree will closely match the patterns in other trees. Crossdating, which is based on this phenomenon, is defined as the identification in different trees of the same ring patterns, each series of rings representing exactly the same period of years. It is crossdating that stands as the fundamental principle underlying all tree-ring dating, and it must be present before either absolute or relative dates may be derived.

Crossdating gives rise to the two most important aspects of tree-ring research. First, in regions that have living crossdatable trees which serve as controls, careful analysis will permit the assignment of calendar dates to each of the individual ring in the series. By starting with living trees and matching patterns in timbers from historic buildings, and then with older and older archaeological timbers, tree-ring chronologies may be constructed for many thousands of years into the past. Second, the very fact that similar patterns exist implies that some external environmental factor, or complex of factors, is exerting a common influence on the growth of trees over a given geographic area.

FIELD AND LABORATORY PROCEDURES

Field collection at the Pueblo de Acoma was accomplished April 21 - 28, 1987 with two teams of two men each. Each morning a member of the Rehabilitation crew helped us locate the homeowner whose house had been scheduled for work that day. After arrangements were made, coring commenced on the ground level with one crew in the north room and one in the south. As a crew finished a room, it moved upward through the hatchways to the second and, where present, third levels. In most cases, coring was finished by noon and the afternoons were spent coring in Area C where certain rooms were still accessible to the Rehabilitation crew.

The coring procedure used small gas generators placed on the ground outside the house with extension cords to 3/8" electric drills using a special core drill bit. This bit, actually a hole saw, removes a 1/2" diameter core or dowel from the outside to the center of the vigas. Every attempt was made to core at a location on the surface of the viga where bark was present or where the surface appeared smooth and unweathered. Vigas were cored, and numbered, in each room from east to west. Lintels or horizontal support beams were cored last. After a core was extracted from a viga, a #4 cork was inserted in the resulting hole.

The cores were labeled and notes taken regarding provenience, beam condition and use, and any other pertinent architectural

details before moving to the next room. In all, a total of 190 cores and 15 cross sections were collected during the project.

In Area H, one house (Room 21) in the critical older central section could not be sampled during the project. Three rooms belonging to Mr. Joe Chino were too full of fragile possessions which might be damaged by the coring activity. Mr. Chino had not attended the property owners meeting and, although very helpful, had not had an opportunity to move the contents. In addition, these rooms were the darkest encountered, with only a single small north window, and would have required extra lighting.

After completion of the field collection, the cores and cross sections were prepared for examination by using belt sanders with a series of finer and finer grits (up to 400 grit) to expose the ring structure. Examination under stereomicroscopes followed standard dendrochronological procedures (Stokes and Smiley 1968). Dating control was provided by a living pinyon site on the west escarpment of Cebolleta Mesa, overlooking the malpais, and by previous archaeological and historical dating in the region (Dean and Robinson 1978: 37). The dated samples from this project were measured and used to strengthen the control chronology, especially for the period A.D. 1650 backward to approximately 1400.

RESULTS

The results of the tree-ring analysis are presented on a room-by-room, not Unit, basis on separate pages following the text of this report. Table 1 should be consulted for species abbreviations and explanation of the symbols used with the dates.

The most striking feature of the original roof construction at Acoma is its consistency. Only two species, pinyon and ponderosa pine, were used for vigas, with pinyon clearly favored. Tree cutting occurred in early fall when some trees were still growing and probably continued into late fall and winter. The vigas, especially pinyon, were heavily and rather coarsely debarked with steel axes immediately on felling. This resulted in an irregular beam surface.

Although rooms utilized as many as eight vigas, the preferred number was six. These were emplaced so that the butt or thicker ends were all in the same wall, not alternated as was so customary in prehistory. Closing material was varied with juniper twigs, brush (chamiso?), and yucca predominating. Repair of roofs on the first and second levels was rare. Only occasionally did we find a replacement viga and only once a replaced roof. On the third level, however, nearly all of the roof vigas had been replaced. This makes a good deal of sense since it was the third level roof that actually was exposed to the elements. There was no evidence in the rooms sampled for any reuse of beams from a previous pueblo.

Area C. Although the sample from this area is small, all original rooms on the first and second levels dated 1646 without exception. However, one loose beam, removed by the rehabilitation crew, dated 1647, suggesting that there may be a span of dates for the original construction of Area C. Still, these are the earliest cutting dates from Acoma.

As usual, the third level roofs have been replaced or substantially repaired. One roof (Unit 13) has dates in the early 1650s which may indicate that construction of Level III lagged the levels below by a few years.

Area H. In contrast with Area C, there are no 1646 dates in Area H and the first level dates exclusively to 1647 except for the two rooms of Mr. Martin which have 1647 and 1648 dates. The second level appears to have been built a few years later with dates ranging from 1647 to 1652. A second level room (Unit 30) in the Area has the only replaced roof, dating to the 1720s, and the only use of juniper for vigas. The third level is consistent with later dates from 1765 to 1792 and in the 1830s.

TABLE 1.

LABORATORY OF TREE-RING RESEARCH
ARCHAEOLOGICAL RESEARCHEXPLANATION OF SYMBOLS

- B - bark is present
- G - beetle galleries are present on the surface of the sample
- L - a characteristic surface patination and smoothness, which develops on beams stripped of bark, is present
- c - the outermost ring is continuous around the full circumference of the sample. This symbol is used only for complete cross sections
- r - less than a full section is present, but the outermost ring is continuous around available circumference
- v - a subjective judgment that, although there is no direct evidence of the true outside on the sample, the date is within a very few years of being a cutting date
- vv - there is no way of estimating how far the last ring is from the true outside. Many rings may be lost
- +
- one or a few rings may be missing near the outside whose presence or absence cannot be determined because the series does not extend far enough to provide adequate crossdating
- ++ - a ring count is necessary beyond a certain point in the series because crossdating ceases

The symbols B, G, L, c and r indicate cutting dates in order of decreasing confidence, unless a + or ++ is also present.

The symbols L, G, and B may be used in any combination with each other or with the other symbols except v and vv. The r and c symbols are mutually exclusive, but may be used with L, G, B, + and ++. The v and vv are also mutually exclusive and may be used with the + and ++. The + and ++ are mutually exclusive but may be used in combination with all the other symbols.

SPECIES CODES

- DF = Pseudotsuga menziesii, "Douglas-fir"
- PP = Pinus ponderosa, "ponderosa pine"
- PNN = Pinus edulis, "pinyon"
- JUN = Juniperus spp., "juniper"
- FIR = Abies cf. concolor, "white fir"
- SPR = Picea cf. engelmanni, "Engelmann spruce"
- QUER = Quercus spp., "oak"
- POP = Populus spp., "cottonwood or aspen"
- Non-con = Non-coniferous species; none of above - usually unidentified shrub

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LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Shirley Chino

Location: Area C, Unit 6, Level I, south room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-15	Spruce	Viga	1967+GB
2	ATP-16	PP	Viga	1633vv
3	ATP-17	PP	Viga	1646B
4	ATP-18	PNN	Viga	1519vv
5	ATP-19	PNN	Viga	1646B
6	ATP-20	PNN	Viga	1646B

Comments:

Although two vigas from this room had ring loss due to debarking and one viga is a recent replacement, the remaining vigas have the same terminal ring. Further, these three vigas with 1646 dates all have complete rings for 1646, indicating that they were cut in the fall or winter of 1646/47 and probably used soon after.

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ACOMA TREE-RING PROJECT REPORT

Owner: Elizabeth Garcia

Location: Area C, Unit 8, Level I, south room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-1	PP	Viga	- No date - 28 rings
2	ATP-2	PNN	Viga	1646B
3	ATP-3	PNN	Viga	1646B
4	ATP-4	PP	Viga	- No date - 21 rings
5	ATP-5	PP	Viga	1635vv
6	ATP-6	PNN	Viga	1646LB
7	ATP-7	PNN	Viga	1646B

Comments:

Although two ponderosa viga contained too few rings to date, the remaining viga clearly indicate cutting at 1646 for the construction of this room. The ring for the year 1646 was complete in all cases, so that cutting may have occurred in the fall of 1646 or even later into the winter and early spring of 1647.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Elizabeth Garcia

Location: Area C, Unit 8, Level II, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-8	PP	Aux	1626++B
2	ATP-9	PNN	Viga	1645+vv
3	ATP-10	PNN	Viga	1646v
4	ATP-11	PNN	Viga	1645+vv
5	ATP-12	PNN	Viga	1607++vv
6	ATP-13	PNN	Viga	1646v
7	ATP-14	PNN	Viga	1646v

Comments:

Although none of the beams from this room retained bark and smoke blackening obscured the surface, the dates indicate that the construction of this room is compatible with the rest of Area C. The vigas were probably cut at the same time - late 1646 or early 1647 - and construction was undoubtedly part of the initial core of Area C.

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ACOMA TREE-RING PROJECT REPORT

Owner: Ventura Howeya

Location: Area C, Unit 13, Level III, south room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-50	PP	Viga	1767vv
2	ATP-51	PP	Viga	- No date - 12 rings
3	ATP-52	PP	Viga	- No date - 23 rings
4	ATP-53	PP	Viga	- No date - 15 rings
5	ATP-54	PP	Viga	- No date - 19 rings
6	ATP-55	PP	Viga	1650vv
7	ATP-56	PP	Viga	1651vv
8	ATP-57	PP	Support	1769vv

Comments:

This room was cored on the outside, beneath the south-facing overhang, thus all the beams were badly weathered. In addition, four of the beams contained too few rings to date. The dates in the 1650s, however, suggest that the construction of the third level of room in Area C may have taken place a few years later than that of the first two levels. This room also experienced repair or remodeling in the mid to late 18th century.

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ACOMA TREE-RING PROJECT REPORT

Owner: Thomas Ortiz

Location: Area C, Unit 16, Level I, south room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-115	PNN	Viga	1644+B
2	ATP-116	PNN	Viga	1646B
3	ATP-117	PNN	Viga	1646B
4	ATP-118	PNN	Viga	1646v
5	ATP-119	PNN	Viga	1646B
6	ATP-120	PNN	Viga	1581+vv
7	ATP-121	PNN	Viga	1646L
8	ATP-122	PNN	Viga	1646LB
9	ATP-123	PNN	Lintel	- No date

Comments:

The beams from this room present a consistent pattern of dates at 1646. All rings for 1646, except one, were complete. However, the single incomplete ring may indicate cutting of this set of beams toward the end of the growth season; perhaps September of 1646.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Thomas Ortiz

Location: Area C, Unit 16, Level I, north room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-106	PNN	Viga	1646B
2	ATP-107	PP	Viga	1646B
3	ATP-108	PNN	Viga	1614vv
4	ATP-109	PNN	Viga	1646B
5	ATP-110	PNN	Viga	1646B
6	ATP-111	PNN	Viga	1646B
7	ATP-112	PNN	Viga	1646B
8	ATP-113	PP	Viga	1641vv
9	ATP-114	PNN	Lintel	1572vv

Comments:

As with its neighboring room to the south, this room has a clear set of beams dating to 1646. All the outermost rings were complete which would indicate cutting after the 1646 growth season and before growth commenced in 1647.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Torivio Vallo

Location: Area C, Unit 19, Level III

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-67	PP	Viga	1823++vv
2	ATP-58	PP	Viga	1846++vv
3	ATP-59	PP	Viga	1871++vv
4	ATP-60	PP	Viga	1849++vv
5	ATP-61	PP	Viga	- No Date -
6	ATP-62	PP	Viga	1864++vv
7	ATP-63	PP	Viga	1847++vv
8	ATP-64	PP	Viga	1853++vv
9	ATP-65	PP	Viga	1848++vv
10	ATP-66	PP	Viga	1840++vv

Comments:

On first inspection these beams appeared quite different from the beams of the "core" rooms of Area C. First, they are all ponderosa and, second, they are much larger. These beams span both rooms of Level III which have been opened into one room by removal of the separating wall. Although no cutting dates were obtained due to shaping and natural growth characteristics, it appears that this roof was emplaced late in the 19th century; certainly after 1871.

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ACOMA TREE-RING PROJECT REPORT

Owner: Castillo Vallo

Location: Area H, Unit 3, Level I, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-164	PP	Viga	1647L
2	ATP-165	PNN	Viga	1647GB
3	ATP-166	PNN	Viga	1607vv
4	ATP-167	PP	Viga	1647B
5	ATP-168	PP	Viga	1647L
6	ATP-169	PNN	Viga	1614++B
7	ATP-170	PP	Viga	1647B
8	ATP-171	PNN	Lintel	1647B

Comments:

This room is a mixture of pinyon and ponderosa with some 1647 rings complete and others incomplete. This would suggest cutting for construction of the room in the early fall of 1647. Since the beams were debarked immediately and there is no sign of weathering, construction of the roof probably took place in the winter of 1647/48.

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ACOMA TREE-RING PROJECT REPORT

Owner: Castillo Vallo

Location: Area H, Unit 3, Level I, north room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-157	PNN	Viga	1647LB
2	ATP-158	PNN	Viga	1647LB
3	ATP-159	PNN	Viga	1647B
4	ATP-160	PNN	Viga	1647B
5	ATP-161	PNN	Viga	1636++LB
6	ATP-162	PNN	Viga	1647B
7	ATP-163	PNN	Viga	1647L
*	ATP-172	PNN	Viga	1647LB
*	ATP-173	PP	Viga	- No Date - 15 rings
*	ATP-174	PP	Viga	1647L

Comments:

This room, like its neighbor to the south, has beams cut in early fall of 1647 - both complete and incomplete terminal rings - and probably roofed shortly thereafter. In contrast with the room to the south, however, all the beams are pinyon. The three beams marked with "*" are exposed in this room but are actually beam ends of the vigas in the next room to the north (recently rebuilt?).

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Castillo Vallo

Location: Area H, Unit 3, Level II, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-175	PP	Viga	1597vv
2	ATP-176	PNN	Viga	1810++vv
3	ATP-177	PP	Viga	1608vv
4	ATP-178	PP	Viga	1649v
5	ATP-179	PP	Viga	- No Date - 12 rings
6	ATP-180	PP	Viga	1604vv
7	ATP-181	PP	Lintel	1649L

Comments:

Although none of the vigas have a bark, or cutting, date, the date from the lintel of the north door and the 1649 date from one viga suggest that construction of this level of Unit 3 may have taken place about two years after the ground level. Beam 2 is obvious repair with a later date and different species.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Castillo Vallo

Location: Area H, Unit 3, Level II, north room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-182	PP	Viga	- No Date - 12 rings
2	ATP-183	PP	Viga	- No Date - 15 rings
3	ATP-184	PP	Viga	- No Date -
4	ATP-185	PNN	Viga	1532+vv
5	ATP-186	PNN	Viga	1606++vv
6	ATP-187	PP	Viga	- No Date -
*	ATP-188	PP	Viga	- No Date -
*	ATP-189	PNN	Viga	1569vv
*	ATP-190	PNN	Viga	1649+vv

Comments:

This roof has evidently been substantially repaired and beams replaced. However, dates of beams from rooms on both sides fall at 1649 and it would be a good guess that this room was originally roofed at that time. The beams marked "*" were cored in this room but are actually beam ends from an original room lying to the north (now gone).

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ACOMA TREE-RING PROJECT REPORT

Owner: Santana Cerno

Location: Area H, Unit 7, Level I, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-140	PNN	Viga	1633vv
2	ATP-141	PNN	Viga	1645+GB
3	ATP-142	PNN	Viga	1647B
4	ATP-143	PNN	Viga	1630++vv
5	ATP-144	PNN	Viga	1647B
6	ATP-145	PNN	Viga	1647B
7	ATP-146	PNN	Viga	1647B

Comments:

This is a matched set of pinyon beams, all smoke-blackened and dating to 1647 except for those with rings removed during debarking. All the final rings are complete, indicating cutting between the fall of 1647 and spring of 1648.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Santana Cerno

Location: Area H, Unit 7, Level II, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-147	PNN	Viga	1650B
2	ATP-148	PNN	Viga	1598++vv
3	ATP-149	PNN	Viga	1649vv
4	ATP-150	PP	Viga	- No Date - 23 rings
5	ATP-151	PNN	Viga	1650GB
6	ATP-152	PNN	Viga	1650LB
7	ATP-153	PP	Aux	- No Date -
8	ATP-154	PNN	Lintel	1612vv

Comments:

Although only three beams yielded cutting, or bark, dates, it appears that tree felling for this room occurred in 1650. The fact that the 1650 rings are both complete and incomplete narrow the time to early fall of 1650. The large auxiliary support beam could not be dated, although it contained enough rings.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Santana Cerno

Location: Area H, Unit 7, Level III, south and north rooms

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
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South Room

1	ATP-126	PP	Viga	- No Date -
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2 - 9 These are 2" x 8" sawn beams - not cored

North Room

1 -3 Squared and carved beams - not cored

4	ATP-127	PP	Viga	- No Date -
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5	ATP-128	PP	Viga	- No Date -
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6 Squared and carved beam - not cored

7	ATP-129	PP	Viga	1782vv
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8	ATP-130	PP	Viga	1561+vv
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9	ATP-131	PP	Viga	1791vv
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10	ATP-132	PP	Lintel	1790vv
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Comments:

These rooms have obviously been reroofed since their original roofing. The south room is mainly quite recent as evidenced by the sawn dimensioned lumber. The north room was reroofed around 1800+ and it is probable that the decorated beams were emplaced then as well. These latter were not cored since the squaring had removed many outer rings.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Josephine Garcia

Location: Area H, Unit 28, Level III, south room

Beam	Catalog No.	Species	Use	Date/Symbol (Table 1)
1	ATP-86	PNN	Viga	1765G
2	ATP-87	PP	Viga	- No Date - 28 rings
3	ATP-88	PP	Viga	1713vv
4	ATP-89	PP	Viga	- No Date -
5	ATP-90	POP	Viga	- No Date
6	ATP-91	PP	Viga	- No Date - 44 rings

Comments:

Although few dates are available, this roof was evidently replaced in the latter half of the 18th century.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Josephine Garcia

Location: Area H, Unit 28, Level III, north room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-92	PNN	Viga	- No Date -
2	ATP-93	POP	Viga	- No Date -
3	ATP-94	PNN	Viga	- No Date -
4	ATP-95	PNN	Viga	1792LB
5	ATP-96	PNN	Viga	1792L
6	Not cored - too dangerous			

Comments:

The pattern of reroofing of the top level (Level III) is seen here with two cutting dates at 1792. This room was evidently reroofed slightly later than its companion to the south.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Josephine Garcia

Location: Area H, Unit 28, Level I, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-68	PNN	Viga	1617++vv
2	ATP-69	PNN	Viga	1647L
3	ATP-70	PNN	Viga	1647B
4	ATP-71	PP	Viga	1647L
5	ATP-72	PNN	Viga	1647L
6	ATP-73	PP	Viga	- No Date -

Comments:

This room conforms well with other ground level rooms in Area H. All the cutting dates fall at 1647 with both complete and incomplete terminal rings. Cutting, therefore, can be fairly confidently assigned to early fall of 1647.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Josephine Garcia

Location: Area H, Unit 28, Level II, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-80	PNN	Viga	1649B
2	ATP-81	PNN	Viga	1651LB
3	ATP-82	PNN	Viga	1634+vv
4	ATP-83	PNN	Viga	1635+vv
5	ATP-84	PNN	Viga	1649v
6	ATP-85	PNN	Viga	1649v

Comments:

The dating evidence for this room is less clear than many others. Either the room was roofed in 1649 with a repair just two years later, or the room was roofed in 1651 partially with beams left over from the 1649 cutting. If so, this is the only evidence for stockpiling of beams encountered in this study.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Josephine Garcia

Location: Area H, Unit 28, Level II, north room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-74	POP	Viga	- No Date -
2	ATP-75	PNN	Viga	1611vv
3	ATP-76	PNN	Viga	1647LB
4	ATP-77	PP	Viga	1647B
5	ATP-78	PNN	Viga	1639++LB
6	ATP-79	PNN	Viga	1651L

Comments:

Like its companion room to the south, this room has a single late date of 1651. Either it was constructed at that time with stockpiled beams from a 1647 cutting, or the 1651 date is a repair. It is quite a coincidence that both rooms were repaired at the same time.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Martha Carrillo

Location: Area H, Unit 7, Level II, north room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-133	PP	Viga	- No Date - 29 rings
2	ATP-134	PNN	Viga	1647L
3	ATP-135	PNN	Viga	1599+vv
4	ATP-136	PP	Viga	1641vv
5	ATP-137	PP	Viga	- No Date - 24 rings
6	ATP-138	PP	Viga	1462vv
*	ATP-139	PNN	Viga	1647LG

Comments:

The dating evidence is not good for the construction of this room. The single date at 1647 probably relates, however, to that event. The beam marked with "*" is the sole remaining beam of the missing floor of the room (roof of Level I).

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Antonito Antonio

Location: Area H, Unit 28, Level I, north room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-97	PNN	Viga	1647G
2	ATP-98	PNN	Viga	1630vv
3	ATP-99	PNN	Viga	1647LB
4	ATP-100	PNN	Viga	1647v
5	ATP-101	PNN	Viga	1646L
6	ATP-102	PNN	Viga	1647L
7	ATP-103	PNN	Support	1646B
8	ATP-104	PNN	Support	1647v
9	ATP-105	PNN	Support	1647v

Comments:

All the 1646 rings are complete, whereas the 1647 rings are both complete and incomplete. This suggests two cutting events, in the early spring of 1646 and in the early fall of 1647 with roofing probably occurring in the fall/winter of 1647/48.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Benny Martin

Location: Area H, Unit 30, Level I, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	Not cored			
2	ATP-27	PNN	Viga	1647LB
3	ATP-28	PNN	Viga	1647L
4	ATP-29	PNN	Viga	1648L
5	ATP-30	PNN	Viga	1648B
6	ATP-31	PNN	Viga	1648v

Comments:

The 1647 rings are all complete while the 1648 rings are both complete and incomplete. This is another example of at least two cutting events contributing to a single roof.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Benny Martin

Location: Area H, Unit 30, Level I, north room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-21	PP	Viga	1723B
2	ATP-22	PNN	Viga	1648B
3	ATP-23	PNN	Viga	1647v
4	ATP-24	PNN	Viga	1647B
5	ATP-25	PNN	Viga	1648B
6	ATP-26	PNN	Viga	1647L

Comments:

This room unquestionably represents the same construction event as its neighbor to the south. Both have a mixture of beams from two cutting events in 1647 and 1648. A single repair beam was emplaced in 1723.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Benny Martin

Location: Area H, Unit 30, Level II, south room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-41	JUN	Viga	- No Date -
2	ATP-42	PNN	Viga	1723GB
3	ATP-43	JUN	Viga	- No Date -
4	ATP-44	PNN	Viga	1726L
5	ATP-45	JUN	Viga	- No Date -
6	Not cored			

Comments:

This, and the adjoining room, has the only use of juniper for vigas noted during the project. With only two dates, it is impossible to tell if the room was newly built in the early 18th century or simply reroofed. The masonry supports reroofing.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Benny Martin

Location: Area H, Unit 30, Level II, north room

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-32	PNN	Viga	1845LGB
2	ATP-33	PNN	Viga	1833++LGB
3	Not cored			
4	ATP-35	PNN	Viga	1838++B
5	ATP-36	PP	Viga	1652LB
6	ATP-37	JUN	Viga	- No Date -
7	ATP-38	PNN	Viga	1649GB
8	ATP-39	PP	Viga	1651L
9	ATP-40	JUN	Viga	- No Date -

Comments:

This roof is a mixture of original construction, at or about 1652, and partial replacement probably in 1845.

LABORATORY OF TREE-RING RESEARCH

ACOMA TREE-RING PROJECT REPORT

Owner: Benny Martin

Location: Area H, Unit 30, Level III

<u>Beam</u>	<u>Catalog No.</u>	<u>Species</u>	<u>Use</u>	<u>Date/Symbol (Table 1)</u>
1	ATP-46	PP	Viga	1834++B
2	ATP-47	PP	Viga	1813++vv
3	Not cored			
4	ATP-48	PP	Viga	- No Date -
5 - 6	Not cored			
7	ATP-49	PP	Viga	1939v

Comments:

This room, now the kitchen, was probably reroofed at the same time as the room below, about 1845. Additional reroofing took place in 1944 according to Mr. Martin. The 1939v date would suggest he is right.