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17 E-52 Ellis, Florence H. - Notes on Use of Tree Ring Dates.

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NOTES ON USE OF TREE RING DATES:

1. Use of Dead Wood in Early Construction
2. Number of Dates required per structure

Florence H. Ellis

The problem of the number of dates needed for satisfactorily establishing the time of construction of a site is tied up with the problem of use of dead wood and re-use of salvage wood from older structures. The matter of dates from wood which had been dead for some time when taken for construction purposes was discussed by O'Bryan in 1949 in connection with prehistoric Anasazi (Basketmaker-Pueblo) sites in the Southwest, and the data is directly applicable to the problem of Navaho sites.

O'Bryan points out (O'Bryan, Deric, "Methods of Felling Trees and Tree-Ring Dating in the Southwest", American Antiquity Vol. XV, No. 2, 1949, pp. 155-56) that

A dead trunk, seasoned hard, is extremely resistant to the blows of a stone axe and fairly unyielding to a keen axe of steel. A high percentage of wood specimens from ruins in the Southwestern United States which furnish outer ring dates before A.D. 600 are parts of trees that were dead before they were felled; they are often weathered, and sometimes show signs of having been attacked by secondary insect pests.

Beams from the earliest dated ruins in the Southwest appear to have been felled and trimmed by burning and breaking... (Examples of such from early sites are here listed.)

A limber, growing tree is harder to fell by burning or breaking than a dry, brittle, dead trunk. The softer wood of growing trees was appreciated by the stone axe men; most of the well preserved wood specimens furnishing outer ring dates in the 600's or later bear larger chopping scars than could have been made on a dead trunk.

O'Bryan then gives data to indicate that stone axes, with grooves or side notches for hafting existed in southwestern ruins dating in the 600's A.D. and after, so that the chances of wood having been cut for construction and hence having a date approximating that of the construction was greatly increased.

But - to turn to the Navaho problem - the manufacture of stone axes by these people at any time is questionable; the varied assortment of styles in stone implements found upon the early Navaho sites indicates that they picked up implements from ruins when they chanced to encounter them. Stone axes were considered particularly valuable because of their rarity and usefulness. Burning and breaking timber for use in building their hogans and windbreaks thus would have been Navaho custom, as for the Pueblos before 600 A.D., except in cases where stone axes were owned and until metal axes came into common use. Some metal axes undoubtedly were obtained by trade or theft from Pueblos and whites before trading posts were opened in the Navaho country, all of which were of post Ft. Sumner date except for two (See list), but advent of trading posts would not immediately mark the end of using salvage wood already so obtained or of obtaining more by the same relatively easy method. Indeed, in the April hearings, Navahos spoke of having further trimmed old logs from earlier structures by use of the metal axe before again building with them. This, of course, puts the marks of a metal axe on wood which actually may be of the pre-metal axe period.

The question of how long timber stands in strong and usable shape after death of the tree is important in interpretation of dates which may derive from such material. O'Bryan gives examples, first quoting Dr. Edmund Schulman, who had intensively studied tree growth records from southern Ganado to northern Mexico:

The chronology in living trees might conceivably be extended backwards in time by the record in standing dead trees. Only one such tree at Mesa Verde, a promising Douglas fir, was examined in late August, 1945. This tree grew, with its roots along cracks, on a bare ledge....It was about ten feet high and some ten inches in lower stem diameter; all branches had been eroded from the strongly spiralled stem. Toppled with some effort, sectioned, and dated, it proved to be only 350 years in age, about half that of the oldest living firs at Mesa Verde. But it had died in A.D. 1819 and was still well braced 126 years later.

Comments O'Bryan: "This log would have been very useful to a man without an axe."

O'Bryan, in giving another example of how long dead but sound trees may stand, tells of having dated a core sample he took from a log which recently had been used in stabilizing one of the prehistoric Mesa Verde kivas. In taking the core, he had thought he was collecting from one of the original kiva beams, and when he found that it dated at 1740+, he quickly checked with the Park Service men for an explanation. (Mesa Verde dates before the end of the 13th century). The forthcoming data added to the surprise, for in 1934 this log had been secured for use in the repair work from a grove of firs growing within the Park. "It was sound, seasoned, and eminently usable as a construction timber almost 200 years after the tree had died." As a footnote, the author continued: "Today we do not use logs as roof rafters the year in which they are cut, dripping pitch, and limber through being unseasoned. The Indians of Pueblo Bonito and Cliff Palace probably were equally sensible."

In applying this information to the matter of interpreting tree ring dates in relation to structure represented, O'Bryan proffers some advice (note publication date: 1949):

A date assigned to the outermost ring of a log used in a ruin in the Southwest has been accepted tacitly as the construction date for the particular archaeological site. Obviously this is an incorrect practice if the bark ring is not present on the specimen ("bare" date), and it is highly questionable even if the bark ring is preserved. The bark date establishes the year of the death of the tree; the beam from the tree could not have been used prior to that date.

I offer the following suggestions regarding the interpretation of the tree-ring dates for ruins in the southwest:

1. The tree-ring date precedes the date of use of the construction log, firewood, or artifact by a year or two at least, conceivably by 200 years in extreme cases. However, series of bark dates (or even plus dates) from a single structure or site may indicate the probable construction date within a few years.

(Note: O'Bryan was not using the plus sign after a date as today, to indicate a few years probably lost in the crowded outer rings still existent on a specimen. He explains in another footnote: "The plus sign following the date signifies that the bark ring could not be identified.")

(Underlining in above quotation ours.)