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The Archaeology of Navajo Origins

Edited by

RONALD H. TOWNER

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Radiocarbon and Tree-Ring Dating at Early Navajo Sites

Examples from the Aztec Area

JERRY FETTERMAN

INTRODUCTION

Navajo origins and the arrival of the Athapaskans into the Southwest are topics of considerable importance to the understanding of the recent prehistory of the Southwest. Although some researchers (C. F. Schaafsma 1992) suggest that the Navajo arrived in the San Juan Basin sometime after the Pueblo Revolt of A.D. 1680, others have suggested a post-Anasazi occupation of the basin, possibly as early as A.D. 1350 (Hogan 1989; A. D. Reed and Horn 1990), by people who shared cultural traits with the Navajo. Hester (1962a) first devised a chronological scheme for ordering Navajo archaeological materials (see Towner and Dean, this volume). The two phases of interest here are the Dinétah phase (ca. 1550–1700) and the Gobernador phase (ca. 1700–1775).

The Navajo occupation of the San Juan Basin after A.D. 1680 is well dated and has been termed the Gobernador phase. It is best known for the construction of pueblitos and presence of Gobernador Polychrome, a locally produced thin, three-color painted ware. The Dinétah phase was created to explain site components in a stratigraphic position suggestive of an occupation prior to the Pueblo Revolt but whose ceramic assemblages lacked Gobernador Polychrome (Hester and Shiner 1963; Brown, this volume). Ceramics on these sites consisted entirely of Dinétah Grayware, a ware also found on later sites (see Reed and Reed, this volume).

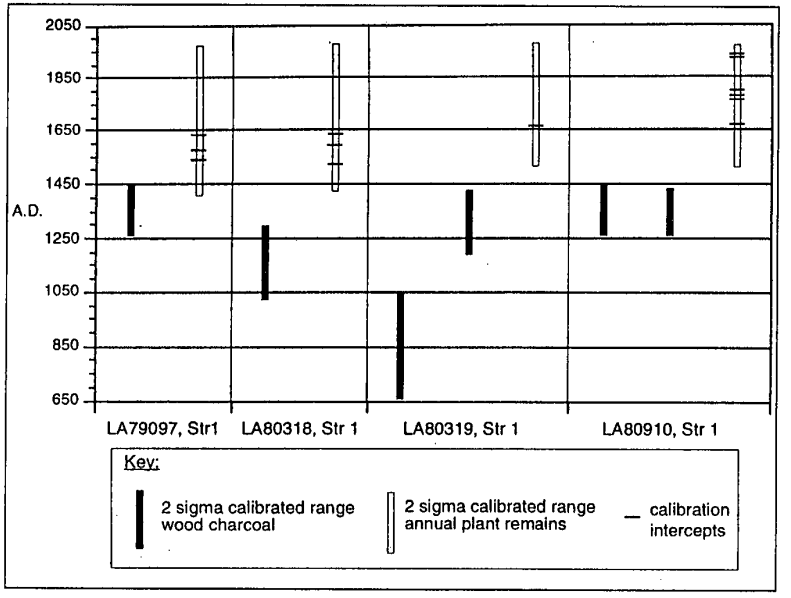

FIGURE 4.5. Calibrated dates from annual plants and wood samples.

These data clearly demonstrate the importance of processing multiple samples. Had the latest sample not been processed, the 1627 cutting date could easily have been used to infer the occupation date.

The charcoal sample (Beta #50855: calibrated A.D. 1290–1440) produced a radiocarbon date even earlier than the "noncutting" tree-ring dates, and the two-sigma calibrated range only slightly overlaps the earliest inside date from the dendrochronological samples. In addition, the inside dates for two of the logs were more than 300 years earlier than date of use of the feature. Thus, it is clear that dead-wood use and the cross-section effect can seriously skew chronological data from early Navajo sites.

In addition to temporal information, these data can provide important information on the site environment. The presence of a pinyon pine that had been dead for almost 135 years yet still retained bark suggests the environment in the vicinity of the project is relatively benign in relation to decomposition of vegetal material.

Radiocarbon Dating Annual Plants

Four sites, LA 79097, LA 80318, LA 80319, and LA 80910, were used as additional tests for the use of old wood; samples of annual plants including juniper berries, *Chenopodium* seeds, and corn kernels were submitted for radiocarbon assays. There was a sufficient number of juniper berries to process a standard sample from LA 80318, but the other samples re-

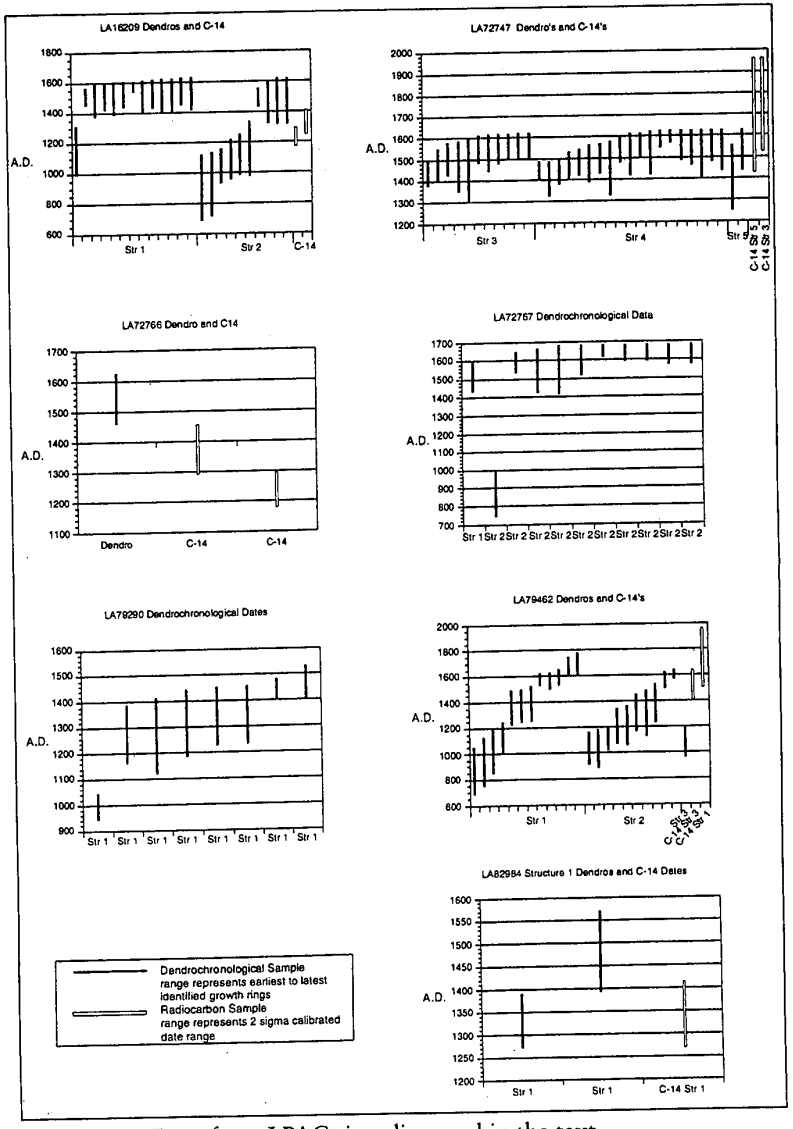

FIGURE 4.6. Data from LPAC sites discussed in the text.

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quired accelerator dating because of their small sizes. Given the annual nature of the dated materials, these dates (LA 79097 - Cal. A.D. 1420–1955 [AA10763]; LA 80318 - Cal. A.D. 1430–1955 [Beta 50854]; LA 80319 - Cal. A.D. 1520–1955 [AA10765]; and LA 80910 - Cal. A.D. 1520–1955 [AA10762]) should more accurately reflect the true age of the site occupation (Creel and Long 1986).

Figure 4.5 illustrates the calibrated date ranges for both the annual plant remains and charcoal samples. As can be seen, the charcoal samples from the structural elements predate the annual plant remains by 200 to 400 years. Thus, the dating of different materials from the sites indicates a significant problem with old-wood use and cross-section effect on the Navajo sites in the Aztec area.

This problem appears to be endemic in the Navajo archaeological record; Figure 4.6 illustrates dendrochronological and radiocarbon dates from seven Navajo sites recently excavated in the area by La Plata Archaeological Consultants (LPAC) (Steve Fuller, personal communication). The use of old wood and the cross-section effect can be seen in all the sites where more than one log was tree-ring dated. At every site with both radiocarbon and tree-ring dates, the radiocarbon dates overestimate the true age of the site, sometimes by as much as 400 years. The only exceptions to this trend are those radiocarbon dates with two-sigma ranges that extend into the twentieth century.

Dinétah Phase Tree-Ring Data

The tree-ring data from LPAC's excavations provide firm data supporting a Navajo occupation in the area prior to the Pueblo Revolt. Specifically, the tree-ring data from site LA 72747 suggest that the structures on this site were built and occupied in the period A.D. 1615–1622.

Site LA 72747 is a multioccupation Basketmaker II–Navajo habitation site (Hovezak et al. 1993). The Navajo occupation is represented by the remains of three burned forked-stick hogans and associated scatter of flaked stone, ground stone, and ceramic items. Ceramics in direct association with structure floors consist of Dinétah Gray jars and sherds.

148	249
149	5
***	
152	7
***	
154	06
155	0
156	02
157	46
158	6
159	11
***	
161	001455689
162	011122222

FIGURE 4.7. Stem-and-leaf plot for tree-ring dates from site LA 72747.

Table 4.2 shows cutting or near-cutting dates for the three structures; Figure 4.7 presents all the tree-ring dates from the site using the stem-and-leaf technique suggested by Ahlstrom (1985). As can be seen, the dates indicate construction of Structure 3 in or slightly after A.D. 1615, Structure 4 in A.D. 1622, and Structure 5 in or after A.D. 1621. The site as a whole demonstrates a strong terminal cluster of cutting dates in A.D. 1622. The consistency of these dates could be interpreted as indicating that all three structures were occupied contemporaneously in A.D. 1621–1622.

TABLE 4.2 Summary of Tree-Ring Dates from LA 72747.

Provenience	*Sample Number*	*Species*	*Inner Date*	*Symbol*	*Outer Date*	*Symbol*
Structure 3	LPM-76	PNN	1384	p	1495	+vv
	LPM-69	PNN	1403		1546	++vv
	LPM-71	PNN	1430	p	1576	+v
	LPM-75	JUN	1358	+/-	1586	vv
	LPM-67	JUN	1313	+/-	1591	vv
	LPM-80	JUN	1487	+/-	1610	vv
	LPM-73	JUN	1447	p	1614	+r
	LPM-70	JUN	1483	p	1615	r
	LPM-74	JUN	1510	p	1615	r
	LPM-77	JUN	1511		1618	vv
	LPM-78	JUN	1502	+/-	1619	v
Structure 4	LPM-91	JUN	1403		1482	+vv
	LPM-107	JUN	1329	+/-	1484	vv
	LPM-92	JUN	1384		1489	vv
	LPM-100	JUN	1413		1527	vv
	LPM-105	JUN	1424	+/-	1540	vv
	LPM-103	JUN	1394	+/-	1560	vv
	LPM-94	JUN	1430		1562	vv
	LPM-108	JUN	1331	+/-	1574	vv
	LPM-82	JUN	1485		1591	vv
	LPM-99	JUN	1419	+/-	1610	vv
	LPM-83	JUN	1509		1611	vv
	LPM-101	JUN	1425	+/-p	1616	r
	LPM-97	JUN	1550	+/-p	1620	vv
	LPM-85	JUN	1573	+/-p	1621	r
	LPM-89	JUN	1490	+/-p	1622	+v

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