

ted and studied. Here most careful observations of cinder cover, drainage, etc., were made.

It would appear fairly obvious that a cover of cinders over a clay or alluvial base greatly increases the size and growth of rings of the Western Yellow Pine. In view of the nearly equal precipitation over the area studied, and the obvious lack of plant food in the unweathered cinders from Sunset Crater, we conclude that the ash acts as a mulch to conserve the scanty water supply.

A glance at the table will bear out these conclusions. It will be seen here that the most ideal conditions for tree growth were represented in areas where about six to ten inches of rather fine cinders, or ash, covered a clay surface, and the drainage slopes were gentle with no prominent valleys.

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### DATES FROM FIVE KIVA HOUSE, UTAH

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The material which this communication concerns, consisting of two beam cross-sections, was deposited with the Laboratory of Anthropology in the summer of 1936, by Mr. Deric Nusbaum, at that time with the National Park Service, and Mr. Zeke Johnson, Custodian of Natural Bridges National Monument. Mr. Nusbaum and Mr. Johnson provide the following information regarding the provenience of the specimens.

Five Kiva House is located in a cave on the west side of Westwater Canyon three miles southwest of Blanding, Utah. Associated with the five circular, subterranean kivas from which the ruin takes its name are some twenty-odd ground floor rooms. Mortar marks on the roof of the cave near its two ends suggest that rooms formerly rose to two stories in these places. Although smaller sites are numerous, Five Kiva House is the only site as large as this in the vicinity and is, accordingly, easily identified. The cave has been used as a picnic ground by the local inhabitants with the result that the ruin has been considerably mutilated. Walls are still standing, however, and structural timbers yet can be found in place. Both of the timbers concerned here were fragments, found in fallen debris.

The specimens are pinyon, in sound condition; both have excellent records, although one is quite short; and both were cut between the growing seasons of 1243 and 1244.

A small collection of sherds from the site, kindly supplied by Mr. Johnson, contained Pueblo I and Pueblo III material, dividing about equal-

ly. The structure just described and the beam specimens are to be associated with the later horizon. The Pueblo III sherds belong to the Mesa Verde complex, but the small number and their condition do not justify further comment. A more detailed examination of the site might be instructive and the dates are recorded with the chance that they may prove helpful in chronological investigations of the regional archaeology.

Clerical data regarding the two specimens and measured widths of their rings are given below. (1) Duplicate specimens are deposited in the Laboratory of Anthropology and the Tree-Ring Laboratory, University of Arizona. It will be noted that the center rings (1115-1179) of LA-U4 are congested; the two absent rings occur in this congested group. One is apparently that of 1166. The identity of the other is not so clear, but it is probably that of 1175 and for present purposes it is so assumed. The inside dated rings as listed are also the center rings.

Specimen Number	Form of Specimen	Inside Dated Ring	Outside Dated Ring	Rings Absent In Sequence	Approximate Radius mm.	Heartwood-Sapwood Date	Rings Lost On Outside	Bark-Date
LA-U3	F.sect.	1200	1243*	0	32	?	0	1243-44
LA-U4	F.sect.	1155	1243*	2	60	?	0	1243-44

\* Ring of complete width.

TABLE OF ORIGINAL MEASURES (mm.)

	0	1	2	3	4	5	6	7	8	9
1150						.20*	.08	.19	.06	.27
1160	.43	.13	.46	.78	.31	.29	.00	.13	.16	.04
1170	.10	.18	.12	.36	.27	.00	.27	.24	.64	.34
1180	1.19	1.05	.91	.65	.73	.66	.06	.72	.49	.28
1190	.63	.40	.54	.64	.62	.78	.64	1.23	.69	.45
1200	1.28 .48†	.64 .43	.80 1.03	1.01 1.60	1.20 1.46	.87 .93	.90 .65	.95 .58	.97 .43	1.68 1.12
1210	1.25 1.35	.95 1.14	1.05 1.03	1.22 1.00	1.30 .98	.80 .56	.70 .32	.74 .37	1.07 .72	1.30 1.00
1220	1.05 .68	.86 .54	1.55 .84	.84 .67	.48 .34	.60 .36	.82 .53	.22 .12	.69 .49	.83 .46
1230	.82 .49	.76 .55	.83 .62	.63 .50	.75 .49	1.08 .70	.93 .56	1.00 .78	1.09 .84	1.10 .97
1240	.82 .58	1.17 .85	1.02 .76	.83 .52						

\* Begin LA-U4. †Begin LA-U3.

It is of interest to note that a few features of the present specimens, represented by the configuration of 1186-89, 1220-21, and 1224-25, which deviate somewhat from the standard classic series, occur prominently in the Rio Grande drainage in northern New Mexico.

(1) For comparative sequences see A. E. Douglass, "Dating Pueblo Bonito and Other Ruins of the Southwest," National Geographic Society, Contributed Technical Papers, Pueblo Bonito Series, 1, pp. 62-63, Washington (1935); "Estimated Tree-Ring Chronology," *Tree-Ring Bulletin*, 2 (2), pp. 14-15, Flagstaff (1935). Major dating criteria in Mesa Verde, Colorado material are listed in Harry T. Getty, "New Dates from Mesa Verde," *Tree-Ring Bulletin*, 1 (3), p. 23, Flagstaff (1935).