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DATES FROM WUPATKI PUEBLO

JOHN C. MCGREGOR

Wupatki Pueblo is located on the Wupatki National Monument, some 28 miles airline northeast of Flagstaff, Arizona, in red sandstone country, on the edge of the Painted Desert. The houses of the site, some of which still retain roof beams in position, are arranged along a narrow ridge and take advantage of the natural topography of the ridge including the use of the flat faces of large stone blocks as walls. Behind the ruin is a high lava-capped mesa, and in front of it stretches the desert with an unbroken view far across the Little Colorado River. Most important is the presence of a good permanent spring, which more than likely determined the location of the pueblo. Several other large sites, all within the Monument, may be seen from Wupatki Pueblo.

Dates from the site previously have been reported by Douglass (a series of 69 dates between 1073 and 1205 A.D.), and by McGregor (the range of 49 dates between 1084 and 1179 A.D.).¹ There is duplication of specimens in the two series but lacking detailed data it is not possible to correlate them at the present time.

The specimens reported are deposited in the Museum of Northern Arizona and have been accumulated over a number of years. Several were collected by the late Mr. J. C. Clarke while he was custodian of the Monument. Small collections were made by the writer from large beams which at one time were scattered about the surface of the site. By far the greatest number came from expeditions undertaken or sponsored by the Museum of Northern Arizona. The latter group is now particularly important because it may be correlated with specific rooms or with specific stratigraphic horizons.² Additional dates probably could be secured from the material already collected, but at the present time these possible additional dates do not seem to warrant the necessary work.

Dendrochronology. The most common wood represented by the specimens is apparently ponderosa pine, with only a few pieces of pinyon and rare

¹ A. E. Douglass, The Secret of the Southwest Solved by Talkative Tree-Rings, Nat. Geog. Mag. 65, 743, map, 1929; Dating Pueblo Bonito and Other Ruins of the Southwest, Nat. Geog. Soc. Tech. Papers, Pueblo Bonito Series No. 1, 52, 1935 (which see especially); Southwestern Dated Ruins: V, Tree-Ring Bul. 5, 10-13, 1938. J. C. McGregor, Southwestern Dated Ruins: III, Tree-Ring Bul. 4, n. 4, 6, 1938.

² A report by Katherine Bartlett, of the Museum of Northern Arizona, is in preparation.

pieces of juniper. Much of the wood here designated as pine is extremely discolored and resembles Douglas fir in appearance. However, a microscopic examination of the specimens failed to reveal the characteristics peculiar to Douglas fir and it is here identified as ponderosa pine. Today the mesa above Wupatki has a profusion of growing junipers, and a few miles back from the edge of the mesa there are clusters of residual pines.

The dated records of the Wupatki specimens match readily into Douglass' diagram of the Central Pueblo Chronology.³ Such differences as occur arise mainly through variations in accent of certain rings, and are variations of degree rather than of kind. For comparative purposes a pattern plot of the Wupatki sequence is given below.

1062 1065 or 65 1067 1069 1070 (1071B) 1072-73-74-75
1078 (1079-80B) 1081-82 1085-86 (1087B) 1088-89-90-91 1093 or 93
1095 (loc.ab.) 1098-99-(1100 var.) (1101-02B) 1105 1107 or 07
1108 1111 1113 or 13 1115 (1117-18-19-20B) (1118 rarely small)
1121 1122 (or 22B) 1123 or 23 1126 1128 or 28 (1129B) 1130-31-32-33
(1137-38 var.) 1140 (1143 or normal) 1146 1148 1150 (1151 var.)
(1153-54 var.) 1156 1158 1161 (1164 var.) 1166 1168-69 1174-75-76-77
1179 1182 or 82 1185-86 or 86 1189-90-91-92.

Distinctive and consistent short series of rings which are of the greatest aid in locating the dates of individual specimens have been termed "signatures" by Douglass. In the Wupatki series, and between 1060 and 1192, occur four such signatures: 1062-1070, 1121-1126, 1146-1161, and 1175-1182.

Most of the specimens from Wupatki have sensitive and datable rings. Complacent records are uncommon, and supersensitive records are extremely rare.

Ecological Change. Wupatki Pueblo is located well within the area of cinder fall from the eruption of Sunset Crater. It has been generally assumed that the presence of this cinder cover attracted people to the site by making agriculture more profitable than it had been, and that, with the blowing off of the cinders sometime later, the people left. Wupatki is believed to have been occupied sometime between the first leveling of the cinders, when agriculture was most remunerative, and the time when the local cinders blew away and it was no longer profitable to raise crops.

Archaeology. In Colton's system of indicating cultural relationships Wupatki may be placed as predominantly of the Elden Focus. This focus is a part of the Sinagua Branch, which is considered a segment of the Mogollon Root.⁴ The site is a later manifestation of the culture found at the Ridge Ruin, only 20 miles to the south, with which it shares outstanding and unusually rich cultural material, apparently derived from several sources.⁵ Outstanding traits include profuse and characteristic carving in bone, wood,

³ A. E. Douglass, Estimated Ring Chronology, VI: 1050-1200, Tree-Ring Bul. 2, 13-16, 1935; *Ibid.* 6, 39, 1940.

⁴ H. S. Colton, Prehistoric Culture Units and Their Relationships in Northern Arizona, Mus. North. Arizona Bul. 17, 1939.

⁵ J. C. McGregor, Winona and Ridge Ruin, I, Mus. North. Arizona Bul. 18, 1941.

DATED SPECIMENS FROM SITE N. A. 405 (WUPATKI)

Number	Outside Dated Ring	Inside Dated Ring	Radius, mm.	Species	Form of Specimen	Number of Absent Rings	Estimated Bark Date	Location
Miscellaneous								
F. 3808	1173	1109	26	Pnn.	¼ Sec.	0	1176±3	Misc.
2532	1167	1092	59	P.P.	½ Sec.	0	1167	"
3834	1152	1098	44	"	¼ Sec.	2	1155±3	"
3840	1151	1077	63	Pnn.	⅛ Sec.	2	1151	"
2510	1139	1096	38	P.P.	Sec.	0	1145±6	"
2538	1131	1091	42	"	Sec.	0	1132±1	"
2552	1130	1077	43	"	½ Sec.	1	1130+X	"
2519	1128	1077	44	"	½ Sec.	1	1131±3	"
2545	1127	1028	57	"	½ Sec.	0	1130±3	"
2525	1125	1019	86	Pnn.	½ Sec.	0	1130±5	"
2351	1124	1024	110	P.P.	Core	1	1127±3	"
2989	1120	1011	60	"	Sec.	0	1140±20	"
2529	1120	1032	66	"	Splint	0	1125±5	"
2541	1118	1047	42	"	Splint	0	1122±5	"
W. 5	1116	1012	68	"	Core	0	1121±5	"
W. 6	1112	1025	61	"	Core	1	1113±1	"
2520	1104	1033	65	"	⅛ Sec.	0	1114±10	"
2991	1094	1032	61	Jun ?	Sec.	0	1095±1	"
2513	1074	1017	52	P.P.	Sec.	1	1084±10	"
Section # 2.								
F. 3902	1159	1129	40	"	Sec.	0	1159	# 24
Section # 3.								
F. 3704	1192	1162	43	"	Sec.	0	1192	# X 2
3758	1167	1131	40	"	Sec.	0	1167	X 2
Section # 4.								
F. 3895	1190	1104	58	"	½ Sec.	0	1192±2	# 58
3864	1189	1165	25	"	Sec.	0	1189	# 29
3884	1189	1154	42	"	Sec.	0	1191±2	# 56
3862	1170	1123	44	"	Sec.	0	1175±5	# 54
3865	1164	1126	38	"	Sec.	0	1164	# 33
3737	1159	1135	23	"	Frag.	0	1159	# 130
3871	1155	1128	45	"	¾ Sec.	0	1155	# 30
3899	1151	1092	39	"	⅛ Sec.	0	1153±2	# 73
Room # 35.								
F. 2949	1190	1134	48	"	½ Sec.	0	1190	# A. 5
3215	1161	1117	50	"	Sec.	0	1161	"
2948	1160	1084	53	Pnn.	Sec.	0	1160	# A. 7
3213	1160	1134	38	P.P.	Sec.	0	1160	"
3018	1159	1133	28	Pnn.	¾ Sec.	0	1164±5	# Roof B.
2973	1156	1120	35	P.P.	Sec.	0	1156+X	# B 7
3012	1150	1113	43	"	Sec.	0	1150	# Roof B.
2952	1127	1090	48	"	½ Sec.	0	1127	# B 2?
2951	1127	1093	47	"	Sec.	0	1127	# B. 1
2947	1099	936	133	"	Plank	3	1099+X	# A. 6
2971	1081	1058	40	Jun ?	Sec.	0	1101±20	# B 3?
Room # 36.								
F. 3030	1137	1096	29	P.P.	⅛ Sec.	0	1137	Roof C.
2954	1129	1108	38	"	Sec.	0	1129	# 4
Room # 41.								
F. 3746	1172	1138	39	"	½ Sec.	0	1175±3	X 3
Room # 45.								
F. 2982	1145	1088	53	"	Sec.	0	1150±5	Roof A.
2981	1137	1027	85	Pnn.	Sec.	0	1140±3	Roof A.
Room # 46.								
F. 2996	1177	1128	40	P.P.	Sec.	0	1180±3	Roof B.
3002	1160	1092	50	"	Sec.	1	1160	Roof B.
2995	1156	1108	65	"	½ Sec.	0	1166±10	" "
2993	1149	1118	37	"	Sec.	0	1149±1	" "
3006	1094	1032	79	"	Sec.	0	1094±X	Rf. beam sup.
Room # 61A.								
F. 4202	1184	1154	28	"	Sec.	0	1184	Roof

Three other beams have been dated in the past, and the short records kept of them checked again, but the actual specimens could not be found to complete the data listed above. They are as follows:

F. 2524—Outside date 1126—Inside 1085—Loc: Misc.

W. 2 —Outside date 1127—Inside 1079—Loc: Misc.

F. 3837—Outside date 1148—Inside 1091—Loc: Misc.

shell and stone; the extremely wide use of paint; a peculiar painted basketry; the use of lac as a modeling and adhesive material, and characteristic masonry unusually good for this section of the Southwest. Walls have rubble cores which are faced with carefully laid small blocks of sandstone and limestone. In the ceramic complex at Wupatki Winona Brown and Sunset Red are the most common plain type and there is some Turkey Hill Red. Tusayan Corrugated and Moenkopi Corrugated are abundant. The painted types include Citadel Polychrome, Flagstaff Black-on-White and Walnut Black-on-White, with Sosi Black-on-White and Wupatki Black-on-White present in smaller amounts.⁶ This is an early Pueblo III complex.

As an examination of the accompanying list of dates will show, early beams were reused in various parts of the pueblo.

Associated with the site is the only known southwestern ball court built completely of masonry. There is also a large circular walled structure, termed a "dance plaza," which in form and location is strongly suggestive of the Great Kivas of the Chaco Canyon and similar sites. It is of interest that the later dates from the Chaco overlap with the earlier dates from Wupatki.

The resemblance between Wupatki and the Bear Ruin in east-central Arizona reported by Haury may also be noted.⁷ Here there is a unit of rooms, a large circular kiva with a wide opening on one side, and the dates are almost identical with those from Wupatki.

DATES FROM KINNIKINNICK PUEBLO

JOHN C. MCGREGOR

Kinnikinnick Pueblo is a late Pueblo III and early Pueblo IV site on Anderson Mesa, some 35 miles southeast of Flagstaff, Arizona. One room, room no. 3, was dug by an expedition conducted by Mr. Milton Wetherill and Sidney Connor, for the Museum of Northern Arizona, in the summer of 1940 in an effort to collect tree-ring material which would bridge a short gap in the local Flagstaff series. This gap originally consisted of some forty years at the end of the thirteenth century and the beginning of the fourteenth. The material collected did not close this gap, failing to do so by only six years, but did extend the chronology to 1311 A.D.

The archaeology of this site gives every evidence that beams may be expected which will fill this small period, for pottery types are found here which definitely date later than 1311. The most common decorated pottery complex consists of Jeddito Black-on-Yellow, Bidahochi Polychrome, and

⁶ H. S. Colton, Winona and Ridge Ruin, II, Mus. North. Ariz. Bul. 19, 1941.

H. S. Colton and L. L. Hargrave, Handbook of Northern Arizona Pottery Wares, Mus. North. Ariz. Bul. 11, 1937.

⁷ E. W. Haury, New Tree-Ring Dates from the Forestdale Valley, East Central Arizona, Tree-Ring Bul. 7, 14-16, 1940.

Winslow Polychrome. The most common types are Chavez Brown and Kinnikinnick Brown recently reported by Colton.¹ The culture represented is the Clear Creek Focus.²

The pueblo, of medium size for this time, was built of Moenkopi sandstone in the lower portion and of basalt boulders in the upper walls. The site appears to have a small court and contains a low wall structure which has sometimes been described as an antelope trap, or corral. Certainly the main portion of the pueblo, that near the edge of the large canyon upon which the site lies, was two stories high, and perhaps was even of three stories. This probably explains the several clusters of dates and the long series of rooms. The entire pueblo contains about twenty ground floor rooms so that with the addition of two or three stories a considerable series is still left unexamined.

Surprising quantities of pottery and other objects were found during the course of this comparatively simple and short excavation. Not only were a number of broken but restorable vessels found but an unusual quantity of bone awls of several varieties came from this room as well as a large sandstone slab with a circular hole in the middle. The latter, though unpainted, was similar to the one reported by Haury from the Pinedale ruin, a site of somewhat comparable culture and time.³

The specimens in the form of charcoal brought into the laboratory were predominantly ponderosa pine, very small amounts of juniper, and very rarely pieces of pinyon; there were no fir specimens. Today with the exception of the pines growing abundantly in the canyon just below the ruin the predominant tree type is juniper, and it is surprising that more juniper fragments were not found here.

In all of this material whenever other indications showed a true outside or cutting surface the cambium layer invariably had bubbled up in burning and carbonized, thus to form what may be a good indication of a cutting date. Another characteristic which seemed to indicate outsides or very near outsides was the presence of checked or cracked outer surfaces to a depth of only a few rings, as though the surface had rotted somewhat and cracked before the beam was burned.

Although one date was secured at 1147 and at 1257, the first well-dated cutting year is 1269 with seven fragments of beams. Unfortunately most of these seem to have been derived from the same specimen so that only three appear likely as independent dates. However, this probably is the first indication of actual building found, for they are all true outside dates. The next building activity seems to have been between 1274 and 1280, for three specimens date 1274, two 1275, and three 1280. The third building period comes sometime after 1285 and between that date and 1305, during which period nineteen dates are found. The last period of building, or repair, is at a date near 1308. The latest date from the site came probably from room 2, instead of 3, for it was found in loose material near the common wall. This was picked up by Dr. A. E. Douglass and the writer previous to excavation.

A large part of this material has either been dated directly by or examined and check-dated by Dr. Douglass.

¹ H. S. Colton, Winona and Ridge Ruin, II, Mus. North. Ariz. Bul. 19, 1941.

² H. S. Colton, Prehistoric Culture Units and Their Relationships in Northern Arizona, Mus. North. Ariz. Bul. 17, 1939.

³ E. W. Haury and L. L. Hargrave, Recently Dated Pueblo Ruins in Arizona, Smiths. Misc. Coll. 82, n. 11, 1931.

DATED SPECIMENS FROM KINNIKINNICK

Number	Outside Dated Ring	Inside Dated Ring	Radius, mm.	Species	Form of Specimen	Number of Absent Rings	Estimated Bark Date
K.N.K. 1	1293	1253		P.P.	Frag.		1295±2
K.N.K. 2*	1269	1244		"	"		1269
K.N.K. 3	1278	1254		"	"		
K.N.K. 4	1311	1276		"	"		1311
F. 4909	1290	1240	26	"	"	1	1290+X
F. 4914	1307	1258	21	"	"	0	1307
F. 4916	1300	1246	38	"	"	0	1303±3
F. 4917	1308	1258	34	"	"	0	1308
F. 4921	1303	1230	52	"	"	0	1308±5
F. 4922	1275	1230	43	"	"	0	1275+X
F. 4923	1309	1278	12	"	"	0	1309
F. 4924	1301	1240	47	"	"	1	1301+X
F. 4926	1304	1270	18	"	"	0	1304+X
F. 4927	1305	1252	36	"	"	0	1310±5
F. 4930	1306	1256	35	"	"	0	1308±2
F. 4942	1307	1208	60	"	"	0	1310±3
F. 4959	1295	1248	40	"	"	1	1295+X
F. 4960	1300	1244	38	Pnn.	"	1	1300+X
F. 4961	1294	1248	35	P.P.	"	0	1294+X
F. 4964	1257	1205	58	"	¼ Sec	0	1257+X
F. 4971	1308	1272	31	"	"	0	1310±2
F. 4979	1303	1227	47	"	Frag.	1	1308±5
F. 4982	1304	1275	35	"	¾ Sec.	0	1304
F. 5024	1295	1259	38	"	Frag.	0	1295+X
F. 5030A	1298	1258	45	"	"	0	1298+X
F. 5030B	1308	1270	19	"	"	0	1308+X
F. 5049	1300	1241	34	"	"	1	1300
F. 5077	1270	1243	39	"	¼ Sec.	0	1270
F. 5078*	1269	1244	26	"	"	0	1269
F. 5079*	1269	1244	30	"	"	0	1269
F. 5080	1269	1249	14	"	Frag.	0	1269
F. 5081*	1269	1244	38	"	½ Sec.	0	1269
F. 5082	1304	1273	22	"	Frag.	0	1304+X
F. 5087*	1269	1243	34	"	½ Sec.	0	1269
F. 5099	1304	1271	38	"	Sec.	0	1304
F. 5108	1274	1229	51	"	Frag.	0	1274+X
F. 5109	1309	1256	26	Pnn.	"	0	1310±1
F. 5110	1280	1231	43	P.P.	Sec.	0	1280+X
F. 5111	1301	1210	60	"	"	0	1301+X
F. 5112	1303	1244	39	"	Frag.	0	1308±5
F. 5115	1280	1239	38	"	"	0	1280+X
F. 5116*	1269	1243	34	"	½ Sec.	0	1269
F. 5117	1147	1081	49	"	Sec.	0	1147+X
F. 5119	1274	1218	46	"	Frag.	0	1274+X
F. 5120	1273	1226	44	"	"	0	1273
F. 5131	1303	1247	32	"	"	0	1313±10
F. 5132	1274	1233	33	"	"	0	1274+X
F. 5150	1275	1232	34	"	"	0	1275+X
F. 5154	1280	1244	30	"	"	1	1280
F. 5158	1300	1270	20	"	"	0	1300+X
F. 5163	1298	1263	39	"	¼ Sec.	0	1298
F. 5164	1308	1249	52	"	"	0	1308
F. 5172	1296	1256	28	"	Frag.	0	1296+X
F. 5173	1292	1243	38	"	¼ Sec.	2	1292+X
F. 5174	1308	1234	46	"	¼ Sec.	several	1308
F. 5175	1307	1251	40	"	"	0	1307
F. 5180	1308	1253	27	"	"	0	1308
F. 5214	1287	1232	38	"	½ Sec.	0	1287

*Possibly all from the same original specimen.

A DATE FROM CHACO YUMA WEST, SOUTHERN ARIZONA

DOROTHY A. KNIPE

Early in January, 1932, Mr. F. C. Lewis of Rillito, Arizona, brought in a piece of ponderosa pine charcoal found lying on the floor of a shallow room in the Chaco Yuma West area. This is a level plain lying west of the Tucson Mountains and contains innumerable sites of pre-historic villages. These extend far around the point of the mountains to the north and continue in the same abundance at Chaco Yuma East on the east side of the mountain. (These names date from the old Yuma stage days). The predominating pottery type is Tanque Verde Red-on-Buff.

A date, the first in southern Arizona, was obtained on this piece in January, 1938, and checked in final test by Dr. Douglass in January, 1942. The specimen shows great ring character, although it carries only a short sequence. The thirty-two rings date from 1243 to 1274. Two fine equal rings, 1263 and 1264, preceded by four large rings, form a strong signature. Tree borings in the Graham and Chiricahua Mountains in 1932 showed that the chronology in southern Arizona pines was generally in agreement with the published Central Pueblo Chronology.

DATES FROM FORT GRANT PUEBLO, SOUTHERN ARIZONA

JOHN L. MILLER

The Fort Grant Pueblo, on the western slopes of the Pinaleno (Graham) Mountains at an approximate elevation of 5,000 feet, is two miles southwest of Fort Grant, Arizona. Mr. B. E. McCowen, the excavator of this pueblo, reports¹ that it was probably a two-storied structure of approximately 1000 rooms and that the beams used in it were cut on Mount Graham.

Five parcels of charcoal and partly charred wood specimens and one section of unburnt juniper from this site were sent to the Tree-Ring Laboratory for examination. The numerous charcoal pieces appear to come from two separate trees on the basis of the ring patterns. All the specimens with the exception of FGP-4, the juniper section, are ponderosa pine as shown by microscopic tests.

By use of the skeleton plot method a continuous time sequence of about 100 rings was constructed, starting at 1232 A.D. and ending at 1332 A.D. On comparison with the photographic chronology of the Central Pueblo Area we find the 1263 ring slightly larger than that for 1264 in the FGP group; the 1269 ring is very small in comparison with its neighbors and can be used as an identification ring in this collection, while 1270 is represented by a normal ring.

¹ Personal communication to Dr. E. W. Haury.