
INFORMATION

AUTHORS

The **Tree-Ring Bulletin** will appear four times a year and will publish papers which are the results of original research on tree rings in their relation to climatology, and to other subjects. No paper which has already appeared will be accepted.

Manuscripts should be typewritten in double spacing. The Editor reserves the privilege of returning to the author for revision approved manuscripts and illustrations which are not in the proper form for the printer.

In reporting tree-ring data authors are requested to submit their data in a table such as appears on the back page of Vol. I, No. 1. This will cut the cost of publication very greatly.

Until funds are available authors will be requested to pay the cost of illustration which may be line cuts or half-tones, but must be drawn or printed on white paper, and mounted with paste, not glue.

Each author will be given, free of charge, twenty-five copies of the Bulletin in which his article appears. Reprints may be procured at cost with or without covers if ordered at the time the galley proof is submitted.

Manuscripts and illustrations should be sent express prepaid or by registered mail to the Editor, Dr. A. E. Douglass, Tree Ring Laboratories, University of Arizona, Tucson, Arizona.

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All correspondence having to do with subscriptions must be addressed to the Managing Editor, Dr. Harold S. Colton, Museum of Northern Arizona, Flagstaff, Ariz.

Should recent subscribers wish to complete their files of Tree Ring Bulletin by beginning their subscription with July 1934, Vol. 1, No. 1, please advise the managing editor immediately and the back issues will be forwarded.

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RING RECORD OF THE GREAT DROUGHT (1276-1299) IN EASTERN ARIZONA

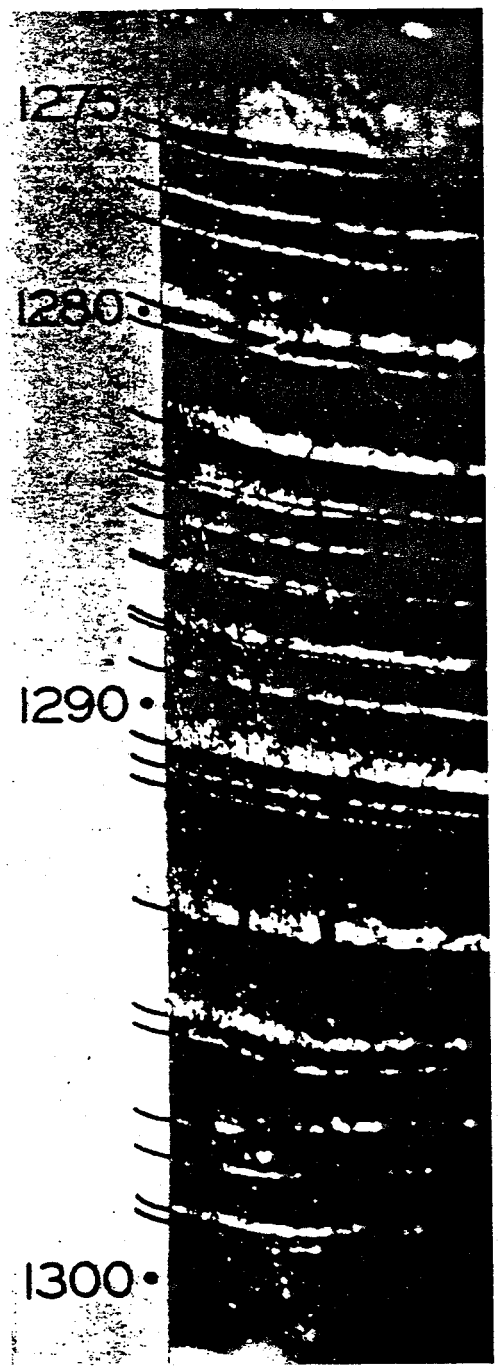
GORDON C. BALDWIN

Specimen FA 21 came from Kinishba Pueblo, which is a large community house tructure located some three miles northwest of the town of Fort Apache, Arizona. This pueblo has been partially excavated during the past five summers by field expeditions of the Department of Archaeology of the University of Arizona and the Arizona State Museum under the direction of Dr. Byron Cummings. The pueblo consists of eight individual groups of prehistoric dwellings, the two largest of which are situated on opposite sides of a rather deep wash that has probably been largely cut through since the puebvlo was abandoned.

This particular piece of charcoal came from Room 44 of Group I, the large group bordering the eastern side of the wash. This room lies at the extreme southeast corner of a large patio or courtyard in the southern end of this section of the ruin. The room was about average size for this pueblo, measuring approximately eleven feet eight inches on a side. The walls are of two types, rubble and ashlar, the former consisting of small rock laid in an abundance of clay mortar, and the latter of larger worked rock in horizontal rows. There is a rectangular fireplace made of stone slabs set on edge in the clay floor near the center of the room. On the west side a small square opening near floor level leads through the wall and under the low banquette surrounding the patio to open about a foot above the level of the patio. This had, however, been walled up before the room was abandoned, as several stones had been placed in the opening into the room. This same feature was found in two other rooms opening on the west side of the patio, but only one of these shafts had been walled up, the other evidently being used throughout the occupancy of the room. From all indications this opening seems to have some religious or ceremonial significance, being somewhat comparable to the opening in the walls of true kivas or ceremonial chambers.

Room 44 did not contain a great many artifacts, and none were particularly distinctive. These include four circular sandstone olla covers, a number of manos and flat metates, several rubbing stones and hammer stones, a small slate knife, two short bone awls, and two horn flakers. However, a great many pottery fragments were found, representing a number of different types, the most common being sherds of black indented coiled ollas and of plain red slipped bowls and ollas. Of the decorated sherds found in this room most belonged to the Late Gila Polychrome and Four-Mile Polychrome types, with some black on red and black on white. The pottery from this room, as well as that from most of the others in this pueblo, clearly showed a blending of Little Colorado and Upper Gila cultures, a condition that is in accord with the location of the pueblo in the Upper Gila area about twenty miles south of the boundary of the Little Colorado drainage area. Thus the pottery and other artifacts, the architecture, etc., place this site about in late Pueblo III, the Great Pueblo period, and the dates that have so far been obtained, ranging from 1238 ± 5 to 1306 ± 5, seems to bear this out.

From fragments of charcoal discovered in Room 44, the roof seems to have been supported by three major beams east and west, with smaller poles north and south, and brush and clay above that. Specimens FA



SPECIMEN FA 21

A record of the great drought

20, 21, and 34 represent parts of these three beams. Number 21 being the southern beam. FA 20 and 23 gave bark dates of 1285 A. D., while FA 21 gave a date of 1306±5. (1) From this it seems probable that the room was constructed about 1285 or 1286, and then fifteen or twenty years later a further beam was necessary at the south end of the room as a support for a weakened portion of the roof.

FA 21 is a three-quarter section of charcoal, a Douglas fir, and shows a very beautiful ring record from 1248, the inside dated ring, to 1301, A. D., the last outside dated ring. It gives an exceptionally good picture of conditions during the great drowth lasting from 1276 to 1299 A. D., showing as very small or even microscopic all the exceedingly dry years during this period, the years 1276, 78, 80, 83, 86, 88, 95, 97, and 1299. No rings were absent in the entire sequence and all are clearly marked, as can be seen in the photograph of this specimen.

(1) Baldwin, Gordon C., 1935. Dates from Kinishba Pueblo. Tree Ring Bulletin, Vol. 1, No. 4, p. 30. Flagstaff, 1935.

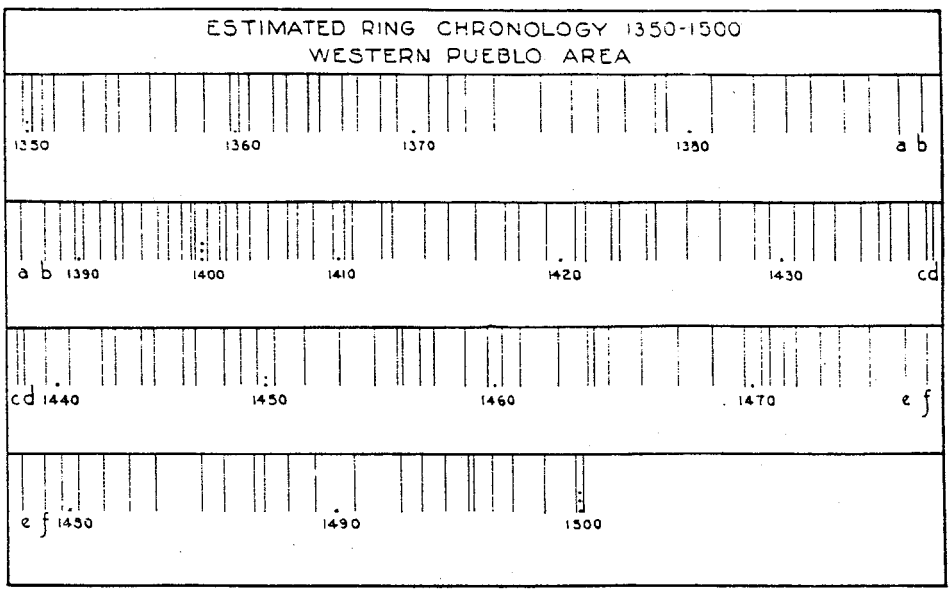
THE PHOTOGRAPHY OF FA-21

H. FAUREST DAVIS

The photography of charcoal specimens requires a special technique because of the difficulty in securing a surface plane enough to give adequate definition to all of the rings and in obtaining proper lighting on this surface. It has been found that a transverse section is the simplest to prepare and highly sat-

ESTIMATED RING CHRONOLOGY IV: 1350-1500

A. E. DOUGLASS



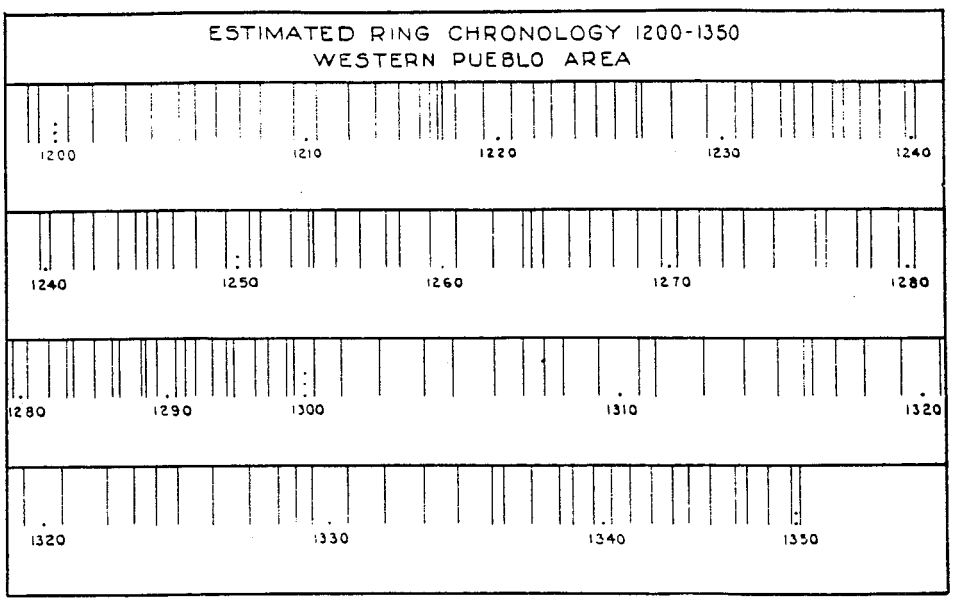
Special Ring Characters

1350-1-2 Always small
1355 Smallish
1357-8-9 Big, but '59 is small in pinyon samples
1360-1 Very small, often microscopic
1360's Odd numbers small
1371-2 Smallish
1379 Very small amidst big rings
1383 Sometimes smallish
1385 Sometimes smallish
1390 Smallish
1396 Small
1399 Very small
1396-1402 Drouth
1402 Very small
1407 Very small
1410-1-13 Very small
1418 Usually small
1421-3-5 Small
1428-9 Big
1435 Small
1438 Small
1441 Big
1442-4-6 Very small
1448-9-50 Very small
1451-2-3-4 Big
1455 Microscopic and often absent
1457 Very small, sometimes absent
1460 Occasionally very small; rarely absent
1464 Very small; often absent
1465 Usually small
1470-3 Small
1471 Very small; sometimes absent
1474-85 Large
1487 Reliably very small; often double
1495 Microscopic and usually absent
1499 Sometimes very small

isfactory with which to work either visually or photographically. Such a section can easily be obtained by breaking the charcoal across the grain with the fingers, but great care must be taken in the breaking to prevent the specimen from crumbling. This type of break gives the rings of the specimen a brilliantly contrasting quality which cannot easily be obtained from a razor-cut surface, although rarely does this method of creating a surface give a working plane enough to be photographed with an ordinary short-focus lens of the sort found in the amateur camera. A lens of at least 25 centimeters focal length is better and one of 50 centimeters is still more desirable in order to bring the many points in the highly irregular surface of the specimen into the focal plane.

A factor of equal importance to preparation of surface is the lighting

CHRONOLOGY V: 1200-1350



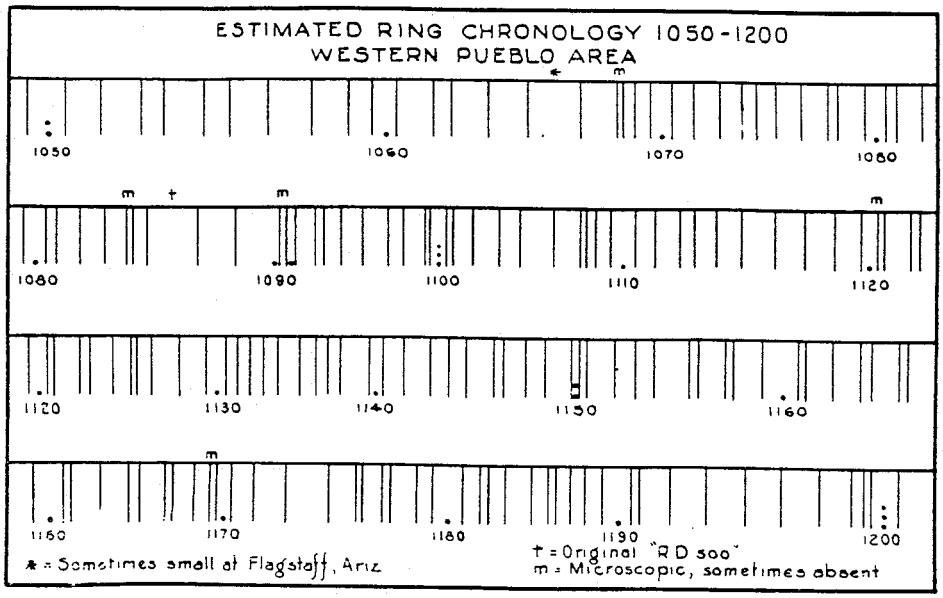
Special Ring Characters

1205 smallish
1208 smallish
1215-6-7 increasingly small
1217 very small; sometimes absent
1218 sometimes small or large
1221 smallish
1227 microscopic to absent amdst liarge rings
1233 sometimes small
1236 sometimes small
1240 always small
1244-5-6 smallish
1249-50 large
1251 medium to microscopic; rarely double
1254 very small and often absent
1258 smallish, weakened
1263 very small; rarely absent
1264 smallish
1270 smallish
1275 very large
1276-99 great drouth
1276 very small
1277 often double
1278 smallish
1280 very small; occasionally double
1283 small to often absent; frequently double
1286 very small to microscopic
1288 very small; often absent
1295 very small
1297 usually smallish
1299 very small to microscopic
(1300's generally larger than average)
1307 small
1311 often small
1316 reliably very small
1322-3 smallish
1328-9 smallish
1335 always small
1338 usually small
1342 sometimes small
1347 small

of surface. For the best possible definition of the rings on the photographic plate it is necessary that the plane of the charcoal surface be perpendicular to the optical axis of the apparatus while retaining the maximum degree of contrast that can be obtained in the rings. Contrast in rings depends upon the relatively compact and compressed nature of cells in late growth as compared with the larger cells of early or spring growth. Thus it will be seen that if light comes from above and a short distance in front of the surface to be photographed, a specular reflection of considerable intensity will be obtained from cell wells of late growth whereas the light falling on the spring growth will be lost in the cell cavaities.

In photographing FA-21 a light-tight specimen box approximately 2'x2'x3' was used. This box is enamelled white on the inside to give great-

CHRONOLOGY VI: 1050-1200

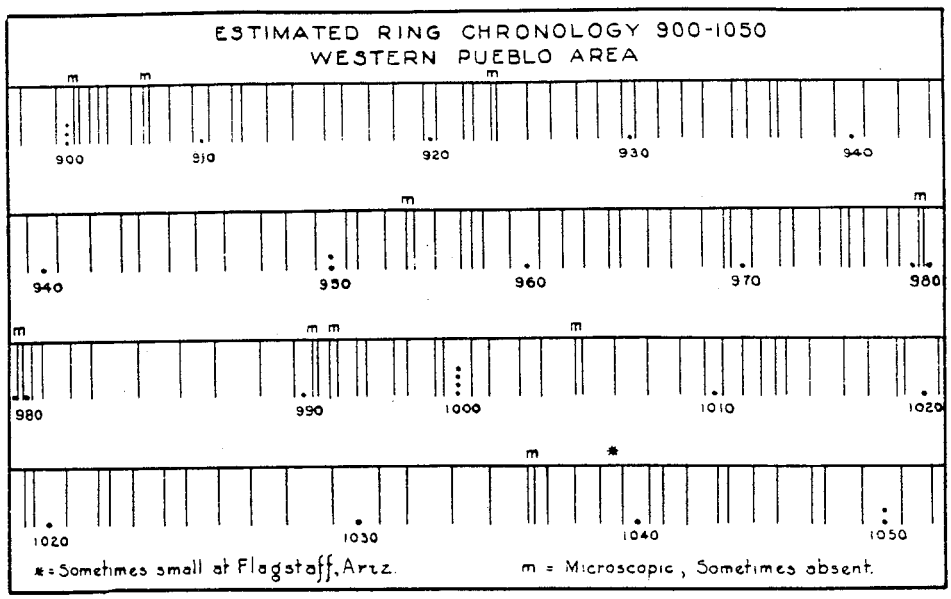


Special Ring Characters

1053 smallish amidst large rings
1062 smallish and usually heavy red
1063-6 large but 1065 sometimes small at Flagstaff
1067-8 very small; either is occasionally absent
1078 always smallish
1081 usually smallish
1085 very small, sometimes absent
1086 small
1087-9 large
1090 very small; often microscopic or absent
1091 very small
1093 very small
1097 very small; occasionally microscopic
1099 very small; sometimes microscopic
1101 very small to microscopic
1102-5 large
1107 very small to microscopic; occasionally absent
1113 always smallish
1121 very small to microscopic; sometimes absent in series of big rings 1122-30
1123 very small
1126 very small
1131-3 very small
1146 very small
1150 very small
1151 usually small
1156 very small
1158 very small
1161 small
1164 smallish
1166 usually very small
1169 usually microscopic
1175 very small to microscopic
1177 very small to microscopic
1182 very small to microscopic
1185 small
1186 very small; occasionally microscopic
1187 small
1191 sometimes small
1193-7 large
1198 smallish
1199 very small amidst large rings

er diffusion. At one end of it is an aperture in which is mounted a Bausch and Lomb Tessar lens of 10 inches (25 centimeters) focal length. A bank of lights is located on the inside of the box against the panel in which the lens is mounted. Of this bank, only one 75-watt element, with diffusing screen, was used on the specimen. To avoid the possibility of any stray or unintended reflector light striking the lens a black cylindrical hood 7" long was placed over the lens cell inside the box and toward the specimen, which was placed in the proper position within the box. A Wratten Panchromatic plate, 8"x10", was selected as being the most desirable for the type of subject and nature of light source. No filter was needed. The lens was

CHRONOLOGY VII: 900-1050



Special Ring Characters

900-4 very small group
901 microscopic or absent
905 large
906 small
907 microscopic and often absent
910 smallish
912 smallish
916 smallish
920 very small
922 usually very small
924 very small to absent; 923 sometimes absent with 922 and 924
930 smallish
935 smallish
937 very small and often absent
943 smallish amidst large rings
951 small
954 microscopic to absent, after small 953
957-8 smallish-equal
964 smallish
968-9 small, one of them sometimes absent
972 small
975 very small
978 small
980 microscopic and usually absent
981 very small to microscopic and even absent
982 small
984 smallish
985-9 very large
991 very small: often absent
992 small
993 very small; occasionally absent
995 very small
1005 always small to microscopic, even absent
1009-14 smallish
1014 small
1019 always small to microscopic, or even absent
1022 small; in Flagstaff area 1023 is sometimes smaller
1031 smallish
1035 always very small and often absent
1036 usually small
1039 often very small at Flagstaff; not so at Chaco Canyon
1041 small
1044 small
1048 smallish

stopped down to f:11 so that an exposure of 5.0 minutes was necessary.

The length of the original ring sequence shown in the cut was 13.0 millimeters and the degree of original enlargement was x8. In order to preserve the contrast of the specimen itself an X-ray developer worked out by Hubble of Mount Wilson was used. The cut shown is a further enlargement of the specimen of about x1.6 from the negative onto Defender Contrast Velour Black Bromide. The illustration gives an enlargement of about x13 from the original.