

It is the "sketch" method which can be reproduced by the simpler zinc plate process, and which at times serves a real purpose of its own. It has long been a habit of the writer to make free-hand sketches of important sequences. These, of course, are not at all accurate, but are found to be very readable. After viewing thousands of specimens and studying different parts of the long chronology in scores and even hundreds of different specimens, a mental picture of the different parts of the Pueblo area chronologically has resulted. When this is put down on paper it becomes a generalized sketch whose value lies not in the precision of ring size, but in its dating qualities for the Western Pueblo Area. It represents for the last few centuries the mental impression left by a thousand or more trees. It has been suggested that such a series of generalized sketches, extended back to the earliest known Pueblo chronology would have some usefulness to students. In giving this plate of "Estimated Ring Chronology Since 1800," the writer desires to receive comment and to learn how far such reproduction may prove useful.

In closing this survey of the problem of presenting suitable evidence of dating accuracy, the writer is not yet assured that sketches such as here referred to, constitute acceptable evidence, yet their value is worth considering. In the present stage of tree ring work, a thorough examination of the best original specimens by one of the most experienced workers, recommended by the Tree Ring Conference, is considered the best form of securing reliability.

NEW DATES FROM MESA VERDE

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The dates presented in this report were obtained from beam material secured in the cliff dwellings of Mesa Verde National Park. This material was secured by the writer as an employee of the Department of the Interior, National Park Service, during the summers of 1932 and 1933.

Dates had previously been obtained for six of the major cliff dwellings from material secured by the National Geographic Society tree-ring expedition of 1923 (1)*. The material obtained in 1932 and 1933 yielded additional dates for the six ruins previously dated and new dates for five other major ruins. This additional information concerning the ruins of Mesa Verde National Park is being used in the Educational Program of the National Park Service (2).

The collecting of the beam specimens from these ruins was not accompanied by excavation nor by the collection of specimens of the associated material culture. However, all ten of the ruins included in this report fit into the Late Pueblo** culture complex as shown by the style of architecture, and by the results of excavations, either partial or complete, previously carried on in these ruins.

Surface ruins on the Mesa Verde yield only pinyon and juniper (chiefly *Juniperus utahensis*), indicating the cover of the mesa top. Cave ruins yield about equal amounts of pinyon and Douglas fir, with a larger proportion of juniper. For the cave structures, in addition to the pinyon and juniper of the mesa top, they were able to get Douglas fir growing near the caves on the slopes of the canyons. Only rarely does yellow pine occur in the ruins, indicating that then, as now, this tree grew only in the northern and higher parts of the Mesa Verde, remote from most of the ruins.

*Numbers refer to Bibliography. **Pueblo III.

Site	Piece Number	Outside Dated Ring	Inside Dated Ring	Approx. Radial Line in MM	Kind of Wood	Type of Specimen	Sap Heart Date	Rings Lost at Outside	Rings Absent Within Sequence	Estimated Bark Date
Cliff Palace	MV 40	1264	1237	25	DF	F.Sec.	1244	0	0	1264
Cliff Palace	48	1209	1091	62	DF	Core	1176	Few	0	1212 \pm 3
Cliff Palace	51	1266	1105	53	Pnn	Core	1234	Few	0	1269 \pm 3
Cliff Palace	52	1267	1222	63	DF	Core	1260	0	0	1267
Cliff Palace	53	1273	1159	50	Pnn	F.Sec.	1233	0	0	1273
Buzzard House	64	1273	1176	83	Pnn	F.Sec.	1240	0	0	1273
Jug House	65	1066	896	71	DF	$\frac{1}{2}$ Sec.	1009	0	0	1066
Jug House	66	1066	947	83	DF	Core	1009	0	2	1066
Ruin No. 16	74	1261	1210	40	Pnn	F.Sec.	1218	0	0	1261
Long House	84	1204	1139	35	DF	Fragm.	1184	Cons.	0	1244 \pm 20
Long House	88	1211	1132	91	DF	$\frac{1}{4}$ Sec.	1190	Cons.	0	1231 \pm 20
Hemenway H'se	148	1172	1056	36	DF	Fragm.	1130	Few	0	1177 \pm 5
Oak Tree House	182	1184	1114	34	DF	Core	1161	0	0	1184
Balcony House	192	1272	1220	49	DF	Core	1244	0	0	1272
Balcony House	196	1204	1175	36	DF	Core	1183	0	0	1204
Sq. Tower H'se	282	1246	1167	95	DF	Core	1223	Few	0	1251 \pm 5
Sq. Tower H'se	284	1243	1158	46	Pnn	Core	1198	Few	0	1248 \pm 5
Sq. Tower H'se	292	1241	1149	40	Pnn	Core	1200	Few	0	1246 \pm 5
Sq. Tower H'se	293	1242	1157	77	Pnn	Core	1193	Prob.0	0	1242

Fragm.—fragment, piece of split wood used in roof construction.

Where beam material was abundant preference in collecting specimens was given Douglas fir and pinyon over juniper, but where material was at all scarce everything was sampled. Beams in situ were given preference over fallen material, though both types were sampled and carefully noted as to position in the ruin. Information concerning the exact location of the beams yielding the dates included in this report are on file in the tree ring laboratories at the University of Arizona.

Dates have been obtained for another ruin in Mesa Verde National Park, Spruce Tree House, which are not included in this report. This ruin contains probably more beams than any other Mesa Verde ruin. Therefore, the writer took a series of specimens from all the beams that it was possible to reach, progressing systematically from one end to the other. It is hoped that the results of this study can be presented in another paper at a later date.

The dates presented here substantiate and emphasize a point previously made by Haury (3) that building activity in the Mesa Verde district came to an end just prior to the beginning of the great drought period of 1276-1299. The latest date given here is 1273, and one of the Spruce Tree House specimens gives a date of 1274. But the number of dates clustered in the middle of the 13th century and proceeding to a point just a couple of years short of the beginning of the drought is evidence of the fact that there had been no appreciable decline in activity on the Mesa Verde until the drought struck.

The sap-heart contacts on all of the pinyon specimens included in this report are very indistinct. The dates given in the accompanying table

for these contacts represent the best possible determination but should not be taken as absolutely certain.

In the Mesa Verde material the following rings are consistently small and can always be relied upon in dating:

1150	1166*	1182	1216	1240	1251**
51	68	86*	17*	44	52*
56	69	91	18	45	54**
58	75*	92	27**	46	58
61*	77	99	36	47	63
	*usually microscopic		**locally absent		

The writer takes this opportunity to thank Dr. A. E. Douglass for checking over the specimens included in this report and certifying the dates obtained.

- 1—Douglass, A. E., 1929. The Secret of the Southwest Solved by Talkative Tree Rings. National Geographic Magazine, Vol. LVI, No. 6, pp. 745-750. Washington, D. C., 1929.
- 2—(a) Franke, Paul R., 1933. New Dates for Mesa Verde Ruins. Mesa Verde Notes, Vol. IV, No. 1, pp. 19-20. Mesa Verde National Park, Colorado, July 1933.
(b) Annual Information Bulletin, Mesa Verde National Park, p. 24. United States Government Printing Office, Washington, D. C., 1934.
(c) Tree Ring Exhibit, Park Museum, Mesa Verde National Park, Colorado.
- 3—Haury, E. W., 1934. Climate and Human History. Tree Ring Bulletin, Vol. 1, No. 2, pp. 13-15. Flagstaff, 1934.

SPECIMENS FROM THE PUEBLO AREA COLLECTED BY THE FIRST BEAM EXPEDITION 1923

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In the seasons of 1923, 1928, and 1929, the National Geographic Society supported "Beam Expeditions" in the Pueblo area for the collection of datable wood material. Something over 430 specimens were secured. Tabulated lists of some thirty-five specimens each, giving information regarding the dated pieces, are being prepared for publication. The following table is the first of these and includes the dated specimens in the first one hundred, all collected by the First Beam Expedition in the season of 1923. The "BE" in the specimen number refers to "Beam Expedition." Mr. J. A. Jeancon of the State Museum, Denver, Colorado, carried on the work of collecting in association with Mr. O. G. Ricketson, Jr., of the Carnegie Institution. Mr. Jeancon's interesting report of his work, dated September 10, 1923, giving the history of each individual specimen collected, is on file and available for inspection at Dr. Douglass' Tree Ring Laboratory at the University of Arizona.

Of the 100 specimens about 10 per cent are juniper, and about 20 per cent are pinyon, while the remainder are Douglas fir or yellow pine, among which are most of the dated pieces. The pieces are in the form of full sections, part sections, v-cuts, cores, and a few fragments. The greater part of these are solid wood, but a few are badly weathered, and many have the outside rings missing. Appropriate columns in the table give specific information on these points.

These specimens were dated by Dr. Douglass several years ago, and during the present work the writer has checked the dating on a number that were questionable, and has noted the dates of beginning of sapwood and other facts required in the table. Dr. Douglass has made a final recheck on all.