

CLIMATE AND HUMAN HISTORY

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The cause and effect of the movements of people is always a fertile field for speculation. Where chronological factors are lacking, explanations may be very difficult to set forth and, whether right or wrong, their worth depends solely upon the limits imposed by the facts. Our knowledge of population shifts in the Southwest has come largely through a penetrating study of material culture, particularly ceramics, but we see in the main only the effects of such moves. The cause—or causes—on the other hand, are more obscure and hence more difficult to explain; yet the determination of the cause may be more important to one's study than the outcome.

The student of the Southwest has come into possession of means, through tree ring researches, that contribute materially to any such an explanation. These are, first, a reliable chronological element that assists in bringing the observed phenomena into proper alignment and, secondly, a weather record of the past 1500 years which, if properly read, may shed light on human activity.

Some of the most outstanding shifts of Southwestern people took place a few centuries before 1540 A. D.—towards the close of the third and during the early part of the fourth stage of Puebloan development. These movements may be roughly dated as having occurred between A. D. 1250 and 1350.

In northeastern Arizona, particularly in the Kayenta district, the bark dates of beams used in the construction of houses ending a long occupation carry readings that fall well into the last decades of the 1200's, the most recent being 1284 from Kietsiel (1). Numerous dates have been obtained (2) for the earlier part of this century and for the preceding centuries, indicating a more or less continuous progress in building. Then, with the lack of dates after 1284, a rather abrupt cessation of building is implied and, with it, a desertion of the immediate area. Going east, we find similar conditions prevailing on the Mesa Verde where, after about 1275, houses were no longer built in the protecting cliff recesses, and it is to be rightly inferred again that there was a general exodus from the Mesa Verde even if only by the remnants of a culture which may have reached its height some time before.

On coming south from the two regions just mentioned, large ruins appear which carry dates well into the 1300's and 1400's. To cite but a few as examples, there are Kawaiku, Kokopnyama, Chaves Pass, Showlow, and Pinedale ruins. It is not to be denied that many, if not all, of these larger villages had beginnings which antedated the quick discontinuance of building activity in the north, but thereafter there was a tendency to centralize in larger and more closely knit communities in those regions not affected by withdrawal. Passing still further south into east-central Arizona below the Mogollon Rim, we find an extensive territory of rugged land, well watered, and offering much in the way of natural protection to cliff dwellers, but little in the way of arable land. In this region large surface pueblos and cliff houses occur in abundance, and they are all late. The last assignable dates in each of the thirteen ruins in the Sierra Ancha region range between 1308 and 1348, and the earliest dated log from this series of sites is 1248. Of an aggregate of 73 bark dates, only ten come before 1300, the remainder falling between 1300 and 1348 (3). This is to say that, while building activity began here before 1300, the real expansion did not come until after the turn of the century.

At approximately this time, an increment of the Pueblo people—the Saladoans—who were allied to those in the Sierra Ancha started a southward and westward movement which took them to the southern limits of Arizona and brought them into intimate contact with the Hohokam whose focus lay in the Gila Basin. Tree ring dates from ruins representing this period of mingling have not been obtained, yet, on ceramic grounds, it is clear that this southwesterly expansion was bound up with the trends already outlined for the north.

Over a territory some 300 miles in length this major disturbance took place, the thrust being to the south. As a cause for setting this in motion a number of possibilities may be adduced, such as the appearance of hostile neighbors to the north, search for better lands, local unrest begun by one or several forces. There is one potential cause intimately connected with tree ring studies which merits attention. This is a period beginning in 1276 and lasting for the remainder of the century when there was less rainfall than during the preceding and succeeding years. The effects of this dry cycle are to be traced in logs from southwestern Colorado in a southerly direction through central Arizona. If the greatest diminution in the ring size over this period indicates the most acute drought conditions, then this prevailed in the northern part of the area, precisely where we saw that building activity came to a close first. And this, it is clear, was within a few years after the dry cycle began. Beginning about this time and lasting into the early part of the 1300's, people living in the drainage of the Little Colorado drifted into the well-watered territory below the Mogollon Rim which, previous to this time, had but a sparse population; other people, in turn, pushed still further to the south and west into desert lands. Why they should elect to make this move in the face of a dry period may be difficult to explain, yet two possibilities suggest themselves; first, that they were being crowded by the thrust of their northern neighbors, and, secondly, that they were attracted by the resident Hohokam, who, owing to their mastery of the land by irrigation, were able to combat the effects of years lean in moisture and to maintain a food supply.

The centralization of people in large communities after 1300, as evidenced by the Jeddito Valley ruins, Chaves Pass, Kinishba, and others, and the effort to place homes in inaccessible places, as in the Sierra Ancha, introduced another factor that may be linked with this chain of happenings. Could it be shown that the drought extended far beyond the territory now recognized, i.e., northward, to cover some of the area occupied by nomads, it would not be difficult to imagine the unbalancing effect that it would have had upon a people dependent upon the chase. Their wider search for food would ultimately lead them to the well-built houses of the Pueblos. Added to the existing crisis, this made it increasingly difficult for the Pueblos to live where they were, and desertion seems to have been the course they followed.

It is, of course, not possible to declare, at this time, that the drought was the main cause for what has been briefly outlined. So closely, however, are the phenomena related chronologically that an entire independence is difficult to imagine, and it does not seem that crucial periods in both weather and Pueblo history should occur simultaneously through coincidence. A larger number of dated ruins and a checking of the evidence for movements or other significant events will doubtless help to determine how

far reaching the effects of the drought were on the Pueblo people.

- (1) Douglass, A. E., 1929. The Secret of the Southwest Solved by Talkative Tree Rings. National Geographic Magazine, Vol. LVI, No. 6, pp. 737-770. Washington, 1929.
- (2) McGregor, J. C., 1934. Dates from Tsegi. Tree Ring Bulletin, Vol. 1, No. 1, pp. 6-8. Flagstaff, 1934.
- (3) Haury, E. W., 1934. The Canyon Creek Ruin and the Cliff Dwellings of the Sierra Ancha. Medallion Papers No. XIV, p. 17. Globe, 1934.

REPORT OF DATES ON THE ALLANTOWN, ARIZONA, RUINS

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A number of structures were excavated near Allantown, Arizona, during the summers of 1931 and 1932 by Dr. Frank H. H. Roberts, Jr., of the Bureau of American Ethnology, Smithsonian Institution. Charcoal specimens only were secured from these structures, 195 in 1931 and 322 in 1932. These are given a group symbol FR, (Frank Roberts), followed by the number of the piece, e.g., FR 320. The majority of specimens were pinon with a few specimens of juniper and Douglas fir.

House 4/32, in Dr. Robert's series, was one in a group of four houses. This was a round pit-house, which had such features of a kiva, as ventilator, deflector, sipapu and banquette, but contained large cooking pots, metates, and other vessels belonging to living quarters.

It is believed to belong to that phase of culture known as early Pueblo I. This culture identity is based on the presence of a ware known as fugitive-red ware, as the red pigment which is placed on the outside of vessels, is easily rubbed off and have never been fired to make it a permanent feature of the vessel; also on the presence of a black-on-white ware showing Chaco influence, and globular pitchers having their handles flush with their lips, and a few pitchers with banded necks; and lastly on the absence of any black-on-red or polychrome ware. A gray granulated pottery was also found there, very irregular in shape and possessing very crude attempts at decoration; this is a type best attributed to the Basket-Maker III and is very similar to that found by Dr. Roberts, (1928), in southwestern Colorado.

The dates secured from charred roof beams, in this structure, were worked out by the writer using the Douglass method of tree-ring dating, (1), and fully checked by Dr. A. E. Douglass. Special attention is called to FR 94 whose outermost ring can be traced over half a circuit, without disappearing. This is strong evidence that we have here the true outside surface of this piece, and the date of its actual cutting.

A second and later chronology was found in Kiva 32/G which was located about a mile up the wash from House 4/32. It is associated with a unit-type house of the Pueblo II culture period. This unit-type house consists of six rooms, all joined, and a large paved court with the kiva. The kiva is located north of the court and east of the house. Kiva 32/G was a true kiva as shown by the absence of metates and cooking pots and the presence of paraphernalia used in sacred ceremonies. The roof of this structure was very similar to that shown in an illustration by Dr. Frank Roberts. (2)

In this ruin there was found a black-on-red ware and the first beginning of a polychrome ware. Pottery shapes had assumed the characteristic shapes attributed to Pueblo II culture and technique of decoration was approaching a masterly stroke.

The dates secured from roof timbers of this structure were also