ON THE RECENT ORIGIN OF THE PACIFIC SOUTHWEST DESERTS

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The history and migrations of the Pueblo Indian peoples are discussed in relationship to drying trends after the Noahic Flood. The decline of Lake Tulare, the Great Salt Lake, other surface reservoirs, artesian wells, and even glaciers are also correlated with flood geology. It is proposed that worldwide climate changes occurring after the Flood led to the migratory phases obvious in Pueblo Indian history. Finally, it is theorized that desert plants may have been catastrophically selected for survival in dry conditions when areas such as Lake Cahuilla became deserts.

Introduction

My interest in the question of how recently the Pacific Southwestern part of the United States became a desert was first awakened by a visit to the Bandelier National Monument near Los Alamos, New Mexico. On October 28, 1970, my daughter took me down to the Park Headquarters in Frijoles canyon and we looked at the many foundations of former Indian dwellings and ceremonial caves. Some of these have been reconstructed.

One of the most remarkable is Tyuonyi, a semicircular apartment-house group of former Indian homes. Only the foundations now remain and indicate that each apartment was only 5 feet by 5 feet (Figure 1). The Pueblo Indians must have been very short people indeed! Archeologists have concluded that they lived in these apartments until about 1550 A.D.

Large caves were dug into the sides of the steep cliffs. One very large one, called the Ceremonial cave, contains ruins of a large religious ceremonial room or Kiva. Most of the dwellings were built right up against the steep cliffs, as shown in Figure 2. All of this building indicates a long period of canyon occupancy. The questions as to when they arrived, and why they left their cliff homes, began to interest me and the following is a rather well authenticated history, the dates estimated by pottery association and tree ring counting.

Pueblo Indians from 1100 to 1580

The golden age of the Pueblo Indians was from 1100-1300 when they lived on the Colorado plateau. Cotton woven into textiles and corn were their main crops. In the 1200's they began to leave and tree ring studies indicate a 200 year period of drought. The lands these people left had been their home for about 1000 years.

Some re-settled southeast in the North Rio Grande Valley, where the Bandelier National Monument is located. Others moved southwest into north-central Arizona. The Pajarito plateau in which Frijoles canyon is located was first settled in the late 1100's. At first the Indians lived on the plateau, and remains of villages having up to 800 rooms, such as Tsirege, Navawi, and Otowi, have been found. Most accessible, at the intersection of State Highway 4 and the South mesa-access road, is Tsankawi with about 350 rooms.

An ancient reservoir 75 by 130 feet has been found about 120 feet west of the pueblo called Puye. This ruin is located about ten miles west of Espanola and 40 miles northwest of Santa Fe. Edgar J. Hewett writes:

> Meagre amounts (of water) could be obtained by opening a spring in sand, but here, as on all parts of this plateau, a much more plentiful water supply than that now existing would be essential to the maintenance of such large settlements as once existed at Puye.[1]

As the plateau became increasingly dry, the Indians moved down into the various canyons, such as Frijoles, and built their cliff houses. The attraction was the stream, much larger than now, and the small flat alluvial areas beside it on which they grew their crops of corn, beans and squash. The peak population was in the 13th, 14h, and 15th centuries and they were called the Jemez people.[2]

Then an even more serious drought, beginning in the 1500's, started driving them out and all but a few stragglers were gone by about 1580. Some of their descendants still live in Cochiti and San Ildefonso pueblos.

Even in recent years there is evidence of increasing drought. Mrs. Evelyn Frey, operator of the Frijoles Canyon Lodge, moved into the canyon with her husband, George, in 1925. She cites two great changes in the last 30 years:

> The winters used to be much colder. We were always snowbound, but it was delightful. And the Rio de los Frijoles is only about half as wide as it used to be. There are hardly any fish left. The river used to swarm with fish that would bite at anything. You didn't feel ethical fishing in those days.[3]

We may conclude that this vast area was blessed with a surprisingly high rainfall until comparatively recent times (1500-1550) and that the drought is getting worse. The former high rainfall seems correlated with much colder winters.

Portions of California Considered

Turning now to California, I was amazed to read in a Pacific Gas & Electric Progress bulletin

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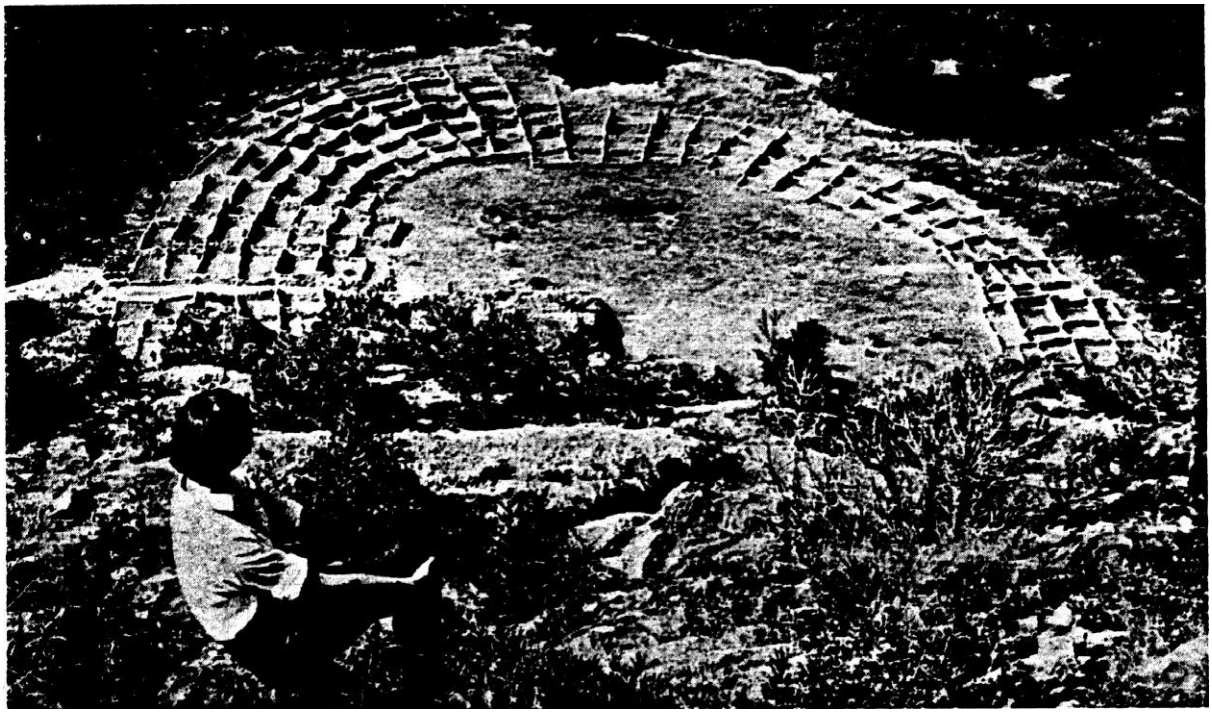

Figure 1. Tyuonyi apartment house type of Pueblo. Photograph reprinted by permission from the publication, "This Enchanted Land," University of California, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, New Mexico 87544.

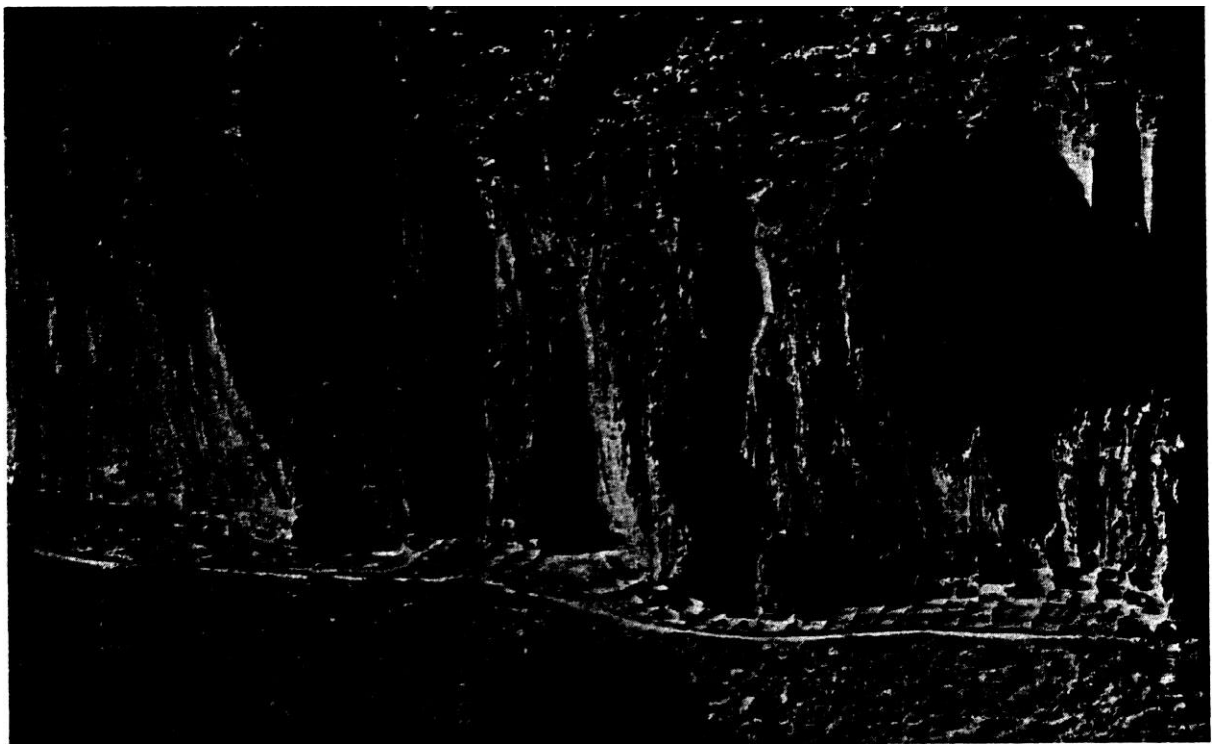

Figure 2. Typical ruins of former cliff dwellings of the Pueblo Indians. Photograph reprinted by permission from the publication, "This Enchanted Land," University of California, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, New Mexico 87544.

of the recent existence of Lake Tulare.[4] Primary sources of information were history books published in the 1850's to the 1870's, such as *Resources of California* by John S. Hittel.[5] In 1875 the sidewheel steamer, *Mose Androsa,* was used to carry hogs and cattle across this lake, and it was joined in 1878 by the *Water Witch,* a shallow draft schooner used to catch terrapin.

In 1870, Lake Tulare was the largest lake west of the Rockies! Fed by the Kern and King's rivers, it was described in 1862 as extending for 60 miles north and south, being 36 miles across at its widest, and covering 800 square miles. Nearby were three smaller sister lakes—Buena Vista, Kern, and Goose Lakes. These great shallow, inland bodies of water sheltered an abundance of aquatic life, trout that weighed up to 40 pounds, perch, salmon, and sturgeon in quantities that supported a commercial fishing industry. Ducks and geese were abundant and great herds of deer and elk grazed along the seashores.

Thousands of Yakuts Indians lived along the shores, and on the islands. They fished from rafts and canoes made of tule reeds. Canadian and American fur traders, who trapped for beaver in the tules, kept the geography of the area a trade secret. Mosquitoes and tule fogs were so bad most of the year that the area was quite uninhabitable.

Seasonal variation in rainfall caused these lakes to wax and wane. Finally, a series of dry years shrank them considerably. In 1880 the state legislature passed an act permitting settlers to buy reclaimable land for $2.50 per acre, $2.00 of which was refunded when the settler spent it on levees or other reclamation.

This touched off a land stampede. Horses were fitted with planks so they could walk in the mud, and vast areas of swampland were drained and cultivated. The lake was doomed, and when the King's and Kern rivers were dammed, reduced to small reservoirs maintained by high levees. Yet last year the run-off from heavy snows caused this phantom lake to spread over 90,000 acres!

Great Salt Lake once had an area of 50,000 square miles, and was known as Lake Bonneville. The shrinking of this lake was more recent than usually supposed and correlated with the drought causing the decline of the Pueblo Indian civilization in the 1200's. More precise information is needed as to the exact times of greatest shrinkages. The decrease in the size of the Great Salt Lake still continues. Thus the big amusement palace built on the shore of the lake in 1925 is now over one mile from shore.

Though a detailed history of the Colorado Desert, in which the Imperial Valley, Salton Sea, and Coachella Valley are located, is beyond the scope of this paper it is of great interest to note that historian George Wharton James wrote:

> Then came a flood which broke over the channel (of the Colorado River) and formed the course of what we call the Alamo River. Year after year it flowed, and maintained the fresh-water character of what had, in comparatively recent times, been an arm of the gulf, then a salt lake, then a dry basin. It was at this time that the fresh water shells were deposited, of which millions are now found. Possibly it was while the bed of the basin was dry that the aborigines first came and dwelt in it. If so this would account for their tradition that long after they occupied the region the floods came and drove them out.[6]

Considering another line of evidence, artesian wells once existed both in Santa Clara county and near the town of Artesia in Southern California. Hittel stated that there were 318 of them within a distance of six miles wide by fifteen miles long![7] The wells supplied about two million gallons in twenty-four hours. Artesia still had some functioning wells in 1918 when my family first moved into the area.

These wells ceased to be of practical value long before the population pressure became a factor. Thus again, Hittel wrote in 1863 "that many have gone dry because the soil is generally dried out." He mentioned the disappearances of Honey Lake on the plateau of the Sierra Nevada and Lake Elizabeth in the great Basin as further proof of the disappearance of surface water.[8]

A comparison of the rainfall in Northern California in the past 88 years is pertinent. In the 44 years from 1879-80 through 1922-23, the annual totals varied from 9.77 inches in 1917-18 to 43.72 inches in 1889-90 with 29 seasons having 20-37.20 inches. In contrast from 1923-24 until 1966-67 the variation was from 8.71 inches in 1923-24 to 36.59 inches in 1940-41, with only 18 seasons having a rainfall of 20 to 31.93 inches. Certainly the trend is still toward lower annual rainfall.

Relation to Biblical Statements and Flood Geology Concepts

As regards the Bible, the story of the Israelites' journey from Egypt has some statements unintelligible in terms of *present day* conditions. Thus, in Exodus 17:5-6, in response to the people chiding Moses for water, he was commanded to smite the rock at Horeb. "And there shall come water out of it, that the people might drink."

Under present conditions this would involve a double miracle, knowing where to strike the rock *and* creation of water in the rock strata. In terms of relatively recent aridity, that area still enjoyed much more rainfall than now, though *relatively* speaking it was already a desert area. Hence much more underground water and water pressure existed.

Later in the desert of Zin at Kadish in 1471 B.C., Moses was commanded to smite the rock and "with his rod he smote the rock twice: and the water came abundantly, and the congregation drank and their beasts also" (Numbers 20:10).

When the spies reported on Canaan they said, "We came unto the land whither thou sentest us, and surely it floweth with milk and honey and this (branch of grapes) is the fruit of it" Numbers 13:27). No one would describe the unirrigated part of Palestine in these terms now!

Even during the time of our Lord (4 B.C. to 33 A.D.), He and his disciples were castigated for going through the grain fields and eating the grain (called corn) on the Sabbath day (Matthew 12:1-2). Rainfall must have been heavier than now to cause such abundant fields of grain to grow without irrigation. It seems the decrease in rainfall has occurred since A.D. 100, but much more research is needed here to be exact.

Relative to Flood geology concepts, the decrease in rainfall seems to be correlated with two phenomena: (1) the drying up of such great lakes as Bonneville, and (2) the decrease in size of the glaciers and snowfields. Water in a sense begets water, and as the great inland lakes resulting from the Flood gradually dried up, the rain clouds generated by the moisture evaporating from inland lakes decreased, and finally were no longer formed.

Then the areas south of them no longer enjoyed rainfall from the storms generated in the vast lake and snowfield areas north of them. They became dependent on moisture from the west. This was **Phase I,** when the Pueblo Indians moved south from the Colorado Plateau.

Decrease in Glaciers Considered

Now the decrease in size of the glaciers is still continuing as a world wide phenomenon. When on our vacation in 1962, I hiked up to the 9000 foot level of Mt. Rainier, Washington, and had a good look at the Nisqually glacier. It was much smaller than even 40 years ago, according to records. Similarly the Paradise glacier had receded a lot, as could easily be seen from the many acres of terminal and lateral moraines. And in 1963, during a trip to Alaska, I was amazed to see how far back the Mendenhal glacier had retreated since measurements made fifty years ago.

Correlated with this decrease in the extent of the glaciers is the extent of the snowfields in the High Sierras. As may be seen from the historical records, the snowfields are not as extensive now as even in 1860. The effect on the size of the rivers of California is pronounced indeed. The King's and Kern rivers are not nearly as wide now, each spring following the snow melt, as they were about 100 years ago. Thus Hittel mentioned in his *Resources of California* (1863) that the King's river was 80 yards wide where it left the mountains.[9]

With extensive snowfields on the High Sierras there would be much evaporation from them, in the spring and early summer, as they melted and decreased somewhat in size until replacement of snow the following winter. The prevailingly westerly winds would carry this over the areas east of them, as clouds giving rain to a limited extent in these areas.

But as the snowfields decreased in size practically no rainfall from the storms originating in the Pacific would reach the inland areas. Moisture would all be precipitated as either rain or snow as the clouds moved higher and over the Sierras, leaving little if any for the valleys and mountain ranges beyond. This was Phase II when the Pueblo Indians had to move down into the canyons and build their cliff houses, such as are found in Frijoles canyon.

The above trend, from an abundance of water at the time of Lake Bonneville until there was so little rain that this whole area became a desert, has been known for a long time. What is remarkable is the *recency* of these events. Were it not for the Biblical record, I would be inclined by a study of the trends to believe that the Flood took place about 2500 years ago instead of over 4000!

Possible Research Project Listed

This study is but one of a series that should be made by Flood geologists. Just how recently did such great areas as Egypt, the Sahara, and Arabia become deserts? Orthodox geologists interpret these trends in terms of tens of thousands of years, mostly on the basis of Carbon-14 dating. Studies by some of our members have shown that these dates are not reliable.[10]

The recency of our Pacific Southwest deserts leads one to wonder if the deserts in other parts of the world may also be more recent than usually supposed. In terms of being a witness to the continual drying up of the world from the Flood, it leads one to wonder if the whole world may eventually become a vast desert?

The remarkable adaptations of plants to the Colorado desert might well be the subject of careful study. These plants include the mesquite, creosote bush, ocatilla, desert holly, and the very unusual cactus species shown by George Wharton James in full page illustrations, facing pages 222 and 224, in his book *Wonders of the Colorado Desert,* already referred to above. Whatever the origin of such plants, they most certainly could not have "evolved" their unusual adaptations in the short time since this area became a desert.

In recent prehistoric times, an area of over three thousand square miles was included in the

Gulf of California. The Colorado River then emptied near Pilot Knob, and in a few centuries formed a dam by the continual extension of its alluvial fan. The upper part of the Gulf became a great salt lake, following which it went through the stages of a dry basin, and then when the Colorado had another flood, a great fresh water lake.

This lake was 120 miles long by 30 miles wide. It was called Lake Cahuilla by W. P. Blake in his government survey report[11] of 1853. For many years the Colorado fed this lake by way of the Alamo River, but finally this ceased and the lovely lake became the desert it now is. At various times since then water has collected in this basin and later disappeared through evaporation.

At the very most, less than a thousand years have gone by since the existence of Lake Cahuilla. Accordingly, plants of the area, which are so well adapted now, must have been carried to the basin by seeds as it dried out. The whole problem of the origin of these desert plants is a fascinating one. Presumably they once grew under conditions of plentiful moisture, possibly in salt, marshes.

Thus the desert holly, *Atriplex hymenelytra*, is able to grow very well when given an abundance of water! A plant I transplanted into a pot in the desert and brought back to my greenhouse did very well when watered just as often as my regular flowering plants. It is still alive by one wall of my greenhouse where it gets an abundance of water.

Now many *Atriplex* species are salt marsh plants or grow in alkaline flats. They do seem to thrive on a high salt content in the soil or water. Perhaps then desert plants have been catastrophically selected by the relatively rapid conversion to desert conditions. Only those *already* having the potential for growing in the desert would survive; that is, those capable of tolerating a high salt level and having a deep root system. Transplantation studies of other desert plants to see if they actually grow well at high moisture levels would be most interesting in this connection.

References

[1]Hewett, Edgar J. The Pajarito Plateau and its ancient people. University of New Mexico Press, p, 67.
[2]This enchanted land—the Jemez mountain wonderland. 1966. Office of Public Relations, Los Alamos Scientific Laboratory, University of California, Los Alamos, New Mexico. See pp. 20, 21 and 29.
[3]*Ibid*, p, 20.
[4]Pacific Gas and Electric Progress. 1970, October. Volume XLVII, No. 10, p. 8. San Francisco, Calif.
[5]Hittel, John S. 1863. Resources of California. A. Roman Company, San Francisco, California, p. 13.
[6]James, George Wharton. 1906. The wonders of the Colorado desert. Little, Brown and Co., Boston, pp. 30-31.
[7]Hittel, *Op. cit.*, p. 67.
[8]*Ibid*, p. 69.
[9]*Ibid*, p. 12. Also interesting data on the navigation of the Sacramento, Feather and Salinas rivers are given.
[10]For example, Clementson, Sydney P. 1970. A critical examination of radioactivity dating of rocks. Creation *Research Society Quarterly*, 7(3):137-141.
[11]Blake, William P. 1853. Geological report for proposed railroad route. Referred to in the Columbia encyclopedia and in George Wharton James' book, *Op. cit.*

LETTER TO THE EDITOR

Your review of *The Flood Reconsidered** (March '71, p. 230) does not, I think, give a very clear idea of the book. May I add some comments?

Dr. Filby seems to have written this book as a "reply" to *The* Genesis *Flood:* it is an attempt at a compromise whereby Christians may believe in some sort of Noahic Flood without committing themselves to the revolutionary doctrines of Whitcomb and Morris. But it can scarcely be said that he has succeeded. On page 9 he writes:

> the authors (W. and M.) . . . have quite spoilt their book by trying,. as George McCready Price and others in the U.S.A. have done, to attribute almost all the geological ages to the Flood of Noah. The argument is thus reduced to absurdity.

Filby appears to accept the standard geological column as sacrosanct because it is drawn up by professional geologists, but when he comes to archaeology and Near East geology, he is prepared to back his own (amateur) opinion against a host of professionals.

The idea of a very extensive Mesopotamian flood was considered a possibility by archaeologists 40 years ago, but it has been steadily losing ground. Now the experts agree in dismissing the idea altogether, as is shown by the 1969 Collins New Bible Atlas (Edited by H. H. Rowley). Near East culture and civilizations are traced back continuously to 7000 B.C. without a break, and Noah's Flood is mentioned *only as a literary tradition or myth.*

Thus Dr. Filby's book is unlikely to convince

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*Editor's Note: Mention of this book on page 230 of the March issue of the *Creation Research Society Quarterly* was simply an announcement under the heading, "New Publications," and was not an actual book review. Readers will note that new books are frequently given this kind of cursory mention. It is gratifying to learn that the "New Publications" feature is read as evidenced by Mr. Watson's letter. His letter can now serve as a more extensive review of Filby's book. It is hoped that many of the volumes listed under "New Publications" will elicit expansive book reviews from qualified readers.