SOME IMPLICATIONS OF THE CARBON-14 DATES FROM A CAVE IN COAHUILA, MEXICO[1]

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When I first began to work in Coahuila, back in 1937, I told myself that, if ever any fluted points turned up in my excavations, I would quickly cover them up and backf ill the trench. I had no desire to get into the "my-site-is-older-than-yours" argument, principally, I suppose, because I found myself interested in culture, not age.

Fortunately, our work in Coahuila did not put this resolve to the test. We found sites that were fabulously rich; we obtained masses of objects and information for cultural studies; and nothing appeared that would indicate we were dealing with Ancient Man. We realized, of course, that our material was reasonably old, specifically that there were similarities to allegedly ancient complexes from the Oregon caves, from Lovelock and Gypsum caves, from the lithic assemblages found on the California deserts, from the Cochise of Arizona. But there seemed nothing that could cause any real excitement among our elephant-hunting colleagues.

In fact, we pursued our cultural studies blissfully unencumbered by Time of any sort. There were no ceramics to compare; there were no tree-rings to precision our sequences; there were no raised beaches, no glacial moraines, and, of course, no thoughts of cosmically contaminated carbon. We could study nature and culture with no thought for Time, except that represented by our one to two or more meters of stratigraphy.

However, there were two small but persistent clouds that marred this serene horizon. First, there were those pesky similarities to ancient desert complexes. Then, there was

1. Published by permission of the Secretary of the Smithsonian Institution. Read before the annual meeting of the American Anthropological Association at Santa Monica, California, on December 30th, 1956.

definite evidence, from the cave deposits themselves, that during the time of their deposition there had been a rather marked climatic change toward aridity. These disturbing possibilities were sustained by the geologists who, in the adjacent regions across the Rio Grande and in the American Southwest, had postulated two possibly pertinent periods of aridity, both of considerable antiquity; the earlier at about 6000 years before the present, and the later at about 4000 years ago (Albritton and Bryan, 1939; Hack, 1942). Could it be that our cultural materials and the indicated climatic change might be of such an age? Did we, after **all,** have Ancient Man? We thought about all this, but with the information and techniques available at that time, the problem was largely academic. We continued our cultural studies, happy in our wealth of strictly cultural data of whatever age.

Then came Carbon-14. Of course, the record had to be complete, and Time was part of that record—so we submitted a request that some of our material be run. Mention was made of the possibility of considerable age, noting specifically the climatic change and the possibly pertinent geological dates. However, it seems that the authorities did not believe in those possibilities. We were told to hold our specimens for a later time when attention would be focused on "more recent levels in the cultural picture." And so we went happily back to our cultural studies.

But the damage had been done. The camel of Time had his nose inside the tent. Carbon-14 offered possibilities which strictly comparative methods of dating had not presented. Furthermore, if our finds were indeed old, I supposed that **I** had better know about it because, among other things, the wealth of detail and the quantitative exuberance possessed by our collections would, if of an ancient age, add greatly to our knowledge of culture development in America. Another request was submitted, this time to the University of Michigan Memorial-Phoenix Project Radiocarbon Laboratory. Thanks to Drs. J. B. Griffin and H. R. Crane, our samples were accepted.

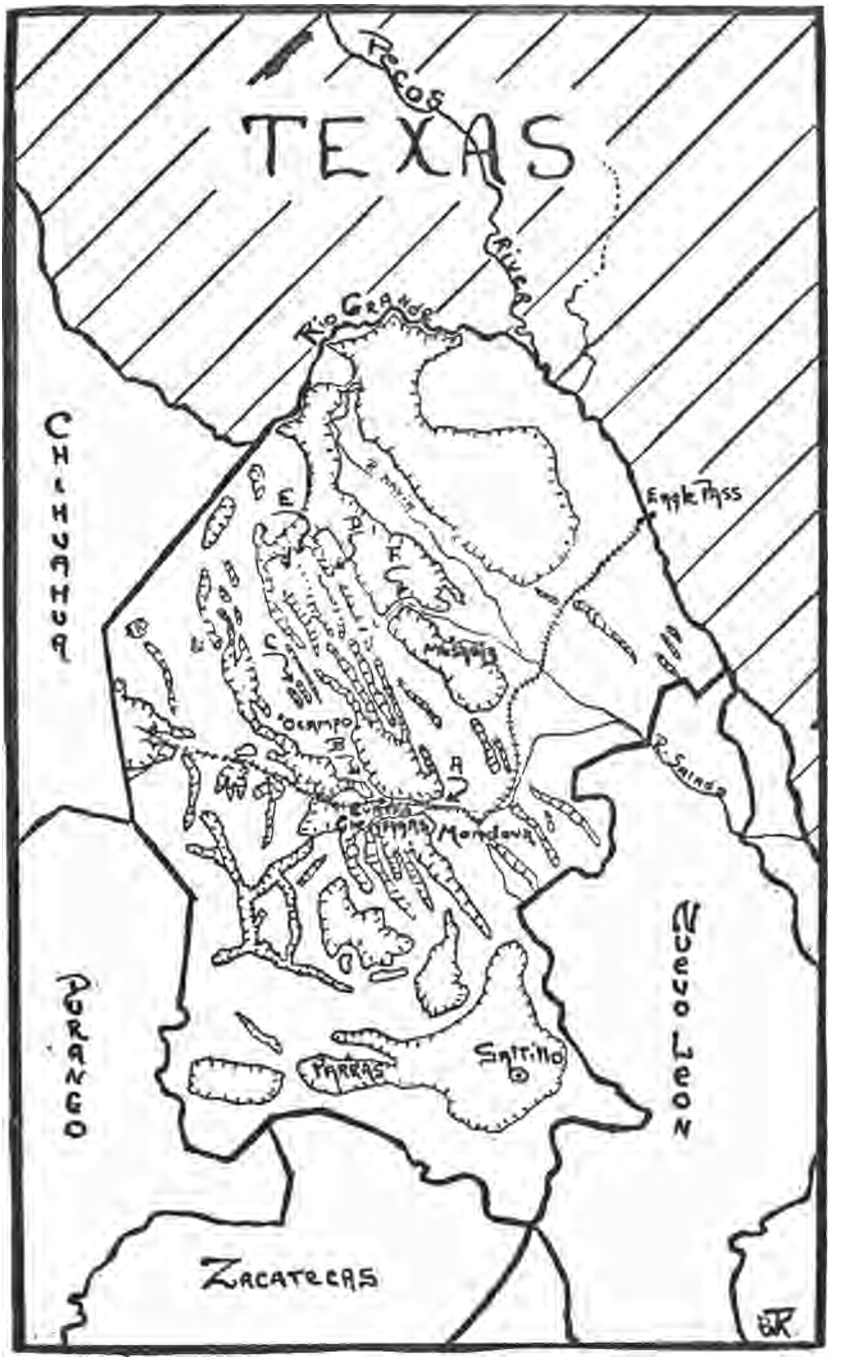


Fig. 18. State of Coahuila, with principal mountain ranges outlined with spurred lines. Frightful Cave lies in the Cuatro Cienegas basin in the central part of the state, where the railroad crosses it.

A little over a year ago, dates began to come back—and with them the camel of Time came completely into the tent! It seems that in Coahuila we not only have Ancient Man, but we have what appear at this writing to be the two oldest dated human artifacts in the Western Hemisphere.

There are 11 dates, all from site CM-68, Frightful Cave, which is situated in the Cuatro Ciénegas basin of central Coahuila, the Mexican state which lies just south of the Big Bend of Texas (Fig. 18). Four of these dates have been published (Crane, 1956) ; the others have been provided in correspondence. All dates are derived from human artifacts or biofacts, the latter being human feces (Table 1) .

It is seen that all dates are stratigraphically consistent except two obtained on wood remnants from the middle level, which are older than any date from the bottom level. There is no evidence to indicate what caused this inconsistency, but it may be suggested that in deposits such as those of Frightful Cave, secondary deposition would not be surprising. It should be remembered, however, that whether or not their stratigraphic position can be accounted for, the oldest dates were derived from artifacts and therefore date artifacts.

These dates, of course, have been and are still difficult to believe. I have gone to the Michigan radiocarbon laboratory to ask questions. But nothing has come up to throw doubt either on these samples or on the counting techniques. Contingent upon checking, which is being done at present in Denmark, it appears that the dates will just have to be accepted as they stand.

What, then, are the implications of the age and the nature of the cultural materials from Frightful Cave? Before discussing a few of these, it will be well to give a brief description of the Coahuila environment and of the cultural materials themselves.

The northern half of the State of Coahuila, where our work has been concentrated, is an arid land belonging physiographically to the Sierra Madre Oriental. The western

TABLE I

CARBON-14 DATES FROM FRIGHTFUL CAVE
COAHUILA, MEXICO

(In years before the present)

Level	Date	Material Dated
	1770 — 250	3-warp fiber sandal
	3200 ± 350	cut wood
Top	3230 ± 350	fiber rosettes*
	3620 ± 350	human feces
Middle	9300 ± 400	cut wood
(Coahuila	9540 ± 550	cut wood**
Complex)	6170 ± 300	human feces
	7300 ± 400	twill-pad fiber sandals
Bottom	8023 ± 350	human feces
(Ciénegas	8080 ± 450	fiber scuffer-sandals
Complex	8870 ± 350	cut wood

* This series of rosettes was a typological sample derived from all three levels of the site. However, it is known from its distribution and frequency in this and other Coahuila sites that the type is a relatively late one. In Frightful Cave, 2 per cent came from the bottom level, 34 per cent from the middle, and 63 per cent from the top level. In site CM-24, Fat Burro Cave, it was found in association with stone projectile points known to have been in vogue as late as around 1400 A. D.

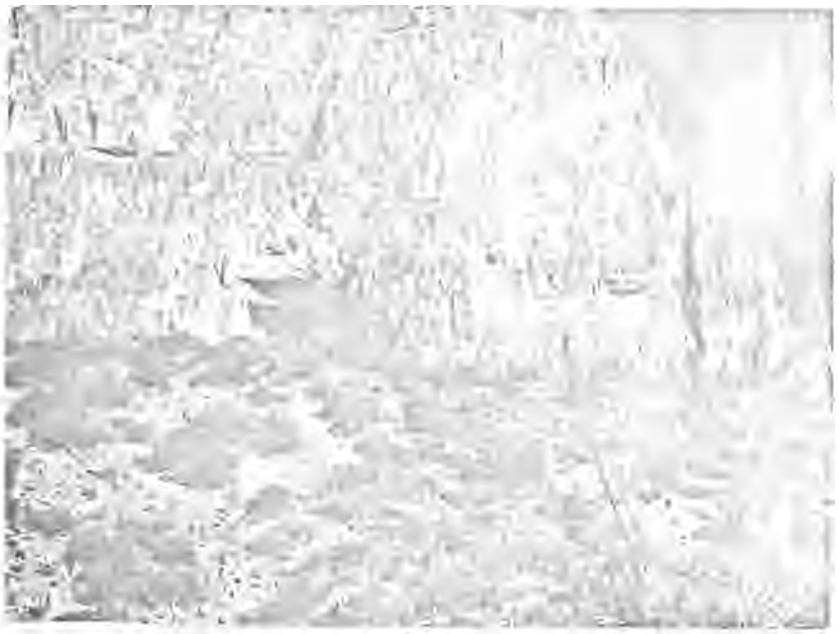
** Due to the accidental inclusion of one specimen from the bottom level in this sample, it was possible that this date was derived either from that one bottom-level specimen alone or from a combination of that specimen with others from the middle level. Therefore a check-run was made on a definitely middle-level specimen from the same sample. The result was the date 9300 ± 400 B. P., thus indicating that the original date was probably not influenced by the accidentally included specimen.

portion of the area, however, exhibits a typical Basin and Range topography with abrupt fault-block mountains and rather narrow alluvial basins, both trending generally northwest-southeast. Vegetationally and climatically, except for the higher elevations, it belongs to the Chihuahua Desert province.

Culturally, our data reveal what I have no hesitation in calling a variety of the generic culture of Arid America. Recently, Jennings and Norbeck (1955) have formally named

a part of this culture the Desert Culture. With confidence, then, I hereby extend Jennings' concept into Mexico. I am convinced that throughout Arid America, and probably extending into the Ozarks and possibly into the sheltered sites and shell mounds of eastern United States, as far back as our present data take us, there have been phrasings of this basic culture. Characteristic of it are such traits as the atlatl, large oval and stemmed (but not fluted) projectile points, the grooved club, the absence of grooved axes and celts, the metate and mano, net carrying frame and/or conical burden basket, fiber sandals, both twined and coiled basketry (the latter probably somewhat the later of the two types), plaited matting, fur cloth, twisted fiber cordage, considerable (if not primary at first) dependence upon vegetal foods but no agriculture, migratory habits and temporary (probably seasonal) occupation of sites, and small (probably patrilineal) socio-political groups. Within this basic and widespread culture, the culture of Coahuila is one of a number of already recognized variants, neither marginal nor aberrant, but probably representing as typical and full an expression as has been uncovered to date.

Detailed and thorough studies of cultural relationships have not as yet been made for our Coahuila materials, but it is certain that they are closely related to those identified as the Pecos River Focus in the Big Bend of Texas immediately to the north across the Rio Grande (Martin, 1933; Pearce and Jackson, 1933; Kelley, Campbell and Lehmer, 1940, p. 24 ff.). To be sure, there are differences, for example, of subsistence economy, of techniques of manufacture, of proportional representation of identical or similar traits. But these differences are not large, nor are they very numerous in comparison to the similarities. Certainly, the two cultural complexes are phrasings of a single basic culture, and closely related phrasings at that. What these conclusions mean in terms of chronology is difficult to say at this moment. It is my hunch that the Pecos River Focus cave-sites that have been excavated so far are no earlier than Frightful Cave and probably would date a little later



A

B

PLATE 28

Views of Frightful Cave, Coahuila, Mexico. A, looking north toward cave; note figure standing in right side of cave mouth. B, looking north from cave mouth to rear, showing completed excavation; the top of a 2-meter stadia rod appears in the second lateral trench at center.

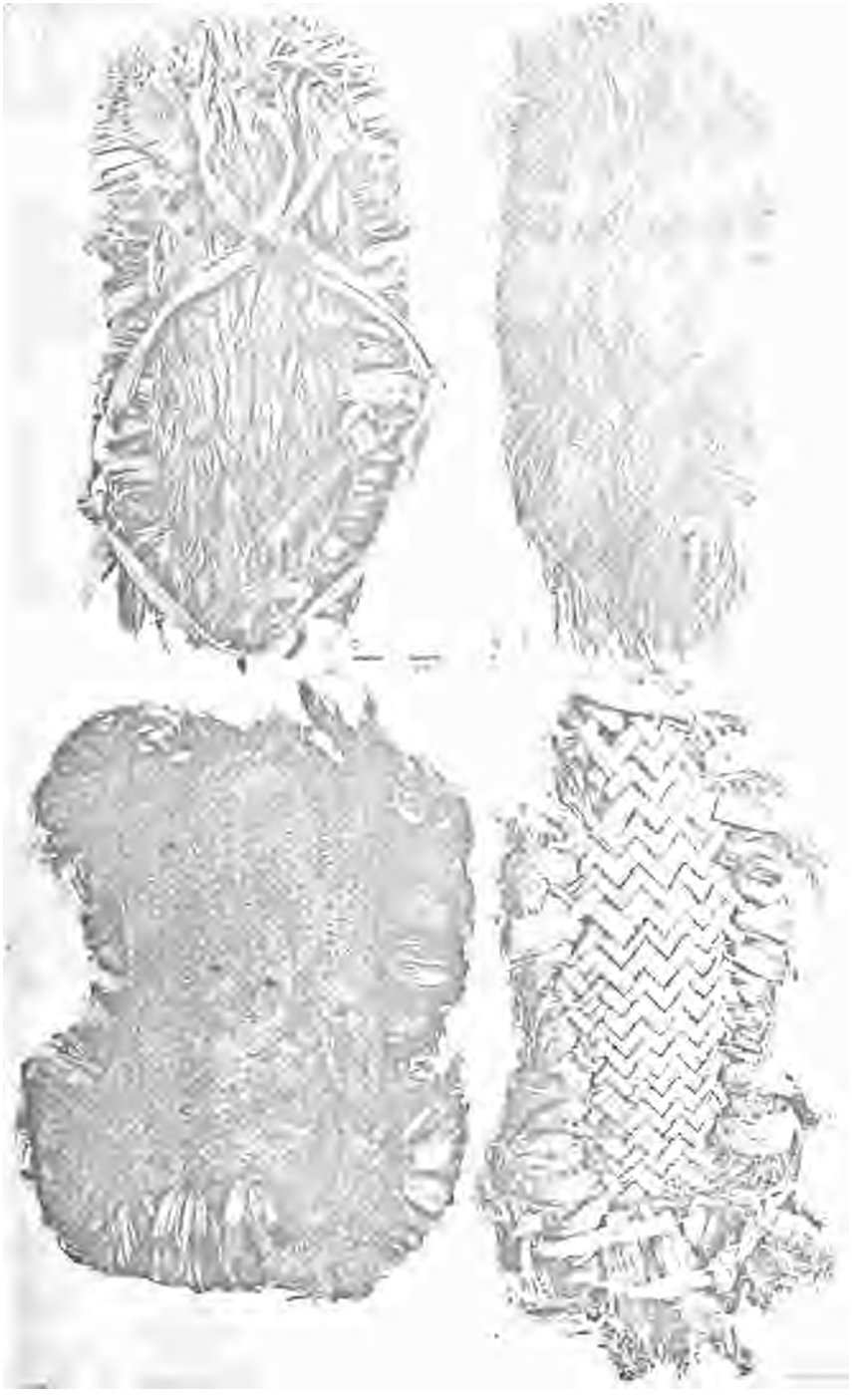


PLATE 29

Sandals from Frightful Cave, Coahuila. The two upper ones are from the "Coahuila Complex", the two lower ones from the older "Cienegas Complex".

than our earliest material, but this does not mean that some earlier Pecos River Focus sites may not yet be found. From a climatological point of view, it is very possible that the desiccation evident in the deposits of Frightful Cave is reflected in the erosion cycle which has been demonstrated to lie between the Neville and Calamity formations in the Big Bend (Albritton and Bryan, 1939, p. 1462 ff.; Kelley, Campbell, and Lehmer, 1940, p. 131 ff.). Or it might be better to say that this period of erosion marked the *beginning* of a long period of aridity which, in fact, has not ended today in that general area. In any event, I believe that our Coahuila dates and the similarity of the Coahuila material to that from the Pecos River Focus make it very probable that the latter cultural complex has an even greater antiquity than has been heretofore suspected (Kelley, 1947, p. 105) .

I should, perhaps, say something about the amount of cultural material with which we have to work—I refer here only to that from our dated site, Frightful Cave, of which only about 55 per cent was excavated. The collection is large, probably larger than any comparably old collection in the Western Hemisphere. There are approximately 1000 artifacts from the bottom level, of which about 950 are of fiber and wood. There are about 1600 artifacts from the middle level, and only about 50 of these are of imperishable material. There are over 2100 artifacts from the top level, of which more than 2000 are of so-called perishable material.

Of course, these figures do not include what I have called the cultural matrix and the cultural refuse (Taylor, 1948, p. 182 ff.). Our complete catalog has never been precisely totaled, but a conservative estimate would place it in the neighborhood of 9000 specimens. I should add that this estimate does not include over 20,000 typed and counted quids, the previous reporting of which has given my colleagues such a kick (Taylor, 1948, p. 172 ff.).

In other words, we have from Frightful Cave an unusually complete and numerous collection—especially so in view of

the determined age. Or perhaps it would be better to say that, *despite* their age, the remains from Frightful Cave present an opportunity to construct cultural contexts in considerably more detail than is possible in most aboriginal sites, even those of lesser age. From my own point of view, this fact makes the absolute age of the deposits a somewhat secondary factor in assessing their value.

But all is not sweetness and light. There are rather large problems, one of which concerns the natural environment, particularly the fauna, existing at the time of the cave's first occupation. In the bottom level, we are presumably dealing with a time somewhere between 8 and 10 thousand years ago. At that time, in areas not far distant to the north, there still lived a Pleistocene fauna including elephant, horse, camel, tapir, ground sloth and others. However, in Frightful Cave, out of the over 2000 identified mammal bones, not a single one was identified as from an extinct species. We do have animals represented which are no longer found in Coahuila, nor as far south, nor at as low an elevation as the Ciénegas Basin, but which nevertheless are still extant. I refer to our specimens of bison, grizzly bear, elk, and yellow-haired porcupine (Gilmore, 1947), and to the land-snail *Humboldtiana* (Drake, 1951). The remains of these species either disappear or diminish as the deposits rise in the cave, thus indicating, together with similar circumstances in certain floral species, a climatic change from cooler and more moist to warmer and drier.

But why are there no extinct forms? Elephants and other now-extinct fauna have been found in Coahuila—and very near Frightful Cave. Are we to assume that by about 9000 years ago the Pleistocene fauna had disappeared from northern and central Coahuila but was still living in southern Arizona, New Mexico, and Texas? This assumption seems to be cutting things pretty fine, but in the face of present evidence, it also seems to be **the** only explanation which **will fit** the facts.

The conclusion would be more worrisome if some archeologists, working in similar cultures and environments, had

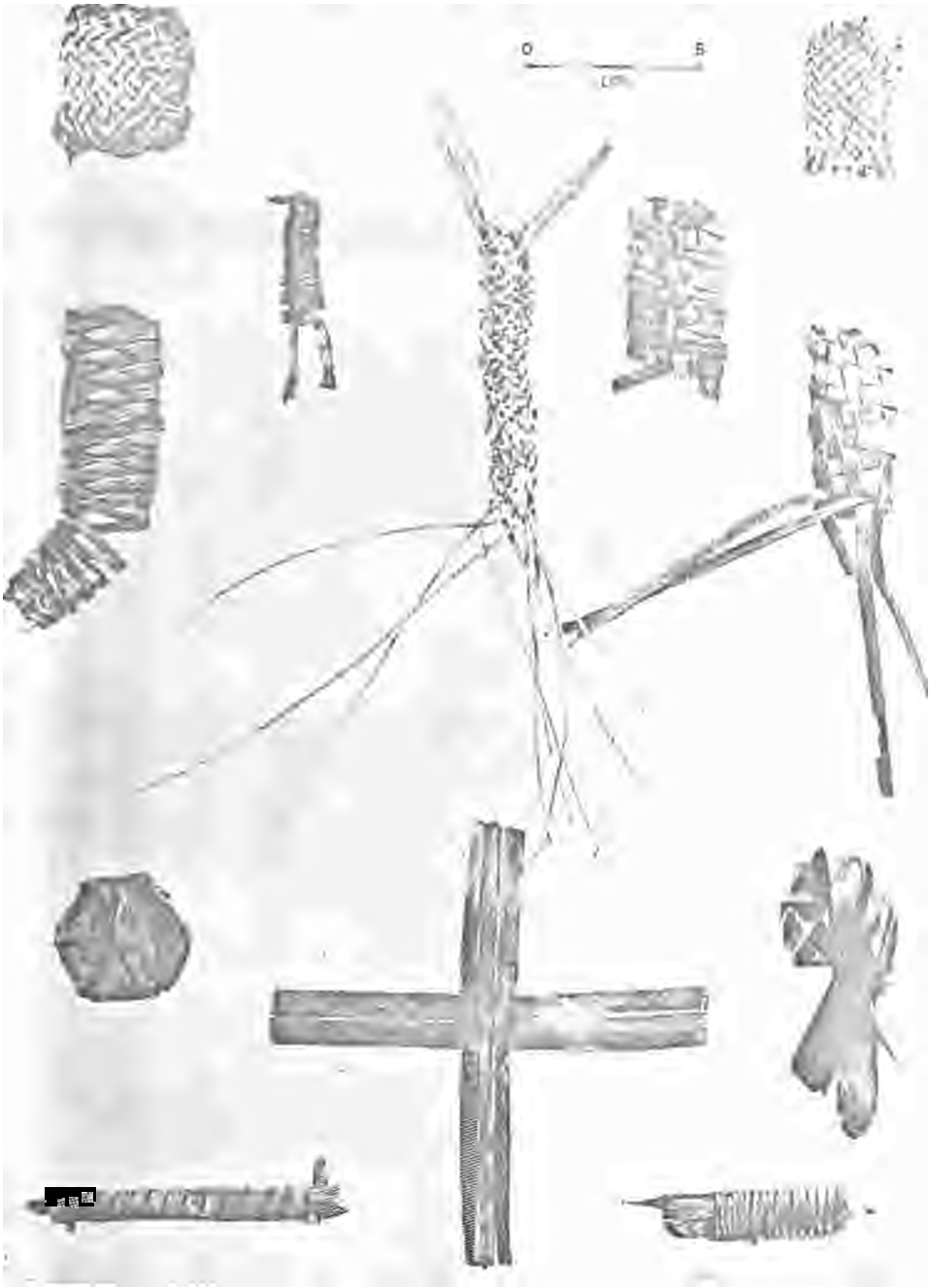


PLATE 30

Miscellaneous fiber artifacts from Frightful Cave, Coahuila. Note one complete and one incomplete "rosette" to left and right, respectively, of the fiber cross near bottom. Similar rosettes provided one of the Carbon-14 dates listed in Table I.

not found the same thing, as for instance at Danger Cave in Utah (Jennings, 1953). It may be possible that the warming and desiccating effects of the Anathermal climate upset the already fine balance of the more arid areas before the more humid regions were appreciably affected (Antevs, 1948). If this was indeed the case, then it is logical to suppose that the Pleistocene fauna would have become extinct in, or migrated away from, the most arid areas first. Also the modern fauna would have emerged in such areas before appearing in the still somewhat Pleistocene and still well-occupied environments of the more humid regions.

How this hypothesis jibes with the discovery of elephants and tapir and hickory charcoal in southern Arizona (Sayles and Antevs, 1941; Antevs, 1953; Haury, 1956) more or less contemporary with, or even later than, the modern fauna of Coahuila and Nevada, is difficult to say. Perhaps these data themselves indicate that, for some reason, southern Arizona was indeed more humid in those days than either Coahuila or the northern Great Basin.

What about the cultural implications of our material? In the first place, it is obvious that the culture of Frightful Cave was, from first to last, definitely oriented toward the use of fiber and wood rather than stone and bone. For example, the ratio of fiber to stone artifacts in the bottom level is roughly 16 to 1. In the top level it is 22 to 1. This is a rather crude method of comparison, but it gives a numerical approximation and places the emphasis where it undoubtedly belongs. The same orientation is seen by studying projectile points and foreshafts. In the bottom level, there are 7 pointed wood foreshafts, 8 stone projectile points, and 2 wood foreshafts notched to receive stone points. But percentage-wise, these 7 pointed wood foreshafts represent 64 per cent of all found at the site, while the figure for both the stone points and the notched foreshafts is only 16 per cent in each case. Thus it is perfectly apparent that, although wood points and stone points were about equally popular in bottom-level times, the emphasis on stone points increases at the expense of wood points. But the significant

point here is, I believe, that the increase is at *the expense* of wood points and that, despite this, wood points are still present in the top level of the site. Such relationships between the two types of points is not common in other sites which have come to my attention.

On the other hand, despite the over-all increase of projectile points and foreshafts upward through the three levels (a total of 17 in the bottom level, 21 in the middle, and 40 in the top) , there is a very obvious shift from animal to vegetal foods, or rather a decrease in the former and increase in the latter. Additional evidence of this shift in subsistence emphasis is seen in the frequency and distribution of metates and manos, of edible seeds and of quids. It is undoubted that this change is to be correlated with, and attributed to, the changing climate, specifically the increasing aridity.

I believe these data have implications that go beyond our local Coahuila problems. If, as I am convinced, the culture of Coahuila is a typical example, neither aberrant nor marginal, of the widespread basic culture which (too narrowly, perhaps) has been called the Desert Culture; and if, as the dates suggest, it is one of the earliest representatives of that or any other culture in North America, then what may we say?

For one thing, there is the suggestion that the differences in basic economy between the Folsom-Clovis "hunting emphasis" and the Desert-Cochise "gathering emphasis" may be temporal and fundamentally environmental, rather than strictly culture-historical. That is to say, the evidence of a shift from animal to vegetal emphasis in the foods of Coahuila at a very early date may be indicative of other early shifts, either toward gathering or toward hunting, within other North American cultures due to the pressures of the changing post-Pleistocene climate.

This further suggests that neither the Desert-type "gathering" cultures nor the High Plains-type "hunting" cultures actually represent the earliest culture-type in western North America. Both may be specializations which arose from

one or more preceding cultures which had different subsistence emphases, in response to strictly local conditions at, or soon after, the end of the Pleistocene climatological conditions.

Although our Coahuila materials contain the empirical bases for a vastly greater number of cultural, chronological, and environmental hypotheses, I shall mention only one more here. Heizer has said, and very understandably, that it is difficult for him to believe that culture in the Great Basin region continued unchanged for 10 to 11 thousand years, as indicated by the radiocarbon dates (Heizer, 1956, p. 53). But after studying our materials and their dates, I can find no alternative to believing that in Coahuila, at least, a single culture complex did in fact exist certainly for 8000 years and probably for at least 10,000. To be sure, there are variations from early to late. New traits appear, and old ones disappear. Shapes change, and the popularity of different techniques waxes and wanes. But there can be no doubt that we are dealing with a single cultural continuum from beginning to end in the deposits of Frightful Cave. And furthermore, when we examine the Spanish documents, we are instantly and strongly struck with the similarity of the cave material to the culture described for the neighboring regions in the 16th and 17th centuries. For example, of the archeologically discernable traits mentioned by Alonso de Leon (1909), for the Coahuiltecan tribes before the middle of the 17th century, 63 per cent are known to exist in the cultural remains of Frightful Cave.

That we are indeed dealing with a cultural continuum is fully attested by other data. One sandal type, made of the same materials and by the identical technique, has been found in *quantity* from bottom to top in the deposits, a span of 8000 years: 89 in the bottom level, 235 in the middle, and 231 in the top. Two other sandal types are also present throughout, although with less frequency. All forms of twining, coiling, netting, and plaiting are found from bottom to top, although there are sequential and significant variations in percentages of representation. In wood, to name

but a few, there are found throughout: atlatls and their appurtenances, fire-tongs, fire-drills and fire-hearths, grooved clubs, pegs, points and/or awls. In stonework, although the shapes of projectile points vary with time, there seems to be a definite continuum in certain forms and, even more surely, in certain characteristics such as serrating and contracting stems. Other than projectile points, stonework exhibits the same techniques and the same basic types of implements from first to last.

It should be unnecessary to point out that, in the case of these particular data from Coahuila, we are talking about a series of dates derived from the sequentially stacked deposits of a single site. We are not dealing with seriated sites over a range of territory. Furthermore, the dates have been derived from artifacts and biofacts, not from products of non-human activity for which assumptions of human contemporaneity have to be made. We are not dating horizons and assuming that their artifact contents are of the same age. We are dating artifacts and assuming that their locus of discovery is their locus of original deposition, or close enough to it to warrant the inference of contemporaneity. But whether this inference is valid or not, it is still the artifacts themselves which have been dated.

In view of all the above discussion, it is apparent that, in Frightful Cave and, by extension, in northern Coahuila, we have a well documented and remarkable instance of cultural continuity and conservatism. Coahuila evidently represents a cultural *cul-de-sac* wherein was retained, for a period of from 8 to 10 thousand years, a culture that was in existence at the close of the Pleistocene epoch in western North America.

BIBLIOGRAPHY

Albritton, C. C., Jr. and Kirk Bryan
1939. Quaternary Stratigraphy in the Davis Mountains, Trans-Pecos Texas. Bulletin, Geological Society of America, Vol. 50, pp. 1423 ff.

Antevs, E.
1948. The Great Basin, with Emphasis on Glacial and

Postglacial Times. Bulletin, University of Utah, A. 38, no. 20.

1953. Age of the Clovis Fluted Points with the Naco Mammoth. American Antiquity, Vol. XIX, no. 1, pp. 15 ff.

Crane, H. R.

1956. University of Michigan Radiocarbon Dates I. Science, Vol. 124, no. 3224, pp. 664 ff.

Drake, R. J.

1951. *Humboldtiana taylori*, New Species, from Northern Coahuila. Revista de la Sociedad Malacológica, Vol. 8, no. 2, pp. 93 ff.

Gilmore, R. M.

1947. Report on a Collection of Mammal Bones from Archeological Cave-Sites in Coahuila, Mexico. Journal of Mammalogy, Vol. 28, no. 2, pp. 147 ff.

Hack, J. T.

1942. The Changing Physical Environment of the Hopi Indians of Arizona. Papers, Peabody Museum of American Archaeology and Ethnology, Vol. XXXV, no. 1

Haury, E. W.

1956. The Lehner Mammoth Site. The Kiva, May, 1956, pp. 23 ff.

Heizer, R. F.

1956. Recent Cave Explorations in the Lower Humboldt Valley, Nevada. Reports, University of California Archaeological Survey, no. 33, Papers on California Archaeology, no. 42.

Jennings, J. D.

1953. Danger Cave: A Progress Summary. El Palacio, Vol. 60, no. 5.

Jennings, J. D., and E. Norbeck

1955. Great Basin Prehistory: A Review. American Antiquity, Vol. XXI, no. 1.

Kelley, J. C.

1947. The Cultural Affiliations and Chronological Position of the Clear Fork Focus. American Antiquity, Vol. XIII, no. 2.

Kelley, J. C., T. N. Campbell, and D. J. Lehmer
1940. The Association of Archaeological Materials with 'Geological Deposits in the Big Bend Region of Texas. Bulletin, Sul Ross State Teachers College, Vol. XXI, **no.** 3.

de Leon, Alonso
1909. Historia de Nuevo Leon. Documentos Inéditos o Muy Raros para la Historia de Mexico, Vol. 25. Edited by Génaro Garcia. Mexico.

Martin, G. C.
1933. Archaeological Exploration of the Shumla Caves. Big Bend Basket Maker Papers no. 3, Bulletin 3, Witte Memorial Museum.

Pearce, J. E., and A. T. Jackson
1933. A Prehistoric Rock Shelter in Val Verde County, Texas. Bulletin, University of Texas, no. 3327.

Sayles, E. B., and E. Antevs
1941. The Cochise Culture. Medallion Papers, no. XXIX.

Taylor, W. W.
1948. A Study of Archeology. Memoir 69, American Anthropological Association.

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Editor's Note: Dr. Taylor generously contributed this manuscript a few days after it was read (see Note 1) but there was no time to prepare adequate illustrations before sending the Bulletin **to** print. In addition to the four photographs reproduced as Plates **28-30,** Dr. Taylor sent several photographs of typical projectile points from northern Coahuila and Frightful Cave. However, it was decided not to reproduce them because they would have meant little without descriptions and frequency studies. It should be pointed out that no examples whatever of the small projectile points commonly called "arrow points" were found in Frightful Cave, its occupation having presumably ended before such small points appeared in that area; this is interesting in view of the lowest date obtained from this cave, 1770 + — 250 years (Table I). **It** should also be mentioned that the two uppermost sandals in Plate 29 are woven in techniques common to the Pecos River Focus **in the** Big Bend area, as shown in the article in this Bulletin by Mardith K. Schuetz. On the other hand, what Dr. Taylor calls the "twill-pad" type of sandal, of which two examples are shown in **the** lower part of Plate 29, almost certainly belongs to a much older period than that of the Pecos River Focus. Plate 30 is included to show what the dated "rosettes" look like. ADK.