

** Excerpts from *Culture Complexes and Chronology in Northern Texas*, by Alex D. Krieger, 1946, pp. 41-49

Antelope Creek Focus

SUFFICIENT DATA FOR a full analysis of the Canadian Valley remains are not yet available. Nonetheless, it seems possible to attempt to outline a complex of culture traits which will form a focus in the Midwestern system of nomenclature. If this can be shown to represent communities of people with the same, or practically the same, material culture, and existing at about the same time, a basis for strict comparisons with neighboring cultures will be provided.

Various names have already been offered to designate the Panhandle ruins and their contents, so that proposal of a new one may seem to add confusion. However, the names so far employed, "Panhandle Culture," "Slab-House Culture," "Panhandle Phase,"³⁶ "Canadian Valley Culture," etc., have been intended to include all remains in the Texas Panhandle in any way connected with masonry, whereas there is reason to suspect that enough differentiation exists in the material here and in contiguous areas to provide, eventually, for the recognition of more than one specific complex. Thus, in order to leave room, as it were, for the possible addition of new specific associations should occasion arise, the establishment of an "Antelope Creek Focus" as a starting point serves, I believe, a useful purpose. In the larger sense, then, such a term as "Panhandle Aspect" may be used to include all the intimately related materials in the northern Texas Panhandle, together with whatever appears in neighboring areas (northeast New Mexico, southeast Colorado, western Oklahoma, etc.) to form a closely related series of foci. Thus "Panhandle Aspect" would serve the same general purpose as the present "Panhandle Culture," with the considerable practical advantage of being flexible enough to include any number of focal subdivisions.

ANTELOPE CREEK FOCUS TRAITS

The list below has been compounded from the following sources: careful consideration of the published material just reviewed; personal examination of materials on display in the museum of the Panhandle Plains Historical Society in Canyon, Texas; information from Floyd V. Studer in correspondence

** Page numbers and footnotes represent original pagination

³⁶ "Panhandle Phase" is employed by Sayles, E. B., *An Archaeological Survey of Texas*, in his application of the Gladwin system to Texas archaeology. In this system, "phase" has a meaning very close to the McKern (Midwestern) "focus," but with "Panhandle" as the qualifier in this case, this term also seems too broad.

and conversation, a visit to Alibates Ruin, and a brief examination of his collections in Amarillo; a letter from Dr. W. C. Holden; and the probability of valid association in the light of the principle of "recurring complex." The last-mentioned is of considerable importance, since the published material on the provenience of artifacts is often indefinite; sometimes locations are recorded within specific rooms, but at other times the text switches to references such as "from the ruins" or "used by the Panhandle Indians." Therefore, those items listed under the various headings are those which are reported from at least two ruins, or mentioned by at least two authors as "typical" features, while the odd and unusual elements are grouped under "Miscellaneous." Items included in the published material are followed by the source in parentheses: (Canyon) refers to the museum in that town, (Studer) indicates notes gained personally from him, etc. The relative frequency with which the traits occur in the various sites will have to remain in question.

Type Site: Antelope Creek Ruin, located on a small terrace on west bank of Antelope Creek, 3 mi. E and 1 mi. N of Fritch, S. W. corner Hutchinson County.

Other Components; Tarbox. (Holden, 1930), Saddleback (Studer, 1931 *a*; Moorehead, 1931; Holden, 1933), Alibates (Moorehead, 1931; Mason, 1929); Ruin 55 (Studer, 1934). Probably others, not yet excavated.

Economy: Joint dependence on maize agriculture and hunting-gathering. Maize certain from numerous small charred cobs (diameter about 1/2 inch, length 1 to 2 inches). Beans and squash inferred from supposed invariable association with maize, but no direct evidence. Irrigation suggested (Moorehead, 1921; Studer, 1931 *a*) but no actual evidence. Animals hunted were principally bison, antelope, and deer; also various small animals and birds: No fish remains reported. Various seeds, nuts; berries probably used where obtainable.

Villages: Primarily situated in comparatively good defensive positions; on ridges and promontories overlooking Canadian or its short tributaries, on mesa tops, and small terraces with steep banks (see Moorehead, 1933, pls. 1-2). Usually within mile or two of small stream or spring, but convenience to fields and water plainly sacrificed for wide view and defensible features. Number of houses in village ranges from 6 or 8 to perhaps 80 or more. Multi-roomed pueblos of one story found in excavated sites, which also contain scattered single rooms. No plan or arrangement of possible social significance has yet been reported. Present indications are that many large villages were occupied simultaneously in the narrow Canadian corridor, with a considerable, concentrated population.

Architecture: Each pueblo consists of an irregular one-story block of rooms, evidently built by adding rooms to a small starting core. Each has a number of large rectangular to nearly square rooms oriented with sides in cardinal directions, plus numerous small rooms of odd shapes which may have been sleeping quarters, work rooms, or storage places. Some small rooms were made by building out from the side of large ones, others by partitioning large rooms, still others by building across odd spaces and corners. Stone-walled rooms are found separate from the main block in each village, but without apparent plan of arrangement. (However, details are needed.)

Greatest emphasis has been placed on the peculiar method of wall construction in which large slabs were placed vertically in parallel rows, then the space filled with adobe and rubble, and other slabs mounted on them in the off-set system described by Holden (1930, fig. 2). While this may have been a common construction, many walls were built simply of unshaped stones held together with liberal amounts of adobe mortar. In each ruin excavated a small amount of horizontal masonry has appeared, in corners, or along one wall of a room, evidently to strengthen them; such coursing usually appears above an initial course of vertical slabs. One case of a wall of small poles covered with clay has been reported (Hobbs, 1941).

Whether these rooms, single or contiguous, were constructed in pits is not known definitely. Some authors have felt that they were made in pits from a few inches to three or four feet in depth, others that the rooms had subsequently become filled with wind and water-borne sand. Mr. Studer has described to the author a method of footing the walls with vertical slabs which may have been placed around the walls of a shallow pit (fig. 1).

Apparently each excavated site shows a consistent pattern of room construction in that the best-made ones are large and follow a definite plan, while the small, odd-shaped rooms are either built-on additions to the large ones or otherwise supplementary to them. Dimensions of the larger, more regularly built rooms appear to range from about 10 by 12 feet to 22 by 24 feet (in one, case 25 by 30 feet). A general description of such rooms, with their plastered walls and floors, sunken central part, central clay-lined firebasins, four roof supports, masonry tunnels extended from the east wall and jutting into the room, and occasional use of two small anterooms or bins flanking this tunnel, will be found under the discussion of Antelope Creek Ruin (pp. 31-38). Discussion of the tunnels as probably representing ventilators, with entrance consequently gained through roof hatches, will be found on p. 33. Other significant items include the discovery of large slabs in such position that they may have served as deflectors between the tunnel and central fire basin, other large slabs inside rooms which may once have lain on the roofs to serve as covers for entrance hatches, and occasional appearance of a raised clay bank at the west end of the central depression, opposite the tunnel, which the writer, suggests may have served as an altar (see also Hobbs, 1941; Johnston, 1939).

All previous suggestions about roofs are that these were flat, supported by four central posts in the wider rooms. It may be pointed out, however, that considering the present dearth of good timbers, the central portion may have been supported on short stringers laid on the posts, with slanting beams laid from the walls to these stringers. Such construction would have made the roofs dome-shaped rather than flat and also have given more head-room inside. Whether such construction would be incompatible with multiple-roomed buildings is open to argument.

The larger, rectangular rooms were presumably dwellings, for they commonly contain broken bones, mealing slabs and other artifacts, and cache pits of oval and rectangular shape.

Every report stresses abundant evidence for destruction of these houses by fire. However, they were often rebuilt, the charred refuse being tamped down and covered with clean sand rather than removed. It is not clear whether the walls were built higher in such cases, or whether there was any connection between interment in the floor and destruction of the house.

Agricultural Implements: Hoe blades of bison scapula have been found in every ruin in which appreciable work has been done (Studer, letter of April 27, 1945). Bison metapodials with beveled ends have been called "digging stick points." Double-bitted implements chipped from quartzitic pebbles,

bearing two notches, have been called "chipped hoes" (Canyon; Studer) but may have been axes; these have been found in two sites only.

Food storage: Slab-lined oval and circular cists were made in house floors and outside within 20 to 30 feet (Moorehead, 1933, pl. 3, fig. 8). These were carefully chinked with small stones, seemingly for rodent-proofing (Studer). Also, circular and rectangular unlined pits were made in floors. *Bell-shaped cache pits*, undercut so as to be wider at the bottom than top, have not been previously mentioned but were described by Studer during our visit to Alibates Ruin; these were some five feet deep and possibly plastered around the interior with adobe.

Food preparation: Grinding implements consisted mainly of sandstone slabs with shallow, oval basins in which rotary motion was used; these were both unshaped and shaped by chipping into oblong and oval forms. (See Studer, 1931 *b*, pl. 11, fig. 1, for a "typical metate" with oval basin.) Manos are of oval to rounded-rectangular shapes, oval in cross-section with slightly flattened faces. "Perhaps four of five" manos found in various ruins were worn to wedge shape, indicating back-and forth motion (Studer); however, this motion is certainly atypical. (See also open-end trough metate mentioned under Miscellaneous.) No two-hand manos on record. Bed-rock mortars near ruins, but no stone pestles.

Certain pits with stone-slab lining have been called "hearths" (Moorehead, 1933, pl. 3, no. 8), but as the slabs are unbroken by heat, these may rather have been storage cists.

Crushing implements are represented by numerous hammerstones of heavy, tough quartzitic material. These range from oval to round in section, are sometimes chipped to a rude point, but never notched or grooved.

Pottery, except for trade ware, was exclusively utilitarian. It is much more common in some sites than others, but apparently very uniform wherever found in the Canadian Valley. No entire specimens known, but Studer collections in Amarillo and Canyon museum include many restored specimens. No adequate study of pottery have been made in the Panhandle; it is uncertain whether or not this ware was coiled. Vessel forms, so far as known, consist entirely of globular, round-bottomed jars with straight rims placed vertically or flaring outward slightly. (For restored vessels see Moorehead, 1931, fig. 37; Smith, 1936, pl. 15, no. 3; Studer, 1934, pl. 15. For miscellaneous sherds see Moorehead, 1931, figs. 38, 49, 50.) Handles generally, if not completely, absent. Exteriors completely covered with cord impressions, usually made vertically but occasionally laid in checks at different angles. Cord marks sometimes smoothed over on rim zone. Deep notches in outer edge of lip fairly common; a single deeply incised line or row of fingernail gougings sometimes occurs around base of rim. Interiors poorly smoothed (with fingers ?) to fairly smoothed (with stone ?), but never polished. Some interiors have a light red wash. Colors center around shades of grey and brown with some orange-brown and tan; however, pottery commonly sooty-black and greasy. Walls range from 1/8 to 1/2 inch in thickness, varying in same vessel due to poor interior smoothing. Paste hard and compact (hardness centers at about 3.5); tempering of crushed quartz, sand, and occasionally bone, but shell probably absent.

Cutting, Scraping, Skin Preparation, etc.: Chipped knives of various shapes, diamond shape with four oppositely beveled edges probably most common; others are of ovate shape, thin, flat, up to 8 inches long, and a narrow, slightly curved form (Studer coll.). Snub-nosed scrapers very common. Side scrapers of large spalls with edge retouch very common. Mussel shells with serrated

edge occur. "Fleshing tools" of bison (or deer ?) humerus, cut across with bevel, with cutting edge sometimes serrated (Studer coll.).

Sewing, Punching Implements: Chipped flint awls or "drills" common, delicate shaft 1 to 2 inches long; bases unworked, shaped to a square, or narrow and crossing end of shaft like a "T." Bone awls very common, mainly of antelope and deer leg bones but also (Holden, 1933) of bison rib and turkey leg bones. Metapodial awls range through head intact, head partly removed and smoothed, head wholly removed and finished-round, and splinters unworked except for tip. (This is the full range described for Pecos; see Kidder, 1932, figs. 171-178, 183-184.) Some slim, pointed awls (?) are square in crosssection with all four faces well smoothed (*idem.*, fig. 189.) All forms of awls are sometimes decorated with incised lines. Long, slim, eyed bone needles present but rare. (Studer coll.)

Unshaped sandstone fragments bear grooves in which awls, needles, etc., were probably sharpened. (Canyon.)

Woven Artifacts: Charred fragments of coiled basketry recovered from several ruins, foundations probably willow-rod bundle, sewing weft of willow splint.

Chipping Implements: Flint and quartzite hammerstones. Bone and antler tools with blunt, rounded tips. Sections of antler with squared ends; considerable battering and smoothing at ends indicates use as drifts, tapping tools, or similar uses.

Weapons: Common use of bow indicated by very numerous small, thin, light, finely chipped triangular projectile points. Those with two side notches may predominate over unnotched, but no study has been made. Base notch with side notches occurs, but seemingly infrequently. Aside from notches, these forms are indistinguishable, edges usually quite straight, base straight to concave; lengths average about one inch, range ½ to 1 1/2 inches; both faces finely flaked.

Use of atlatl indicated by a few heavy, percussion-chipped projectile points in each ruin. At Alibates, 18 dart points have been found, against about 500 triangular arrow points (Studer coll.), a proportion which may apply to other ruins as well. "Dart" points are broad, thick, 2 1/2 to 3 inches long, with broad notches in corners, stems ranging from parallel-sided to expanding; stem base straight to convex. They are rather uniform in these features and closely resemble dart points found infrequently at Pecos (Kidder, 1932, fig. 3, w-y).

No other weapons, such as spear or lance, appear to have been used.

Shaft smoothers are represented by small brown sandstone blocks with groove the length of one face (Canyon); these neither common nor well shaped but appear similar to usual Plains implement. Two more elaborate specimens mentioned under Miscellaneous. .

Shaft wrenches ("straighteners") indicated by few worked sections of bison rib, but no definite examples. Antler wrenches not reported.

Ornaments: Pendants of mussel shell unworked except for small hole at end. Bird-bone sections may represent beads, but not common. Most ornamental material imported: *Olivella* shells (source not determined) with spire removed; small disk beads and pendants of turquoise; cylindrical beads, probably of conch columnella, from Gulf of Mexico (?); small disk beads of red stone (jasper ?), rare (Canyon).

Ceremonial Objects: Possibly in this category: Pipes, elbow form, of fine-grained sandstones and/or argillaceous limestones, commonly grey but occasionally deep red material (not catlinite). Arms of these pipes are barrel-

shaped, thickest in middle and tapering toward elbow and end; arms of about equal length but one (the bowl ?) may be thicker than other; one or both ends have slightly raised flange which may be incised with simple lines (Studer coll.).

One short tubular clay pipe from Ruin 55 (Studer, 1934, pl. 15); others mentioned by Hobbs (1941) from Antelope Creek and Alibates Ruins.

Bone "rasps" of bison rib (Studer, 1934, pl. 16) and deer metatarsal (Canyon) with regular, parallel grooves incised across edge and face.

Burials: Flexed and semi-flexed in oval graves, sometimes lined with slabs. Lined storage cists sometimes served for graves, both inside and outside houses. Graves sometimes found on ridges near ruins but not in rubbish heaps (Studer, 1931 *a*). Some have slabs laid on grave fill. No durable offerings, but some objects probably left on corpse as worn in life.

Miscellaneous: Pottery disks cut from sherds, both plain and centrally perforated, occasionally found (Studer coll.).

One fragment of channeled Folsom point from Ruin 22 (Studer coll.).

One tortoise-shell rattle containing small, polished black pebbles (Holden, 1930) may have had ceremonial usage.

Polished greenstone celts, oval in cross section with tapered poll, rarely occur in or on ruin sites and must have come from eastern tribes by trade (two complete in Canyon museum; three or four fragments in Studer coll.).

Two shaft smoothers more elaborate than the sandstone blocks: one has polished groove at right angles to a ridge pecked out in relief, the groove crossing this ridge at its center (compare Kidder, 1932, fig. 52 *c*). Another has a groove running length of one face and a short ridge flanked by peck-out pits at right angles to the groove but on one side only (something like *idem.*, fig. 54 *b*). These objects are in Canyon museum, labeled "from the ruins"; both are made from brown quartzitic material.

One troughed metate of Pueblo form, the trough open at one end only, found in place in Antelope Creek Ruin (Canyon), said to be the only such specimen found in Canadian Valley sites in Texas (Studer).

Obsidian flakes, unworked, found in various sites, indicating trade with New Mexican tribes. These very rarely shaped into artifacts (Studer).

Plaited and twined basketry reported from Ruin 28 (Studer, 1934, p. 90).

Six restored skulls from Antelope Creek Ruin (Canyon) show no artificial deformation.

Puebloan trade sherds are discussed in text below.

It should be mentioned that practically all chipped artifacts found in the Canadian Valley sites were made from the peculiar red-banded material commonly called "Alibates flint" from the enormous outcrop on the ridge above Alibates Creek, and smaller quarries to the north, across the Canadian. The material is actually a silicified dolomite, but in chipping it behaves almost exactly like flint.

Perhaps it should be stated again that the writer makes no claims as to the absolute occurrence in a single association of all the items given above. It will be quite obvious that specific data is needed on nearly every point. Questions which arise in reading the above compilation may be checked in some cases by reference to the published papers, but it is, I think, a fair summary of what is known to date by one who can treat the material only secondarily. Assuming that this is a valid representation of general characteristics in Antelope Creek Focus, except for several of the Miscellaneous items, The next question is: can the focus be dated?

DATE OF ANTELOPE CREEK FOCUS

The finding of Puebloan trade sherds was mentioned for Saddleback Ruin near Tascosa, with identification as Glaze I and Biscuit A types dating approximately 1350 to 1450 A.D.³⁷ Johnson listed sherds from Antelope Creek Ruin as early Pueblo IV, and quoted Lowery that they belonged to a Glaze I type.³⁸ Studer has informed me (letter of April 27, 1945) that the following types were found at Alibates and Antelope Creek Ruin:

Lincoln Black-on-Red, *circa* 1350
 Glaze "A" Cieneguilla Glaze-on-Yellow (Mera), *circa* 1400
 Aqua Frio Glaze "A" (Mera), *circa* 1350-1400
 St. Johns Polychrome, *circa* 1200

One cannot, of course, state that the entire life of the focus is to be dated by these sherds. This general mode of life may have been established for some time before Puebloan trade relations were opened, but of this we know little. On the other hand, there is no reason to doubt that this culture was flourishing during the time suggested by the majority of trade sherds—about 1350 to 1450 A.D. The presence of St Johns Polychrome probably indicates that this time should be extended back somewhat, as does the one open-end trough metate from Antelope Creek Ruin. These items suggest contact with Puebloan's by 1300 or possibly shortly before. It is also problematical just how much time should be allowed for actual carriage of trade pottery over long distances. Thus, if Glaze I pottery was first brought into the vicinity of Pecos Pueblo from farther west at about 1375³⁹ how many years should be allowed for its transport some 300 miles farther eastward? Similarly, how much lag seems reasonable in the occurrence of St. Johns Polychrome and the open-end metate?⁴⁰

³⁷ Holden, W. C., *The Canadian Valley Expedition of March, 1930*

³⁸ Johnson, C. Stewart, *A Report on the Antelope Creek Ruins*.

³⁹ Kidder, A. V., *The Pottery of Pecos*, Vol. II, p. 608.

⁴⁰ St. Johns is said by one authority to have been manufactured between about 1100 and 1200 A.D. (McGregor, John C., *Southwestern Archaeology, Appendix II*). Kidder, A. V., (*The Pottery of Pecos*, Vol. II, pp. 350-353) has discussed the distribution of this type in detail, arguing that it was probably made for about 100 years, from 1125 or 1150 to 1225 or 1250 and that by 1275 it had gone out of fashion in its homeland the Little Colorado basin of eastern, Arizona. Kidder states that of all Southwestern potteries, St. Johns was traded over the greatest territory and that its then (1936) most eastward occurrence was at Tecolote Ruin near Las Vegas, New Mexico. In the Forked Lightning Ruin near Pecos Pueblo, abandoned at about 1300, Kidder found some 200 sherds of St. Johns, whereas at Pecos itself, established when Forked Lightning was abandoned, only six were recovered. It might then be argued that after 1300 the type became so rare at Pecos (as elsewhere) that its chances of reaching the Texas Panhandle were slight.

Bartlett, Katherine, *Pueblo Milling Stones of the Flagstaff Region and Their Relation to Others in the Southwest*, lists both troughed and slab-in-bin metates for the Pueblo III period and states that in Pueblo IV the slab-in-bin had "entirely replaced" the troughed form in the plateau area (but not elsewhere in the Southwest). Hobbs, Hulda R., *Two Texas Panhandle Ruins*, wrote that "troughed and basin metates" were found at Antelope Creek Ruin, as though there were several of each, but according to Mr. Studer only the one troughed example has been found in the Panhandle ruins. Whether this indicates a lingering use or a pre-1300 date here cannot be decided on a single specimen. No troughed metates were found at Pecos, and only two at Forked Lightning (Kidder, A. V., *The Artifacts of Pecos*, p. 69, fig. 43 a).

Some reports have mentioned discovery of ash beds and rubbish under the masonry walls, pointing to a possibility of earlier occupation.⁴¹ For this and other reasons it will be best to reserve judgment on the most probable beginning date. Present indications are that 1300 seems reasonable.

At the other extreme, the Canadian Valley agriculturists appear to have abandoned their villages completely before the time of Coronado. By the time of the great entrada, 1541, there is no hint in the records of anything suggesting these people or their towns. Instead, what is now the Texas Panhandle was populated by roaming bands of bison hunters, who, from the descriptions, possessed many culture elements easily identifiable with those of historic Plains tribes.

. . . In an easterly or northeasterly direction from Pecos, Coronado's party, after 18 days march, began to encounter roaming bands of people "who lived like Arabs," and whose sustenance "comes entirely from the cows, because they neither sow nor reap corn." One of the camps is said to have had 200 tents. These people used the skins of the bison for clothing, ropes, and tent covers, the sinews for thread, and the wool in cord making. For transporting their baggage they used large dogs, of which they had many. There is unmistakable mention of the conical tipi, dog traction, the breechcloth, skin clothing, the bow and arrow, pemmican, face painting (or possibly tattooing ?), and sign language. Pottery was absent. In winter these people brought hides and robes to the pueblos, especially Pecos, in exchange for corn. Two "tribes" are noted: the Querechos, supposedly Plains Apache, and the Teyas. Beyond and northeast of these nomads, where the country was more broken and fertile, near some large rivers [in southern Kansas], were found settlements of quite another character. . . .⁴²

One cannot, to be sure, determine that Coronado actually crossed the Panhandle at a point near enough to the stone villages to have seen or heard of them, but on the other hand, the Puebloan sherds, so far reported do not yield dates later than approximately 1450. Later trade sherds have been found in the Texas Panhandle, but not in the ruins.⁴³ Moreover, as discussed on pp. 37-39, there are some indications that the abandonment was forced by adverse climatic conditions. In this connection, an interesting speculation, one which will bear further study, is that a long drought in this area may possibly be correlated with one of the prehistoric droughts in western Nebraska, as determined from tree-ring dates by Weakly.⁴⁴ These are:

1587-1605 (except for 1594-96)

1539-1564 (26 years)

1459-1468 (9 years)

1439-1454 (15 years)

⁴¹ E.g., Holden, W. C., *Some Recent Explorations and Excavations in Northwest Texas* (Tar-box Ruin); Moorehead, W. K., *Archaeology of the Arkansas River Valley* (Gould Ruin in Handley group and tests made along valley of Wolf Creek).

⁴² Wedel, Waldo R., *Culture Sequences in the Central Great Plains*, p. 324; see also Wedel, Waldo R., *An Introduction to Pawnee Archaeology*, pp. 9-10, and Wedel, Waldo R., *Archaeological Remains in Central Kansas and Their Possible Bearing on the Location of Quivira*. An interesting account of the expedition may be found in Day, A. Grove, *Coronado's Quest*, Chapter 12.

⁴³ Kidder, A. V., *The Pottery of Pecos*, Vol.- II, p. 381, states that he has seen sherds ranging from Black-on-white to Glaze V in the collection of Mr. Leslie Nunn, near Amarillo, Texas.

⁴⁴ Quoted in Wedel, Waldo R., *Environment and Native Subsistence Economies in the Central Great Plains*, p. 24.

With these figures, Weakly added that "Several of the droughts were of sufficient severity to very largely depopulate the plains even now." Wedel furthermore remarks that

They [the drought conditions in the western plains] have significant implications, however, for they suggest that prolonged droughts comparable to those held responsible for extensive ethnic disturbances in the Southwest in 1276-1299, and again in 1573-1593 (Douglass, 1935, p. 48), might well have occurred in the Great Plains, though not necessarily concurrent.⁴⁵

The two droughts mentioned by Weakly, 1439-1454, and 1459-1468, might also be regarded as one very long period of desiccation extending from 1439 to 1468, or 29 years, with a five-year interruption. Having seen what havoc was wrought in the "Dust Bowl" drought of the southern plains in three years, 1934-1936, one may imagine the consequences of such periods lasting several times as long. As the period 1439 to 1468 appears to agree rather well, from the information given above, with the approximate time of abandonment of the Canadian Valley agricultural communities, a correlation with the fifteenth-century Nebraskan drought is not unlikely. On the other hand, the possibility of evacuation forced by inroads of warlike tribes, perhaps the very Querechos and Teyas mentioned in the Coronado journals, is not to be neglected. But such a factor must have been present for at least a century or two before the final abandonment. We may recall the defensive position in which most of these villages are found.

This circumstance is remindful of that discussed by Mera in the glaze-paint area of central New Mexico.⁴⁶

Information based on analyses of the ceramic content of a large number of sites from this section appears to indicate that most, if not all, of the sedentary settlements had been deserted by the middle of the 15th century, never to be reoccupied. The reason for such a statement is posted on the fact that there' have been found no intrusive glaze-paint sherds later than late Group A nor any other alien types having a like time implication.

. . . it seems logical to postulate an abandonment of the former region rather than a discontinuance of trade.

Three possible reasons for this large-scale abandonment are considered: disease, drought, and warfare. The last seemed to Mera the most plausible, the farming population having been terrorized by "an enemy having no fixed adobe and hence possessing great mobility," and ". . . the deserted area was later the acknowledged range of the Mescalero Apache."

There is no reason why both factors may not have operated to finally bring an end to the Canadian Valley civilization: a protracted period of enemy raids perhaps climaxed by long, crop-killing drought.

⁴⁵ *Idem.*, p. 24.

⁴⁶ Mera, H. P., *Population Changes in the Rio Grande Glaze-Paint Area*, pp. 38-39.