



Southwestern Lore

OFFICIAL PUBLICATION
THE COLORADO ARCHAEOLOGICAL SOCIETY

Vol. 31

December 1965

No. 3



A TYPOLOGY OF MIDDEN CIRCLES AND MESCAL PITS

by

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Over the years, interest has grown concerning a type of archaeological site known most commonly as a midden circle or mescal pit. Other names applied to this type of site include: ring midden, doughnut midden, circle mound, cooking mound, cooking pit, sotol pit, and earth oven. This site appears on the surface as a circular midden composed of fire-cracked limestone rocks and gray ash. The shape of the midden is a large doughnut with one side slightly higher than the other. In the center is a wide (*ca.* 13 feet), sometimes shallow depression, usually filled with dark ash and a small amount of rock. There is considerable variation in form (Figs. 1, 2), as the following descriptions will show. The middens can be semi-circular mounds, low circles of midden debris, or a circle of burned rocks scattered around a shallow subsurface depression. Occupational debris which commonly occurs on these sites includes: snail and mussel shells, bone fragments (usually small animals—some burned), siliceous stone flakes (commonly chert), chipped stone artifacts (Figs. 3, 4), grinding and pounding tools, and, in some areas, pottery. Grinding facets and mortar holes are often found adjacent to the middens.

These middens usually occur at the base of a small, low hill, which seems to provide limited wind protection. However, they also occur on the sides or tops of hills and, rarely, on terraces bordering a creek or arroyo. A water source, such as a seepage spring, is often nearby, but this is not consistent.

This type of specialized midden is widely distributed (Fig. 5). It is reported from central Texas (Campbell 1952), western Texas (Kelley 1933; Sayles 1935; Jackson 1937; Kelley, *et al.* 1940; Kelley and Campbell 1942; Tanner 1949; Taylor 1949; Gerald 1959; Greer and Benfer 1963), the Guadalupe Mountains of southeastern New Mexico (Mera 1933, 1938; Burnet 1933; Ferdon 1946), the Sacramento Mountains of south-central New Mexico (Mike Marshall, personal communication), east-central Arizona (Reagan 1930), northern Chihuahua (Sayles 1936) and other parts of northern Mexico (Beals 1932), and west-central Baja California (R. G. Vivian, personal communication). They appear to extend north into southern Colorado (Galen R. Baker, personal communication).

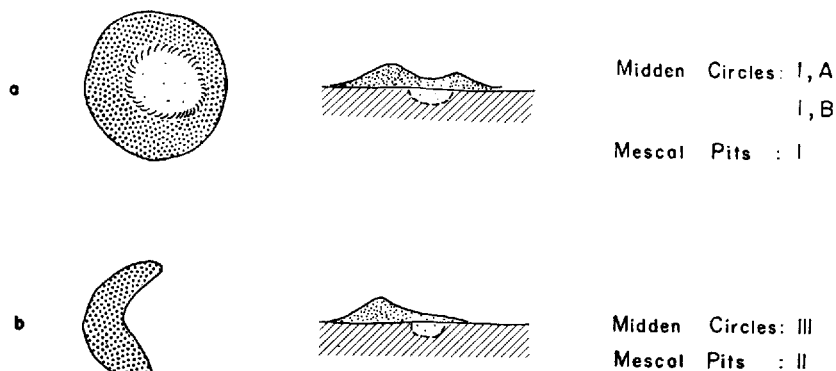


FIGURE 1. Types of midden circles and mescal pits, plan (left) and cross-section (center).

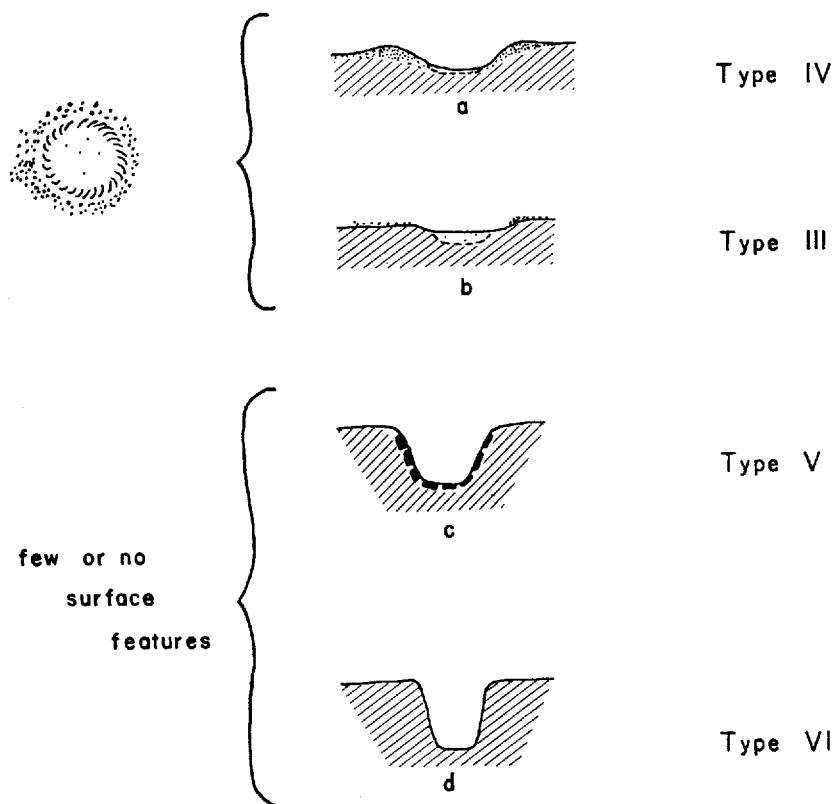


FIGURE 2. Types of mescal pits, plan (left) and cross-section (center).

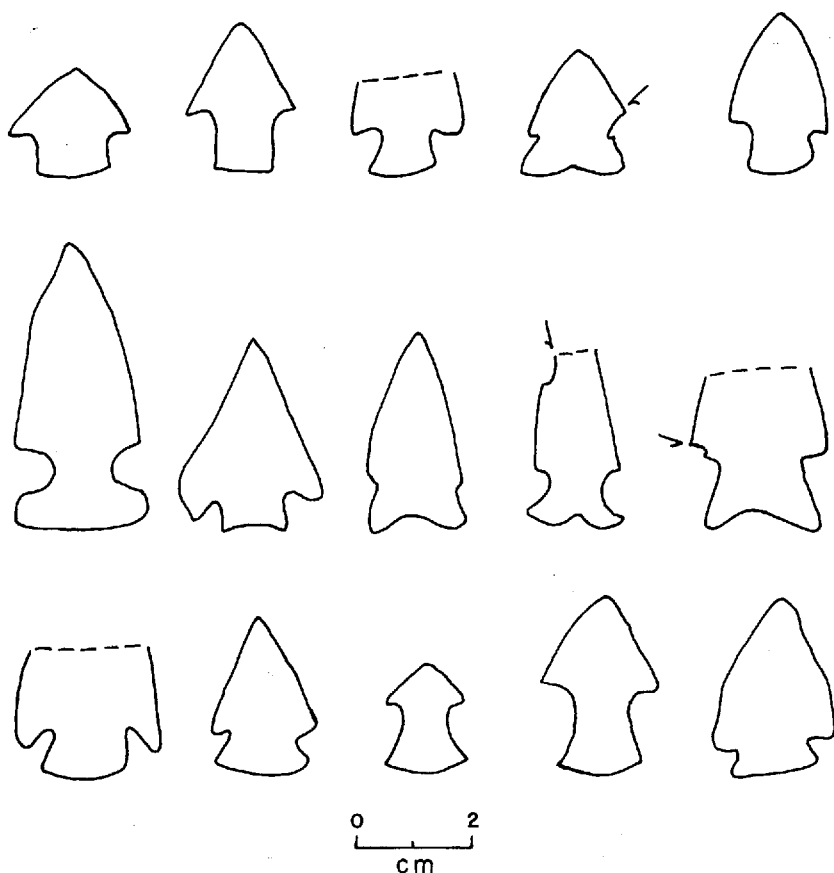


FIGURE 3. Projectile points ("dart points") from midden circle and mescal pit sites in southeastern New Mexico and western Texas.

Because of the great diversity in forms of these sites, an attempt is here made to classify them into types (Figs. 1, 2) for the eventual study of distributions, occupations, and associations. The term "midden circle" is restricted to sites lying entirely on the ground surface (Mera 1933), while "mescal pits" have an intrusive pit dug below ground level. The three types of midden circles follow generally the descriptions by Mera (1938) from his work in southeastern New Mexico.

MIDDEN CIRCLES

Type I (Fig. 1a) is a symmetrically circular midden with a widely depressed center. Single middens range from 30 to 55 feet in diameter and average about 3 feet high. Multiple or overlapping middens naturally range much larger in size. The central depressions average about 12 feet in diameter at the bottom, with very little variation. Type I middens are found in all types of topography: from the tops of high ridges down to level land in the bottoms of canyons and out considerable distances on the flats beyond

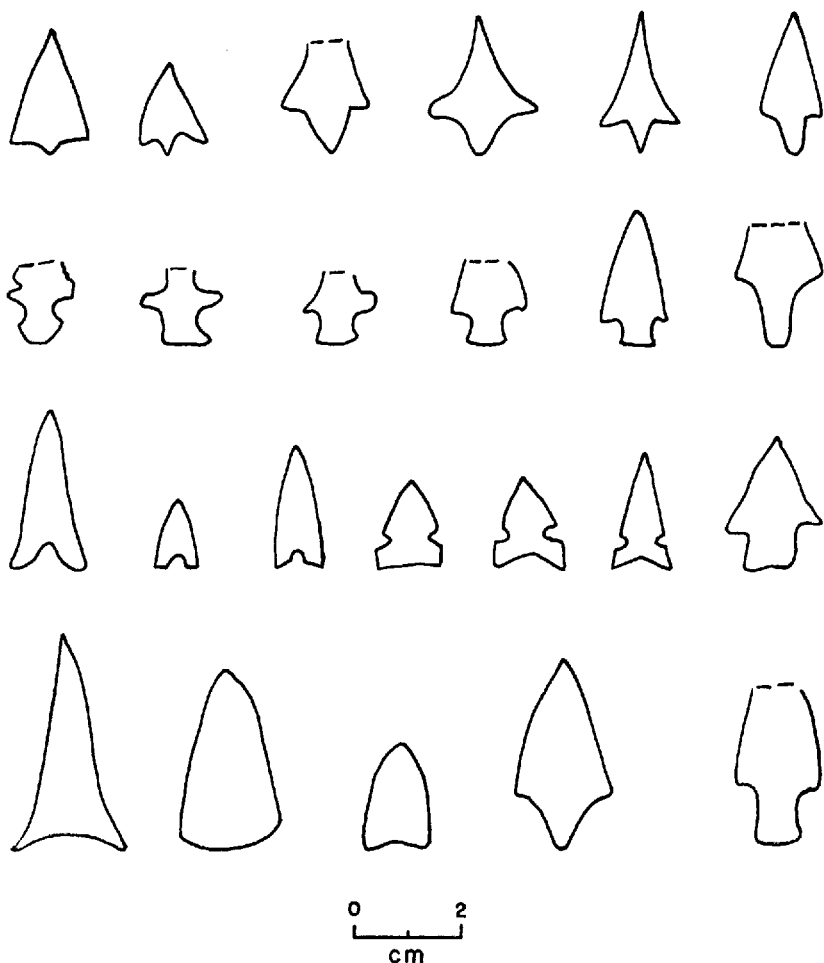


FIGURE 4. Projectile points ("arrowpoints") from midden circle and mescal pit sites in southwestern New Mexico and western Texas.

the borders of the last foothills (Fig. 6). The middens are usually found in mountainous or hilly country. Concerning this type of midden, Mera (1938:20) states that "a large number of structures would indicate an extended occupation or perhaps repeated occupation over a comparatively long period."

The Type I midden circles occur in two forms which are thought by some people to be the same type. Form A (Figs. 7, 8) is a large circle of debris, 40 to 55 feet in diameter and 4 to 5.5 feet high. These are composed almost entirely of heat-fractured limestone rocks which average 4 to 5 inches in diameter; there is almost no ash among the mounded stones. Another striking feature is the central pit, which is steep-walled and commonly reaches natural ground level. Form B (Figs. 9, 10) is generally

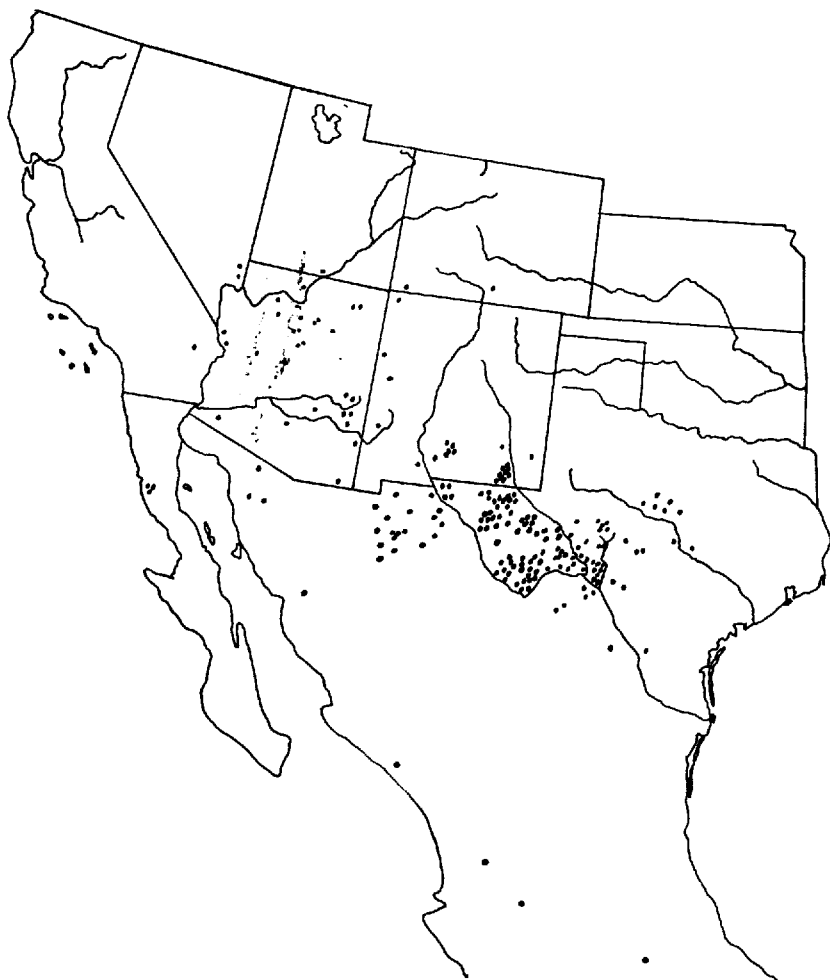


FIGURE 5. Distribution of midden circles and mesquite pits, compiled from archaeological and ethnographic data.

smaller (30 to 40 feet in diameter and 0.5 to 3.5 feet tall) and is composed of small rocks (2 to 3.5 inches in diameter) and an accumulation of ash, bones, shell, and chipped stone. The central pit is smaller (0.5 to 2.0 feet deep) and is filled with fine, black or dark gray ash. Form B is more common but often occurs in groups with a single Form A midden. Form B middens containing fairly early materials (*ca.* 1000 B.C.) are found in many areas in which Form A is absent. These occurrences suggest functional and temporal differences between the two varieties.

Type II is included in the midden circle category by Mera (1938). These are elongated middens which average 30 to 40 feet long and occur on a terrace against a cliff face or in front of a rockshelter.

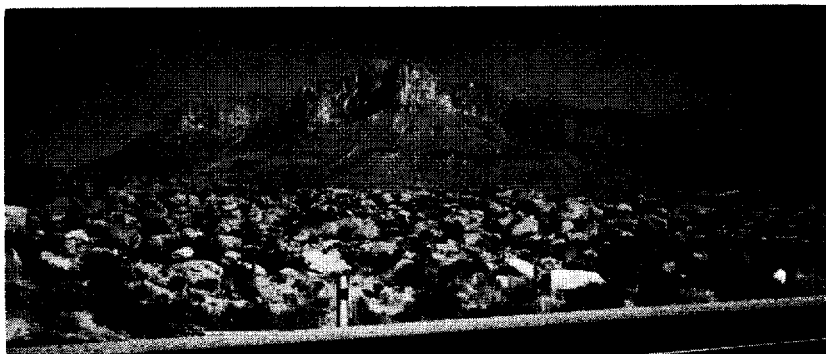


FIGURE 6. Signal Peak (El Capitan) in the Guadalupe Mountains. Midden circles occur in the area containing boulders, the distant foothills, and the flat on top of the peak.



FIGURE 7. Midden circle, Type IA, Eddy County, New Mexico.
Note clipboard for scale.

Type III middens (Fig. 1b), a semicircular type and Mera's last category, occur in the mouth or in front of a cave or rockshelter. The size and shape depend on the size of the shelter opening.

The material culture for midden circle sites has been reported by the numerous individuals working with this type of site (Sayles 1935; Mera 1938; Tanner 1949). Tanner (1949) stresses the scarcity of artifactual materials present on midden circle sites. Projectile points are represented by small, side- and corner-notched dart points and numerous types of arrow-points (Figs. 3, 4). Scrapers, small choppers, and burins usually comprise the majority of chipped stone artifacts.

Pottery is probably the most important cultural remains found on midden circles because of its usefulness as a dating device. The identification of pottery types makes possible approximate dates, based on tree-ring dates from central New Mexico (Stubbs and Stallings 1953:Fig. 70; Hawley



**FIGURE 8. Midden circle, Type IA, Eddy County, New Mexico.
Note hat for scale.**



**FIGURE 9. Midden circle, Type IB, Jeff Davis County, Texas. Initial stage with
rock washed partially into central depression. Note hat for scale.**

1950). Mera (1938) reports mainly Chupadero Black-on-white (A.D. 1150 to *ca.* 1670), El Paso Brown and El Paso Polychrome (A.D. 1150 to post-1450), Three Rivers Red-on-terracotta (A.D. 1150 to *ca.* 1300), and one Rio Grande glaze Group IV (Pecos Classification; probably San Lazaro Glaze Polychrome, A.D. 1450 to 1515, according to Mera 1940:3). Chupadero Black-on-white was the most common type found, as is the case throughout the Rio Grande where it was widely traded.

These dates suggest a fairly late occupation for the southeastern New Mexico sites, probably A. D. 1150 to at least 1300. The late Rio Grande glaze sherd could be from a later occupation. Tanner (1949:160,162) dates midden circles in the adjacent portion of western Texas, based on the dates of Chupadero Black-on-white, El Paso Brown and El Paso Polychrome. He suggests a beginning date of A.D. 1250 to 1300, with occupation probably continuing into the historic period.



FIGURE 10. Midden circle, Type IB, Pecos County, Texas.

MESCAL PITS

In addition to the midden circles described by Mera and others, subsurface cooking pits also occur. Here we are mainly concerned with the cooking pits with a bordering accumulation of heat-fractured stone and ash. For convenience of uniformity in terms, these are divided into descriptive types. It should be noted that only Types I and II have the midden accumulation, although Types III and IV are at least sometimes related to the middens. Types III, IV, and VI are included in this discussion because of the general consensus that these pits were used in the preparation of mescal, either as food or beverage. These are commonly referred to as "mescal pits" in much of the archaeological literature of the Southwest.

Type I mescal pits (Fig. 1a) are cooking pit middens conforming to the Type I midden circles (probably Form B) but with a subsurface pit in the center. From the scanty evidence, it seems that these middens range 6 to 35 feet in diameter and are usually no higher than 2 feet high. Much more information needs to be gathered on this type of midden. Archaeologically, middens of this type have been reported only from western Texas (Gerald 1959), although the actual construction and use of such pits have been observed in western Texas (Buckelew 1911), northern Coahuila (Walter W. Taylor, personal communication), west-central Arizona (Reagan 1930), and probably many other areas of the Southwest and northern Mexico (Spier 1928; Beals 1932). This type of pit is still being used to cook sotol bulbs in the preparation of an intoxicating drink in central Coahuila (Taylor, personal communication).

Type II (Fig. 1b) is very similar to Type I, but the midden accumulation is only semicircular. Only two pits of this type have been noted: one in Val Verde County, Texas (41 VV 260; Greer and Peterson 1964), and one in Carlsbad Caverns National Park, New Mexico. The opening, in both cases, faces approximately east, and the open side of each depression has a slight border of scattered rock. The midden in both cases is about 2.5 feet high and has an outside diameter of 25 to 35 feet.

Type III (Fig. 2b) is simply a shallow pit dug into the ground. Scattered stones border the depression, but no midden accumulation or mound accompanies the pit. The pit size ranges from 3 to 12 feet in diameter. One pit of this type has been noted in Carlsbad Caverns National

Park in a small group with a Type II mescal pit and a Type IA midden circle. Others have been reported from the area of El Rosario, Baja California (R. G. Vivian, personal communication).

Type IV (Fig. 2a) mescal pits generally conform to Type I, but occur only inside or in the mouths of rockshelters and caves. The pit diameter ranges from 10 to 20 feet, but may be slightly larger as a few are up to 30 feet in diameter and 3 feet deep. Fire-cracked rock and ash have been thrown back from the pit in a circular fashion, but these accumulations seldom occur in a mounded form, certainly not over one foot high. Location within the shelter is extremely variable, although they are usually found toward the front in a fairly deep deposit. The pits may also occur next to one of the shelter walls. Type IV pits have been reported from numerous sites in northern Mexico (Taylor, personal communication), western Texas (Coffin 1932; Pearce and Jackson 1933; Thomas 1933), and southern New Mexico (Ferdon 1946). Ferdon dates a Type IV mescal pit in a rockshelter in Eddy County, New Mexico, at about A.D. 1250 to 1300. This date is based on the presence of Lincoln Black-on-red and Chupadero Black-on-white.

Type V is large conical pits about 6 to 10 feet in diameter and 8 feet deep. At present these seem to be limited to the Hohokam areas. This type has two forms, which differ mainly in the degree of preparation of the pit walls.

Form A is a large pit (Fig. 2c) that has been reported by Charles C. DiPeso (personal communication) from recent excavations at Casas Grandes, Chihuahua, by the Amerind Foundation. He states, "During the course of excavation of Casas Grandes (Chihuahua:D:9:1), we opened five large mescal pits. All of them had these features in common: the sides of the pits were lined with rock set in a mortar, heavily fire-fractured; in cross-section the pits were conical in shape, having a base diameter of some 1.75 m.; they averaged 4 m. in width at the mouth and approximately 2.5 m. in depth." Although the phase to which the pits are to be assigned is uncertain at present, the site as a whole was occupied from A.D. 1000 to 1650. A complete report on the site is presently in preparation by DiPeso and his associates.

Concerning Form B, W. W. Wasley (personal communication) states that during recent excavation at Snaketown, in southern Arizona, numerous conical pits were found, ranging throughout the cultural sequence. These pits were about 6 to 8 feet deep and 6 to 8 feet in diameter at the top. The sides were unlined, and some walls still had the marks of the digging sticks. Conical roasting pits of this type are said to be present throughout the Hohokam region.

Type VI (Fig. 2d) is a type most commonly referred to in modern literature as a "mescal pit." These are found over most of the southwest and surrounding areas to the south and east. These are slab-lined pits, 2.5 to 3 feet in diameter and 3 to 3.5 feet deep. The walls are straight and slightly slanted, and the bottoms are slightly rounded. Ashes or small bits of charcoal are rarely found at the bottoms of these pits. Burned rocks surrounding the pits are uncommon and are never mounded. In some areas of northern Chihuahua, this type of pit is used to make an intoxicating drink and a type of candy from mescal.

ETHNOGRAPHIC DISCUSSION

Some mention should be made of the function of the mescal pits and midden circles. As was just mentioned, some pits in the Fort Apache region were used to prepare an intoxicating drink from the mescal bulbs at the base of the upper leaves (Reagan 1930). Reagan's description of these corresponds to the Type I mescal pit. The use of the mescal drink continues into northern Chihuahua in the use of the smaller Type VI mescal pits, which have no midden accumulation surrounding them.

Walter W. Taylor (personal communication) describes the commercial preparation of an intoxicating drink from the bulb of the sotol plant, which is quite similar to mescal but has a much narrower leaf. Taylor's work was in the dry, hilly region of central Coahuila. Here, small groups of five to ten men travel to an area of abundant sotol. While most of the men gather the bulbs, others work to prepare a pit for roasting. The sotol is cooked completely covered in this pit for a considerable period of time. The pit is then opened and the bulbs put into an old screw-type press, which is transported about on a small wagon by burros. The sugary juices are extracted and collected into containers to be sold later to a central agency. The pit is repeatedly used while the crew is in one area. When abandoned, the pit easily conforms to the Type I mescal pit and the surface features are identical to the Type IB midden circles.

No doubt, the practice of making a drink from the bulbs of mescal or sotol was very wide-spread. I have long thought that at least many of the so-called mortar holes, which are occasionally adjacent to midden sites, especially in western Texas, were used as containers for a liquid, rather than the grinding of plant parts as a primary purpose. The average man could not touch the bottom of some of these holes with his arm. At one site in Val Verde County, Texas, mortar holes which are close together (6 to 10 inches) are connected by a small trough about one inch wide and deep (Fig. 11). It seems probable that these holes in the limestone boulders once were filled with some sort of liquid that may have been allowed to

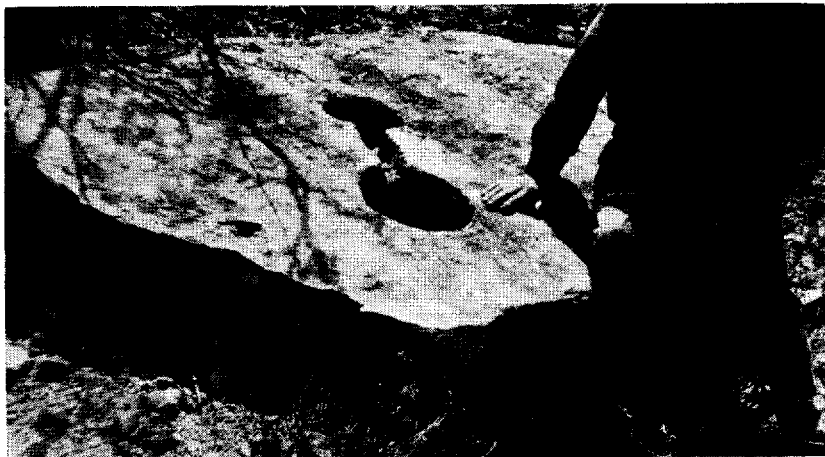


FIGURE 11. Mortar holes connected by a small trough, possibly used in the preparation of a drink from sotol, Val Verde County, Texas.

pass from one hole to another, possibly to remove impurities, such as small amounts of fibers and leaf parts. Future studies should consider the possibilities of the relationship between mortar holes and the preparation of mescal and sotol.

Probably the primary purpose of the pits was the preparation of mescal and sotol for food; that is, the bulbs were cooked and eaten. Hough (1959: 846) gives the following description of mescal pits and the procedures of cooking mescal or maguey:

It was roasted in pit ovens and became a sweet and nutritious food among the Indians of the states on both sides of the Mexican boundary. Mescal pits are usually circular depressions in the ground, 6 to 20 feet in circumference, sloping evenly to the center, a foot to 3 feet in depth, and lined with coarse gravel. A fire was built in the pit, raked out after the stones had become hot, and the mescal plants put in and covered with grass. After two days' steaming the pile was opened and the mescal was ready for consumption.

Buckelew (1911:72-3) described the preparation of sotol bulbs for food in a subsurface pit by a group of Lipan Apaches somewhere near the Pecos(?) River in western Texas. The pit here described would probably conform to the Type I mescal pit, as do most ethnographically recorded earth ovens.

In preparation of this plant for food, large quantities of the bulbs were gathered and collected in a place suitable for a large kiln. A large circular hole was then dug three or four feet deep and several feet in diameter. In this hole they would place a large pile of wood and rock in such a way that the rocks would become thoroughly heated by the time the wood was consumed. The rocks were then replaced in such a way that the soto [sotol] could be placed on and around them. When this was completed, brush and leaves were placed next to the soto, and the entire heap covered over with dirt so as to make it air tight. This was allowed to remain several days during which time the heat from the rocks would penetrate the soto, and thoroughly cook it. When satisfied that the contents were thoroughly cooked they would remove the dirt and leaves, exposing a glistening white heap of crisp soto. The bulbs were then spread out in the sun where they could dry. When perfectly dry, the flakes or thin layers would separate easily. This completed, the task of preparing it for food was just begun, as it was necessary to make large holes in rocks or logs in which the soto was placed when it was beaten and ground by large wooden pestles until it resembled white flour. This flour was then mixed with water and made into small cakes and baked in the ashes and embers of a fire.

In a discussion of the White Mountain and San Carlos Apache groups of east-central Arizona, Reagan (1930:293) discusses mescal as follows:

In gathering and preparing mescal tubers (mescal or maguey plant is a cousin of the century plant and has a very large beet-like root), the women go in a company to the hills where it grows, the best place being in the break-country east of Canyon and Oak creeks. Here they camp and proceed to the hills to collect the tubers. Usually six or eight women are in the group. It takes them about two days to collect a ton of tubers and carry them to the camp (the beet-like root being gathered just before the stem is run up by nature to go to seed). When enough are gathered, a large pit is dug and filled

with dry wood, on which a large quantity of stones is piled. The wood is then ignited and when it burns down to live coals and the stones to a white heat, wet twigs, rushes or flags are quickly placed on them to a thickness of about a foot. The mescal roots are then hurled on the smoking mass, wet grass and twigs placed over them, and then all the whole is snugly covered with a foot or more of earth. A fire is then kindled over this pile and kept burning. The cooking continues for about twenty-four hours. The pit is then opened and the tubers taken out and packed on burros or carried by the women to their homes where they are stored for future use. They taste like squash, except that they have a slightly burned tinge.

Reagan (1930:292) also describes a similar preparation for corn:

At corn husking time, the green corn is gathered and thrown into a separate pile. When the field is all gathered and husked, a pit is dug and a large quantity of wood thrown into it. On this, stones are piled. The wood is then ignited. When it has burned down to the live coal stage, the wet grass, twigs or cornhusks are piled in and then the green corn with the shucks on is hurriedly thrown on. The corn is covered with more wet grass or corn fodder and about six inches of dirt is heaped over the pile. Just before closing in the top a quantity of water is poured in, to make steam. The cooking process is then allowed to take its course for twenty-four hours, when the dirt is removed and the corn taken out. The husks are then stripped and tied together and the corn hung out to dry on the cob. When dried it is shelled and stored in large storage baskets or jugs for use when needed. The abandoned pit is left as sort of a mound for the speculation of future generations.

A similar description for the Havasupai of northwestern Arizona is given by Spier (1928:105-6) in quite detailed form:

Mescal (the agave plant), which grows on the canyon benches, is ripe in May when the flower stalk is 30 to 60 cm. tall. The plant is severed entire by pounding a chisel-shaped buckthorn stick about 1 m. long, 3 cm. diameter, against its base. The outside leaves of the inverted plant are trimmed of their green portion with a special hatchet. This consists of a broad stone blade set in a slot midway in the length of a short handle, 30 cm. long, (sometimes of piñon wood), where it is held fast with glue or pitch and by lashings. A load of thirty or forty plants is carried home. A pit 1.5 m. in diameter, but of lesser depth is dug in sandy soil, not in gravel, else the steam would escape. Green or dry brush of any description is piled into the hole to the height of a meter above the ground; the uppermost brush must be dry. Stones the size of one's fist are spread over this to a depth of 10 cm. The pile is fired early in the morning before sunrise. After three or four hours, when the wood is nearly consumed and the stones are red hot, several men (not women because of danger from the flames) pound on the pile to reduce it level with the surface of the ground (?). Meanwhile women pile the mescal all around the pit to have it conveniently at hand. The pit is apportioned in sectors among several people; when the mescal is put in it, some plants are stood on edge to mark these divisions, the others are then packed indiscriminately in between. Long green grass, gathered by the women at the time the fire was started, is first carefully arranged over the plants, and then piled in to a depth of 5 cm. This is then covered with a layer of dirt, 15 cm. deep. It is now 8 or 9 a.m., depending on the quantity of plants. Forty-eight hours later the pit is opened, and

grass spread over a convenient space to receive the roasted mescal. The leaves of the roasted mescal may either be chewed at once to obtain the pulp and juice, or they may be mashed and spread in a thin layer on an arrow reed mat to dry. When half dried, the fibrous layer is turned over to dry further. While it is still flexible, one edge is folded back and the opposite edge folded over to meet the crease. This preparation will keep indefinitely; it is soaked in cold water for an hour to make a sweet drink.

The distribution of earth ovens used in connection with the preparation of mescal during historic times has been discussed by various people. Probably the most prominent groups which prepared mescal in pits were the Mescalero (Schroeder 1960) and other Apache groups (Reagan 1930; Opler 1941), and probably the Navajo (David M. Brugge, personal communication, from Navajo informants). Spier (1928:119) states the following:

Mescal (agave) is gathered and roasted in pits by most, if not all, the non-Puebloan peoples and perhaps by the Pueblo and Mexican tribes as well. It is an item of some importance for the Jicarilla, Mescalero, White Mountain and San Carlos Apache, Navajo, Havasupai, Paiute, Yavapai, Pima, Cahuilla, and Huichol.

Beals (1932:164) includes the following additional tribes: Cochimi, Sonora, Sinaloa, Culiacan, Concho, and Jumano. He also reports the use of pit ovens for agave in the Mexican states of Nuevo Leon, Jalisco, and Mexico.

Besides the uses of agave and similar plants for food and beverage, Spier (1928:106) mentions another use of mescal in relation to the pit ovens of the Havasupai. These people make a paint by boiling the rocks at the bottom of the pit to remove the dried mescal juices which covered the stones during the roasting. Red paint is added to this juice and the mixture boiled until it reaches a doughy consistency. It is then rolled into a small ball, which may be used as a crayon or mixed with water to form a liquid paint.

References show that similar pits were dug and used as cooking pits for many additional types of food, both plant and animal (Spier 1928; Reagan 1930; Opler 1941). Pit cooking techniques continue into recent times, as ranchers, at least in Val Verde County, Texas, occasionally cook animal heads in this manner (W. H. Baker, personal communication), as did various Apache groups (Opler 1941). The use of earth ovens and preparation of foods in a pit are by no means restricted to the area included in this paper, but are, rather, world-wide occurrences. Some day, perhaps, an overall study of this type of site will be made, comparing sites and techniques of use from all areas.

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ERRATA

"A Morphology of Scrapers and their Methods of Production," by Kenneth Honea, *Southwestern Lore*, Vol. 31, No. 2, September 1965 contains the following errors:

Page 32, fourth line from bottom of page: "well-shaped" should read "shell-shaped."

Page 39, lines 13 and 14: "The long-axis of these edges is at an angle of 25- to 45-degrees to bladelet long-axis (Z-Z)" should read "2. The long-axis of these edges (Y-Y) is parallel to the flake (blade, bladelet) long-axis (Z-Z)."