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# Prehistoric Use of Rock-Lined Cache Pits: California Deserts and Southwest

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cache *n* [F, hiding place . . .] 1 **a** : a hiding place, *esp* : one used by settlers, explorers, or campers for concealing and preserving provisions or implements **b** : a secure place of storage 2 **a** : something that is hidden or stored in a cache. . . .

*Webster's Third New International Dictionary  
of the English Language, Unabridged, 1986*

**T**HIS paper reports subterranean, or subfloor, rock-lined cache pits built in sheltered places by aboriginal peoples in the California deserts. These features have received almost no attention in California because excavations traditionally have emphasized the recovery and analysis of portable artifacts. Studies in which nonportable structural features of any kind have been discovered, exposed, and systematically investigated in California are few. Failure to more consistently investigate nonportable facilities has hindered interpretation of the archaeological record in the desert region.

The purposes of this paper are: (1) to discuss the organizational strategies of hunter-gatherers that are likely to have resulted in the construction and use of rock-lined cache pits; (2) to determine if possible whether, in hunter-gatherer contexts, food, equipment, or raw material likely would have been stored in such cache pits; (3) to report a group of rock-lined cache pits discovered in excavations at Indian Hill Rockshelter in southeastern California; (4) to review the reported occurrence of similar features elsewhere from the California deserts; and (5) to compare and contrast the use of rock-lined cache pits in the California deserts with that in Southwestern contexts, primarily on the Colorado

Plateau; and (6) to suggest how and why caching technology may have changed over time.

## CACHING IN HUNTER-GATHERER CONTEXTS

Any discussion of caching behavior in hunter-gatherer contexts in the California deserts must recognize different kinds of organizational strategies, different kinds of caches, and the potential for identifying evidence of caching in the archaeological record. Published accounts lead us to conclude that caches were used by hunter-gatherers to store foodstuffs, equipment, and sometimes raw materials. Current literature recognizes "tool caches" and "resource caches." The term "resource cache" often is applied to caches of foodstuffs (Binford 1980). Unfortunately, such terminology is confusing in that it fails to differentiate between the caching of foodstuffs, which often are available only on a seasonal basis, and the caching of raw materials such as tool stone. Unless access to tool stone was restricted by snow or other adverse conditions, caches of such material likely would have little or no implication for seasonality. We use the terms "food cache," "equipment cache," and "raw material cache" to differentiate these concepts.

*Food caches* generally required some specialized context, structure, or container to minimize loss due to moisture, fungi, insects, or rodents. Review of the Southwestern literature suggests that in more nomadic

hunter-gatherer contexts (Archaic and Basketmaker II) caching often involved concealing food supplies below living surfaces in sheltered settings. The practice may have been particularly common along territorial boundaries where different groups might have camped at the same spot. Among more settled, food-producing groups such as in the later periods of the Anasazi tradition, food storage often was done in special above-ground rooms and was less concerned with concealment or secrecy.

*Equipment caches* are expected to have differed from food caches. Caching equipment, even that of a perishable nature, generally imposed fewer requirements than caching foodstuffs. Most important was that the equipment remain dry. Other items of equipment, the "site furniture" left on-site, also must be considered. We discuss such "public" furniture below and contrast it with "personal" equipment actually stored in caches.

We believe *raw material caches* most often were used in areas where highly desired, expendable commodities such as obsidian were obtained, field processed, and traded. Use of caches apparently varied between populations that were mostly sedentary or semisedentary (often relying on part-time horticulture) and more nomadic people who practiced little or no horticulture. This distinction, however, is by no means clear.

### **Models of Hunter-Gatherer Organizational Strategy**

The circumstances under which hunter-gatherers cached food and equipment in antiquity are thought to have been intimately entwined in the configuration and working of their overall *organizational strategy*. By this we mean the full range of choices and decisions that together configure the settlement and subsistence adaptation of a group. Observa-

tions of remnant hunter-gatherer populations have provided some information for conceptualizing these complex situations.

Binford (1980) recognized two extreme expressions of hunter-gatherer organizational strategy. On the one hand are groups that tend toward sedentism, send out task groups to acquire food resources, and are heavily involved in food caching; these groups follow what is called a *collector* strategy. This adaptation contrasts with what is termed a *forager* strategy typical of more nomadic groups that practice little food storage but move from one resource area to another. These are seen as idealized extremes of the ways aboriginal peoples traded off their residential pattern against the uneven distribution of food resources in time and space.

We discuss the idealized collector/forager concepts with reference to aboriginal California desert populations. Some of the ethnographic California groups and the prehistoric Southwestern groups derived part of their sustenance from horticulture; Binford's collector/forager model is derived from hunter-gatherers that relied not at all on horticulture. We believe the collector/forager model is relevant anyway, and it is in fact the only model available. Probably most or all hunter-gatherers manipulated their environments to one extent or another, and horticulture is one form of environmental manipulation. The highly varied degree of environmental manipulation present at the Archaic-Formative interface would be difficult to characterize. The important point is not that environmental manipulation occurred to one extent or another, but that storage needs existed, at least seasonally, regardless of the organizational strategy of the group in question (cf. Testart 1982).

**Food Caching by Collectors.** The term "collector" is applied to hunter-gatherer

organizational strategies in which there is a certain degree of residential stability. The strategy involves permanent villages or use of one to several residential sites between which people regularly moved during the year. Instead of identifying productive resource zones and moving *en masse* to them, collectors sent out "logistically organized" task groups to acquire the resources and bring them home. Such groups likely took highly task-specific equipment kits with them, made use of site furniture at their short-term resource exploitation camps (field camps), and acquired the resources in brief but often vigorous campaigns. The need to work quickly often was dictated by the seasonal nature of the resources. Indian ricegrass (*Oryzopsis hymenoides*), for example, ripens on the Mojave Desert in a brief period of about two weeks beginning in late May. Successful harvests of such resources necessitated concerted effort. Rather than cache food afield, groups characterized by a collector strategy generally brought it home to their group residential base and stored it there. In such settings, the regular site of the food cache was the site of residence for at least part of the year. The food was stored in a safe and visually obvious manner; it was not hidden.

Binford (1980) attempted to correlate food caching with effective temperature. The correlation was poorly conceived: in many tropical areas, storage is hampered by humidity and spoilage, while in the high latitudes meat and fish (the standard fare) traditionally are dried and frozen. We think food caching correlates better with settings in which the availability of key resources fluctuates between periods of abundance and periods of scarcity, and in which storage is, after all, possible.

Like the Northwest Coast, much of aboriginal California was one of the unique

areas of the world that supported large, dense populations of generally sedentary hunter-gatherers. The part-time horticultural and fully sedentary Cahuilla of the Coachella Valley (the northern Salton Basin; Strong 1929; Bean 1978) provide an ethnographic example of this strategy. Although part-time cultivators, they also were collectors in the fullest sense of the term. A generally similar but somewhat less stable adaptation characterized the Cocopah (Alvarez de Williams 1983), Quechan (Bee 1983), and Mohave (Stewart 1983) of the Lower Colorado River. All of these groups relied on horticulture for perhaps at least one-third of their sustenance and lived in established villages. The ethnographic Kamia (Kumeyaay, Tipai; Gifford 1931; Luomala 1978) of the southern half of the Salton Basin had a more ephemeral adaptation. Their farming endeavors frequently were disrupted by inadequate water for irrigation. At such times it is believed they took up residence with their linguistic kin on the Lower Colorado, or became more nomadic and relied fully on hunting and gathering in the desert and mountains to the west (in effect, adopting a forager strategy; Heintzelman 1857). These examples of sedentary or semisedentary hunter-gatherer adaptation in southeastern California may have existed for 1,000 years or more.

All of these southeastern California tribes made extensive use of woven-brush, above-ground granaries for storage of mesquite (*Prosopis juliflora*, *P. pubescens*) beans and horticultural produce (cf. Bean 1978: Figs. 4-5). The granaries were located in the village. These caches did not secret anything away (the first definition of the term "cache" given at the beginning of this paper), but they were secure places of storage (the second definition). They kept the contents dry and readily at hand. Sealed ceramic ollas also were used to store foodstuffs and were placed inside or

atop houses. Storing substantial portions of wild plant harvests or agricultural crops in this manner helped to buffer lean periods that resulted from the strongly seasonal nature of important vegetal staples.

Sealed ollas containing mesquite beans (Swenson 1984) and grass (*Panicum urvilleanum*) seeds (Bean and Saubel 1972:99) also have been recovered where they were cached in canyons near permanently occupied villages. They are believed to have been hoarded, out of sight and public awareness, insurance for use in cases of emergency, when sharing may not have seemed a good idea. A jar containing parcels of agricultural seeds was reported from the mountains of San Diego County by Treganza (1947) and illustrates another aspect of caching by part-time horticultural tribes engaged in an apparent collector strategy.

The extent to which large quantities of foodstuffs were stored at field camps in gathering areas away from villages is not known, but the practice is thought to have been little emphasized. If practiced, it may have been insurance against expected future demands on available food supplies.

Equipment storage by collectors is less well known, but we believe that most gear was stored at home and that sanctions limited access to, and use of, personal equipment. Specialized equipment used for harvesting distant food resources (such as poles and hooks for harvesting pine nuts) was left afield where needed (e.g., Bettinger 1989:81-83). Equipment depots of this kind are discussed below.

Of food caches, ceramic ollas hidden away in rock crevices and small shelters would be the most readily recoverable archaeologically and the most readily recognizable as actual caches. We would expect them to be uncommon occurrences at field camps or other locations far distant from residential

sites. The woven platform granaries at residential sites would leave little recognizable evidence in the archaeological record.

**Food Caching by Foragers.** The term "forager" is applied to hunter-gatherers who moved about the landscape identifying exploitable food resources, mapping onto those resources, and seasonally moving the base camp to the place where the resources occurred. Food was obtained on a daily basis on short foraging loops from the base camp. Residence lasted as long as the resources held out or until other resources became available elsewhere. Foraging peoples probably were more keyed into the location and timing of food resources than any other hunter-gatherers in prehistory. They knew where, when, and how to get food; had they not, such groups would have gone extinct, or at least gone hungry, with their first major error in subsistence planning.

Ethnoarchaeological studies (Binford 1980) suggest that caching of foodstuffs by foragers was discouraged because of the constant need to move the base camp; it merely exacerbated the already uneven distribution of resources in time and space. Caching in such contexts ensured that the food would be where the people were not, and someone would have to go back and get it later. Caching of food would have been favored, however, if the foraging group intended to loop back and reoccupy the base camp for another purpose later in the season (cf. Binford 1982). In such cases, stored foods could augment those obtained on a subsequent visit. Concealment, such as in a rock-lined cache pit in a rockshelter, may have been important if the site was expected to be used by other groups during the interim. Such joint use of sites by two or more groups may have occurred in areas where water sources were few.

Nomadic hunter-gatherers following a forager strategy occupied most of the

California desert region in ethnographic times. These groups included the Panamint Shoshoni (Steward 1938; Thomas et al. 1986), Kawaiisu (Zigmond 1986), and Southern Paiute-Chemehuevi (Kelly and Fowler 1986), and they typified a lifeway common to almost the entire desert area for thousands of years.

Little specific information is available on the caching behavior of California desert foragers. What information is available suggests that they adopted a collector strategy when resources were abundant and then regularly cached food. They cached autumn resources such as pine (*Pinus monophylla*) nuts collected to sustain the group over winter. At such times, the forager strategy definitely was abandoned. Steward (1938:27) reported that a single family might harvest at least 450 kg. of pine nuts in a good year. Storage on this scale meant that people often were compelled to spend the winter at or near the place of storage. If a decision was made to remain in the mountains where the nuts were gathered, the field camp became the winter village. Often, however, the winter village was located some distance away, preferably at a lower elevation that offered a more favorable climate and other amenities. In such cases, some of the nuts were transported to the village and the remainder were cached where collected.

Descriptions of pine nut caches vary according to region and author, and are sketchy at best. Some accounts say the cones or nuts were buried in the ground and covered with grass and rocks; others suggest they were buried but not in a pit; still others suggest they were cached and covered with brush and earth within a circle of rocks (cf. Hoffman 1878:473; Steward 1933:242, 1938:73, 1941:332). All agree the caching occurred outdoors in the pinyon groves, rather than in rockshelters. A thorough and systematic study of such caches has not been accomplished, but

they should leave a conspicuous and decipherable record on the landscape.

**Site Furniture vs. Equipment Caches.** Important resources often were located in zones distant from residential sites, and specialized tool kits may have been required for collecting and processing such resources. Depositing resource-specific equipment at the place it was used may have been an integral part of hunter-gatherer existence regardless of the overall organizational strategy of the group. Whether such equipment depots should be considered caches, or whether they should be considered site furniture (Binford 1979:263-264) must be considered.

**Site Furniture.** Field gear, such as pinyon hooks and poles, seemingly would have required little maintenance and special care, and would have been of little value for anything but harvesting pine nuts. Pinyon harvesting gear would have been left, usually in trees, where last used. Pointed or chisel-ended hardwood poles for extracting agave hearts (Bean and Saubel 1972:34, 168) would have been useful for little else, and likely would have been left near where agave was obtained.

We have observed large block millings stones left in plain view as site furniture on the surface in patches of wild bunchgrass at various locations in southern and western Nevada and eastern California. These millings stones mark the resource patch and also the field camp or work area from which the resource was harvested. Elsewhere in the same region we have seen similar millings stones around ephemeral ponds or lakes, perhaps left there as site furniture to be used when aquatic resources (useful plants, brine shrimp, waterfowl?) appeared at irregular intervals. Equipment of this nature likely would have been available for use by anyone in the group. The place it was left thus would not have been secret, and the equipment

would have been used on subsequent visits to harvest the same resources. Such equipment would have been too heavy to carry away readily and almost indestructible anyway if someone else chanced upon it and used it.

Because site furniture (millingstones, hearths, etc.) often tended to consist of large objects or facilities that remained at the site, anyone who used the place was likely to bring them into service. The situation can be described no more clearly than thus: "Upon arrival at a known site, one generally searches for the 'furniture' and pulls it 'up' out of its matrix for reuse. This means that large items of site furniture get continuously translated 'upward' if a deposit is forming" (Binford 1979:263-264; cf. House and Schiffer 1975:174; Baker 1978). A distinction must be made, however, between *visible site furniture* that is publicly accessible, and *concealed site furnishings* (such as cache pits) not intended for use by others.

**Equipment Caches.** Highly specialized and maintained personal equipment such as snare or trap bundles of the kind found at Ord Shelter, San Bernardino County, California (Echlin et al. 1981), many similar examples reported by Janetski (1979) from across the American West, and a cache of deadfall triggers from Fortymile Canyon, Nye County, Nevada (Lockett 1988), are examples of equipment caches. Hidden equipment of this nature would have been retrieved from the cache and put to use only by the person that owned and cached it. The place of concealment would not have been generally known, and such gear would enter the archaeological record upon the death of its owner.

A cache of basketry, ceramic, and metal containers was reported by King (1976) from Joshua Tree National Monument. This equipment cache was secreted in a small rockshelter. Whether it represents the activities of foragers, who left it for use on a

subsequent trip to the same area, or whether it represents a field camp of collectors, cannot be determined on the basis of available information. Whatever the case, the equipment appears to be of too specialized and personal a nature to be considered site furniture.

In few or no cases involving equipment of these kinds do we believe specialized caching or storage pits would have been used. Highly cared-for personal equipment would have been hidden away where it was safe; site furniture would have been given only the necessary care to ensure its presence the next time it was needed. Put another way, personal equipment was cached (hidden); site furniture simply was abandoned (left on-site).

**Assessment of Existing Models.** The models of hunter-gatherer organizational strategy discussed with reference to aboriginal life in the California deserts were derived largely from observations on remnant hunter-gatherer populations in various parts of the world. In no case was the group being studied as residentially stable as those we have characterized as collectors in southeastern California, nor were they part-time horticulturalists. The models are idealized extremes that are of limited value to characterize the actual range of variation in aboriginal settlement and subsistence behavior in the California deserts. They tend to characterize extremes beyond the actual range of variation displayed by any group. Many ethnographic groups that were primarily foragers employed a combination of the two strategies, or switched from one strategy to the other and back again as circumstances changed, even in the course of a single year. Their organizational strategy therefore changed, and in some cases they may have occupied the same site more than once in a given year, each time with different agendas (Binford 1982). The models are heuristic devices that we employ

to force us to consider the nature of hunter-gatherer organization and how it might help us characterize site function. When used in that way, they are useful; they simply cannot be taken too seriously or they lose their intended utility.

Construction of better theoretical models is necessary for understanding the role and significance of food caches and the full range of food caching behavior in prehistory, and using such insights for anticipating other aspects of the archaeological record. Improved models will come from reanalysis of ethnographic accounts and from additional ethnoarchaeological observations, but the real contribution must come from carefully collected data from prehistoric contexts. All hunter-gatherers probably manipulated their environments to one degree or another. Horticulture is merely one form of environmental manipulation, and it is an integral part of prehistoric cultural adaptations on parts of the Colorado Plateau, where during early Anasazi times extensive use was made of rock-lined cache pits that apparently were concealed in rockshelters. Models that attempt to explain caching behavior should therefore not be limited strictly to nonhorticultural hunter-gatherers, or they become even less useful for broad application to understanding prehistoric adaptations in the California deserts, the Southwest, and elsewhere.

#### ROCK-LINED CACHE PITS IN THE CALIFORNIA DESERTS

Rock-lined cache pits have been reported occasionally in various parts of the California deserts. A brief review of the evidence is presented here, followed by comparative notes on similar structures in the Southwest.

##### Indian Hill Rockshelter

Indian Hill Rockshelter (CA-SDI-2537) is

a large overhang in Anza-Borrego Desert State Park of southeastern California (Fig. 1). This region lies in ethnographic Kamia territory on the eastern slope of the Peninsular Ranges and west of the Imperial Valley just north of the international border. Elevations in the desert range from below sea level to over 1,000 m. To the west, the Peninsular Range rises to nearly 2,000 m.

Extensive excavations (Wilke et al. 1986; McDonald, in preparation) disclosed that aboriginal use of Indian Hill Rockshelter probably began as early as 5,000 years ago. Fairly continuous but nonintensive use of the site occurred into the historic period. Although ethnographic records for the region document irrigation of crops by the Kamia (Kumeyaay) at nearby Jacumba, higher in the mountains to the southwest (Gifford 1931), no evidence of horticulture was found in the excavations. All available evidence recovered from the shelter suggests a nonhorticultural, hunter-gatherer adaptation, although it is recognized that the same group(s) that used the shelter may have been involved in horticultural pursuits elsewhere in their seasonal round, at least in very recent times.

The archaeological deposit is nearly two meters deep. The artifact assemblage includes abundant manos and metates, projectile points, hammerstones, and debitage. The assemblage suggests use of the shelter by groups engaged in hunting and plant gathering, but industries such as basketry and skinworking are poorly represented. In short, the assemblage suggests the activities of task groups, not the residue of daily living. Excavations were conducted both within the shelter (behind the dripline) and in the exposed area to the front. Rock-lined cache pits or cists were encountered throughout the lower levels of the deposit, but only in the sheltered area behind the dripline. The upper levels (approximately the upper 45 cm.)<sup>1</sup>



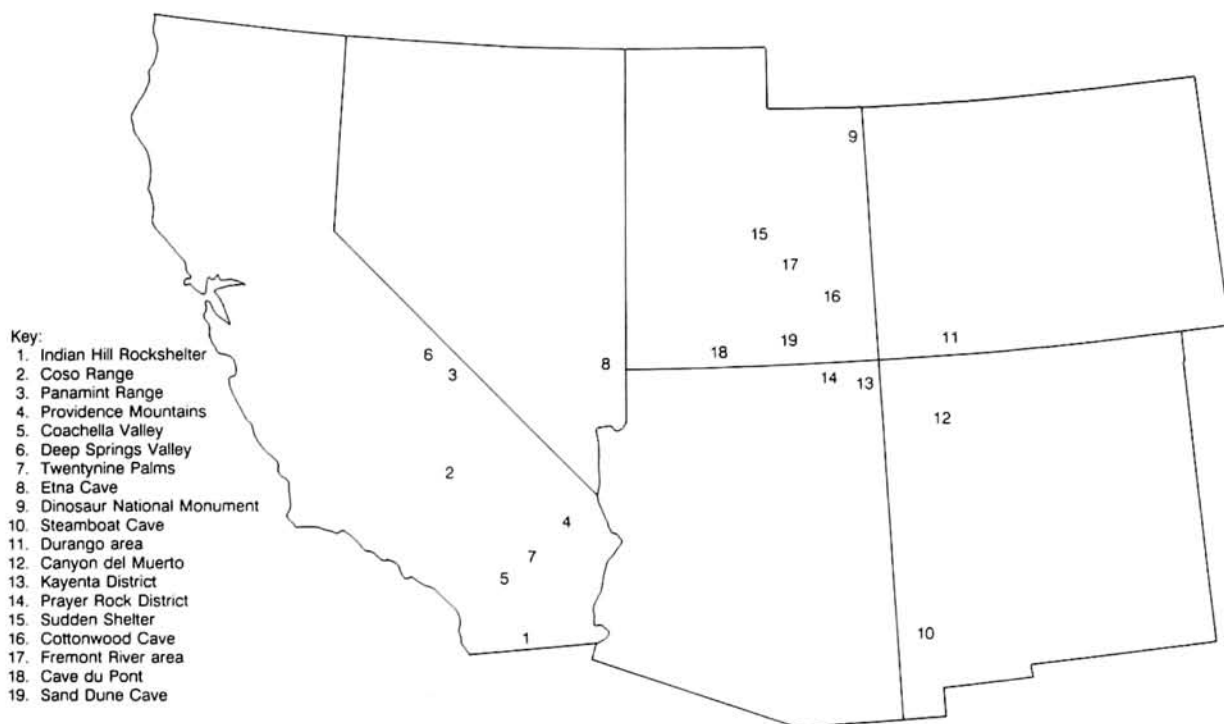


Fig. 1. Locations of sites and areas with rock-lined cache pits in the California deserts and in the Southwest. The case for Etna Cave, Nevada, is not clear, and the structures at Sudden Shelter and Sand Dune Cave, Utah, are reported to be slab-lined hearths (but see note 3).

contain little evidence of cache pits, but instead contain ceramic sherds. Although radiocarbon analyses are still in progress, we anticipate that the levels containing abundant ceramics span no more than the last 1,000 years.

Eleven rock-lined cache pits were exposed in the sandy deposits at Indian Hill Rockshelter. None of these was covered (i.e., sealed, or roofed over); all had been opened and emptied of their contents in antiquity (Figs. 2, 3). Thus, what remained of many of the cache pits were the rock-lined or paved floors and some portions of the rock-lined walls. For this reason, no complete measurements for diameter, depth, or volume are meaningful. Several other features also may have been cache pits, but were lacking enough structural detail to be certain; these were recorded as "rock clusters." No evidence of

burning was found, so the features were not hearths. Three general methods of construction were noted during excavation: overlapping slabs; slabs placed in a mosaic fashion; and large, irregular rocks and/or millstone fragments, sometimes chinked with smaller rocks.

Several of the cache pits were made entirely of flat slabs of quartz diorite that evidently had fallen from the ceiling of the shelter. In each case, these tabular rocks were carefully overlapped to make as tight a construction as possible (Fig. 4). Overlapping the rocks presumably would be effective in keeping burrowing animals out of food stores.

Other slab-lined cache pits differed in that the rocks were placed in a mosaic fashion rather than overlapping. No small chinking rocks were noted in any of these features. One of these (Fig. 5) was constructed



Fig. 2. Aerial exposure of a portion of Indian Hill Rockshelter showing rock-lined cache pits in place (excavation in progress, January 1985).

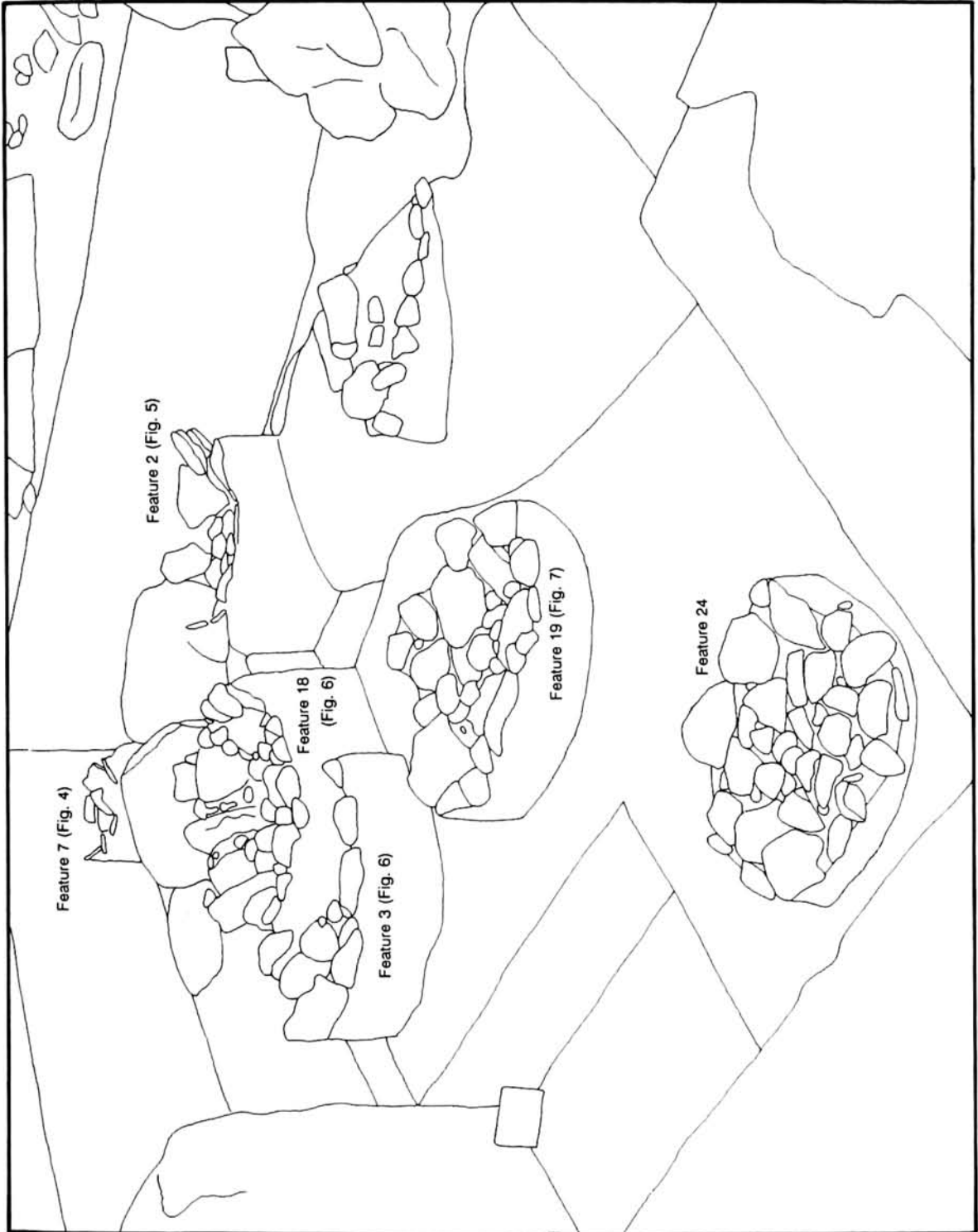


Fig. 3. Schematic of Figure 2 with individual rock-lined cache pits indicated and reference to other figures where appropriate.

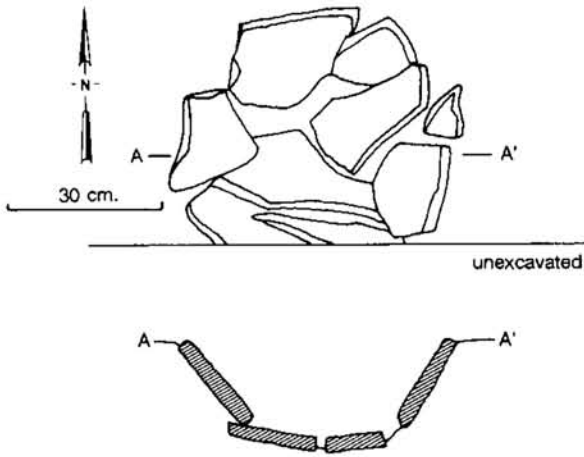


Fig. 4. Feature 7 at Indian Hill Rockshelter. Upper: view west, showing the pit lined with slabs (which apparently fell from the ceiling). Lower: plan and profile of same.

predominantly of tabular rocks and was placed such that two massive boulders were part of the overall construction. Incorporated into its construction were two metate fragments, both of granitic material. The fill of the feature consisted of miscellaneous rocks and soil, a mano and two mano fragments, and one complete unifacial block metate. Some of the milling implements or other rocks from the fill may have been used in its construction.

The majority of the cache pits excavated at Indian Hill Rockshelter were constructed of medium- to large-sized rocks of overall

globular, as opposed to tabular, form. In some cases, smaller rocks were used to chink spaces between the larger rocks (Fig. 6). One cache pit (Fig. 6), constructed of irregularly shaped rocks, lacked any small rocks or

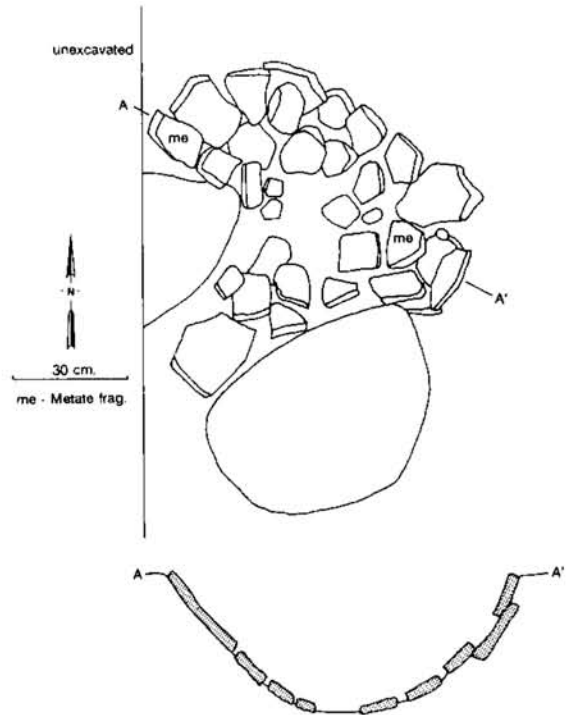


Fig. 5. Feature 2 at Indian Hill Rockshelter. Upper: view southwest, showing the cache pit made of slabs (which apparently fell from the ceiling) and incorporating two large boulders. Lower: plan and profile of same.

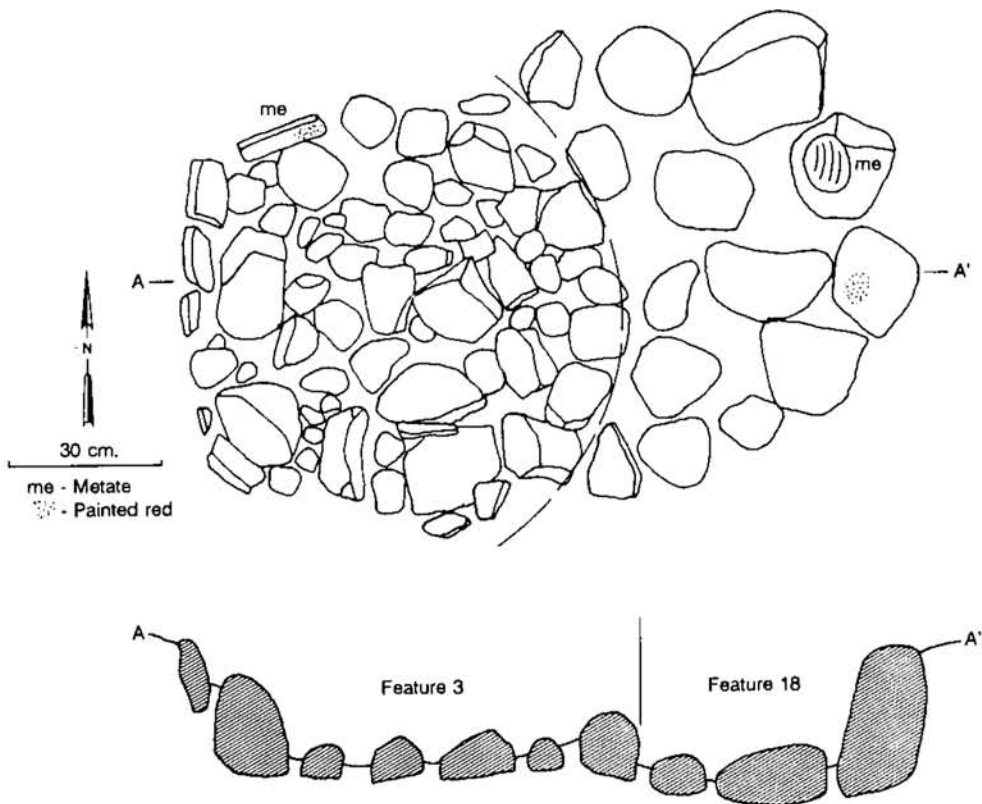
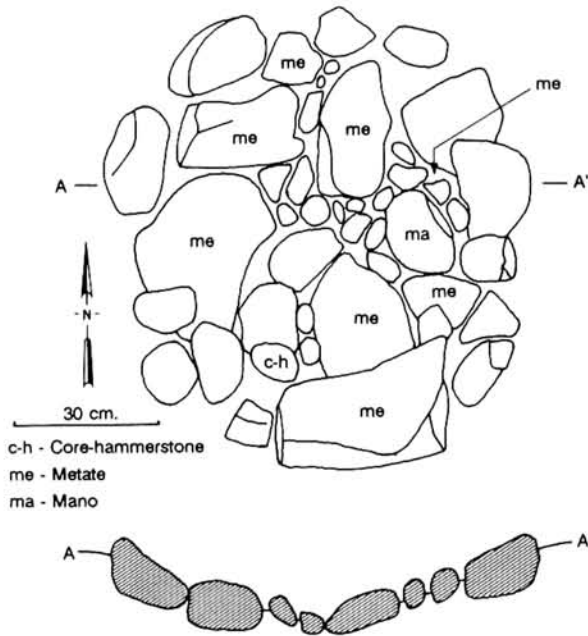


Fig. 6. Features 3 and 18 at Indian Hill Rockshelter. Upper: view south showing Feature 3 (built later) intruding into Feature 18 (built earlier); both constructed mostly of irregular rocks of varying sizes. Lower: plan and profile of same.



chinking, and there were large spaces between the rocks. Some rocks may have been taken from this feature and reused in the construction of the overlapping cache pit or for another purpose. One of the rocks used in the feature is a bifacial block metate; also present was a rock with a patch of red hematite paint.

Feature 19 (Fig. 7) was a well-constructed rock-lined basin. It was fairly shallow and apparently represented the floor of a cache pit. Construction material consisted of about 40 rocks, including one core-hammerstone, nine block metate fragments of granitic material (some more than 30 cm. across), and one unifacial mano. This feature was unique among the cache pits in that it contained so many large metate fragments.

The situation at Indian Hill Rockshelter, then, is one in which rock-lined cache pits were built in sandy matrix using either flat slabs or other rocks, including metate

fragments. Care was taken in some of the cache pits to overlap the slabs used in their construction, and in others to chink interstices between rocks. This suggests attempts to make the structures rodent-proof. We therefore conclude that bags or baskets of foodstuffs, rather than equipment, most likely were stored in these cache pits. We are inclined to classify these cache pits as group-specific, permanent furnishings at Indian Hill Rockshelter. Each cache pit may have been used many times, each time carefully roofed over, perhaps with bunchgrass to keep the sand out, and then rocks, and concealed beneath the sand that formed the floor of the shelter. Concealment may have been considered important in the event other groups used the shelter. We thus interpret the cache pits as more or less "permanent" site furnishings of whatever group used Indian Hill Rockshelter, but not publicly available site furniture.

In all cases the contents of the cache pits had been removed in antiquity. In most cases, only the rock-paved floors of the cache pits remained intact, and most of the rocks that formed the walls were lacking. In some cases large rocks all but filled the cache pits, apparently having been discarded there upon abandonment of the cache. The roofing rocks and wall rocks, which may have extended to near the former ground surface, must have been pulled up out of the site matrix and used elsewhere for the same or another purpose. The ethnographic description of "pulling up" the site furniture (Binford 1979:263-264), or "site furnishings," in this case using it elsewhere at the site for the same or for another purpose, appears to describe the situation at Indian Hill Rockshelter.

The levels from which cache pits are believed to have been dug have few or no ceramic sherds, but ceramics are common in overlying levels. This distribution leads to the

conclusion that ceramic ollas may have replaced rock-lined cache pits after the inception of ceramic technology in the region. Ollas may have been buried in the same sheltered sites that formerly contained rock-lined cache pits.

### Other Reported Examples

Most of the other reported rock-lined cache pits in California appear to date from the late prehistoric period, but the age of the constructions is seldom clear, and seldom have they been found with the contents intact. Examples are known from the Coso Range, Panamint Range, Providence Mountains, Twentynine Palms region, and Coachella Valley.

**Coso Range.** Rock-lined cache pits are reported from two sites, Chapman Rockshelter No. 1 (CA-INY-1534A; Hillebrand 1972) and Resurrection Shelter (CA-INY-2844; Ancient Enterprises 1989). Four rock-lined cache pits were excavated at Chapman Rockshelter No. 1. These cache pits were lined with basalt slabs, and metates were used in the construction of two of them. They ranged from ca. 75 to 95 cm. in diameter and from 45 to 60 cm. in depth. Two of these cache pits contained historic artifacts (wool and cotton cloth, a dynamite cap, etc.); the third was built from a comparable level below the surface (ca. 40 to 45 cm.). Linings in these cache pits included such material as bunchgrass; buckwheat plant parts, Joshua tree fiber, tule matting, and twined basketry. The fourth cache pit possibly may be older, as it was built far below the others, at about 1.2 m. below the present surface. This cache pit was not lined, but contained debitage, a small biface, a slate pendant fragment, a basalt mano, a bone bead, pinyon hulls, and twined basketry.

A large, rock-lined cache pit was partially exposed during test excavations at Resurrec-

tion Shelter on the eastern slope of the Coso Range near Darwin Wash. The maximum diameter of this feature is estimated to be about 2 m., the depth about 40 cm. It was constructed of large, blocky rocks. None of these appeared to be metates, nor was any chinking with smaller rocks noted. The pit was lined with alternate layers of bunchgrass plants and Joshua tree (*Yucca brevifolia*) bark. A covering of rocks was not discernible, but a large pile of rocks just inside the entrance of the shelter and next to this cache pit once may have covered it. Artifacts in and around the cache pit include basket fragments, a remnant of a fiber brush, fiber cordage, pinyon nut shells, fiber cordage wrapped with strips of skin, and painted reed fragments (probable arrowshaft fragments). The shelter is very small, and it may have been used only for storage. Some or all of the artifacts could have found their way into the cache when opened. Since pinyon trees grow several kilometers away at higher elevations, the nut shells apparently did not get into the cache pit accidentally. The available evidence suggests the cache served for storage of pine nuts rather than equipment. A detailed report by the investigators is in progress, and radiocarbon analyses are planned for selected materials from this cache pit (W. T. Eckhardt, personal communication 1989).

Insufficient information is available to make a determination of the organizational strategy of the people that built the cache pits in the Coso Range. Ethnographically, the region was occupied by Panamint Shoshoni, who shifted from a dispersed forager strategy during the spring and summer to a clustered collector strategy during the fall and winter.

**Panamint Range.** Four cache pits were excavated in Coville Rock Shelter (CA-INY-222; Meighan 1953), located in the Panamint Range west of the extreme northern end of Death Valley. The deposits in the back of the

shelter where these features were located reached a maximum depth of about a meter; the levels from which the cache pits were constructed ranged from ca. 25 to 40 cm. below the modern surface. Two were constructed with slabs of dolomite, and then lined with bunchgrass, while the other two were simple pits lined only with grass. The slab-lined pits were built against the back wall of the shelter, incorporating this wall into the construction. None of the pits contained artifacts, but one of the construction rocks had been used as a metate. The dimensions of the two rock-lined cache pits were ca. 90 cm. in diameter and 45 cm. in depth, and 50 cm. in diameter and of shallow depth. Small arrow points, arrow parts, and an arrow shaft straightener were among the artifacts recovered from the deposit, and Meighan (1953:189) conjectured that the shelter may have been used sporadically from about A.D. 1450 to 1750.

Comments concerning the organizational strategy reflected by the data from the Coso Range are appropriate here, and in the Providence Mountains, discussed next.

**Providence Mountains.** Four cache pits were excavated in El Pakiva Cave (part of the Mitchell Caverns, CA-SBR-117), two by Malcolm Farmer and two by L. A. Payen. Details regarding the construction and contents of the pits excavated by Farmer are unknown, but it is believed that they were not rock-lined (Pinto 1989:94-95). Those excavated by Payen were a meter or less in diameter and perhaps 30 cm. deep, and walls and floors were constructed of abutted flat slabs. The bottoms were generally flat, and the walls sloping. Lining consisted of bunchgrass and other plant materials. The cache pits were not covered over by slabs; instead, coverings consisted of *Ephedra* sp., bunchgrass, and other plant materials (L. A. Payen, personal communication 1989). One

pit contained 27 pinyon pine (*Pinus monophylla*) cones, neatly packed, stem side down. The cones still contained nuts. The other cache pit contained a large ball of red ocher in a decomposing leather bag.<sup>2</sup> Structurally, the cache pits excavated by Payen in El Pakiva Cave are a close match with the ones at Indian Hill Rockshelter. The cones in one cache are of unknown significance; it would seem more practical to have cached shelled pine nuts than whole cones. Caching of ocher indicates that occasionally such cache pits were used for raw materials.

**Coachella Valley.** Excavations at Tahquitz Canyon (CA-RIV-45, Locus I) exposed three large rock-lined cache pits beneath a rock overhang. They resemble the cache pits at Indian Hill Rockshelter and appear to have been constructed from levels below those that contained pottery. The site is in ethnographic Cahuilla territory. The organizational strategy of the persons that built and used these cache pits far back in prehistory remains uncharacterized. A detailed report by the investigators is in preparation (Lowell Bean, personal communication 1988).

**Others Briefly Mentioned.** Julian Steward (1933:334) briefly mentioned a "slab-lined cist, about 3 feet diameter and 18 inches deep, debris-filled" in a rockshelter on the west side of Deep Springs Valley (east of Owens Valley in Inyo County, California). Campbell (1931:37) mentioned the use of stone- and grass-lined cache pits in the vicinity of Twentynine Palms, but discussed no specific examples found during her archaeological survey of the region. S. M. Wheeler briefly reported 10 cache pits at Etna Cave near Caliente, Nevada. Although grass linings are mentioned, an illustration (Fowler 1973:Fig. 40) shows what appear to be rocks surrounding, or among, the grass. The cache pits may have been rock-lined.



## COMPARISONS WITH THE SOUTHWEST

We draw comparisons with rock-lined cache pits in rockshelters in the Southwest for two reasons. First, it is the only known area of western North America where examples of such features are common. Second, use of these features during the Archaic-Formative interface on the Colorado Plateau equates generally with the archaeological context at Indian Hill Rockshelter. Our concern in this section is specifically with rock- or slab-lined cache pits in rockshelter settings. We feel justified in not emphasizing caches built beneath house floors, above-ground caches such as occur between houses in many Basketmaker III sites, and storage rooms in pueblos. These cultural settings are characterized by substantial expenditures of time and effort in the construction of dwellings, which in turn implies greater sedentism. Our emphasis is on what appear to be more seasonally nomadic contexts, but some of the Basketmaker caves discussed below do in fact contain the ruins of pithouses. The problem of Southwestern storage is extremely complex and requires consideration of many interrelated variables. A full treatment is beyond the scope of this paper (but see Gross 1987).

A wide variety of sizes, shapes, and construction methods are reported for excavated storage pits, but many published descriptions lack detail. Some cache pits merely were dug into hard clay or sandstone, others were lined with clay, and others were slab-lined. Use of slabs to line the walls of many Southwestern storage cists may have helped to stabilize the walls when cache pits were dug into soft matrix. In Southwestern literature, storage pits (particularly slab-lined examples) are almost universally called cists, so we use that term here. We conclude that such features are so commonplace that they often generate little enthusiasm on the part of

Southwestern excavators, frequently being reported only as "typical cists."

Rock-lined cists are common in rockshelters on the Colorado Plateau, particularly in the Four Corners area, where they are a diagnostic attribute of Basketmaker II culture. They occur also in transitional Basketmaker II-III times (Berry 1982) and in certain Basketmaker III rockshelter sites (cf. Morris 1980), but are not common in sites with pueblo architecture. Many well-known Basketmaker III sites are open-air pithouse villages. For example, Shabik'eshchee Village (Roberts 1929) had subfloor slab-lined cists, but there also were many outdoor caches, often slab-lined and in part above-ground, between houses. These various situations seem to reflect differing concepts and attitudes regarding concealed vs. visible storage of food among what apparently were more seasonally nomadic vs. more sedentary village-dwelling, peoples.

Decreased reliance on slab-lined storage pits in post-Basketmaker times may be linked to the rise of ceramic technology, which presumably better performed the requisite function of storage and protection of food-stuffs and seed stores from rodent and insect pests. However, changes in Southwestern storage methods also are linked to increased dependence on agricultural products, increased sedentism, the transition from pithouses to pueblos, and higher population densities per settlement (Glassow 1972; Cordell 1984:230-233; Gross 1987). The large size of many Southwestern storage structures reflects their use for storing ear corn. Better aeration would have been obtained by storing corn on the cob rather than shelled from the cob. Large size may also be linked to grappling with problems of farming at a time when the maturation season of corn was still longer than the growing season on the Colorado Plateau.

Slab-lined storage pits are known from as far north as Dinosaur National Monument in extreme northeastern Utah (Breternitz 1970), to southwestern New Mexico (Cosgrove 1947), with many sites on the Colorado Plateau (Fig. 1). The following sections review a few better-reported examples of rock-lined cache pits from selected rockshelter sites.

Seven cache pits were excavated in an apparent Basketmaker II context at Steamboat Cave, near the upper Gila River in southwestern New Mexico (Cosgrove 1947). Six were grouped toward the front of the chamber; two of these contained rock floors, but for the most part vertical slabs were lacking. The remaining cache pit was found by itself in the rear of the cave and was "curbed with stone slabs set on edge. It was lined with grass and contained 27 extra-large corncobs, four of which had a stick thrust into the large end of the cob" (Cosgrove 1947:12). The sticks may indicate attempts to dry ears of seed corn by standing them in a dry aerated place during in a period of damp weather.

Among the earliest well-dated cache pits in the Southwest are those uncovered at the wholly aceramic Basketmaker II sites of North and South shelters, near Durango, Colorado (Morris and Burgh 1954). (For a discussion of the chronology of these sites see Berry 1982:Chapt. 4.) These shelters contained many slab-lined cists. Dimensions of these cists varied, but many were a meter or so across and perhaps half that deep, with walls sloping out somewhat toward the top. Some cists occurred in apparent open areas of the sites, but most are believed to have been placed under "floors." These floors are attributed to actual houses, but details of construction are generally lacking due to subsequent occupational disturbance.

In a probable (but not certain) late Basketmaker context at Canyon del Muerto,

New Mexico, Morris (1925:270) discovered a large number of storage cists, 60-180 cm. in diameter and of various depths. They had earthen floors, but the sloping sides were slab-lined, "the joints of which were sealed with mud made tough with shredded bark, reed leaves, or corn husks."

Morris (1980) reported late Basketmaker (Basketmaker III) examples of both rock-lined and mud-lined cache pits in the Prayer Rock district of northeastern Arizona. About 60 cache pits, some one-third of which were of coarse masonry construction, formed an almost continuous row along the back wall of Broken Flute Cave, an enormous rockshelter. The shelter also contained the ruins of 16 pithouses. In plan, cists ranged from irregular to circular, depending on available space, and were generally less than a meter in diameter. Closure was often accomplished with logs set in mud, apparently above the existing ground surface. The practice of closing cists with cribbed logs and mud, as well as the pithouses, is reminiscent of late Basketmaker contexts in which a commitment toward more sedentary living had already been made.

Kidder and Guernsey (1919) and Guernsey and Kidder (1921) reported cists in the Kayenta district, northeastern Arizona. At Cave 1 in Kinboko Canyon, nearly 60 circular cists were clustered somewhat honeycomb-fashion. The cists averaged about 75 cm. across and 75 cm. deep, with slab walls. Most had adobe floors, and many were lined with soft grass or bark (Kidder and Guernsey 1919:75-77). About 20 of the cists contained burials, probably reflecting post-abandonment use of storage pits. Cave 2 in the same canyon had about 20 cists of overall similar construction, but some were larger and oval in outline. Six of the latter averaged ca. 1.4 m. long, 75 cm. wide, and 45 cm. deep, and were lined with grass and shredded bark. Most of these cache pits had been built by

carefully packing adobe clay around the stone slabs. At Sunflower Cave in the same general area, only a few of the 12 cists were lined with slabs; the remainder merely were dug into hardpan (Kidder and Guernsey 1919:95-96; Guernsey and Kidder 1921:3-7, Fig. 2). Some of these cists had been used for disposal of the dead. In nearby White Dog Cave, more than 50 cists were found, of varying sizes up to 1.5 m. across and approximately as deep, but most were not slab-lined (Guernsey and Kidder 1921:10-22). As at Sunflower Cave, many finally were used for disposal of the dead, possibly following site abandonment. Additional examples of cists in the Kayenta district were reported by Guernsey (1931).

In Utah, in Fremont culture territory, rock-lined cache pits have been reported by several investigators.<sup>3</sup> Gunnerson (1969) described them at Cottonwood Cave near the Dirty Devil River in the southeastern part of the state. This site, of Basketmaker II attribution, contained at least nine slab-lined cists, six of which ranged from ca. 60 to 120 cm. in diameter, and from ca. 50 to 90 cm. in depth. Reflecting common Southwestern perspective on the subject, Gunnerson (1969:53) noted: "All but one of these cists are of the usual type in which a pit has been lined with nearly vertical stone slabs."

Morss (1931) reported numerous storage pits in rockshelters and caves near the Fremont River in south-central Utah. Most of these were reflective of typical Basketmaker II slab-lined cists, but some were more sophisticated, resembling cellars, and apparently dating from some portion of the Fremont occupation. One cellar even had a circular sandstone "manhole cover." Some cache pits were small holes excavated into the sandstone floor of a rockshelter and fitted with circular sandstone slab covers. Site 16a contained a large slab-walled cist used as an equipment cache. It measured 1.6 m. in

diameter by 76 cm. deep and contained elk antlers, mountain sheep hide, pieces of tanned elk hide, and bison hide worked into some sort of "armor," all on a nest of shredded cedar bark. Site 19 had, among others, a cist containing a half-dozen ears of corn, apparently saved for seed. There is much diversity in form and structure of the cache pits in rockshelters in the Fremont area. Available evidence suggests that they were built from Basketmaker II well into Fremont times.

Outstanding examples of slab-lined cache pits were found at Cave du Pont, a probable Basketmaker II site in southern Utah (Nusbaum 1922; Fig. 8). The floor of the rockshelter is sand, and use of the site for storage necessitated construction of slab-lined cists, which numbered 31. The cists were flat-bottomed, paved with slabs, and the walls sloped out about 15 degrees from the vertical. Sandstone slabs used for construction were carefully selected and fitted together. Gaps were filled with wads of grass and bark, or mud. Most of the cache pits were nearly round or oval, up to 1.5 m. across and about 75 cm. deep. Contents of the cists ranged from ear corn to food and manufacturing detritus, and there was often secondary use for burial.

Also in southern Utah, Sand Dune Cave (Lindsay et al. 1968) contained 20 slab-lined cists. Some were built of thin slabs, others of thicker rocks more reminiscent of cache pits at Indian Hill Rockshelter. Some cists had slab-lined floors, emplaced before the walls were lined. Examples attributed to the Desha Complex (Archaic) averaged 70 cm. in diameter and 48 cm. deep. Those assigned to either Desha Complex or Basketmaker II averaged 68 cm. in diameter and 32 cm. deep. Others built during Basketmaker II times averaged 95 cm. in diameter and 33 cm. deep. Some of these Basketmaker II cists had slab-lined floors, but others had floors of sand.



Fig. 8. Slab-lined cache pits exposed in Basketmaker II context in Cave du Pont, southern Utah. Courtesy of the Museum of the American Indian, Heye Foundation, New York.

Some of the rocks used in building the cists were metates, and spaces between rocks were filled with vegetal matter or clay.

### Summary

Most of the reported examples of rock-lined cache pits, or cists, in rockshelter sites in the Southwest are on the Colorado Plateau and are attributed to Basketmaker II-III contexts, that is, a part-time horticultural and preceramic or early ceramic cultural context. Evidence from Sand Dune Cave, Utah, suggests a carryover from earlier Archaic times. Cists varied in form and mode of construction, but generally were carefully made. Slabs were almost always used in

preference to other rocks, and they were selected or broken to fit. Cracks often were caulked with clay or plant material, or a mixture of both. Many of the Southwestern cists are large, sometimes more than 2 m. across. Often, they occur in great numbers in larger rockshelters and sheltered overhangs, where exposure to moisture would have been minimized. Use of slab-lined cists for storage of foodstuffs seems fully supported by available data (including quantities of corncobs or ear corn found in them). Need for aeration during storage of such high-bulk foodstuffs as ear corn may have contributed to the larger size of many Southwestern cache pits. At some sites, larger cists finally were

used for disposal of the dead, perhaps after regular use of the sites had ended.

With the inception of effective pottery technology in Basketmaker III times, use of cache pits, slab-lined or otherwise, appears to have declined. Presumably, ceramic jars proved more effective for storage of foodstuffs. Additionally, varieties of shorter-season corn may have been developed, obviating the need for storage of corn on the cob to facilitate drying.

### DISCUSSION AND CONCLUSIONS

Most of the rock-lined cache pits at Indian Hill Rockshelter and elsewhere in the California deserts appear to have been permanent site furnishings used for concealing food supplies in preceramic, or at least nonceramic, times. This conclusion is based on the following reasoning:

(1) The cache pits are up to a meter in diameter and have remaining depths to 30 cm. Thus they could have contained substantial amounts of cached goods.

(2) Cache pits were carefully constructed, and often chinked with small rocks. This appears to document a determined effort on the part of the builders to render the pits rodent-proof. This attribute would be most important if baskets or bags of foodstuffs, such as seeds, nuts, or cooked agave hearts, were to remain undisturbed for later use. Lining cache pits with rocks also may have been necessary when the matrix in which they were built was sandy or otherwise friable.

(3) Storage of foods in this manner is suggested by the fact that the rock-lined pits occur stratigraphically inferior to most of the ceramic sherds recovered during the excavations at Indian Hill Rockshelter. Sherds that occur in levels containing the pits probably are intrusive. Following the inception of regular ceramic use in the region, large ollas may have been more effective for food caching,

making rock-lined cache pits obsolete. If this is the case, the cache pits probably were used for storage of foods rather than for storage of equipment. Had they been used primarily for storage of equipment, it seems likely that they would have been built also during the time ceramic vessels were used in the region. In that case, they should have occurred also in the same levels that yielded ceramics in abundance.

(4) The rocks found in the interiors of some of the cache pits may represent the remains of the covering pavement placed over cached commodities. If so, they were discarded following opening of the caches, or possibly they were left in the pits for reuse at a later time. Absence of upper wall rocks in most of the cache pits found at Indian Hill Rockshelter may be accounted for by their having been pulled up and used elsewhere.

Cache pits at Indian Hill Rockshelter and elsewhere in the California deserts differ from what is usually termed "site furniture" in that they were concealed beneath living surfaces, and thus not available for use by anyone who occupied a site that contained them.

The specific organizational strategy of the hunter-gatherer groups that made and used food caches at Indian Hill Rockshelter and other California desert sites remains difficult to characterize. It may have been that of foragers who intended to cache temporarily surplus food, loop back, and consume it during reoccupation of the base camp on a later visit during the year. It may have been that of collectors in which temporary food caches were made by logistically organized task groups during harvest and transport of foodstuffs to a residential base. It may have been that of collectors who perhaps annually spent time exploiting the resources within the collecting radius of a particular residential location. The exact strategy almost certainly varied from one site to another and through

time at any specific site. Insufficient data are available to make such determinations, and we have difficulty identifying the kinds of data necessary for such distinctions. Certainly, it is unlikely that much of the needed information, such as complementary data from other nearby sites, has survived.

Rock-lined cache pits at Indian Hill Rockshelter and elsewhere in the California deserts generally are reminiscent of similar structures referred to as cists in the Southwest. The best examples comparable to those at Indian Hill Rockshelter occur in Basketmaker II-III contexts on the Colorado Plateau. Such features may prove typical of Archaic contexts, but evidence currently available suggests a reliance on them in the Southwest in later contexts characterized by a certain degree of sedentism. While some of the Southwestern examples were used for storage of equipment (or raw material [?] in the case of hides and antlers at a site in the Fremont River area of Utah) at least some of the time, food storage is clearly indicated by the presence of such things as ears of corn. Many of the Basketmaker examples saw final use as burial repositories. The method of construction also shows deliberate attempts, through chinking and caulking of interstices between slabs, to prevent loss of the contents to rodents.

Conspicuous use of slab-lined cists on the Colorado Plateau seems to have declined after the beginnings of effective ceramic technology in Basketmaker III times. Differences between the California and Southwestern examples are readily seen in the larger size and decidedly better construction of many Basketmaker cache pits. The context in which rock-lined cists were used in the Southwest is not absolutely clear with respect to the collector/forager continuum. A semisedentary collector strategy in which the beginnings of plant cultivation are often

apparent, and in which a wide variety of plants and animals were collected and brought to the rockshelters that served as residential locations, appears indicated at many Southwestern sites.

The models employed in the opening discussion are useful as heuristic devices. They force us to polarize our conceptions, perhaps to unrealistic extremes, to better identify the actual variables that must be considered if we are to understand what went on in prehistory and why. This does not mean they are ineffective models. It means simply that coarse-grained models cannot elicit fine-grained distinctions in the range of variation in complex and ever-changing organizational strategies of ancient hunter-gatherers, including those involved in early horticulture, especially when there is only a partial record with which to work.

#### NOTES

1. Measurements given here are in the metric system; the English system was used in the field to make the excavation data more readily comparable with those obtained in earlier work at Indian Hill Rockshelter (Wallace and Taylor 1960; Wallace et al. 1962).

2. Documentation on the cache pits excavated in El Pakiva Cave by L. A. Payen is based on clear recollection by Payen (personal communication 1989) of their appearance when he excavated them, his notes, photographs, and drawings made at the time of fieldwork, and on Pinto (1989:94).

3. Eighteen slab-lined firepits were reported from Sudden Shelter in south-central Utah (Schroedl 1980). Most averaged about 40-50 cm. across and 30-35 cm. deep, and clustered in levels dated to about 4,500-5,000 years ago. Although their descriptions superficially match those of slab-lined cache pits elsewhere, they bore evidence of pronounced burning that resulted in cracking of the slabs and reddening of the surrounding matrix, thus supporting the interpretation that they were some kind of specialized hearth. They are not commonly reported elsewhere. We have no reason to question the interpretation, but we do suggest that slab-lined cache pits could have been fired to kill insect pests in the site matrix. We also suggest, based on available information, that Hearth 10 at Sand Dune

Cave, Utah (Lindsay et al. 1968:41, Fig. 19) may have been a slab-lined cache pit.

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