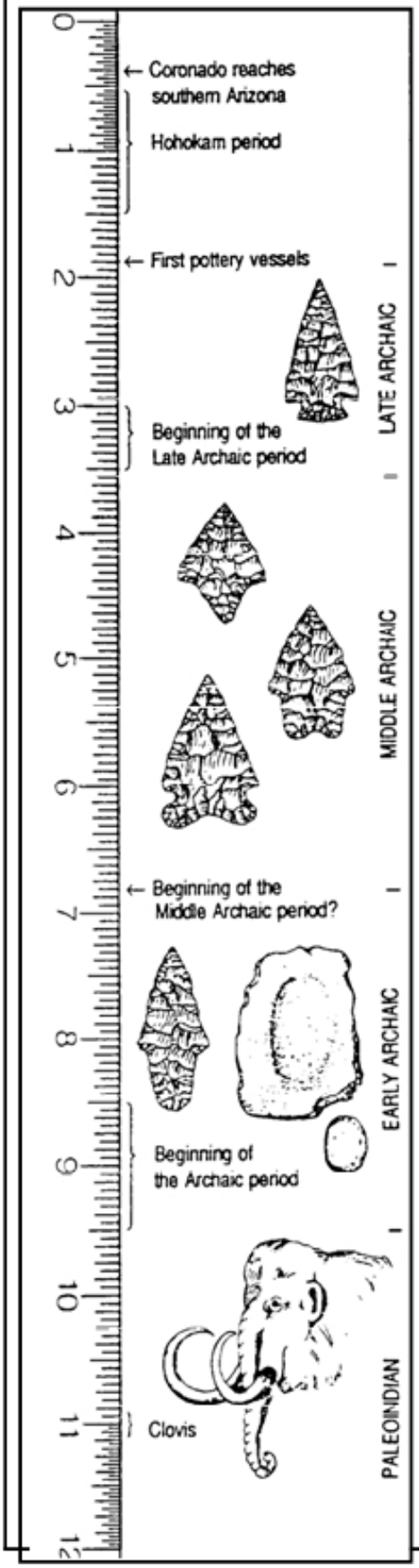
# ARCHAEOLOGY IN TUCSON

Vol.8, No.2 Newsletter of the Center for Desert Archaeology April 1994


A *time line for Tucson Basin preceramic prehistory.*

# People without Pots:

## Preceramic Archaeology of the Tucson Basin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If you, as a resident of modem Tucson, were asked to conjure up a mental image of what life here was like during the prehistoric past, what would come to mind? It is probably safe to assume that your picture would be one of pithouse villages, populated by folks wearing shell and stone jewelry; surrounded by beautiful painted pots; growing corn, beans, and squash in nearby fields; and perhaps holding dances or religious ceremonies at ballcourts. As appealing and perhaps accurate as such a mental picture is, it probably applies to only the last 1,500 years or less of the total span of more than 11,000 years of human occupation of the Tucson area. What of the preceding 9,500 years? Who lived here? What did they do for a living? What was the area like? The purpose of this article is to provide you with colors and images to paint some new mental pictures.

From approximately 11,000 years ago until perhaps 2,000 years ago, there were indeed people in the Tucson Basin. The figure to the left may help you visualize these rather large numbers in relation to a simple ruler. We know relatively little about these ancient people, for they did not leave behind many traces of their passing. Archaeologists refer to this 9,000-year-long period as "preceramic,'" signifying that the people did not manufacture pots, those artifacts we most commonly associate with prehistoric sites in our area.

Where does one find preceramic sites? What do they look like? They occur in many places. You might discover them on terraces overlooking the Santa Cruz River, on the flat topped ridges in the Santa Catalina foothills, in caves or rockshelters in the canyons of the Catalinas or Rincon Mountains, or in the banks of our many deep arroyos that carry runoff from storms. Often these sites are unobtrusive—a scattering of stone tools among the creosotes, perhaps including a projectile point or two; a few scrapers; some waste flakes; and maybe a couple of manos or pieces of metates. Protruding from the banks of a wash a few fire-cracked rocks and maybe a few stone tools might be visible, buried under several feet of sand and silt. Or, if you're really fortunate, you might stumble across the huge bones of an extinct elephant with a big, beautiful spear point lying next to them. (Of such stuff does a preceramic archaeologist dream!)

The preceramic period is split into two parts called Paleoindian and Archaic. The division is based in part on economy, and in part on time. *Paleoindian* refers to an economy dominated by hunting of large mammals, beginning approximately 11,000 years ago and terminating as late as 8,000 years ago in some parts of the Southwest. *Archaic* is the term applied to the period of time between 8,500 and 1,800 years ago that was typified by diversified economies reliant on the gathering of plant seeds, the hunting of deer and rabbits, and—very late in the period—the growing of crops.

Let's take a look at what archaeologists have been able to piece together over the last 60 years about the preceramic period in the Tucson area. It is, as yet, a patchy record for so long a period of time, one that invites as many questions as it provides answers.

**Paleoindian Populations.** Humankind's first discovery of the Tucson Basin occurred at the close of the Pleistocene epoch or Ice Age, and was made by a people whose lifestyle was quite

different from that of any who followed. A small number of them probably arrived in southeastern Arizona not too many years after their ancestors decided to seek their fortunes south of the ice sheets that covered most of Canada. Our familiar Sonoran Desert was not here at that time (imagine Tucson without saguaros or palo verdes!) because the cooler, wetter Ice Age climate caused grasslands to thrive, dotted here and there with scattered shrubs. The Santa Cruz River, as well as the Rillito, Pantano, and Tanque Verde creeks, probably flowed year-round. The Santa Catalinas, Rincons, Santa Ritas, and even the lowly Tucson Mountains all sported forests of juniper and pinyon extending much farther down their slopes than these trees do today. Populating this landscape were mammoths (elephants), bison, and perhaps more exotic creatures such as camels, horses, ground sloths, and four-horned antelope.


*A Clovis fluted projectile point from Naco II, Arizona. Used with permission of ETHNOLOGY and Dr. Larry D. Agenbroad.*

These earliest Tucsonans—or, at least, Arizonans—belonged to a culture known as Clovis. The most recognizable legacies they left us are the large, beautifully made and distinctively grooved, or "fluted," spear points they used in their hunts (see illustration at left). Skillful hunters they were, too. Though we have found few Clovis points in the Tucson area (page 8), the San Pedro Valley to the east has at least five deeply buried sites where Clovis points and other tools have been found among the bones of mammoths and bison. Imagine the skill and cooperation it must have taken to bring down a mammoth, which, when fullgrown, might have stood 12 to 14 feet high at the shoulder. At the Lehner archaeological site southeast of Sierra Vista, as many as a dozen mammoths may have fallen victim to Clovis hunters over a few years. Only 11 miles to the north at Murray Springs, Clovis hunters surrounded and killed a small herd of at least 12 bison, all at once. They probably also hunted smaller mammals and made use of some plant foods, but unlike later peoples, they had no manos or metates with which to grind seeds.

Here in the Tucson area, we have yet to find our first Clovis kill site, and our chances aren't improving. As the banks of our washes are straightened and reinforced with soil cement, we lose the excavating power of floods to reveal such deeply buried sites.

Carbon-14 dates tell us the Clovis people were here in southeastern Arizona about 11,000 years ago. They left no traces of habitations—only a single campsite is known near Sierra Vista—and many of their tools are made of beautiful, highly colored chert not local to our area. From these clues, archaeologists surmise that these hunters probably ranged over a huge area, never lingering long in anyone place. In fact, the entire Clovis occupation of the San Pedro Valley may represent the activities of one small group for only a few years.

Following this, our screen goes blank. Were there people here after Clovis? If so, who? The late Ice Age mammals were probably almost all gone sometime between 11,000 and 10,000 years ago—how did people adjust to their disappearance? Right now we simply have no clear record of any subsequent human presence until sometime around 8,500 years ago, when big changes appear.

**Archaic Period Archaeology.** If you take a look at the ruler on page 1, you'll see that sometime between 9,500 and 8,500 years ago, the Archaic period began in our area. And, casting your eyes along the ruler, you'll find that pottery appeared shortly after 2,000 years ago. To put it another way, the Archaic period covers 6 to 7 of the 11 inches representing the human career in southern Arizona.

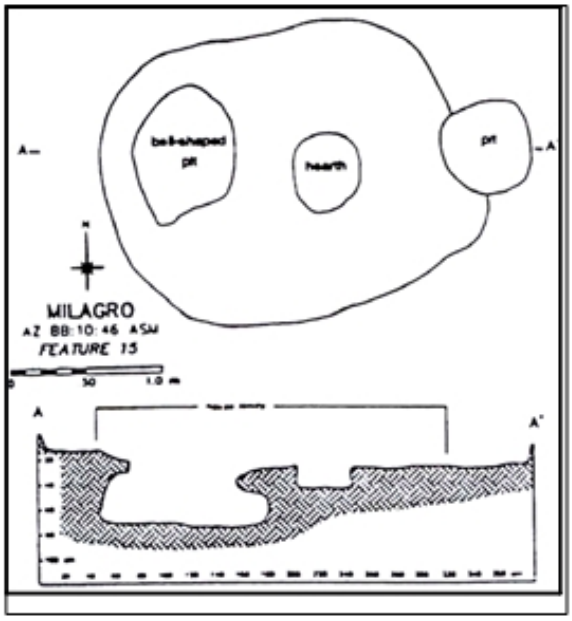
Archaeologists recognize the Archaic period primarily by the appearance of ground stone seed-milling equipment in sites. The first grinding stones (see page 1 figure) are simple affairs, consisting of slab metates and oval or round cobble manos, some worked to shape, some not. All the manos are of a size that can be comfortably held in one hand. In place of the large spear points known from Clovis sites, small projectile points only 1 to 4 inches long appear, they probably were used on lightweight throwing spears for hunting deer, bighorn sheep, antelope, and perhaps bison. Other flaked stone tools such as scrapers, gravers, choppers, and flake knives also appear, often made from relatively poor-quality but locally available rocks. Other "artifacts" commonly gracing Archaic sites in great abundance are fire-cracked rocks. These document the development of a new food-cooking technology involving pit-roasting. The ground stone tools suggest the Archaic economy was a more balanced one, relying on plant foods to a much greater degree than the Paleoindians.

Some readers may have heard of the "Cochise Culture," to which, for most of the last 50 years, Archaic period sites in southeastern Arizona were assigned. The Cochise Culture was first defined in southeastern Arizona and is one of several sub-regional or local "cultures" that are part of the Archaic period. Literally dozens of such localized Southwestern preceramic traditions have been defined, most from very small numbers of sites and from artifact assemblages that may or may not fully represent the range of variation in artifact types.

In reaction to these local preceramic "cultures" and their attendant problems, archaeologists have begun to take a broader, regional view and to apply the term "Southwestern Archaic" to most of the preceramic sites found across the Southwest. The Southwestern Archaic can be subdivided into two or more parts, and there are currently several systems that attempt to

do this. For our purposes here, a three-pan approach is used to divide the overall Archaic era into *Early Archaic, Middle Archaic,* and *Late Archaic* periods. *As* shown in the ruler on page 1, time limits are poorly fixed for all but the most recent of these.

**Hunting and Gathering in the Tucson Basin.** What did Archaic people do to survive in our area? We have described the Archaic adaptation to the Southwest as one that emphasized hunting and gathering, but what did such an economy involve? For the Middle Archaic period, we can probably sketch the general form such a system may have taken, using some archaeological information and other observations about how hunter-gatherers have made ends meet during the recent past. From studies of hunter-gatherers in arid environments similar to our own Sonoran Desert, two general conclusions about this lifeway can be drawn: they live in small groups and they move around a lot. Most archaeologists believe the same was probably true for the Southwestern Archaic folks.




A *2,900-year-old Late Archaic pithouse with an interior bell-shaped storage pit. Computer art by Geo-Map, Inc.*

Small group size makes sense in an environment where food is seldom available in great abundance or high density in one place. How small were the Archaic groups? Again, from observations of recent or historic hunter-gatherers, a local group size of about 25 may have been common. However. the composition of the group probably varied—individuals and families came and went, moving from one small local group to another. Usually, kinship ties were the basis of such movements, because people had relatives by blood or marriage scattered across a wide area. Periodically, during times of higher resource abundance, several local groups would join to form a larger temporary group of perhaps a few score individuals. Such short-term gatherings were important for exchanging information on hunting and gathering, performing ceremonies, finding mates, and conducting activities with large groups.

Historic hunter-gathers also tended to cover a lot of ground—hundreds of square miles—to obtain food. Their movements were seasonally coordinated and consistent from year to year, determined mainly by the times when particular plants produced edible leaves, flowering stalks or buds, and seeds or fruits. If you visualize the seasons of different plants in the Tucson area, you will recognize that in early spring a number of annual plants begin to grow, first producing edible greens and later seeds. Many of these are small and only yield tiny seeds, but they're often present in great abundance. Later in the spring, flower buds and tender young pads of prickly pear and other cacti become available, and later still the mesquite beans and saguaro cactus fruits come into season. Also at this time, the agave, or mescal, plants in the surrounding mountains are preparing to sprout their flower stalks, so the Archaic folks might have made a trip into the local highlands to cook mescal hearts.

Being hot and dry, the late spring probably offered few resources until rains later encouraged the growth of summer annuals. During July, August, and September, greens and small seeds were again ready to eat. By July, acorns and walnuts were available in the mountains. A second harvest of mesquite pods was probably made in late summer and early fall, a time when animals were also healthiest In addition, pinyon-pine nuts could have been harvested in the mountains during the fall.

Winter would have been the most difficult time because plants do not grow or produce seeds during this season. The Archaic people may have stored some of the summer's and fall's wild-plant food harvests to help survive the winter, and they probably relied more heavily on hunting as well.

**Early Archaic Sites in Southeastern Arizona: Looking Outside-In.** The Early Archaic period is the most poorly understood part of the Archaic sequence in southeastern Arizona. In addition to problems in dating it, archaeologists still are in doubt about what kinds of artifacts typify it. In the Tucson area, the Early Archaic has not been positively identified, not only because all the early sites arc deeply buried in the ground, but also because we're not really sure what kind of artifacts to look for. Therefore, what little we do know or suspect of the Early Archaic here is based on what's been found in surrounding areas.

Nearly 60 years ago, excavations along Whitewater Draw, some 9 miles northwest of Douglas, yielded an assemblage of unifacially retouched tools, one-hand manos, and slab metates from a geological deposit stratigraphically *below* a layer containing bones of extinct Ice Age mammals. Projectile points were conspicuously absent, although ground stone milling tools were abundant. On the face of it, this evidence seemed to suggest the existence of a plant-gathering culture prior to 10,000 years ago, when the late Pleistocene animals became extinct. These Whitewater Draw sites provided the material from which the "Sulphur Spring stage" of the Cochise Culture was defined.

Geoarchaeological work along Whitewater Draw in the early 1980s at this site and others produced a number of radio-carbon dates between about 8,000 and 9.000 years old. These dates suggest that the bones of the extinct animals were probably

eroded out of older Pleistocene deposits sometime after 8,000 years ago, and then reburied above the layer containing artifacts from the Sulphur Spring stage. Unfortunately, the 1980s work did not produce very many artifacts, so all we know is that by 8,000 to 9,000 years ago, Archaic hunter-gatherers were present along Whitewater Draw, and so they probably were living elsewhere in southeastern Arizona, too.

Some projectile points found on surfaces of archaeological sites in the Tucson area are reminiscent of certain points found buried deep within 6,800- to 8,000-year-old sand-dune sites in northeastern Arizona and northwestern New Mexico. The points from those sites to the north of us typically have a long, slightly tapering stem and broad, triangular blades (see lowest point shown on page 1). Finds associated with these northern Arizona and New Mexico points include numerous flaked stone implements but very few ground stone tools.

Are these Tucson-area sites with the same kind of projectile point actually Early Archaic sites? Because these points have only been found on the surface, they cannot be accurately dated. Until they can be found in buried sites, associated with materials that can be radiocarbon-dated, the Early Archaic period is likely to remain buried in mystery.

Complicating the Early Archaic site-recognition problem is the fact that intact alluvial deposits older than about 6,000 years are extremely rare in the Santa Cruz and San Pedro valleys. The time between about 8,000 and 6,000 years ago was a major era of erosion that removed many (most?) of the older geological deposits along these rivers and their tributaries. Whitewater Draw is exceptional in still having alluvium of this age. Therefore, finding an Early Archaic site in the Tucson area has proven to be as difficult as coming up with the proverbial "archaeological needle in the geological haystack."

**The Middle Archaic: Metates, Moisture, and Mobility.**

Perhaps as early as 6,800 years ago, the Middle Archaic period began, and it lasted until sometime between 3,500 and 3,000 years ago. With this period of time, we make it to slightly firmer archaeological ground. In the Tucson area, sites of this period have been discovered in the Catalina foothills, the Rincon and Santa Rita mountains, the bajadas of the Tucson Mountains, and in the vertical banks of the Santa Cruz River and its tributaries.

The Middle Archaic is characterized by not one but several different kinds of projectile points, as shown in the photograph on this page and in the ruler on page 1. These types actually may be sequential in time rather than contemporaneous. In addition, the deep basin metate makes its first appearance during the Middle Archaic period, as does the large stone pestle.

What did the Tucson area look like between 7,000 and 3,500 years ago? The climatic conditions in our area at this time are still a matter of debate—it was almost certainly hotter during the summer and colder during the winter than now, but it may have been drier, or moister, or some of both, over this 3,500-year-long span of time. Summer temperatures around 6,000 years ago may have been slightly hotter than today—2 degrees centigrade (3.6 degrees Fahrenheit) or so—but winter freezes were probably also more common. Climatic reconstructions suggest precipitation was greater at that time as well, perhaps by as much as an inch per year. These climatic conditions prompted most of the rivers in the Southwest to erode their floodplains between 8,000 and 6,000 years ago.

*Examples of Middle Archaic dart points.*

The Tucson Basin of 6,000 years ago probably looked only a little different than it does today. Most, but not all, of our Sonoran Desert plants would have been present, but more frequent winter freezes would have limited the abundance and location of those species more sensitive to cold. The juniper and oak trees would have retreated to the higher, wetter upper elevations of the mountains.

Most known Middle Archaic sites in the Tucson area are on the surface, and nearly all are simply scatters of stone artifacts and fire-cracked rocks; preservation of bone, carbonized plant materials, and pollen is poor to nonexistent. The few investigated sites of this era have produced some bone that suggests rabbits and large mammals such as deer and mountain sheep were the favored hunting prey. However, one surprising discovery in a 4,200-year-old site southeast of San Xavier mission was the bones of bison. That such animals lived in our area shows the effects of that warmer, wetter climate. We have not recovered many traces of plant remains from sites of this age, so we don't know exactly what foods were gathered. Also found at two sites are poorly preserved human burials, the oldest remains of people in the Tucson area.

The high mobility and contact that cultural anthropologists have observed among recent hunter-gatherers is also suggested for Middle Archaic people by the artifacts they left. Projectile points and other tools found in the Tucson area are sometimes made of obsidian, which has been chemically matched to quarries in west-central and southwestern New Mexico. Whether the obsidian to make these tools was acquired by the people themselves, or whether they obtained such artifacts or materials by trade, these artifacts document the movement of people or goods over hundreds of miles.

**Late Archaic Abodes, Agriculture, and Arts**. By approximately 3,500 years ago, a climate closely resembling that of the present had become established, and the Sonoran Desert in all its glory could be found across the Tucson Basin. The deep arroyos cut between 8,000 and 6,000 years ago had not only filled, but the streams began to deposit sediments rapidly, deepening and broadening their floodplains.

At this same juncture, a major change seems to have occurred in how Tucson Basin Archaic people made their living.

For the first time, we begin to see settlements that have many of the characteristics of later Hohokam villages. As illustrated in the January issue of *Archaeology in Tucson,* the few Late Archaic sites excavated thus far have been found to contain small round or oval pithouses (see figure on page 3); storage pits with distinctive bell shaped cross-sections; roasting pits; small firepits; human burials; and thick, dark gray cultural deposits chockfull of artifacts. These sites have been found on low terraces overlooking the floodplains of the Santa Cruz River and its tributaries, or revealed far down in the floodplain sediments by some of the deepest-cut modem arroyos.

Why do these sites look so different from their Middle Archaic predecessors? Flotation samples provide one important clue: *Zea mays,* commonly called corn. Carbonized fragments of corncobs are abundant, showing that hunting and gathering was being augmented with maize farming.

The importance of agriculture to people who had previously relied only on hunting and gathering must have been profound. Agriculture demands a fair amount of labor—field clearing and preparation, planting, tending, harvesting, and constructing storage facilities—but the return on the labor is a large quantity of food that can be stored and used for several months. This means that people can rely at least in part on stored food to help them survive the winter and early spring months. The Late Archaic occupants of the Tucson area probably were serious about their farming—calculations of the capacity of their bell-shaped storage pits show that a single pit could have held several thousands of ears of maize. Other crops such as beans and squash were probably grown, but few traces of these have been found.

These Late Archaic folks continued the hunting - and gathering ways of their ancestors as well, gathering the seeds of spring and summer annual plants, cactus fruits, mesquite, and perhaps other legumes, as well as acorns, agave, and manzanita berries from the mountains.

The artifacts that come from the Late Archaic sites include large, side- or comer-notched dart tips known as San Pedro points (see ruler, page 1) because they were first identified along the San Pedro River. Also, marine shell jewelry, in the form of beads or small pendants, makes its first appearance. Despite the fact that pottery vessels were not yet being made, small fired-clay human figurines and beads appear. Such figurines, shell jewelry, and bell-shaped pits all occurred in Mexico—where maize was domesticated—several centuries earlier than in Tucson. It therefore seems that the people of the Tucson Basin and southeastern Arizona turned their attention to the south during the Late Archaic.

**Culmination and Continuation.** The Late Archaic period clearly set the pattern for the later, pottery-producing residents of the Tucson Basin, but it represents only the culmination of an 8,000-year long story of changing climate and various people's efforts to make the best of what the area had to offer. We can see the end of the story, but the beginning is far from clear; perhaps half or more of the tale can only be guessed. The immensity of the time involved and the resulting problems of preservation make it difficult to find places where even a few pages of the story can be found and read. Too, time is not on our side. The rapid growth of Tucson is removing or obscuring traces of our preceramic past every day. Still, the challenge to learn about these remarkably successful people is an exciting one, and I am optimistic that by the turn of the century, we'll know much more about them.

# The AIT Volunteer Program

**Volunteer Opportunities to Do Archaeological Fieldwork**. Fieldwork for the Center for Desert Archaeology's Lower San Pedro survey is continuing this spring between the communities of Cascabel and Benson (about a 1-hour drive east of Tucson). Remaining survey dates are Saturday, April 16, and Sunday, May 1, 1994. We can take only a limited number of people out on survey at a time. so if you'd like to volunteer for any of these days. call Jim Bayman at 881-2244 to make reservations.

To Work with Archaeological Site Records. Archaeological sites found during the Lower San Pedro survey must be plotted on maps, and a record of each site identified must be typed on a special form for reporting to the Arizona State Museum, University of Arizona. If you'd like to help with these in-office activities, call Jim Bayman or Al Dart at 881-2244.

. And to Help with Artifact Curation. The cost of curating archaeological collections is far higher than most people (even m any archaeologists) would guess. Items collected fro m archaeological sites not only must be carefully prepared and catalogued for curation, but the museum that agrees to curate them is obliged to maintain them perpetually under climatically controlled conditions, and to make sure the artifacts and the records that go with them do not deteriorate or get lost. This is costly in terms of museum staff salaries, building and records maintenance, utilities, and other expenses, so even government-funded museums require outside sources of money to pay for curation. Part of the curation costs are therefore charged to licensed archaeological research organizations that use such services.

The Center for Desert Archaeology's state archaeological survey permit requires that all artifacts collected during the Lower San Pedro project be curated at the Arizona State Museum. The fact that volunteers are doing the project does not exempt us from payment of these fees. which currently cost $10 for every person-day spent on the project's fieldwork. Since several hundred person-days of field time have been logged over the past four years of the Lower San Pedro project, the Center is obligated to pay the State Museum several thousand dollars for curation.

Fortunately, the State Museum recently offered to discount some of the curation fees for the Lower San Pedro project if the Center can provide volunteer labor to help the Museum staff process archaeological collections from the Lower San Pedro survey and other projects. The Museum asks that each volunteer agree to spend at least 40 hours working with curators on weekdays (but the 40 hours can be spread out over several weeks). To sign up for this cooperative Center for Desert Archaeology-Arizona State Museum curation endeavor, call Liz or Catherine at 881-2244.

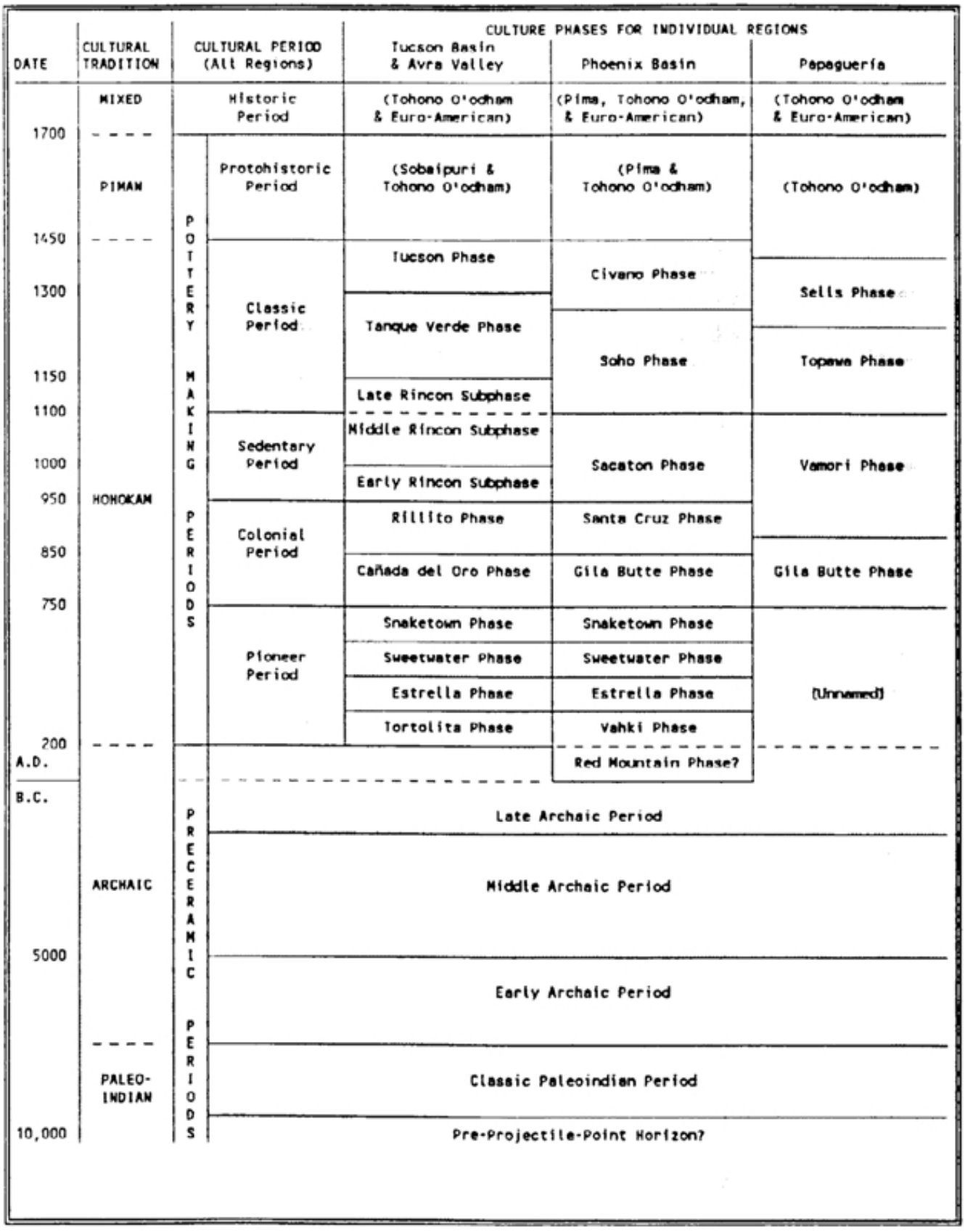



Table 1. Comparative cultural sequences for south-central Arizona.