

ARCHAEOLOGY IN TUCSON

Vol. 7, No. 3

Newsletter of the Center for Desert Archaeology

July 1993

Archaeology in the Heart of Downtown Tucson

By J. Homer Thiel, Michael K. Faught, and James M. Bayman

Forgotten Folk, Forgotten Facts. The City of Tucson has one of the richest and longest documented settlement histories in the United States. Many societies have called Tucson home: the prehistoric Hohokam, historic Tohono O'odham, 18th and 19th century Spanish missionaries and their soldier compatriots, Mexican and Anglo-American pioneers, entrepreneurs, and settlers of the 19th and 20th centuries. Each of these cultures has made Tucson into an important center of political and economic resources amid harsh surroundings of the great Sonoran Desert.

Surviving documents, often hidden away in libraries, museums, even basements, paint a picture of life in Tucson over the last two centuries. Yet the picture these documents provide is too incomplete to give us more than teasing glimpses of the city's past. In reality, there are all too few accounts of the city's early historic occupations, and even the ones we can find often ignore children, women, the vast majority of Mexican and Native American residents who lived here, and other important segments of society. And the accounts tell us nothing about the native peoples who lived in the Tucson Basin before history began to be written down. In all of these cases, the archaeological record fills in details of the cultural chronicle.

Through an extremely fortunate set of circumstances over the past two years the Center for Desert Archaeology and its associated research consulting company, Desert Archaeology, Inc., have had opportunities to undertake a series of archaeological projects in the heart of downtown Tucson. The story that is cradled within Tucson's "Block 192" the vicinity originally bounded by Alameda, Church, Pennington, and Court streets (and now occupied mainly by the old Pima County Courthouse building with the tiled dome)—is being pieced together now as a result of our excavations. [Continued on Page 2]



Excavations in 1992 revealed part of the Tucson Presidio wall (center), a floor support for the 1881 County Jail (lower left) and the base of a fountain built in 1929 (top left). Photo by Homer Thiel.

How Old Is It? Dating in Archaeology

By Jeffrey S. Dean

Laboratory of Tree-Ring Research, University of Arizona

One of the first questions asked about any archaeological discovery is: "How old is it?" Archaeologists devote considerable time and effort to dating, not merely to satisfy people's curiosity about the antiquity of their finds but also to answer a wide variety of questions about the past. Accurate chronologies are crucial to understanding culture change and development, intergroup interaction, population trends, environmental adaptation, migrations, and other aspects of human behavior. The continuing interest in developing new dating techniques and refining existing ones reflects the importance of chronology in archaeology.

Much dating is inherent in archaeological relationships such as stratigraphy, wall abutments, and ceramic type distributions. Other chronological indicators are independent of archaeological context. Of the many independent techniques that have been developed during the last century, three have been especially productive in the Southwest: tree-ring, radiocarbon, and archaeomagnetic dating.

Tree-ring dating (dendrochronology) was developed early in the 20th century by the astronomer Andrew Ellicott Douglass, who discovered that Southwestern lower-forest-border conifers produce a common sequence of wide and narrow rings that reflects the sequence of wet and dry years that the trees lived through. By 1929, he had matched the patterns in living trees and archaeological wood to construct a 1200-year composite ring chronology and derive the first absolute, calendar dates for scores of prehistoric sites whose dating had previously been purely conjectural. Subsequent work in the northern Southwest, where suitable coniferous trees are available, has produced more than 50,000 individual dates from more than 5000 sites and extended the regional tree-ring chronology back to 322 B.C. These ring records give the Southwest the best prehistoric chronological controls in the world.

Tree-ring dates apply to a single year of the Christian calendar and have no associated "plus-or-minus" (\pm) factor, or statistical error. Under ideal circumstances, the dated outermost ring on a sample specifies the *exact* year in which the tree was felled for use. Dendrochronology, however, is restricted to areas where ring-datable tree species occur. [Continued on page 7]

Archaeology in the Heart of Downtown Tucson

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A Hohokam Heritage. Archaeological excavations over the last 60 years in the Tucson area have revealed ancient settlements where Hohokam farming families lived along the banks of the Santa Cruz River, building their pithouses and tending fields. Much like the European inhabitants who would arrive centuries later, the prehistoric Hohokam found the river valley highly desirable for settlement.

A substantial Hohokam village once stood in the area near Church and Alameda streets between A.D. 450 and 1250. Before we began our Block 192 projects, archaeological excavations at the corner of Washington and Church in 1954 and at the northeast corner of Church and Alameda in 1989-1990 had located pithouses built by these early people. Our own excavations last year exposed other prehistoric pithouses, pits for storage, and a large, filled-in hole that we think was used prehistorically for mining caliche to mix with dirt and water for making adobe.

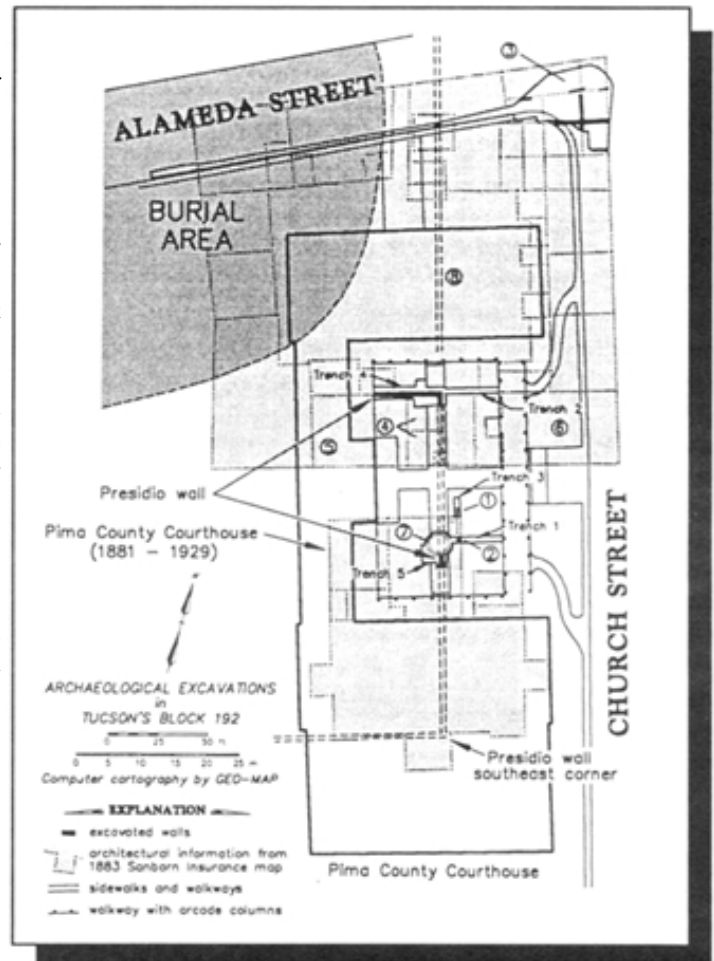
In the courtyard of the old Pima County Courthouse the deepest of our excavations went down almost 7 feet below the current ground surface, revealing the prehistoric occupation layers underneath Spanish Colonial, Mexican, and Anglo-American materials that came later. Artifacts associated with the Hohokam features included parts of pottery bowls and jars, shell ornaments, chipped and ground stones used for manufacturing pottery and processing plant and animal resources, and polishing stones for putting the finish on pottery vessels. A ceramic figurine representing a woman was found in one abandoned storage feature.

Missionary and Military. The first Europeans to occupy Arizona were missionary priests and Spanish (often Basque) soldiers beginning in the 1690s. They did not move into the northernmost Spanish military outpost, Tucson, until the last half of the 18th century. The newcomers built missions, fortified missions, military forts called *presidios*, and eventually, spread-out settlements called *rancherías* that were devoted to cattle industry or farming. The presidios became increasingly important as unfriendly native tribes, particularly the Apache, began to raid the *rancherías* of the settlers and the mission communities and as the need to defend New Spain's northern frontier grew.

In 1775 Spanish soldiers abandoned their northernmost presidio at Tubac and advanced even farther north to begin the construction of a new military fortress at Tucson. This new position was closer to the remaining Pima Indian settlements of that time, and to the missions of San Agustin del Tucson and San Xavier del Bac. Not only could the Tucson Presidio help protect these missions and settlements, it was also charged with establishing Spanish control over a proposed route to California.

Historical documents show that an initial Tucson fort wall was a palisade of upright logs. It was replaced, probably by 1783, by a wall of adobe bricks set on stone foundations. The reported final size of the structure, 750 feet to a side, suggests it was enlarged during its use as an enclosed fort because other Spanish presidios were much smaller.

Further records of building activities at the Tucson fort are vague. In 1827 there seems to have been a flurry of maintenance



Map showing selected historical and archaeological features identified in 1992 in Tucson's Block 192.

or reconstruction, if not actual enlargement, due to political upheaval brewing southward in Sonora where the Opata, Yaqui, and Pima tribes had begun to rebel against the tide of European settlers. But by the late 1840s and early 1850s the threat of attack by all tribes, even the Apache, had diminished enough that Tucson's residents reportedly punched new gates through the presidio's massive outer wall to allow easier ingress and exit. Eventually portions of the wall were torn down, other parts crumbled due to lack of maintenance, and folks began using the wall's bricks as building materials. (Later some could truthfully say that their homes were part of the Tucson Presidio wall.)

The earliest known map of Tucson Presidio, drawn in 1862 by U.S. Army Major David Ferguson, depicts its wall surviving in fragments. But by the early 1900s only one portion of it was still standing, and that part was torn down a few years later. The precise location of the fort's outer wall was forgotten.

In 1929, as workmen dug holes for the foundation of a new Pima County Courthouse, Tucson's city building inspector, Donald Page, made the first accurate maps of the Tucson Presidio wall. He carefully plotted portions of the fort's east and south walls (#8 on page 2 map), including its southeast corner, and re-

corded his observations about the adobe bricks that had been used to construct it.

In 1954, the first professional archaeological excavations to look for evidence of the presidio were conducted by Emil W. Haury and E. B. Danson in a parking lot at the corner of Washington and Church streets. Their work uncovered what they believed was the northeast corner of the fort, a three-foot-wide adobe-brick segment built directly on the ground, without foundations. But the discovery of a more ancient Hohokam pithouse next to the wall diverted their attention and consumed the rest of their excavation effort. It is uncertain whether the adobe-brick feature was part of the presidio wall or a structure dating to the later Mexican or American period.

Repository Records, Radar Readouts. Recent renewal of interest in Tucson's early history spurred the Center for Desert Archaeology's attempts to determine whether any of the town wall of the 1776-1783 era survived intact below the downtown ground. To tackle this question the Center was awarded grants from the Arizona Heritage Fund, the City of Tucson, Pima County, and El Presidio Trust. Before actually searching for the presidio wall historical repository records were reviewed to verify that the fort extended from Washington Street south to Pennington and from Church Street west to Main. Our archives search suggested that the presidio's outer wall had bastions built at the corners and houses constructed against the inside of the wall so that their roofs could be utilized as platforms during battles. Inside the fortress were soldiers' barracks, a commandant's house, other buildings, and stables arranged around three plazas. In the eastern section of the fort was a church or chapel that had a *campo santo*, or churchyard cemetery, to its north and south.

To avoid having to trench blindly through the maze of buried utility lines downtown, the Center's initial probe for the presidio wall, in July of 1991, utilized "ground penetrating radar," a machine dragged across the surface on skids to obtain readouts on possible locations of buried walls, pits, or other cultural features. Carl Glass of the Department of Mining and Geological Engineering, University of Arizona, used the radar to locate what we think is the thick adobe wall that was uncovered in the courthouse's courtyard in 1954. The radar also sensed other buried anomalies suggestive of a north-to-south-running wall just east of the courtyard's central walkway.

Presidio Search Takes Side Seat. Before the Center could verify its radar findings, however, Southwest Gas Corporation contacted Desert Archaeology, Inc. early in 1992, asking for an archaeologist to monitor its pending construction of a new gas line trench along Alameda Street. This request was made because the trench was going to cut through an area where burials associated with the presidio had been disturbed during earlier construction projects since the 1880s and especially during the

1929 courthouse construction. As described in the April 1992 issue of *Archaeology in Tucson*, the gas line trench along Alameda Street did cut through a portion of the Tucson Presidio's cemetery. But even though it had been suspected that the cemetery was in this area, the sheer number of burials was a surprise.

In all, 20 complete or nearly complete burials were found along this single pipeline trench. They included 13 adults, 1 six-year-old child, and 6 infants or toddlers. Five additional graves that we identified in the trench were left undisturbed because they were not threatened by pipeline construction. However, in addition to the individuals in the 25 discrete graves, many more skeletal remains were encountered in the Alameda Street trench. In all, bones of as many as 14 men, 11 women, 29 adults of unknown gender, and 50 children were uncovered. As the archaeologists carefully removed bone after bone from the trench it became clear why there was such a large number of jumbled bones: the area available for use as a cemetery within the presidio was so limited that as more and more people were buried, new graves

had to be dug through earlier, probably forgotten ones. However, when earlier burials were encountered by later gravediggers, the disturbed bones were treated with respect. They were set aside temporarily, then placed carefully with the new burial, usually on or beside the legs or hips of the newly deceased.

A few glass beads found with some skeletons plus records that the presidio's church was in the immediate vicinity indicate that the Alameda Street graves were of the historical period and were within the fort's churchyard cemetery. The remains encountered in the gas line trench are probably from people who were buried during the last few years the *campo santo* was in use—probably some time in the 1850s. Studies of the bones by physical anthropologists confirmed that most were of Caucasian or Mexican origin, but others were bones of Native Americans.



This padlock from Trench 4 in the courthouse courtyard probably secured Tucson City Jail cells between 1883 and 1929. Photo by Homer Thiel.

Excavations in Search of the Presidio Wall. In October 1992, after local excitement about rediscovery of the presidio cemetery had died down, the Center for Desert Archaeology returned its attention to locating the eastern presidio wall. We dug two exploratory trenches to uncover the two underground linear features that had shown up east of the courtyard sidewalk on the radar readouts, hoping that one of them might be the fort's east wall. But one of them, in Trench 1 (#2 on page 2 map), turned out to be the east wall of the county jail that had been built in 1881 and demolished in 1929. The other eventually was identified as a 6-inch water main!

Trench 1 also struck the foundation for a public fountain (#7 on page 2 map) built in the same year as the courthouse, 1929. The only other architecture we uncovered in October, in Trench 2, was the north foundation of the city firehouse built in 1883. The illustration on page 8 shows where the 1883 firehouse was planned.

No presidio walls were detected in our October excavations

but both Trenches 1 and 2 revealed an archaeological feature associated with the Spanish fort. This was a compacted layer of earth about 6½ feet below the present courtyard lawn. We believe this hard layer was the original ground surface when the presidio was in use, and that it became compacted by constant use of people and vehicles over it. Beneath this layer we found only prehistoric artifacts.

Trench 3 (page 2 map) was excavated to verify whether the stone foundation we had seen in Trench 1 was really part of the 1881 county jail. Our discovery of the foundation corner in Trench 3, exactly where the northeast jail corner was shown on historical maps, confirmed our identification of this feature.

The Center for Desert Archaeology got a second chance to search for downtown archaeological features in December when the Pima County Facilities Management Department contracted with us to see whether any archaeological features were present in the courtyard prior to the County's efforts to restore the courtyard's original (1929) appearance. Continuing the trench numbering sequence we had begun in October, in December we first opened up Trench 4 in the northwest part of the courtyard (see map). It revealed the base of a large wall built of pinkish adobe bricks. But this wall followed an east-west course, so it couldn't be the fort's east wall, which ran north-south. We suspected, therefore, that the east-west wall in Trench 4 was part of a post-1820s (Mexican or American) structure.

Before we completed the December excavations we paid another visit to the Arizona Historical Society Museum to check into some historical newspaper accounts that had been dug out by historian James Officer. Some 1929 news stories noted that city building inspector Donald Page had mapped in the location of the presidio wall while the courthouse was being built. In the Museums' files we quickly turned up an incomplete map by Page, and eventually another carefully drawn courthouse-area map that precisely plotted the presidio's east wall. From the latter map we surmised that the wall had to be right below the north-south sidewalk through the center of the courtyard. We began Trench 5 in an area where construction workers had removed the concrete from the south end of that walkway, and within a few hours uncovered a substantial wall of pink adobe bricks like the wall in Trench 4. The Trench 5 wall ran north-south on a stone foundation. Each of its bricks was 11 inches by 22 inches by about 4 inches thick, the same size as the bricks reported for the east presidio wall by Donald Page in 1929.

This adobe-brick wall was the only one we found that did

not cut into earlier walls, leaving little doubt that it was the presidio wall. Sadly, most of it had been destroyed during construction of 19th century buildings and the 1929 fountain.

Our final excavation on this part of the project connected Trenches 2 and 4 after workers had removed the sidewalk between those trenches. This final effort revealed another remnant of the presidio's east wall that formed a corner with the wall segment we'd identified in Trench 4. Both of the adjoining adobe-brick walls were set on the same foundation and were made of the same kind of pink bricks, leaving no doubt that the builders of the wall had constructed a corner here, intentionally.

The wall corner that we found under the sidewalk is puzzling. What does it represent? One possibility is that it was an opening for a gate. Historical documents indicate that a gate in the west wall of the fort was called the *puerta de la guardia*, or 'gate of the guard,' because it was constantly guarded in the presidio's early days. Another gate on the east side has been called the 'gate of the camp.' The original term for it in Spanish evidently was *puerta del campo*, suggesting it got its name from its closeness to the campo santo, the cemetery in the east part of the presidio. This eastern gate was smaller, and many Tucson historians have supposed that it was cut through the wall many years after the presidio was built, to allow access to a new cemetery outside the fort. Most scholars place the east gate where Alameda Street now crosses the fort's eastern limits. However, a man born inside the Tucson Presidio in 1850, Hilario Gallego, remembered in 1926 that the east gate was instead just back of where the 1883 city hall stood about where we found the buried wall corner (see page 2 map). It is possible, then, that the opening we found is the gate reported by Gallego. Otherwise, the corner might have been part of a later addition to the presidio, or even an original eastern gate for which we have no archival records. Whatever it is, the careful construction of this corner foundation suggests that an opening was intentionally built into the wall (rather than cut through it). And its relationship to remnants of a stables built against the fort's east wall in 1874 suggests that the corner predates 1874.

Post-Presidio Structures and Citizens. Soon after southern Arizona was absorbed into the United States, Tucson was transformed. The sequence of construction that occurred after 1862 in the area of our downtown archaeological work provides apt illustration of the change that characterized post-presidio period Tucson. Major Ferguson's army map of

1862 depicts only two structures other than the presidio wall in Block 192. One of these was outside of our excavation areas, but the other, which was built against the western, inside face of the presidio's east wall, is represented by brown adobe bricks in Trench 5. Portions of this structure were demolished in 1881 but the adobe bricks of its west wall had survived intact, all still lying on their sides in nearly perfect order in our trench.

We also sniffed out signs of a business alluded to on page 4—a stable operated

July 19: Free Program on Downtown Tucson Archaeology

Besides the discoveries related in this story, other major archaeological finds were made in downtown Tucson in 1989-1990 by archaeologists working for Statistical Research, Inc. in the city block immediately northeast of Alameda and Church streets. That project is described in an upcoming report, *Pithouse, Presidio, and Privy: 1300 Years of Archaeology and History on Block 180, City of Tucson, Arizona*, by Richard Ciolek Torrello and Mark Swanson, Editors.

This month Dr. Ciolek-Torrello will team up with Homer Thiel (one of this article's authors) to present a free public program on the recent archaeological work in downtown Tucson. This special joint presentation will be hosted by the Arizona Archaeological and Historical Society on July 19 at 7:30 PM. It will be held in the Harvill Building Auditorium (Room 150) on the University of Arizona Campus.

For more information (including locations of free parking) call Allen Dart at 327-3509.

from 1874-1881 by Robert Leatherwood—in the south part of the block. Evidence for this enterprise was a buried, 4- to 6-inch thick layer of decomposed manure piled up against the east, or outer side of the presidio wall.

In 1881, Pima County constructed its second courthouse, a three-story Victorian brick building, in the south half of Block 192. This building replaced the original county courthouse, an adobe that had been built in 1868 facing west onto Court Street (an appropriately named road). The new edifice faced south onto Pennington Street and had the Pima County Jail attached to its back, or north, side (see page 8 map). The 1881 county jail's northeast corner, parts of its east and north walls, and three floor-support piers were found in our Trenches 1 and 3. Trench 3 also revealed the dilapidated flagstone sidewalk that ran along the north side of the jail for 38 years (#1 on page 2 map).

The north side of the jail faced Library Street. This was little more than a lane that bisected Block 192 where the eastwest courtyard walkway is shown on our page 2 map. Tucson's first city hall, marshall's office (#4 on page 2 map), and firehouse were all built in 1883 along the north side of Library Street. In Trenches 2 and 4 we uncovered portions of the marshall's office and firehouse, part of the city jailyard (#5 on map), and foundations for a courtyard wall built for "Pioneer Hose," the local fire department (#6 on map).

Residences made up the remainder of Block 192 north of Library Street in the late 19th century. Foundation remnants of one such abode were encountered next to the city jailyard along with thousands of artifacts discarded by the residents of these homes, mostly folks of Mexican heritage. Much of the trash was thrown out by members of the Serrano family, which was headed by Marcia Serrano after she emigrated from Mexico in 1870. Further study of Block 192's household artifacts should provide details on the life-ways and ethnicity of lower-income, female-headed households in post-presidio-era Tucson.

In our excavations within the intersection of Alameda and Church we uncovered foundations of a house that city archives identify as belonging to Maria Frye DeLong (#3 on page 2 map). She purchased this house in 1885 and lived there until she died in 1914. Maria was the wife of Sidney DeLong—entrepreneur, newspaper publisher, and the first Mayor of Tucson. And more. Just two months after becoming mayor, in 1871, Sidney DeLong accompanied a band of Anglo, Mexican, and Pima men to the Aravaipa Creek valley about 50 miles northeast of the city, where they slaughtered over one hundred Apaches, mostly women and children. A trial in this case, now known as the Camp Grant Massacre, resulted in acquittal of all the perpetrators. The jury deliberated for all of 15 minutes.

Tiled Courthouse Dome, Matching Fountain. By the late 1920s the Victorian-style Pima County Courthouse and the adjoining jail were falling apart. The county therefore authorized construction of a new courthouse, one that would occupy the entire block. This ambitious plan required that the old courthouse in the south half of Block 192 be demolished, along with the old city hall, city jail, the firehouse, and all the homes in the north half. The new courthouse, which we now know as the Old Pima County Courthouse, is the Spanish Colonial Revival-style, pink



Maria DeLong (right) and Mary Shibell Brown in Mrs. DeLong's doorway, 143 N. Church St., ca. 1914. Photo courtesy of the Arizona Historical Society, Tucson.

building with the tiled dome, now facing Church Street. It was completed in 1929, as was the fountain whose octagonal foundation we uncovered in our trenches. The courthouse was added to the National Register of Historic Places in 1978.

The courtyard fountain, which spouted water from a bronze finial, was an elaborate affair decorated with tilework to match the courthouse dome. Unfortunately, the fountain's builders constructed it atop a brick floor-support pier from the 1881 county jail, like the one shown in our page 1 photo. Uneven settling of the foundation over this pier apparently caused the fountain to crack, rendering it nonfunctional. The date of its demolition is not known but its foundation was left intact beneath the courtyard walkway (page 2 map).

In the mid-1950s a second fountain was constructed in the center of the courtyard and crowned by a cherub (named "Mamie"). Pima County's removal of this fountain in 1992 caused a public uproar. However, the fountain-razing was mitigated some when the courtyard was restored to its 1929 design during the recent Pima County project to return the exterior of the Courthouse to its original appearance. Reconstruction of the 1929 fountain actually had been planned for two years. With the restoration of the courtyard just completed last month, a replica fountain now graces the southern half of the courtyard, and a polished granite marker commemorates the alignment of the Tucson Presidio's east wall.

Unanswered Questions. Despite all of the archaeological work conducted downtown recently, many questions remain unanswered. How big was the area's Hohokam village? What was the function of the enigmatic wide adobe wall uncovered in 1954—presidio wall, corner tower, or was it even contemporary with the fort? Is more of the presidio wall still intact downtown? And exactly when did people build the wall we discovered? (Was it really part of the original presidio, or a later addition?) Continued research in the heart of Tucson is expected to answer these questions, and raise many more, as we dig into the past.

J. Homer Thiel, Michael K. Faught, and James M. Bayman are all professional archaeologists who have been employed on research projects of both the Center for Desert Archaeology and Desert Archaeology, Inc.

Southern Arizona Archaeology Current Events on the Archaeology Scene

In a survey for the Arizona Department of Transportation (ADOT) in the San Pedro River valley, **Archaeological Research Services, Inc.** (ARS) of Tempe has identified 23 archaeological sites along State Route 77 between Mammoth and the Aravaipa road. The sites include six Classic period, walled settlements (one has over 100 surface rooms and 2 small platform mounds), other prehistoric housing sites with free-standing masonry rooms, rockpile agricultural fields, prehistoric artifact scatters, and a road and a structure that date from the 1930s.

An unexpected bonus of the Route 77 survey was the relocation of AZ BB:2:3 (ASM), a platform mound site near the junction of Aravaipa Creek and the San Pedro River that had been "lost" for nearly 40 years. Recorded in 1953, this site had been misplotted on Arizona State Museum maps due to vague and partly incorrect locational information on the original site

record. By carefully examining records of this site and others recently recorded nearby, archaeologist Tom Wright relocated BB:2:3's large mound and enclosing wall on private land outside the Highway 77 right-of-way. Rediscovery of this site will allow greater understanding of the large prehistoric settlement complex that existed in the Aravaipa Creek-San Pedro River confluence area. The Center for Desert Archaeology's Lower San Pedro archaeological survey project [see box, right] identified many of these sites.

ARS also surveyed for ADOT in the Gila Valley below the San Pedro confluence, along State Route 177 between Kearny and Winkelman. Ancient rock-pile fields, pre-A.D. 1150 artifact scatters, pre-1300 artifact concentrations associated with small cobble features, and a post 1300 Salado roomblock were found. ARS also recorded early to mid-20th century road segments, wooden flumes, pipelines, powerlines, and railroad-related features.

The **Arizona State University** Department of Anthropology is working with the U.S. Army Corps of Engineers to establish a

visitor center and interpretive trail at the Hedgpeth Hills petroglyph site just north of Phoenix, near Adobe Dam. As part of this effort, department head Dr. Charles Redman invited representatives of Arizona and New Mexico Indian tribes to tour the site with ASU and other local archaeologists so that Native American interpretations of the ancient art can be included in the development plan. The new rock art museum will open in 1994 under the direction of Dr. Peter Welsh, who has been chief curator at the Heard Museum for the past seven years.

Cultural & Environmental Systems, Inc. of Tucson has been conducting archaeological surveys and monitoring construction for 74 miles of new telephone line in the San Pedro Valley. Most of the more than 100 archaeological sites in or near the phone line corridor were recorded previously. They represent mainly Hohokam, Salado, and Mogollon habitation and agriculture but some are of the

Center for Desert Archaeology Ends Spring Season for the Lower San Pedro Archaeological Survey

The Center's all-volunteer archaeological survey for *Archaeology in Tucson*

members ended its spring 1993 season in the vicinity of Cascabel, due east of Tucson and the Santa Catalina Mountains. Nine days of survey were scheduled from January through May, but one of them had to be called off because the road into Redington had been destroyed by flooding and deep water was still running. During the eight days work we discovered 35 archaeological sites and rerecorded two known ones.

The previously recorded sites include a 70-meter-long Hohokam ballcourt associated with at least five square rock enclosures or rooms, and a rock-masonry pueblo with a surrounding compound wall. Of the 35 sites we recorded for the first time, two are rather unusual. One was a bedrock mortar with a pestle still inside it. The other was a massive, meandering alignment (a wall perhaps?) of boulders and cobbles built across a low area of a ridge between two hills, associated with only a few flakes of chipped stone and two outlying rock piles.

Fourteen of the sites are generally on high sloping terraces some distance from the river and are characterized by rock piles and alignments interpreted as agricultural features. Five sites on terrace fingers overlooking the river floodplain each contain 4 to 6 square rock foundations that may be

for field houses.

Another four houses have stone artifacts

made of fine jasper plus circular rock enclosures that might be the foundations of Sobaipuri (early O'odham) houses occupied between A.D. 1450 and the 1700s. The other 11 sites are simply scatters of prehistoric potsherds, chipped stone, and occasionally stones used for grinding; some of these may contain buried pithouses or other archaeological features.

Archaeology in Tucson members are invited to participate in the upcoming fall 1993 season of the Lower San Pedro survey. To get on the list for volunteering call Jim Bayman at 881-2244.

Center for Desert Archaeology Excavates in Catalina State Park

Directed by archaeologist Debbie Schwartz, *Archaeology in Tucson*

volunteers completed three weeks of archaeological testing this spring at the Romero Ruin, a prehistoric Hohokam village and historic Mexican ranch site. Prehistoric features exposed by our excavations include segments of the rock-masonry wall that enclosed the Hohokam village, wall segments (for rooms?) joined to the inside of the enclosing wall, a pit-room lined with upright cobbles, and pits used for mixing adobe mud. We also collected artifact samples

from several separate layers of a deep prehistoric trash deposit that had accumulated before the Hohokam built a wall over this refuse midden to enclose their village.

We also excavated inside and outside of one of Francisco and Victoriana Romero's ranch buildings that included an interior corner fireplace.

All these features are along Catalina State Park's interpretive trail through the ruin. They have been stabilized by a crew of the Arizona Conservation Corps and informational signs have been posted.

Archaic and Historic periods.

In test excavations at AZ U:15:175 (ASM) in the Florence Townsite Historic District, C&ES identified 23 historical features where the Town of Florence plans a new seniors' center. House foundations, remnants of out-buildings, a possible well, and trash areas at this site evidently were associated with occupations by the J. J. Devine and Manuel S. Ramirez households, ca. 1880-1960. Also identified were traces of School Street (abandoned in the 1930s) and some prehistoric artifacts suggesting earlier Hohokam and Salado use of the area from A.D. 1150-1450.

In recent archaeological testing along Interstate 10 in Tucson, **Desert Archaeology, Inc.** (DAI) discovered five Late Archaic (1500 B.C.-A.D. 500) pithouses with floor assemblages at a site near the Miracle Mile interchange. In the same project five other pithouses and some outdoor features were found in association with Gila Polychrome pottery made after A.D. 1275, at a small Hohokam settlement just south of Grant Road. DAI has also conducted test excavations along State Route 188 north of Roosevelt Lake, near Sycamore Creek. Sites include a Hohokam pithouse area and several wall-enclosed Salado settlements.

Statistical Research, Inc.

of Tucson recently finished ex-

cavations at the West Branch archaeological site in Tucson, near Irvington and Mission roads, for the Pima County Department of Transportation. Of 23 prehistoric Hohokam houses identified, some were considerably remodeled and reused and a few yielded large

large assemblages of artifacts. Crafts in evidence were production of slate-like palettes, turquoise ornaments, and pottery. Many pottery-making anvils and polishing stones were found, along with small bowls and other caches containing powdered specular hematite, crystalline manganese, and balls of ground-up ocher. These minerals, which were in various states of processing, evidently were used to decorate Red-on-brown, redware, and polychrome pottery. SRI's finds thus confirm suggestions by Frederick Huntington, who surmised that West Branch was a ceramic production center during the 11th century, based on his work there in 1984.

SRI conducted extensive excavations for the Bureau of Reclamation along the Verde River near Horseshoe and Bartlett dams in the Tonto National Forest. Sites investigated include a large Pioneer-Sedentary period Hohokam village with two ballcourts; a large Classic period hamlet; and several agricultural sites with prehistoric dryfarming and irrigation features. Although most of the ancient houses identified in the excavations are typical Hohokam "houses in pits," several were built with raised wooden floors supported by stone piers, and some entryways include extensive stone construction. Ties with the Phoenix-area Hohokam seem to have broken down after A.D. 1100 in this area, as later prehistoric materials in SRI's excavations show strong affinity to contemporary cultures near Payson, Cave Creek, and other central Arizona uplands.

The University of Arizona is beginning a new archaeology field school excavation project in the Mogollon Rim area of east-central Arizona. As part of a long-term research project the Department of Anthropology began excavating at two pueblo ruins, Pottery Hill and Bailey Ruin, in the Sitgreaves National Forest near Pinedale. This summer's field season began June 1 and will end July 9.

How Old Is It? [Continued from page 1]

Thus, the method has not been widely applied to Hohokam sites because desert hardwoods are unsuitable for tree-ring analysis. Furthermore, the time depth of the technique is limited to the length of the relevant master chronology, which varies from 8600 years in the Great Basin to less than 1000 years in many other areas. Thus, the development of more widely applicable dating techniques with greater time depth was enthusiastically received.

Shortly after World War II, Willard F. Libby introduced the radiocarbon dating method, one of several "radiometric" techniques, that is, methods that are based on the "decay" of radioactive isotopes. Radiocarbon dating, which spans the last 50,000 years, is the most widely used radiometric method and underlies most archaeological chronologies.

Radiocarbon dating is based on the transformation (decay) of atoms of radioactive Carbon-14 into atoms of Nitrogen-14. This process occurs at a fairly constant rate that is expressed as the half-life (5730 ± 30 years), the time required for half the original Carbon-14 to decay. Thus, in 5730 years half the original amount will have decayed, in an additional 5730 years half the amount remaining after the first 5730 years will have decayed, and so on. Any living organism possesses an amount of Carbon-14 equal to that in the atmosphere. When the organism dies, however, replenishment of carbon ceases, and the amount of radioactive carbon begins to diminish through decay. The amount remaining at any time thereafter indicates how long it has been since the organism died. Plant and animal remains from archaeological sites are dated by measuring the amount of Carbon-14 remaining compared to the original concentration. This produces a radiocarbon age with an associated statistical error (the \pm). Because the process is complicated by fluctuations in the amount of atmospheric Carbon-14, radiocarbon determinations must be calibrated against long tree-ring chronologies. Calibration produces a calendar date range with a specified probability of bracketing the true date of the organism's death.

Because of its universal applicability, radiocarbon dating is used in contexts that cannot be tree-ring dated. Thus, Carbon-14 dates have helped refine the ceramic-based Hohokam chronology. The technique is also used to date materials older than the oldest recorded tree-rings. Paleoindian and Archaic chronologies, for example, are based primarily on radiocarbon dates.

Radiocarbon dating has some weaknesses. The \pm factor can be so large as to render the date ambiguous. High variability in the calibration curve produces considerable inaccuracy in dates that fall in the last 2000 years. Finally, problems associated with the carbon content of the dated material (bone, shell, wood, annual plants) often limit the relevance of dates, so the search for independent dating techniques did not end after the advent of radiocarbon dating.

In the 1960s, archaeomagnetic dating was developed from the knowledge that the position of the earth's north magnetic pole has moved over time. A record of polar movements is preserved in immovable objects that include iron-rich clays, such as hearths dug into the earth. Heating the clay above a

[Concluded on page 8]

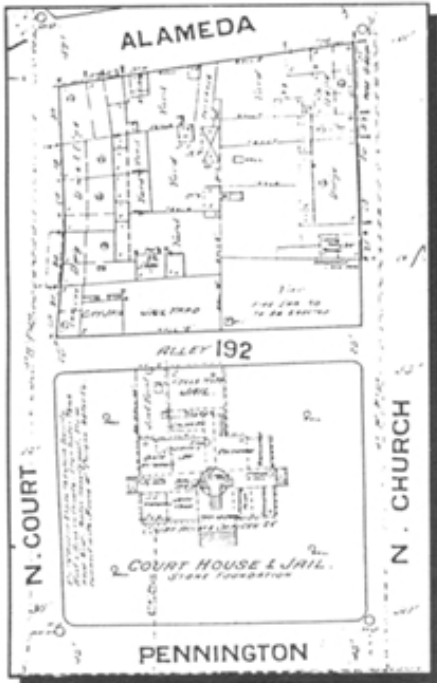
The April issue of *Archaeology in Tucson* was mailed by Carol Richardson, Jean Reid, and Bess Puryear. Information in this issue was contributed by Jim Bayman, Richard Ciolek-Torrello, Jeff Clark, Bill Deaver, Bruce Huckell, Barbara Mills, Kim Savage, Laurie Slawson, Debbie Swartz, Stephanie Whittlesey, and Tom Wright. *Archaeology in Tucson* is printed by the AlphaGraphics Superstore at 7306 N. Oracle Rd.



William Deaver (University of Arizona Geosciences Dept.) collects archaeomagnetic samples from a hearth. Photo by Jack Lord.

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A section of the 1883 Sanborn Insurance Company map of Tucson, Arizona, showing structures in the city's Block 192.

How Old Is It? [Continued from page 7]

certain temperature frees iron particles, allowing them to orient themselves with the north magnetic pole. When the clay cools they become fixed in this orientation. The direction of the north pole at the time of firing is determined by averaging several measurements of the remanent, or leftover, magnetism in the hearth. Therefore, several samples of earth are used for each archaeomagnetic sample, as is indicated in the photo on page 7.

By putting together a sequence of archaeomagnetic hearth readings the movement of the north pole can be traced, and when the hearths can be independently dated (usually dendrochronologically) dates can be assigned to sequent points along the trace, or archaeomagnetic curve. Subsequently, hearths of unknown age are dated by determining where their magnetic alignments intersect the dated curve of polar movement.

Because archaeomagnetic dating is more widely applicable than dendrochronology, usually has a smaller statistical error than radiocarbon dating, and lacks many of the contextual and material problems associated with radiocarbon dating, it has become vital to Hohokam chronology building. The limitations of the method are its restriction to fixed objects containing iron-rich clays, the necessity to calibrate the system for fairly small regions, the statistical error in measuring the remanent magnetism and in determining the intercept on the polar curve, and ambiguities caused by uncertainties in tracking polar movement and by reversals in the polar curve.

Given the strengths and weaknesses of the three primary independent dating techniques, it is safe to predict that archaeologists will remain deeply concerned with dating and will continue to promote the improvement of other existing techniques (such as obsidian hydration, thermoluminescence, and fission track dating) and the development of new methods.

The Center for Desert Archaeology

The Center for Desert Archaeology is a nonprofit research and education organization that specializes in the study of archaeology and history of desert regions. Our primary research focus has been southern Arizona.

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