

# Excavations at Tumacacori 1979/1980

Historic Archeology at Tumacacori  
National Monument, Arizona

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TUMACACORI EXCAVATIONS

1979/1980

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National Monument, Arizona

PART I: CULTURAL AND NATURAL STRATIGRAPHY IN THE CAMPO SANTO OF  
TUMACACORI MISSION

by  
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PART II: TUMACACORI DRAIN EXCAVATIONS, EXCAVATION OF GRANARY WELL  
POINTS

by  
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PART III: EXCAVATION IN THE SOUTH CONVENTO OF MISSION TUMACACORI

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## ABSTRACT

The Western Archeological and Conservation Center conducted excavations in the Campo Santo (cemetery), granary, and convento area of Tumacacori National Monument, Arizona, prior to a series of stabilization projects within the mission complex.

A trench dug by C. Michael Barton in the Campo Santo revealed a series of well-defined occupation levels from the early mission period. This area was found to be associated with secular functions and domestic activities, indicating that the Campo Santo originally may have been part of the Indian village rather than the mission complex.

Kay Simpson excavated two trenches in Rooms 13 and 14 of the granary. A complicated building sequence was found which included fill, plastered use surfaces, and bricks and cobble stones embedded in foundation mortar. Also uncovered was an earlier room, badly disturbed, but possibly predating the convento.

Lee Fratt excavated in the cloister and Rooms 42 and 60 of the south wing of the Franciscan convento. Architectural features exposed included walls, floors, the cloister bench, and an unidentified adobe structure. Deposits predating the convento also appeared.

Although all three projects were limited in scope, the information recovered suggests that extensive, undisturbed, cultural deposits from the mission period still exist at Tumacacori.

PART I

CULTURAL AND NATURAL STRATIGRAPHY IN THE  
CAMPO SANTO OF TUMACACORI MISSION

by  
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## INTRODUCTION

### The Background

The staff of Tumacacori National Monument (Fig. 1) noticed in March of 1979 that a mesquite tree, growing from the base of the south side of the mortuary chapel, was sending roots across the Campo Santo and into the church. Although the root growth could damage the church, the monument staff speculated that the removal of the tree might cause ground subsidence which would damage the mortuary chapel. For this reason, it was decided that a trench 45 to 60 cm (from here on referred to as the Trench) would be dug between the tree and the church, in order to cut the roots.

The Campo Santo had been used in the late 19th and early 20th centuries as a corral, and the subsurface material was thought to be "badly disturbed." The only published report of excavation in the Campo Santo refers to a trench which was dug just inside the east wall (Mayer et al. 1971). The monument staff thought that a similar but unrecorded trench might have been dug along the north wall of the church many years ago.

### The Project

Because of the "disturbance" in the Campo Santo, I was sent, as an archeologist, only to monitor the digging of the Trench. Very soon it was clear that undisturbed strata had been exposed. This required a drastic change in the method of excavation. The workers assigned to the task had been conscientious and attempted to complete the Trench rapidly. For this reason, some features and provenience control were lost before more careful supervision and recording were begun. In addition to the Trench between the tree and church, we decided to excavate a Test Pit to look for stratigraphic evidence of the unrecorded trench mentioned by the staff. The Test Pit was centered along the north wall of the church (center at 8.3 m from the northeast corner of the church) and adjacent to it. It measured 1 m x 0.5 m and was excavated to a maximum depth of 0.7 m (Fig. 2).

No stratigraphic evidence of this trench was found along the north wall of the church. In fact, we found a series of relatively well defined, undisturbed cultural strata (Fig. 3). The strata seem to rep-

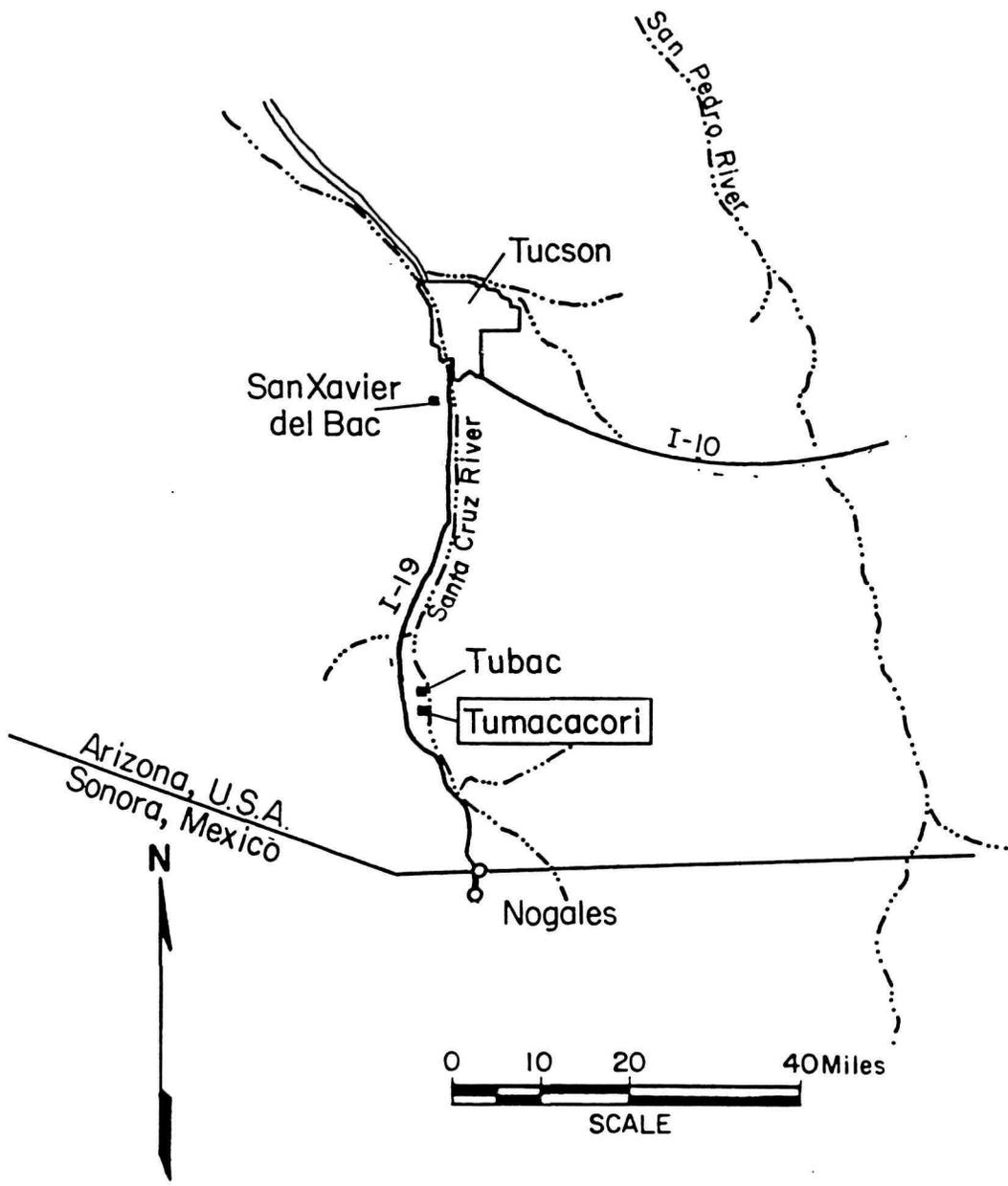


Fig. 1. Location of Tumacacori National Monument.

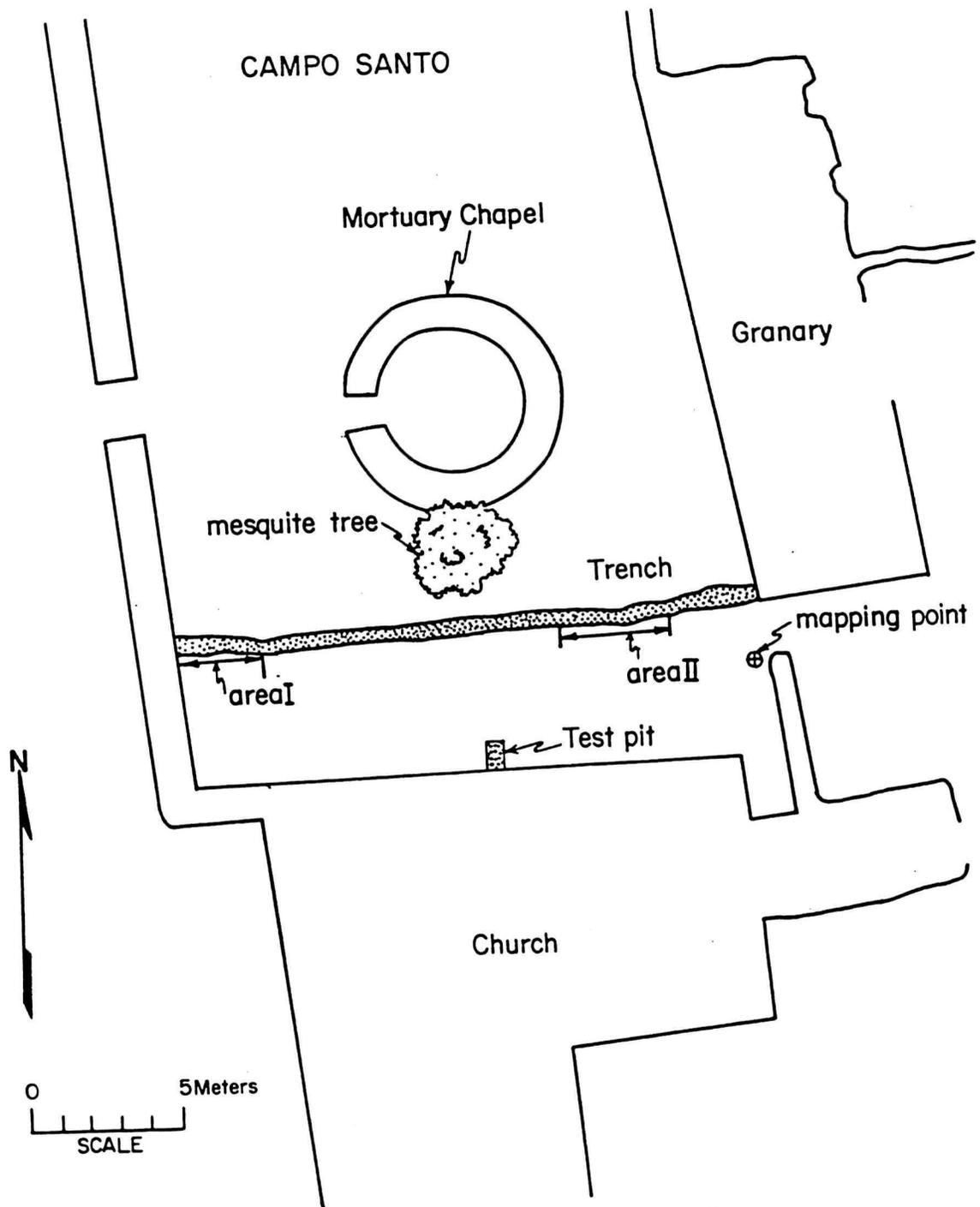


Fig. 2. Plan of Campo Santo Showing Trench and Test Pit

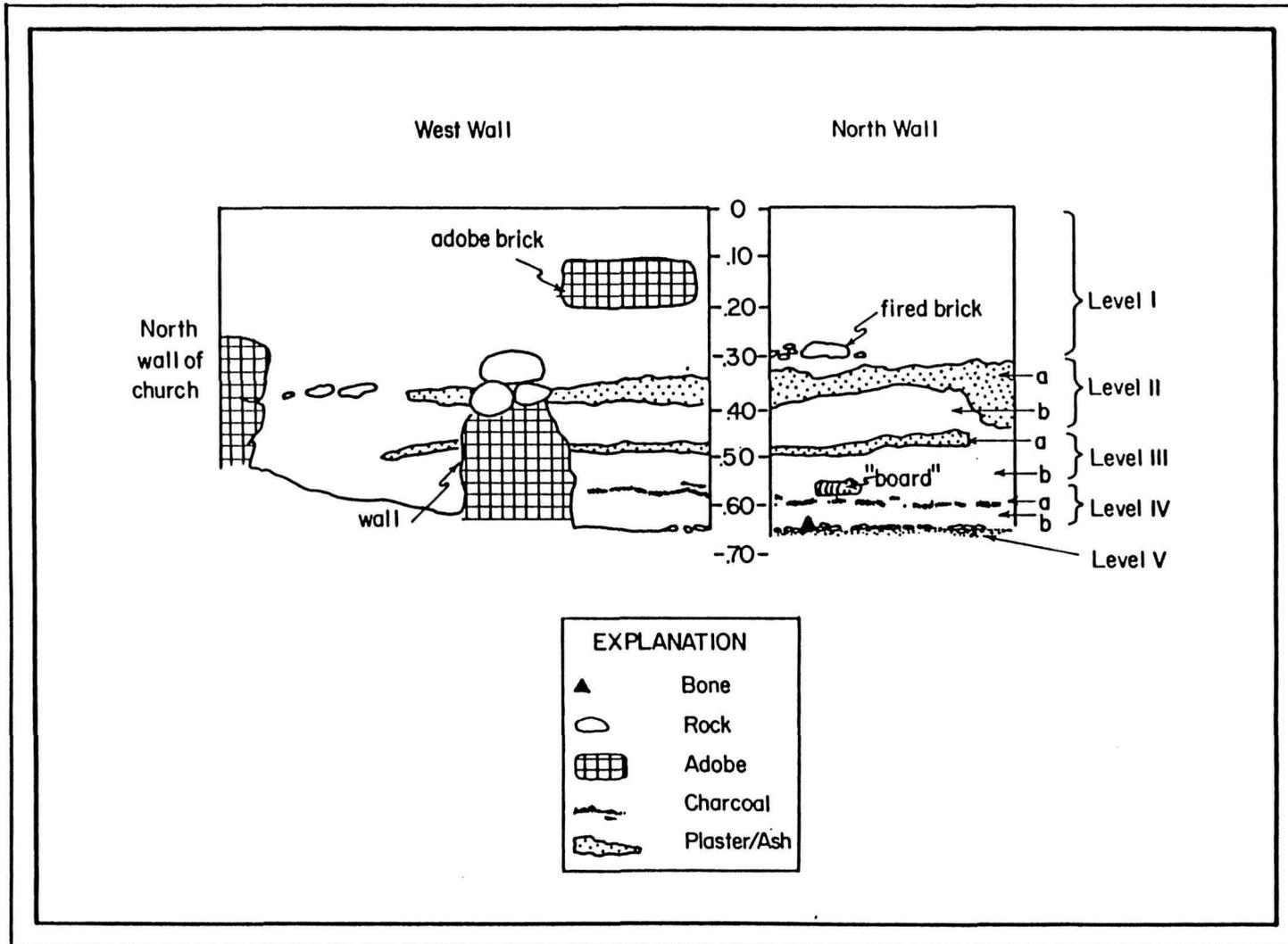


Fig. 3. Test Pit Profile.

resent a midden separated into layers by thin deposits of charcoal, ash, plaster, and brick. An adobe wall, roughly parallel to the north wall of the church, ran across the Test Pit.

The upper 25 cm (level I) of the deposit contained a scattering of burned brick and adobe and did appear to be disturbed. On the basis of the stratigraphy of the Test Pit, the monument staff was informed that if this pit was representative of the deposits in the rest of the Campo Santo, then no place was "safe" to excavate to a depth of more than 25-30 cm without damaging archeological deposits. Any excavations should be done very carefully and with supervision by an archeologist.

Influenced by previous views of the cultural resources at Tuma-cacori, I had expected that the excavations would reveal a few late 19th or early 20th century artifacts and bones of domestic animals (i.e., those kept in the corral) and little else. I also expected a few scattered human bones or mission period artifacts, but thought perhaps this was unlikely because of the relatively shallow depth of the trench. If any artifacts or bones were to be found, I had assumed that they would be out of their original context and of minimal archeological value. As this report indicates, the results did not support these expectations. A few historic or recent artifacts, animal bones, and one small fragment of a human infant skeleton were found. Unexpectedly, our excavation revealed a series of well-defined occupation levels from the early mission period.

## EXCAVATION RESULTS

The following is a description of the stratigraphy in the Campo Santo in the two excavated areas: (1) the Test Pit measuring 0.5 m x 1.0 m, adjacent to the north wall of the church and (2) the Trench (measurements mentioned above), opened in order to cut the mesquite roots (Fig. 2). The level designations in both the Test Pit and the Trench refer to the sequence of deposits encountered from top to bottom in each of these areas and do not imply equivalent stratigraphic units in the two excavation areas. While the areas were separated by about 3.5 m at their closest point, it is possible to correlate at least some of the stratigraphic units.

### Test Pit

The stratigraphy of the Test Pit was more easily discernible and more complex than that of the Trench. Profile drawings and photographs were made for the north and west walls. Refer to the profiles (Fig. 3) for clarification of the following discussion.

Level I. This is a relatively thick unit, occupying the upper 30-35 cm of the Test Pit. It is undifferentiated and rather heterogeneous in composition. The matrix consists of a fine, medium brown, sandy soil. Included in this matrix are a scattering of gravel, small pebbles, a few charcoal flecks, fired brick fragments and adobe. An interesting feature is an adobe brick at the north end of the west wall. The top of the brick is 10 cm below the surface. It is rectangular, 10 cm thick, and 27 cm long. The visible plaster of the church wall continues into the upper half of level I, indicating deposition of the level after construction of this portion of the church. Below the plaster is an unplastered adobe brick wall, which is probably part of the church foundation. At the base of level I, in the northeast corner of the Test Pit, we found a bone and a concentration of fired brick fragments. This may be scattered rubble of this level or material derived from level IIa. A large rock in the center of the west wall at the base of level I (top at 30 cm below surface) seems to be associated with an adobe wall that runs through the Test Pit and extends below the bottom of the pit.

Level II. Level II consists of dark brown soil. It is gritty and

moderately compacted. Coarse gravel and charcoal flecks are lightly scattered throughout the level. This level is divided into sublevels IIa and IIb.

IIa is defined on the basis of relatively high concentrations of plaster and/or ash included in the matrix, giving it a grayish appearance and a very gritty texture. Beginning at 30-35 cm below surface, IIa is about 5 cm thick through most of the Test Pit. It is somewhat thinner in the south half of the pit, and adjacent to the church wall it is marked by a line of medium-sized rocks. In the northeast corner of the Test Pit, the bottom edge of the layer dips sharply for 10 cm, giving the appearance of a small pit in profile.

IIb, directly below IIa, is composed of the same matrix but lacks the ash and/or plaster. It begins at 35-40 cm below surface and varies in thickness from 5 cm to 15 cm.

Level III. This unit is both darker and more compact than Level II and quite gritty. Charcoal and a light scatter of gravel are included in the matrix. It is divided into sublevels IIIa and IIIb.

IIIa is defined by the inclusion of plaster and/or ash in the matrix. The top of the layer is 45-48 cm below surface. It is relatively narrow, between 1 cm and 3 cm thick. It looks as though it may disappear next to the church wall, and perhaps was cut off by the excavation for construction of the wall footing.

IIIb is the same matrix as IIIa but lacks the plaster and/or ash. Seen in profile, it contains what appears to be a burned board. At 56-58 cm below surface, the rectangular board is 7-9 cm wide, about 1.5 cm thick, and 6 cm long. The rings of the tree from which it was cut are clearly visible. It might be possible, with careful excavation, to obtain tree-ring (if an exterior surface exists) and C14 dates. This wood may be associated with the charcoal layer of level IVa rather than with level III.

Level IV. The matrix of this level is very dark brown. It is compact and has a gritty texture. Small flecks of charcoal are common throughout. It is divided into sublevels IVa and IVb.

IVa includes a heavy concentration of charcoal along with ash and/or plaster in the matrix. It begins at 55-59 cm below surface and is only about 2 cm thick. It is most apparent on the north wall of the

Test Pit and only appears in the northernmost 15-20 cm of the west wall. Because IVa appears only on the north side of the adobe wall that runs through the pit, it may be in some way associated with this wall.

Level IVb has a matrix similar to that of Level IVa without the high concentrations of charcoal, ash, or plaster. It begins at 57-61 cm below surface and seems to be about 5-7 cm thick.

Level V. This is a line of rocks and plaster at the bottom of the north wall of the Test Pit. Its depth and extent are not known. A bone was recovered from this unit 5-10 cm from the western edge of the north wall. It has been identified as a proximal fragment of the left radius of a domestic cow (Bos taurus). The base of the adobe wall that runs across the pit may rest on the top of Level V. This wall is 20-23 cm thick and at least 25 cm high, extending up through Level IIb. It may have been topped with medium-sized rocks, three of which are visible in the west wall. The wall is roughly parallel to the north wall of the church and was present across the total width of the Test Pit (0.5 m).

### Trench

While the stratigraphy of the Trench is neither as complex nor as well defined as that of the test pit, more features and marked disturbances exist because of the larger area exposed. The location of features are designated here in centimeters below surface and meters west of the east wall of the Campo Santo. Profile drawings were made of the south wall of the Trench (Figs. 4a, 4b). Figure 4a has a 4:1 vertical exaggeration; figure 4b is in correct proportions.

Level I. This is disturbed trench fill, excavated during stabilization of a granary in 1971 (Mayer et al. 1971; Shenk 1976). The walls of this excavation are lined with plastic, so they are easily detected. The disturbed material extends 0.5 m west at the surface and slopes in toward the east wall of the Campo Santo to a maximum depth of 45-50 cm.

Level II. This level represents the uppermost deposits throughout most of the Trench. The matrix is a medium brown, loose, sandy soil. Within the matrix is a light scatter of gravel, a few medium-sized rocks, some fragments of fired brick and possibly some fragments of adobe. Where the boundaries can be determined (especially in area I), level II seems to be about 20-25 cm thick. The level appears to be dis-

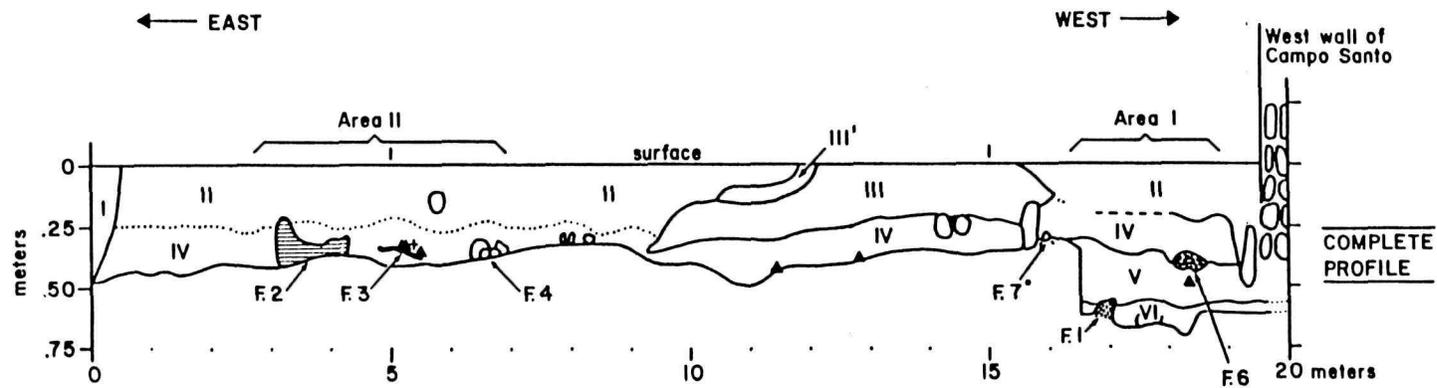


Fig. 4a. Trench Profile.  
(4:1 vertical exaggeration.)

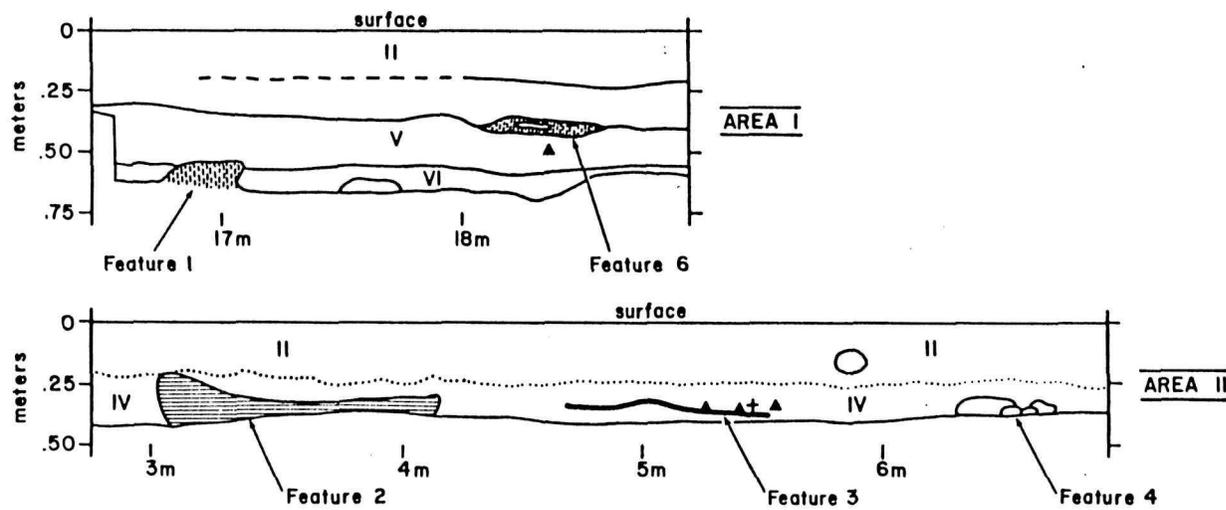
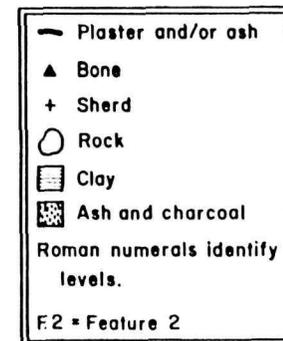


Fig. 4b. Details of Areas I and II.  
(Actual horizontal and vertical measurements.)



\* Adobe

turbed because it contains cultural material from various periods such as recent visitor trash, a rusty tin can, some rusty wire, a few fragments of bone, mid-19th century glazed pottery, and a few Piman plainware sherds. Some of this apparent disturbance, however, may be the result of the rapid and careless digging at the beginning of the excavation.

It is not difficult to delineate level II in the western portion of the Trench (16.5-19.4 m west), where it is slightly lighter in color and less compact than the underlying level IV. In the eastern half of the Trench (0.5-9.2 m west), however, it is difficult to distinguish from level IV. The characteristics that differentiate level IV are the compactness of the soil and the artifacts and features (apparently undisturbed) that may indicate an Indian occupation. Between 9.2 and 11.8 m west, levels II and IV are separated by level III, which is easily distinguished. Level II does not occur in the Trench profile between 11.8 and 15.6 m west, where level III is exposed on the surface.

Level III. This represents a layer of gravel restricted to the area between 9.2 and 16.1 m west. It is exposed on the surface between 11.8 and 15.6 m west. Level III dips to the east from 11.8 m west to its terminus at 9.2 m west, where its upper edge is 34 cm below surface. The level varies in thickness from 5-10 cm at its eastern edge to 20-25 cm in the center. It is composed of fluvial gravels with a medium brown, sandy soil (similar in appearance to the matrix of level II) filling the interstices. No cultural materials were encountered in this level.

Level IIIa is very hard and cement-like. It encompasses the upper 6-10 cm of level III between 10.5 and 12.0 m west and could be a calichification. However, no calcium carbonate deposits were obvious, and the origin of level IIIa is not known.

Level IV. The matrix of this unit is similar to that of level II (i.e., a medium brown, loose, sandy soil). It appears more compact than level II and perhaps has a slightly higher clay content, as it seemed to become harder with exposure to the air. It is a bit darker at the western end of the Trench, where it is cut off by a trench just inside the west wall of the Campo Santo. The matrix includes a light scatter of gravel and a few medium-sized rocks, some in clusters. It also contains

a few fragments of fired brick (at least in the upper portion of the level toward the eastern section of the Trench) and perhaps some fragments of adobe. The top of the level begins at about 20 cm below surface, except in the area of level III, and is 15-20 cm thick. Where level III dips into level V (9.2-11.8 m west), level IV becomes increasingly thinner, almost disappearing between 9.2-9.4 m west.

Level IV contains numerous cultural materials, all of which may relate to an Indian occupation. These include Piman plainware and redware sherds, lithic debitage, and animal bone. Also found in level IV are features 2-5 described below.

Feature 2. This is a very compact soil extending from 3.0 to 4.13 m west that seems to have a high clay content. Feature 2 is sloped on its western edge, but the remainder is fairly level. The eastern end (3.0 m west) is 20 cm below surface. It then drops to 25 cm within the next 20 cm west and continues at that level until it ends abruptly at 4.13 m west. A bone fragment is located in the wall 10 cm east of the eastern edge of feature 2.

Feature 3. This is a very thin lens of ash and/or plaster. It is only 1-2 cm thick, but it extends from 4.7 to 5.5 m west. It dips slightly to the west, occurring 32 cm and 35 cm below surface at its eastern and western edges, respectively. Several bone fragments and a plainware sherd, directly associated with feature 3, were found in situ in the Trench wall.

Feature 4. This line of medium-sized rocks extends roughly north-south across the Trench and is about 40 cm wide. It has the appearance of a portion of a wall.

Feature 5. Feature 5 consisted of about a dozen medium-sized rocks (the same size as in feature 4) that were mistakenly removed by a workman before they were seen by the archeologist. They were found somewhere between 8 m and 12 m west. The exact location and original configuration are unknown.

Area II. Features 2, 3, and 4 in level IV are grouped together under the heading of area II (3.0-6.7 m west) because these features appear to be related contextually and spatially. A concentration of cultural material including animal bone, plainware and redware sherds, and lithic debitage was found in this area (see the discussion of mate-

rial culture and faunal remains). Feature 5 also may have been related to area II, but this is impossible to determine.

Level V. The matrix of this unit is a dark brown, gritty, fairly compact soil. Level V is both darker and more compact than level IV above it. It contains a very light scatter of gravel, a few small fragments of fired brick, and scattered flecks of charcoal.

This level first appears in the bottom of the Trench (32 cm below surface) at about 7.72 m west and continues to appear at a depth of 32-40 cm from this point west to where the more deeply excavated area I begins (16.5 m west). Throughout most of area I (16.5-19.4 m west) the top of level V is about 40 cm below surface 15-20 cm thick. At the western edge of the Trench, the upper 10 cm of level V is cut off (as is all of level IV) by the trench mentioned earlier, along the inside of the west wall of the Campo Santo. The lower 10 cm of the level continues under the west wall. Level V contains cultural materials consisting of animal bone, Piman sherds, a projectile point, and includes features 1, 6, and 7 described below.

Feature 1. Feature 1 is an ash lens located between 16.76 and 17.01 m west. Irregular in outline and of uncertain thickness (at least 8 cm), its maximum east-west length is 25 cm. The top of the lens is in level V (56 cm below surface), but it extends down into level VI. Although it was not possible to determine the associated stratigraphic unit, feature 1 probably belongs with level V. Two burned plainware sherds, a piece of burned bone and a small triangular projectile point were found in situ within and adjacent to this lens.

Feature 6. This is a lens of very dark (probably burned) soil; it contains considerable charcoal. It is 50 cm long (18.0 to 18.5 m west), and its top is 38-40 cm below surface, or level with and slightly above the top of level V. It is 6-8 cm wide, thinning toward its edges. The center of the feature contains a dense charcoal concentration 15 cm long and 2-3 cm thick. A fragment of bone was found in the wall of the Trench a few centimeters below feature 6. Although this feature is included in level V, it may be an intrusion from level IV.

Feature 7. This is a large chunk or concentration of burned jacal or adobe. Located at the bottom of the Trench between 15.85 to 16.00 m west, its top is at a depth of 26 cm from surface, and it ex-

tends down into level V. No artifacts were associated with feature 7.

Area I. A section of the trench was excavated to a depth of 60-68 cm below surface. Located between 16.5 to 19.2 m west (the west wall of the Campo Santo), this portion of the trench was given the designation area I. Features 1 and 6 are included within area I but are located at different depths.

Level VI. This lowest stratigraphic unit in the Trench is a mottled, yellow-brown soil with a high clay content. It was only exposed below area I, but appears to continue to the east and under the Campo Santo wall to the west. Its top begins at 56-60 cm below surface. No cultural materials are associated with this unit, except possibly those of feature I, which extends into this level. Since only a small portion (both vertically and horizontally) of level VI was exposed, it is possible that with further excavation cultural remains may yet be found within it.

## INTERPRETATION

### Synthesis of Stratigraphy

The following is a synthesis of the stratigraphy of the Campo Santo presented in the order of deposition: (1) The basal clay layer seen in the Trench is probably a terrace of the Santa Cruz River. There is no definite evidence for human occupation within the terrace material. (2) Directly on top of the terrace is a midden deposit that does contain evidence of human occupation: artifacts, bones of domestic cow and sheep, charcoal, ash, plaster, and one wall of an adobe structure. (3) Following this period of occupation is the construction or deposition of the mound or terrace seen in the western half of the Trench, consisting of a lower layer of dirt and an upper layer of gravel. (4) During or after the emplacement of this mound or terrace, area II was occupied and then buried. (5) Deposits of corresponding depth in the Test Pit cannot presently be correlated with those described in (3) and (4) above. However, they also indicate human occupation. (6) Finally, the sediments that form the present surface of the Campo Santo were deposited.

### Chronology

It would be valuable to be able to correlate at least some of the deposits in these excavations with the period of construction and/or use of the existing Franciscan structures at Tumacacori. Unfortunately this is not possible, although some relationships may be inferred.

Level VI and part of level V in the Trench continue under the west wall of the Campo Santo. Also, the west edge of level IV and the upper part of the west edge of level V in the Trench are cut off by what appears to be excavation for the footing of this wall. This would indicate that the deposition of these levels predates construction of the Campo Santo wall.

If area II does represent some kind of activity area and associated structure, it would most likely preclude use of the area as a cemetery at the same time. Area II and the deposits in which it is located (the eastern part of level IV in the Trench) would then also predate the enclosing of the Campo Santo and its use as a cemetery by the Franciscans. Apparently all deposits in the Trench, with the possible excep-

tion of the surface level (II) and the stabilization trench (level I), predate this cemetery. The Campo Santo is intimately associated with the Franciscan church structure, and dates to sometime after 1796 (construction of the present church was begun between 1796 and 1802). This makes 1796 a rough termination date for deposition of all but the uppermost level in the Trench.

It is somewhat more difficult to chronologically interpret the Test Pit deposits in this manner. If levels III through V in the Test Pit correlate with level V in the Trench as is suggested below, it would mean that these levels also should be dated prior to 1796. This opinion is supported by the presence of the adobe wall associated with these levels and (based on its placement and size) apparently unassociated with the Franciscan church. The only indication of a relationship between the Franciscan structures and level II of the Test Pit is that level IIa seems to terminate a short distance from the church wall. This suggests that IIa (like the western edge of levels IV and V in the trench) may have been disturbed by excavations for the footing of the church walls. If this is the case, level II in the Test Pit would also predate the Franciscan complex.

#### Correlation of Levels

Level VI Trench. Level VI represents the earliest material found in the excavations. As it appears at the west end of the trench, its high clay content would suggest a fluvio-lacustrine origin. Lacking further data, the most reasonable assumption would be that it is a terrace deposit of the nearby Santa Cruz River. Although this clay was not found in the Test Pit, it seems to have been located by Teague and Goddard (1976) at a depth of 65 cm below surface during corings done prior to a sewer project in the Park Service residence area, about 150 m southeast of our excavations. The extent of this clay would support the interpretation that it represents a terrace.

This earliest unit, judging from the very small amount exposed, seems to be lacking evidence of human activity. An ash lens (feature 1) extends downward into level VI in the western part of the Trench. The fact that the ash lens is also seen above in level V (Trench) suggests that the lens intrudes into level VI from above. While no cultural

material can be definitely associated with this lower level, its upper edge marks the beginning of human occupation of Tumacacori, as recorded in these excavations.

Level V Trench, Level III-V Test Pit. A cultural deposit overlies the lowest levels. The soil is dark, gritty, and compacted, containing numerous scattered flecks of charcoal and lenses of plaster and ash. This deposit includes layers III through V in the Test Pit and layer V in the Trench. The soil color and texture, as well as the charcoal content, suggest that this deposit may be a result of human activities, perhaps a midden.

Besides the soil itself, there are other indications that human activity was involved in the deposition of these levels. The ash lens mentioned above (feature 1) is probably associated with the basal part of level V in the Trench. Bone, sherds, and a projectile point were found with this ash deposit. The adobe wall in the Test Pit probably was constructed some time during the deposition of this level. The lower part of the Test Pit (level IV) contains an abundance of charcoal. A dense layer of this charcoal can be seen in level IVa. Finally, the bone of a domestic cow was found in the lower level of the Test Pit. The end of this depositional episode is marked by a thin layer of plaster and/or ash (level IIIa). In the Trench, level V grades fairly sharply into the overlying level or levels. Although this juncture is not marked by the same plaster/ash level seen in the Test Pit, there is a lens of dark burned earth and charcoal (a hearth?) in the west end of the trench.

Level IV Trench. In the levels above this cultural deposit, stratigraphic interpretation becomes rather confusing. Level IV and level II in the Trench appear to be similar in depth and thickness. It would seem most logical to assume that these levels represent the same depositional unit. However, level IV is not continuous throughout the Trench and dips at the eastern end of level III. Level III is probably deposited on a former ground surface. There are several possible ways to interpret the relationships between these levels:

(1) In the Trench, level IV-west is a continuous unit from the eastern edge of level III (9.2 m west) on to the west, temporally following the deposition of level V. East of 9.2 m west the deposition of

level IV either did not occur or was removed, culturally or naturally, giving a terraced appearance to the ground surface following the deposition of level IV-west. The upper terrace would have been composed of level IV-west and the lower one of level V. Following this, level III was deposited. Finally, level IV-east (east of 9.2 m west) was deposited on the lower terrace, making the ground surface once again level. Consequently, the eastern portion of level IV is more recent than level III, which was deposited after the western part of level IV.

(2) An alternative explanation also is possible. Following the deposition of level V, a small mound was formed. It consisted of the central part of level IV (9.2-16.2 m west), topped by level III. Following the deposition of the mound, it was surrounded by material represented by the remainder of level IV.

It is not possible at this time to choose between these alternatives and, in fact, other solutions are quite possible. However, it is probable that the eastern portion of level IV (containing area II) was deposited after level III. This last relationship is important, because it involves the stratigraphic position of the features included in area II.

Area II (level IV Trench) is composed of a packed clay surface (feature 2), an ash lens (feature 3), and an alignment of rocks (feature 4). Plainware sherds and animal bone were found in direct association with feature 3 and in close proximity to features 2 and 4. These data would suggest that area II represents some type of occupation surface or activity area. The simplest interpretation is that features 2 and 3 comprise an interior floor or exterior work area associated with a structure represented by feature 4 and also perhaps feature 5 (which was removed). This area was occupied during or after the construction or deposition of level III and the underlying portion of level IV (Trench).

Speculation on the relationships between the stratigraphic units represented by levels III and IV in the Trench and the units of corresponding depth in the Test Pit (level II) is difficult. The Trench deposits are very complex, and the soil of level II (Test Pit) is not similar to the soil of levels III and IV (Trench). It is darker, grittier, and contains more charcoal. The ash and/or plaster layer (level IIa) in the Test Pit dips and cuts off the underlying soil of level IIb.

Level III in the Trench dips at about the same east-west position. Although this is suggestive of a correlation between the two features, they could easily be unrelated. Additional work is necessary to make sense of the relationships between the levels in the Test Pit and Trench.

Level II Trench, Level I Test Pit. The last period of deposition resulted in the material that now forms the surface of the Campo Santo. This is the medium-brown, loose, sandy soil of level II in the Trench and of level I in the Test Pit. It is easily seen in the Test Pit, extending to a depth of 30-35 cm below surface, and in the western portion of the Trench, extending to a depth of 20-25 cm below surface. While its lowest boundary was not detected in the eastern portion of the Trench, it is assumed that this layer extends to about the same depth as evidenced elsewhere. It contains Anglo artifacts from the 19th and 20th centuries, Piman plainware sherds, animal bone, and building rubble. It appears to have been churned, as would be expected in a surface layer.

#### Problems

There are several possible sources of error in the preceding discussion. It was necessary to record elevations in depth below ground surface rather than in reference to a fixed datum. A topographic map has never been made for the Campo Santo. These factors add to the difficulty of making correlations between the levels in the Trench and in the Test Pit. It is also difficult to observe the true slope of deposits in the Trench. The dip of level III, at its east edge, appears to be a significant paleotopographic feature, as may be the apparent disappearance of level V east of 7.72 m west. These problems might have been resolved if more accurate elevation measurements had been available. Another problem was the difficulty in distinguishing between levels II and IV in the eastern part of the Trench. This, along with the dip in level III, is especially important in the interpretation of area II and level IV.

## MATERIAL CULTURE

Because of the lack of archeological controls at the beginning of the excavation of the Trench, the cultural materials represent only what could be salvaged, and not everything that was removed from the excavations. For example, during the excavation of three small holes for survey markers on the south and west sides of the church at Tumacacori (Barton 1979), more ceramics and lithics were recovered than from this entire project. The holes were only 30 cm in diameter and 60 cm deep, but were carefully excavated and nearly all the cultural materials were recovered.

Despite the lack of provenience, it was possible to locate generally the original position of a few of the recovered pieces. It also was possible roughly to determine the depth at which some pieces were found in area I, area II, and the Test Pit. Exact provenience was not possible. Table 1 lists material culture recovered in the course of the project. Table 2 lists the faunal remains. Following is a brief discussion of the materials salvaged during the project.

### Lithics

Only two pieces of chipped stone were recovered. One is a thick, irregular, noncortical flake of a light red, fine-grained rhyolite. The other is a small, triangular projectile point with a concave base, 2.17 cm long and 1.18 cm wide at the base. This type of projectile point is commonly found in late prehistoric and protohistoric Upper Piman sites (Doyel 1977) and in historic sites of the mission period and later in southern Arizona (Robinson 1976; Shenk and Teague 1975).

### Ceramics

Representatives of both local and imported wares were recovered. These include 24 Piman sherds and four imported sherds. Due to the small sample and lack of good provenience, all the Piman sherds are described together. Table 1 gives a breakdown by level.

Piman Ceramics. The Piman ceramics include 21 plainware sherds (87.5%), two red-slipped sherds (8%), and one possibly painted sherd. It was impossible to determine the type of vessels represented, but the

Table 1  
MATERIAL CULTURE RECOVERED FROM THE TRENCH

| Horizontal Provenience                   | *Vertical Provenience   | Ceramics (number of sherds)  | Lithics                     |
|--|-------------------------|--|-----------------------------|
| Area I - Feature 1<br>(16.5-19.2 m west) | 60 cm BS                | Piman plainware (2)  | Triangular projectile point |
| Area II                                  | 0-20 cm(?) BS           | White earthenware transfer print (4)   |                             |
|  | 30-35(?) BS             | Piman plainware (13)<br>Piman redware (1)                                    |                             |
|  | 35-40 cm BS             | Piman plainware (5)  |                             |
| Unknown<br>(from trench)                 | Unknown<br>(0-40 cm BS) | Piman plainware (1)<br>Piman redware (1)<br>Painted? sherd; black-on-red (1) | Rhyolite flake              |

\*: (?) refers to some uncertainty of exact vertical provenience

BS: Below surface

Table 2  
OSTEOLOGICAL MATERIAL FROM CAMPO SANTO

|                | Provenience |                       | Taxon                                 | Elements (number)   | Age      |
|----------------|-------------|-----------------------|---------------------------------------|---|----------|
|                | Horizontal  | Vertical <sup>2</sup> |                                       |   |          |
| Test pit       |             | 65 cm BS              | <u>Bos taurus</u><br>ILM <sup>3</sup> | L. radius, proximal fragment (1)<br>fragment (1)  |          |
| Area I         |             | 20-40 cm BS(?)        | <u>Bos taurus</u>                     | metacarpal, distal epiphysis (1)  | juvenile |
| Feature I      |             | 60 CM BS              | ILM ( <u>Ovis spp?</u> )              | limb, shaft fragment, burned (1)  |          |
| Area II        |             | 30-35 cm BS           | <u>Bos taurus</u>                     | femur, shaft fragment (1); scapula, blade fragment (1); P <sup>x</sup> /M <sup>x</sup> fragments (2)                  |          |
|                |             |                       | <u>Bos spp</u>                        | metapodial, distal fragment (1)   | juvenile |
|                |             |                       | <u>Ovis aries</u>                     | terminal phalanx (1) lumbar vertebra, fragment with butcher marks (1); axis, anterior fragment with butcher marks (1) |          |
|                |             |                       | <u>Ovis spp?</u>                      | femur, distal fragment (1)  |          |
|                |             |                       | <u>Canis latrens</u>                  | L. ramus, fragment including mandibles symphysis and alveoli for I <sub>1</sub> -P <sub>3</sub> , no teeth (1)        |          |
|                |             |                       | ILM                                   | fragments (23)  |          |
|                |             | 35-40 cm              | <u>Ovis aries?</u>                    | P/M fragment (1)  |          |
|                |             |                       | small mammal cf <u>O. aries</u>       | rib (1)   | juvenile |
|                |             |                       | <u>Homo sapiens</u>                   | cervical vertebra 3-7, L. hemiarch  | 3 years  |
|                |             |                       | ILM                                   | limb fragments (4)  |          |
| Unknown trench |             | Unknown (0-40 cm)     | <u>Bos taurus?</u>                    | phalanx 2 (1)<br>rib, shaft fragment (1)  |          |
|                |             |                       | <u>Ovis aries</u>                     | phalynx 1, distal fragment (1); rib, shaft fragment (1); sternbrae, fragment (1); P/M fragment (1)                    |          |
|                |             |                       | ILM                                   | fragments (4)   |          |

<sup>1</sup>All faunal identification by Stanley J. Olsen, Department of Anthropology, University of Arizona. Corroborative identification and age determination of human remains by Dr. Walter Birkby, Human Identification Laboratory, University of Arizona.

<sup>2</sup>(?) indicates uncertainty of exact vertical provenience.

<sup>3</sup>Indeterminate large mammal

one rim sherd of red-slipped ware suggests a jar. Its rim has the thickened lip characteristic of late prehistoric through historic Piman jars.

The thickness of the sherds varies from .5 to 1.1 cm. Most of the sherds are at the smaller end of this range. Ten sherds (42%) exhibit a thickness of .6 cm, and 19 sherds (79%) fall within the range of .5-.7 cm.

The color of the paste ranges from solid black, to a black-streak core with gray-brown to reddish-brown exterior, to solid gray-brown. The temper is of fine grit that often shows on the surface. Although pieces were examined with a 10x hand lens, it was impossible to tell whether the grit was river sand or the crushed rock described by Doyel (1977) for Upper Piman ceramics at the Baca Float sites. Both angular and rounded grains appear to be present.

Fire clouding and polishing are variable; surfaces range from highly polished to coarse and lumpy.

Two sherds bear a red slip. The rim sherd mentioned above is slipped on both the exterior and interior surfaces. It is smooth but not highly polished. The other sherd, slipped only on the interior surface, has crisscrossed polishing marks. The exterior face is fire-blackened and smoothed.

One sherd may be painted. About one-third of the exterior face is covered by a dark, sharp-edged discoloration. The remainder of the face is the light brown of the fired, unaltered paste. The discoloration resembles fire clouding, but its sharp edge suggests intentional decoration.

These ceramics seem identical to the group of Piman wares that appear just prior to European contact (Doyel 1977) and continue through the mission period (Robinson 1976; Shenk and Teague 1975) to the present century (George Teague 1979: personal communication).

Anglo Ceramics. Four sherds of historic Anglo ceramics also were recovered. Although their original provenience is uncertain, they were found in area II of the Trench and probably derive from the first 20 cm below surface. Probably the remains of at least two plates, these sherds are varieties of white earthenware transfer print ceramics produced in the United State and Western Europe (most notably Great Brit-

ain). Two sherds have a purple-on-white design, and the other two are medium blue-on-white. Both rim sherds show a fine-lined background.

The purple-on-white sherds represent a style manufactured from the late 18th or early 19th centuries to the 1870s (Fratt 1979: personal communication). The medium blue-on-white sherds represent a style produced between the 1780s and 1870s (Fratt 1979: personal communication). A sherd that appears identical to the purple-on-white rim sherd found at Tumacacori was found in excavations by McGuire at Rancho Punta de Agua (McGuire 1979), a site occupied from 1855 to 1874-77 (McGuire 1979:81). McGuire provides a concise but inclusive discussion of the interpretive value of such ceramics, but the sample from Tumacacori is too small to allow analysis. These four sherds are significant, however, because they are the only cultural remains from these excavations that can be firmly attributed on stratigraphic and typological grounds to the Franciscan or later periods at the mission.

All material culture recovered from these excavations can be attributed, on the basis of typology, to the historically recorded occupation of the mission of Tumacacori. This does not conflict with the stratigraphic placement of Indian materials within the Jesuit period at Tumacacori. The Anglo ceramics, probably from the disturbed upper 20 cm of the deposits, date somewhere from the Franciscan period to the 1870s (after the site was abandoned).

It is difficult to make any functional/social inferences from the material culture because of the lack of detailed data. However, the relatively large number of bones (see below) and sherds, coupled with the features found in area II, suggest that this may well have been a localized activity area, quite possibly a dwelling.

#### Faunal Remains

This report presents, I believe, one of the first descriptions of any faunal material found in the deposits of Tumacacori. The large size (Table 2) of this faunal collection is especially significant because it represents only a portion of the material removed from the Trench and Test Pit. The amount of material associated with area II is noteworthy, considering the suggestion that area II represents a living floor or activity area.

Another significant characteristic of the faunal remains is the number of bones of domestic cows (Bos taurus) and sheep (Ovis aries). The presence of such remains would date the occupation level sometime after the introduction of these domestic animals into southern Arizona by the Spanish (probably by Father Kino) after 1687 (Shenk 1976). A radius of Bos taurus was found 60 cm deep (just above the floor) in the Test Pit. This would mean that the lowest levels containing evidence of human occupation would probably date to after 1687 and most likely after 1753. This was the earliest date for occupation of the site recorded by the Spanish. The presence of these particular faunal remains would seem to suggest a heavy reliance on domestic cattle and sheep as a source of meat for the inhabitants of Tumacacori. However, the faunal sample is far from adequate as a basis for any kind of definitive statement on subsistence.

Butchering marks were observed on two sheep vertebrae from area II. On a lumbar vertebra, these marks appear as several parallel transverse cuts across the dorsal side of the centrum. The posterior portion of an axis had been removed by means of a straight, smooth (apparently sawn), oblique cut, obviously made to remove the sheep's head.

#### Human Remains

Only one piece of human osteological material was recovered from the excavations. This was the left hemiarch of one of the last five cervical vertebrae of an immature individual. The recovered portion had not yet fused to the centrum or the other hemiarch, indicating an age of less than 3 years.

The vertebral fragment was found in area II at a depth of 35-40 cm below surface. It was not possible to determine whether this was associated with the occupation of area II or was intrusive, dating from the use of the Campo Santo area as a cemetery (late 18th through early 20th centuries). Lacking further information, either alternative seems equally possible.

## SUMMARY

Although the limited nature of the excavations described here precludes definitive statements, the information recovered does suggest some of the events that may have occurred in the Campo Santo area. It is probable that nearly all of the cultural deposits described here are from the period between the first recorded settlement of the area in 1753 and the beginning of the construction of the Franciscan complex in 1796. The earliest cultural deposits rest on apparently sterile clay. However, this conclusion may be incorrect because of the small exposure provided by the excavation. More extensive excavation in both area and depth is needed before this clay (and also any underlying deposits) can be conclusively shown to be sterile. The deepest cultural deposits are assumed to represent the first occupation of Tumacacori in 1753. Artifactual evidence from this level does not contradict this view, and the presence of a bone of a domestic cow indicates a post-Hispanic contact occupation. Recovery of additional artifactual and faunal materials and perhaps C14 dating would be extremely useful in documenting such a conclusion.

After initial settlement, the Campo Santo may have been a portion of the Indian village that made up the major part of Tumacacori. The midden deposits, the adobe wall in the Test Pit, and the several lenses of ash, plaster, and charcoal could be seen as a result of domestic activities and the accumulation of occupational debris.

Following this first period of occupation, the nature of the deposits changes somewhat but indicates that the Campo Santo was probably still a portion of the Indian village. Level III (Trench) and perhaps the underlying portion of level IV seem to be associated with earth-moving activities rather than an accumulation of trash. These levels lack organic and artifactual remains. They may be associated with leveling and/or excavation for the construction and use of the structure and floor of area II. The bone, sherds, and structural features from area II suggest that it represents a habitation, with evidence of associated domestic activity, including animal butchering.

## RECOMMENDATIONS

The preceding interpretation is, of course, highly speculative and not unequivocally supported by the data from these excavations. These interpretations should be viewed as a set of hypotheses to be tested, or as a framework for future work.

It is very important to know how the deposits in the Campo Santo relate to those in the rest of the mission grounds. Records of previous excavations, with the exception of Brewer's work (1951), are nonexistent. Establishing relationships between known deposits would involve rather extensive excavation. Coring alone would not be sufficient to establish such relationships because of the relatively complex stratigraphy of the site.

To increase our knowledge about the Campo Santo and to test the interpretations presented in this paper, several procedures are suggested. A study of horizontal patterning of artifacts, faunal materials, and occupational features would provide information on whether or not this was, indeed, a portion of the village. It would also show the nature and range of activities that occurred in the vicinity. More extensive excavation could also determine the extent of level III in the Trench and its relationship to area II and the deposits in the Test Pit. Recovery and analysis of floral material and microfauna could provide environmental data, along with information concerning subsistence activities. Prior to excavation, soil samples could be collected through coring. A chemical analysis of these samples might provide data relating to the patterning and intensity of human occupation and be used as a guide for subsequent excavations.

## CONCLUSION

The excavations described here suggest that between the initial settlement of Tumacacori in 1753 and the beginning of the construction of the Franciscan complex in 1796, the Campo Santo was associated with secular functions and ongoing domestic activities, rather than with the mission complex itself. The deposits in the Campo Santo appear to represent a fairly continuous record of this 43-year period, encompassing the Jesuit and early Franciscan periods at the mission. The most important aspect of these deposits is that they may preserve a record of daily life in an Indian village of southern Arizona in the early historic period, information that generally is lacking in historic literature.

The discussion of the stratigraphy in these excavations in the Campo Santo and the interpretations are descriptive, speculative, and admittedly inconclusive. This work should not be taken as a definitive stratigraphic history of the Campo Santo, but be used as a guide to future, more archeologically sound work. The most important understanding to be derived from the description of stratigraphy presented here is that extensive, undisturbed cultural deposits containing artifacts and features of archeological value do exist in the Campo Santo. This contradicts previous interpretations and the widely accepted view that, as a whole, the subsurface deposits at Tumacacori are badly disturbed and of minimal archeological value. Such a view is a very convenient one, allowing any worker, archeologist, historian, or developer, to avoid the time-consuming and costly procedures of careful excavation, collection, recording, and description, all of which are standard when dealing with an archeological site. At Tumacacori such procedures have sometimes been ignored at the expense of valuable archeological data.

## REFERENCES

- Barton, C. M.  
1979 Archeological Monitoring of Excavations for Emplacement of Survey Markers at Tumacacori National Monument. Section 106 Compliance Report on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Brewer, Sallie  
1951 Report on Archeological Trenching at Tumacacori National Monument, May 1951. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Doyel, D. E.  
1977 Excavations in the Middle Santa Cruz River Valley, Southwestern Arizona. Arizona State Museum Contributions to Highway Salvage Archaeology in Arizona No. 44. Tucson.
- Mayer, M. T., Tom Caperton, and S. R. Henderson  
1971 Stabilization Report, Tumacacori 1971, Mission, Granary, and Convento. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- McGuire, R. H.  
1979 Rancho Punta de Agua: Excavation at a Historic Ranch Near Tucson, Arizona. Arizona State Museum Contributions to Highway Salvage Archaeology in Arizona No. 57. Tucson.
- Pinkley, Frank  
1936 Repair and Restoration of Tumacacori, 1921. Southwestern Monuments Special Report 10:261-284.
- Robinson, W. J.  
1976 Mission Guevavi: Excavations in the Convento. The Kiva 42(2):135-75.
- Shenk, L. O.  
1976 San Jose de Tumacacori: An Archaeological Synthesis and Research Design. Arizona State Museum Archaeological Series No. 94. Tucson.
- Shenk, L. O., and George A. Teague  
1975 Excavations at the Tubac Presidio. Arizona State Museum Archaeological Series No. 85. Tucson.
- Teague, G. A., and Richard Goddard  
1976 Archeological Clearance of the Tumacacori Evapotranspiration Project. Letter Report for Clearance No. TUMA-153 on file, Western Archeological and Conservation Center, National Park Service, Tucson.

PART II

TUMACACORI DRAIN EXCAVATIONS,  
EXCAVATION OF GRANARY WELL POINTS

by  
KAY SIMPSON

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## INTRODUCTION

Archeological excavations were conducted in Rooms 13 and 14 of the granary at Tumacacori National Monument, preceding well point installation in these rooms. This building is inside the northwest corner of the mission convento; the west wall of the granary is also the east wall of the cemetery. Long room blocks, now backfilled, lie to the east and south. A covered arcade (area 41a-c) once separated these rooms from the plaza (Fig. 1a). The north convento, granary, and cemetery wall were built between 1809 and 1821, before the present church was completed (Shenk 1976:59).

The granary (Fig. 1b) is the only known, two-story auxiliary building in the mission complex. Vigas, horizontal beams of mesquite or cottonwood, mark an upper story. A stairway and vestibule divide the ground floor into two rooms; no evidence exists for an upper story partition. Other prominent room features include a bench with 13 circular depressions, interpreted as pot rests, along the east side of Room 13, and a batter of cobbles set in adobe mortar along the west side of both rooms.

Before 1970, very little stabilization work was done on the granary other than capping the walls with cement plaster (Becker 1962). In 1970, Martin Mayer supervised a major stabilization and restoration project in the granary. He replaced deteriorated adobes, recapped the walls, and constructed a metal roof over the building. In 1976, Anthony Crosby, project architect, recommended removing the roof and installing subsurface drains (Crosby 1976:133-34).

The new drainage plan consists of a drain basin laterally connected to a well point inserted in the floor. A well point is a hollow pointed rod with a perforated intake driven into a hole to lower the water table by pumping. Well points often are used to lower the water table in pervious soils. Construction Engineer Henry Apadaca placed the well points in sumps--low elevation areas that collect water. Disturbance area for each well point is approximately 2.5 m deep, 0.45 m wide, and 1.4 m long. Since well point dimensions are too small to serve as archeological excavation units, we expanded the trenches to 1 m wide, and a minimum of 2 m long.

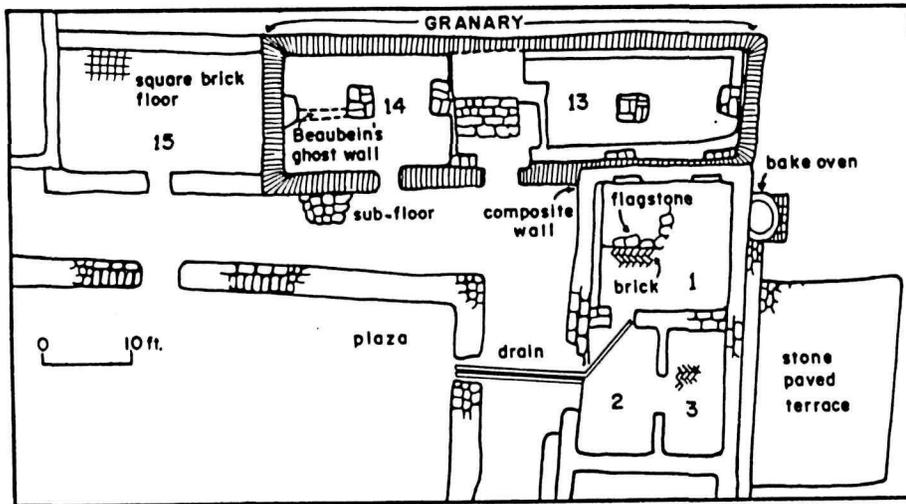


Fig. 1a. Detail of North Convento, Tumacacori National Monument.  
(Base map from Jackson 1962.)

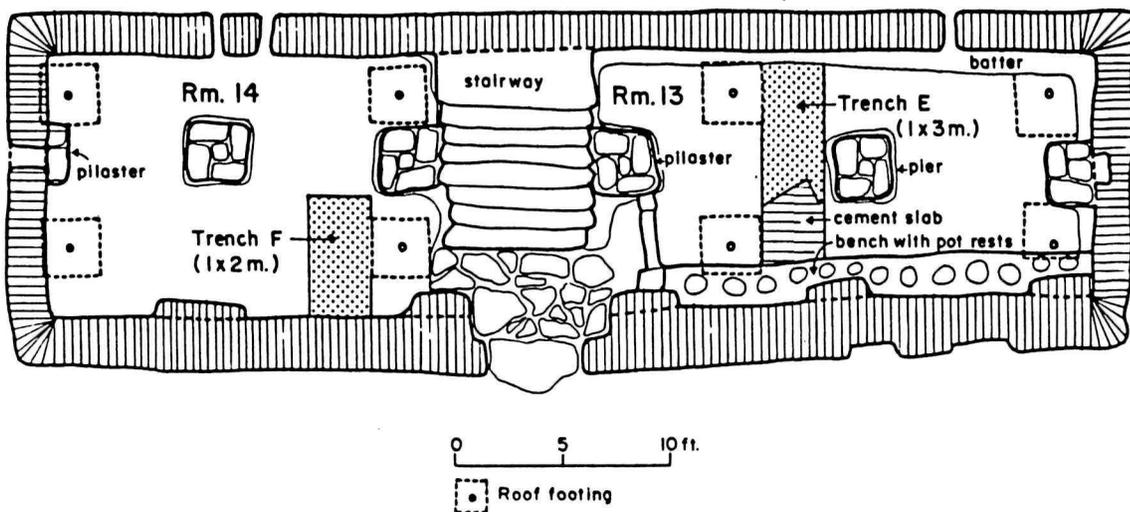


Fig. 1b. Detail of Granary.

### Method and Technique

Excavations by the Western Archeological and Conservation Center began March 3 and ended March 11, 1980. Kay Simpson was supervisory archeologist; Maurice Montgomery was assistant archeologist and photographer. Two laborers worked eight days with the archeologists.

In Room 13, a trench 1 m wide was superimposed on the well point location, but laterally extended to the west wall and to the bench on the east wall, in order to link the walls and floors. However, a large treasure hunter's hole obscured investigations of the east wall. This trench had the advantage of being positioned next to an internal pier, enabling an investigation of pier construction. In Room 14, a 1 m wide trench was laid over the well point location and extended to the east wall. Therefore, in Room 13, the floors were linked to the building's west wall and in Room 14, to the east wall (Fig. 1b).

In accordance with Lee Fratt's field designations, the trench in Room 13 was labeled "E" and in Room 14, "F" (Fratt 1981).

Vertical control was maintained by removing deposits in natural levels. Arbitrary subdivisions were not needed. Fills and bed mortars were removed as levels; floors, cobble foundations, and pits were designated as features. Floor plans were made for each level; each constructed floor was mapped and photographed. Only two profiles for each trench were drawn because at least one side of each trench was partially obscured by concrete roof footings.

The concrete floor overlying the trenches was removed with a small jackhammer. Fill was excavated by pick, while features were defined with trowels and other small hand tools. All excavated earth was screened through 1/4-inch mesh hardware cloth. All artifacts including slag and charcoal were retained. Soil and plaster samples were taken.

### Previous Excavations

Previous archeological excavations at Tumacacori were sketchily recorded, and most room fill was removed with little or no control. In 1934, Paul Beaubien exposed, mapped, and backfilled over 100 rooms or areas inside and outside the church. In most rooms he trenched along the walls leaving an "island" of unexcavated room fill. Beaubien did not disturb walls or floors and only investigated subfloor features in

areas previously disturbed by treasure hunters. Ideally this should have left sufficient material for reinvestigation. But over the years, maintenance and stabilization efforts have blurred architectural distinctions.

Caywood (1965, 1966) reexcavated most of the north convento, excluding Rooms 13 and 14. His excavations were not published, but a copy of his crew chief's fieldnotes are stored in WACC archives (Kayser 1965). Unfortunately, all floor plans and profiles are missing. It is difficult to interpret building phases of the granary after so many poorly documented excavations in the adjoining convento.

In 1970, Mayer's stabilization project showed that undisturbed stratigraphy existed beneath the floor of Rooms 13 and 14 (Mayer 1971). Installation of roof footings required subfloor excavation in 0.9 m squares approximately 1.2 m deep. Notes were made, but the size of the excavation units obscured relationships between features, and the scope of the project did not include linking fill to the walls.

### Objectives

The primary objectives of the 1980 Tumacacori drain excavation were: to document relationship(s) of any existing floors to walls, to determine if there was undisturbed room fill, and to investigate construction phases within the structure. If extensive undisturbed room fill did exist, a secondary objective was to investigate the function of the room.

The only historic period reference to this building was by Powell in 1849:

"East of the church there was a large square yard, on the west side of which, passing under some solid arches, we came to a flight of steps leading to a granary, etc. It is a very large establishment and the monks and priests had every accommodation to make life comfortable. . . ." (Powell 1931:141-142).

But in the 1920s and 1930s, locals called the building a dormitory (Attwell and Gordon 1935:7; National Park Service 1921:11). It is not known whether this appellation implies a local tradition or a creative interpretation for a new tourist facility.

No known mission period documents or artifacts confirm Rooms 13 and 14 as either a dormitory or granary. The only remaining possibilities

for investigations of room function are an ethnobiological study of the room fill and artifact analysis. Unfortunately, Beaubien removed the remainder of debris left by treasure hunters from the collapsed second story and roof. But at that time modern investigative procedures were not known.

## EXCAVATION RESULTS

### Room 13

Floor Construction. Three floors are superimposed, one upon the other. Floor I lies under concrete veneer (Fig. 2). The upper and lower layers of lime plaster, each about 3 cm thick, encase poorly fired adobe bricks. These bricks show no evidence of wear; no dirt or debris was found between the lime plaster layers. The bricks were not exposed as flooring; the upper lime plaster was the use surface.

The bricks were unevenly set in a southwest trending direction. This sequence was interrupted near the center of the pier; here, bricks were laid horizontally. One brick lay parallel to the pier against the original plaster. Floor I was laid after the pier was constructed.

In Room 13, unlike Room 14, the bricks were badly eroded and broken in places. Floor elevation descended 16.5 cm within 2 m, from west to east. Next to the pier the floor had visibly buckled. A large treasure hunter's pit in the east half of the trench either caused, or at least influenced this slump. This area of dark, disturbed soil and out-of-sequence bricks, designated as feature 3, was adjacent to and under the cement slab. This area had been disturbed twice. The earlier disturbance (feature 3a) is a treasure hunter's hole excavated down to the cobble substrate. The pit was partially backfilled with building debris, such as chunks of lime plaster and fired adobes, but the upper portion was left open long enough for silt lenses to accumulate. Such heavy lensing implies that the roof was already gone. The later disturbance (feature 3b) was the result of stabilization efforts to fill in the hole and restore the pier.

Underneath floor I is a hard, crumbly, dark brown fill 8 to 12 cm deep that abuts the pier and postdates it. More cultural material was recovered in this fill than in any other trench unit, but the quantity was too small to call this level "trashy."

This fill overlies a thin, soft fill or use floor, floor II, on top of a cobblestone foundation (Fig. 3). The cobblestones were laid irregularly in an adobe bed mortar. Thin patches of lime plaster on some stones suggests an original use surface of lime plaster over cobblestone paving. When this plaster floor eroded, a thin earth floor accumulated.

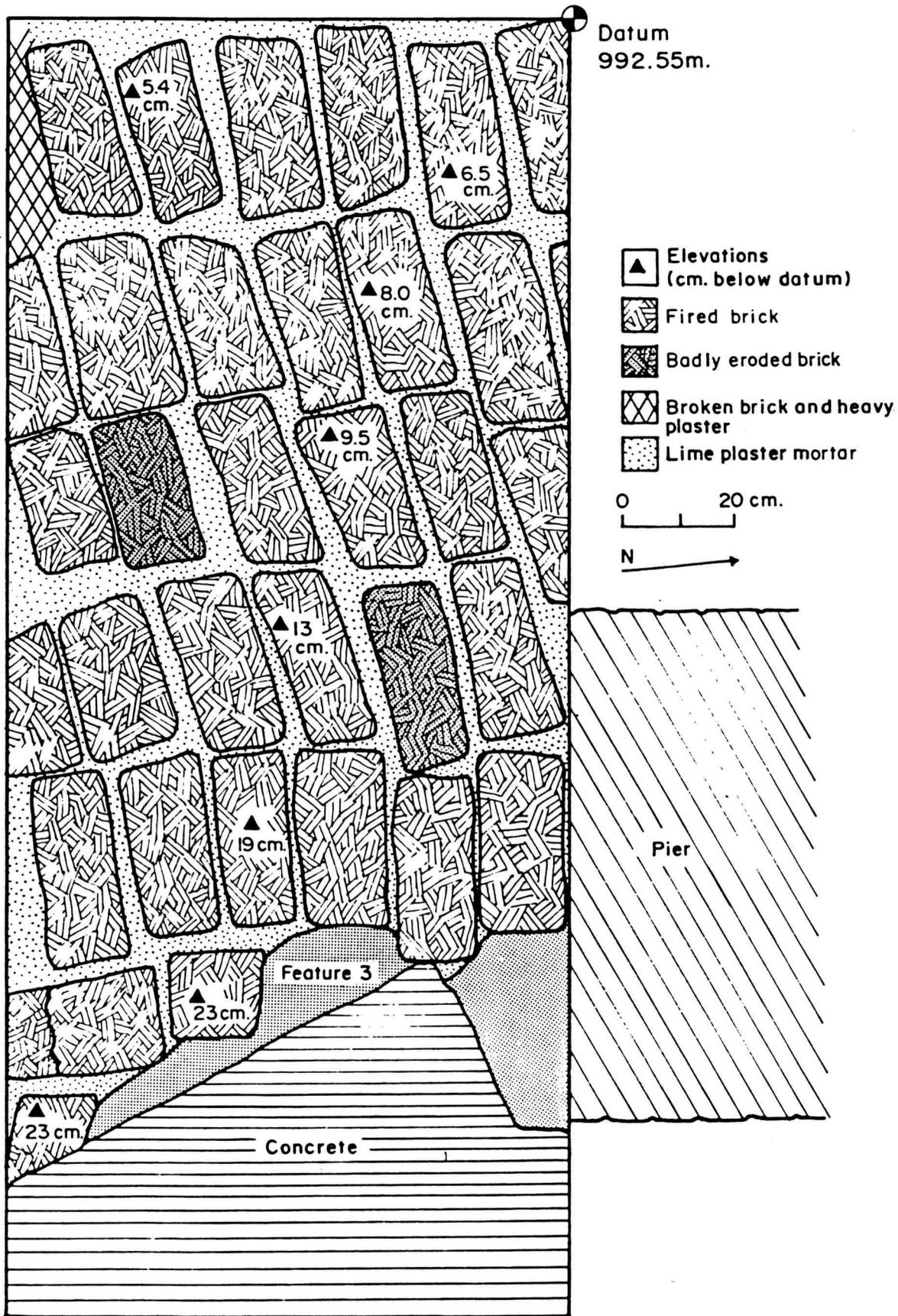


Fig. 2. Room 13, Trench E, Floor I.

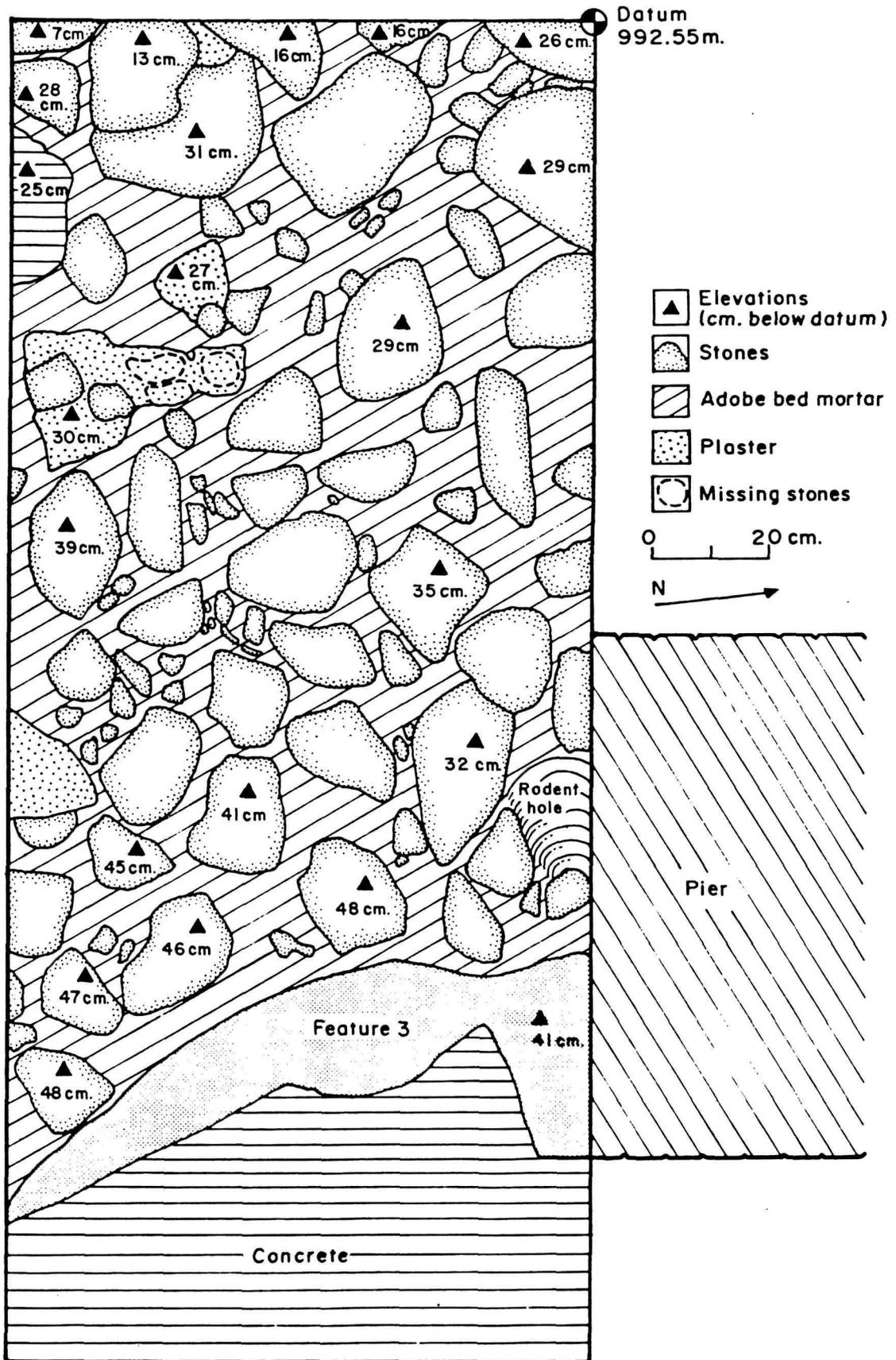


Fig. 3. Room 13, Trench E, Floor II.

This floor abutted the batter mortar which extends farther into the room at this level (Fig. 4).

Both the cobble foundation and its bed mortar underlie the pier. The use surface rides up to the edge of the pier although original plaster adhering to the pier obscures contact. Therefore, the pier is contemporary with the construction of floor II.

The bed mortar was spread on the original room floor, floor III, a 1 cm thick, undulating use surface. Floor III rides up to the foundation trench of the west wall under the batter, and is contemporary with the wall foundation.

Beneath floor III was a thick (ca 40 cm) layer of soft, sandy, dark brown soil, interpreted by Mayer and others (1971:39) as sterile. Artifacts were recovered from this unit (Fig. 4; level 5), but they could not be related to specific activities. Therefore, it was interpreted as merely a preconstruction surface. It is impossible to tell if the limited number of artifacts belong to a pre-mission period. This layer was excavated down to a cobbly substrate (Fig. 4; level 6). Levels 5 and 6 correspond well with a physical description of soil underlying the church: ". . . heavy, fine grained, . . . liberally supplied with well-worn boulders, . . . frequent streaks of arroyo-carried gravels and rocks . . ." (Jackson 1962:4).

Mayer and others (1971:53) reported an identical sequence of plastered fired bricks (floor I), fill, and plastered cobblestones (floor II) in roof footings in the northwest, southeast, and southwest corners of Room 13. Cobblestones without plaster were also found in the northeast corner of Room 13.

Fieldnotes from the same project (Caperton 1970) contain a reference to "a substantial amount of rock in the trench along the west exterior of the granary," but apparently it was not decided whether the rock related to foundation material or to floor II. No floor plans, photographs, or drawings were made of the exterior rocks. Barton's Trench (this volume) against the granary's southwest wall showed only Mayer's excavation trench and no cobblestone features.

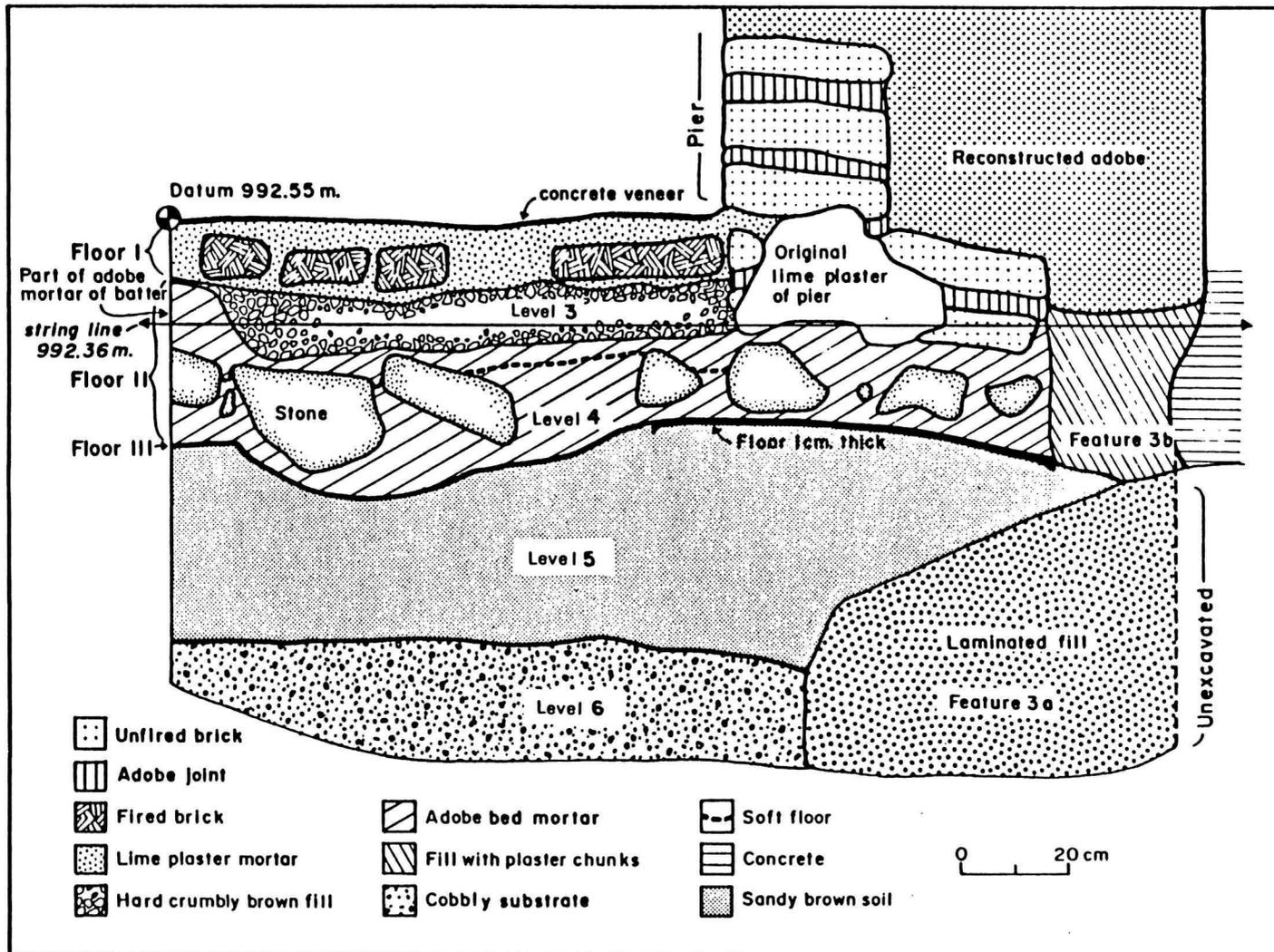


Fig. 4. Room 13, Trench E, North Wall Profile.

Floor I = Levels 1 and 2.

Floor II = Levels 3 and 4.

Wall construction. As in many cases at Tumacacori, the west wall was constructed of unfired adobes set on a stone footing composed of unmodified cobbles and boulders, with adobe mortar as a bonding agent. Because the foundations match the cemetery wall foundations, Mayer and others (1971:37) concluded that the granary was built while the cemetery was under construction. The west wall was offset 20 cm near the north end in an effort to parallel the east wall, which had to abut the previously existing west wall of Room 1. Mayer further determined that "the batters along the west and north walls are not patches to save deteriorating walls but are inset foundations."

Excavation was carried out underneath the batter along the west wall to locate the wall foundation and to date the earliest floor. The west wall rests on a stone foundation set inside a foundation trench, cut into level 5. Floor III rides up to the foundation trench and is contemporary with the wall foundation (Fig. 5). This confirms Mayer's argument that the batters are original construction, not repairs, and clarifies his confusing statement concerning "inset foundations." The wall has an inset stone foundation, not the batter.

#### Room 14

Floor Construction. The floor sequence of Room 14 was not identical to that of Room 13. Here four, instead of three, construction phases are present. Floor I (Fig. 6), fired adobe bricks sandwiched between two layers of lime plaster, is the same in both rooms, although the bricks in Room 14 are in better condition. The bricks lie in even rows facing north/south. The floor may have been laid at different times in each room, but under the same directive, as implied by an identical technique, using reinforcing bricks facing opposite directions not seen after final construction. Floor I postdates all internal architectural features within the building and is the final use floor in both rooms. The upper floor of Room 15 also consists of fired brick laid "checkerboard fashion" (Beaubien 1937:199) instead of the convento's more common herringbone pattern.

The only irregularity in floor I occurs in the northeast corner of the trench. Here, the bricks face east/west. Although this possible

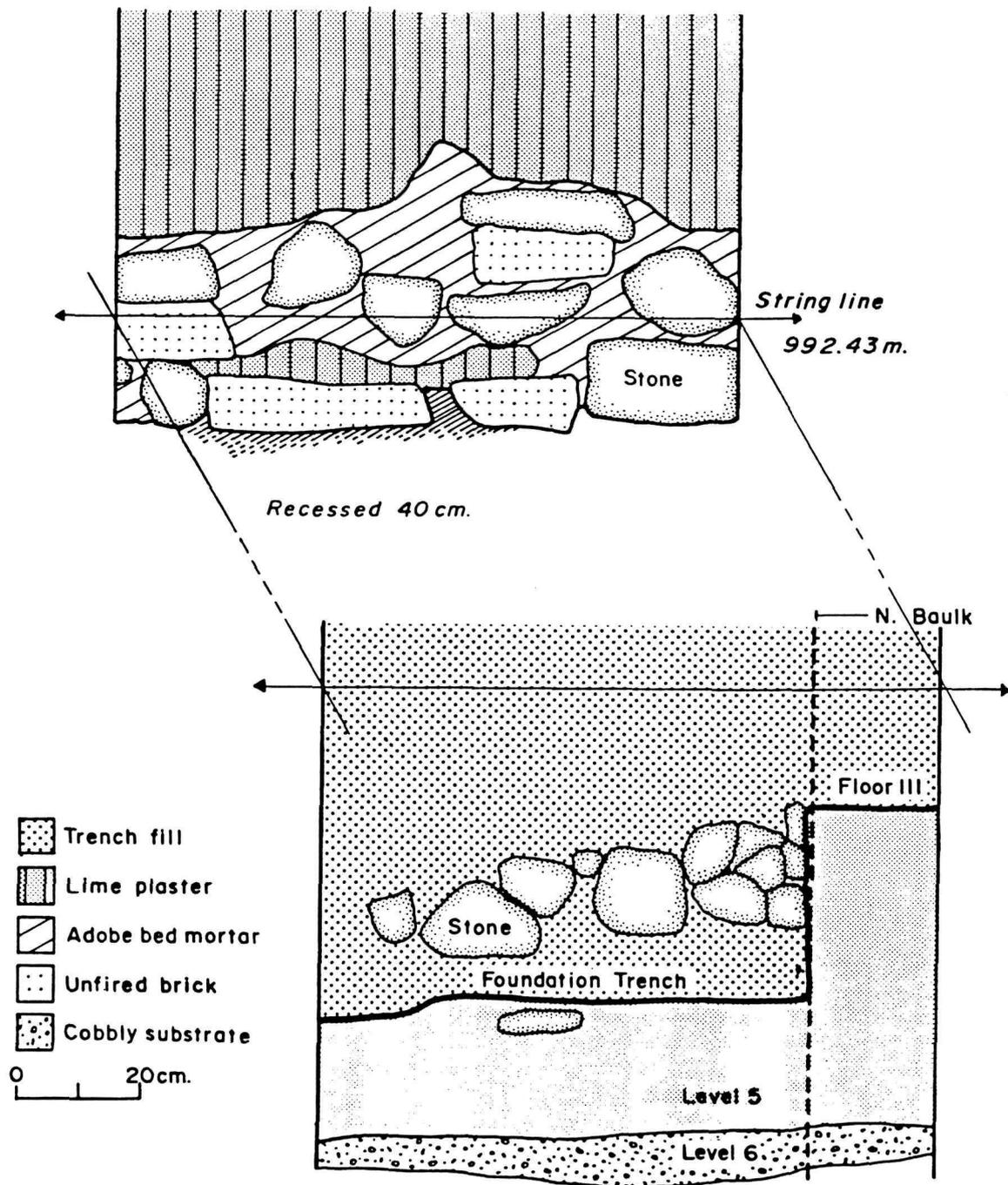


Fig. 5. Room 13, Trench E, West Wall Profile.

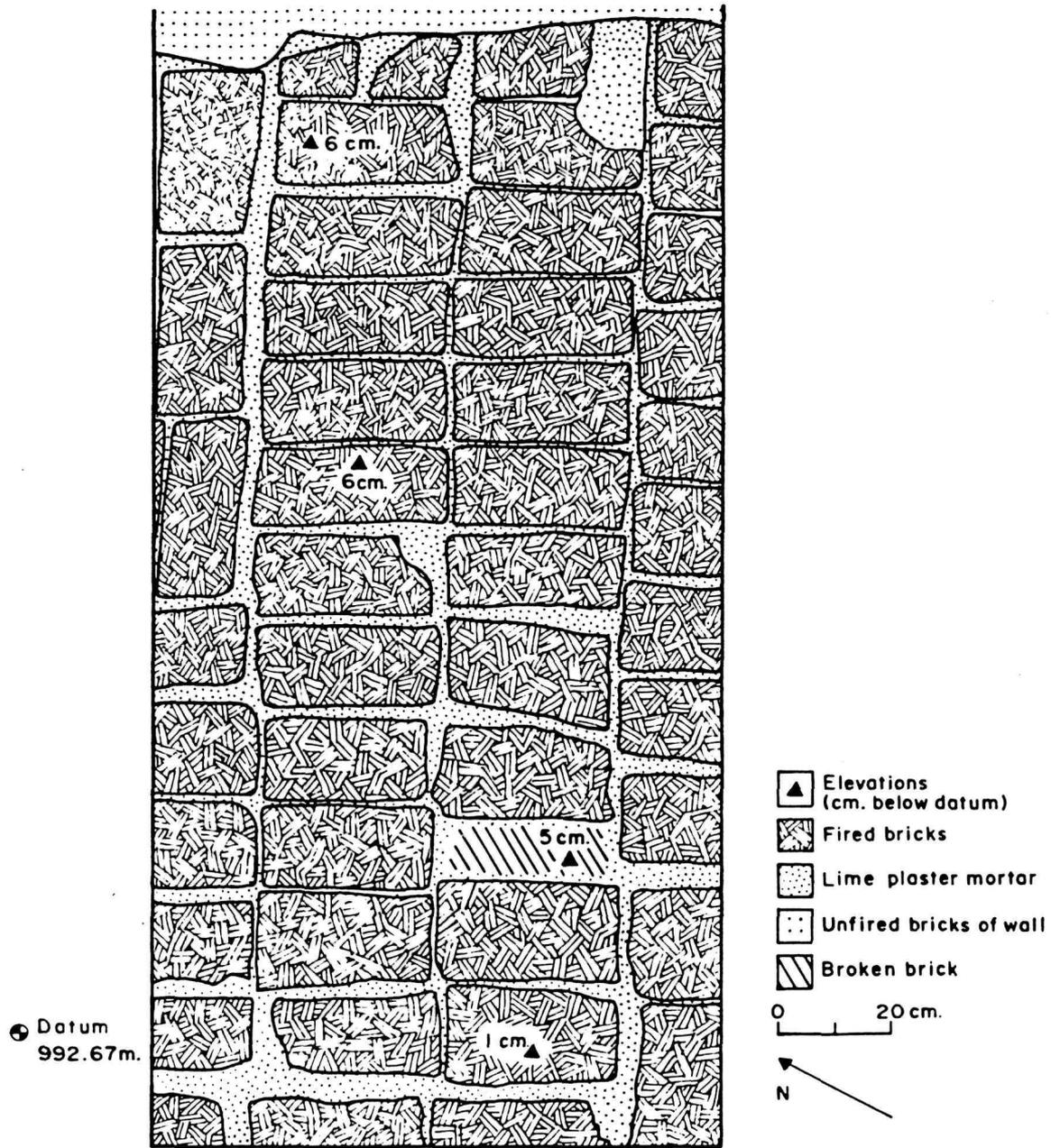


Fig. 6. Room 14, Trench F, Floor I.

disturbance abuts the northeast roof footing, no evidence of recent repair was observed. However, a disruption in the sequence of floor bricks may not indicate a recent disturbance, but rather repair during the mission period. These bricks also may have been aligned differently because they abut the vestibule stones.

Under floor I was a thin fill layer (Fig. 7). In the north trench section, the fill was so thin or nonexistent that the plaster over floor II was mistaken as floor I plaster and removed with the upper unit.

Cobblestone paving (Fig. 8) with a fragmentary lime plaster surface set in an adobe bed mortar, makes up floor II. The cobbles of floor II are flat, large, and set close together to form a smooth flagstone surface. This regular paving may not have required a heavy fill (as in Room 13) in order to level the surface for laying floor I.

Floor II was not present along the north section of the trench. Cobblestones were missing and the adobe mortar was cut. Again, it is difficult to assign this disturbance (feature 3) to stabilization work. It is more reasonable to assume that during the mission period, the stones were removed, and that this activity may have necessitated the installation of floor I.

Floor II overlies another cobblestone floor sequence. Floor III fill, of which only a small portion remains (Fig. 8), is below a slag lens overlying irregularly laid cobblestones set in an adobe bed mortar. Many small chinking stones were used in the stone foundation. Loose fill, mineral-fiber insulation, such as slag, rock, or glass resists moisture conductivity. The use of slag as a thermal insulator on the oldest floor indicates a long-term problem with ground water percolation at Tumacacori. Mayer and others (1971:53) conclude that since slag was found between the floors, metallurgy was practiced on the site. There is no evidence to support this conclusion. The latter may be true, but slag in these rooms bears little relationship to that problem. The slag found in the granary is from adobe making, not ore smelting. Slag was deliberately used as an insulating agent on top of the cobblestone foundation of floor III and could have been brought in from anywhere.

The lowest bed mortar does not rest on a use surface, but on a pre-granary ground surface (Fig. 7, level 5) identical to that in Room 13.

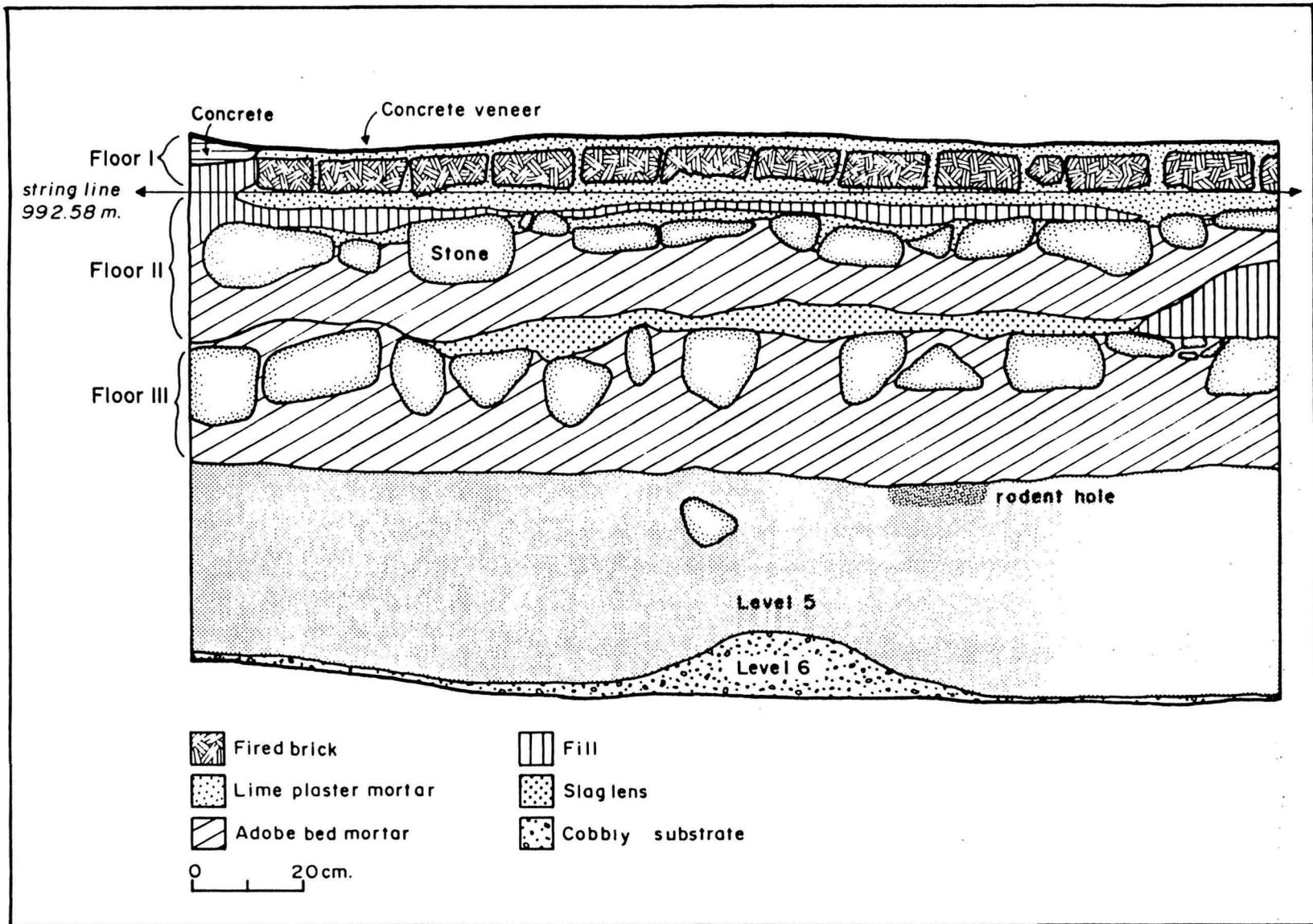


Fig. 7. Room 14, Trench F, South Wall Profile.

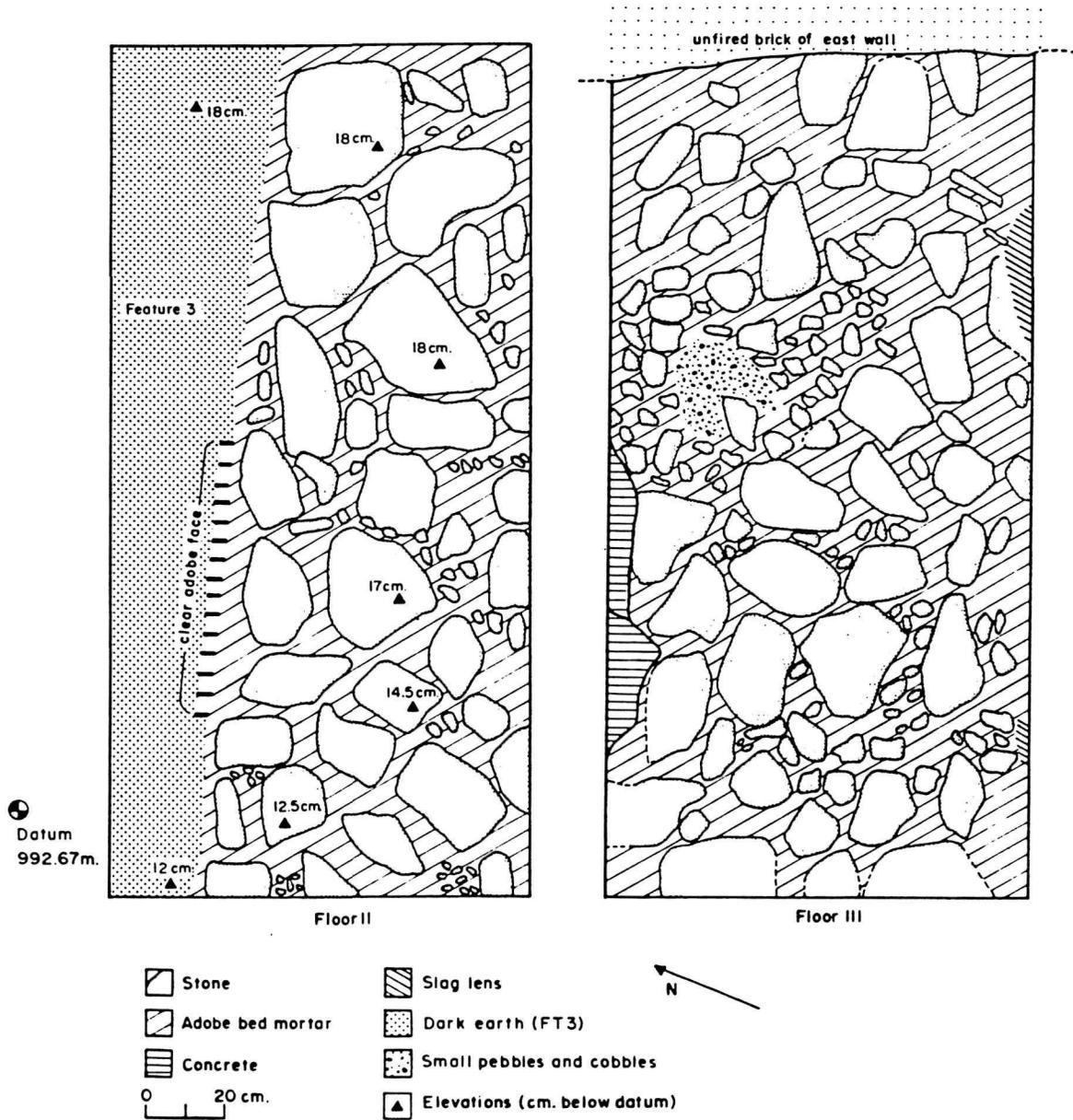


Fig. 8. Room 14, Trench F, Floors II and III.

Excavation was terminated when river cobbles appeared in the trench (Fig. 7, level 6).

The 1970 granary excavations (Mayer et al. 1971; Caperton 1970) revealed remnants of an early room in the southeast corner of Room 14. An adobe wall was found with a rock foundation parallel and adjacent to Beaubein's "ghost wall:"

On the floor between this pillar and the pilaster to the south was a streak, 1' 2" wide, of roughened plaster, indicating a former wall. There is no evidence of a wall butting against the pilasters, however. The pilaster at the south end of Room 14 leans to the side several degrees but was plastered the same time as the wall (Beaubein 1937:194).

Caperton equates this wall with the adobe rubble Beaubein found in area 41a, south of the entrance to Room 14, which is now bricked in:

Six adobe bricks, 3½" x 12" x 24", seemed to be in place against the east wall of room 14. The group was laid three courses high and two bricks long. Possibly they marked the site of a bench (Beaubein 1937:203).

Figure 9 shows Caperton's postulated plan of this early room. The room floor (Fig. 10, floor III) was of "adobe." It is inferred that he meant a simple use surface similar to floor III in trench E. Caperton reports that cobblestones (floor II) go over the top of this adobe wall.

In a test pit just north of these adobes, Beaubein (1937:203) encountered a "boulder floor" 60 cm "below the east wall of Room 41a" (Fig. 1). If Beaubein was measuring from the top of the east wall of 41a, which was reported by Kayser (1965:12) as being 53 cm high, then this floor would correspond well with the cobblestone foundation of floor II. Mayer and others (1971:39) reported finding this cobblestone floor outside the granary to the west and the east (although this is not documented by them) and suggested that this floor also predates the granary, and possibly the convento.

Therefore, the construction of Room 14 is extremely complicated. Three profiles were drawn: the southeast roof footing (Fig. 10), trench F in the northeast corner (Fig. 7), and the southwest roof footing (Fig. 11). None match. The early wall is in the southeast corner. In the southwest corner, a sequence was found similar to those in trench E, and reported by Mayer (but not drawn) for the Room 14 northwest, and Room 13 southwest roof footings. Trench F has a unique sequence of two cobble-

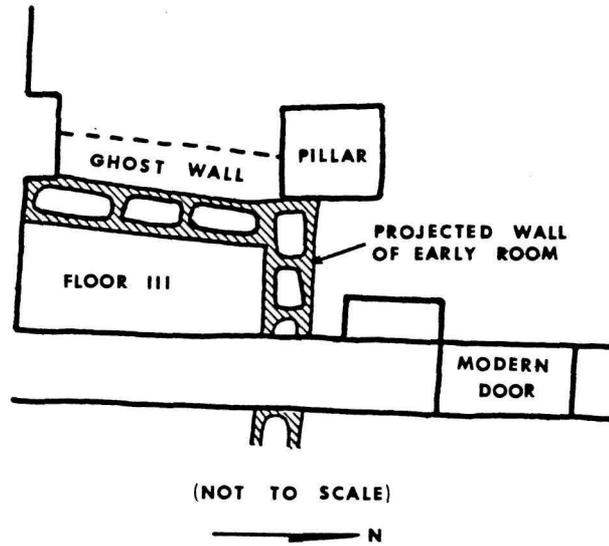


Fig. 9. Postulated Plan of Early Room Beneath Room 14. It appears that floor II goes over the top of the floor III adobe walls (from Mayer et al. 1971).

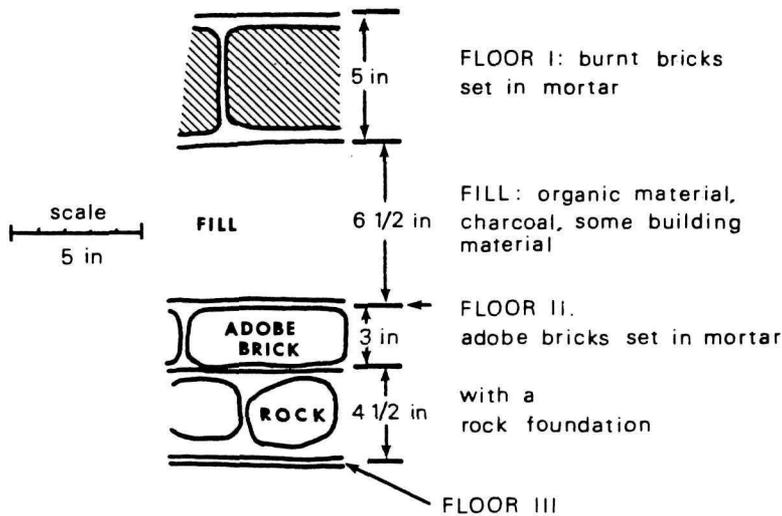


Fig. 10. Room 14, Profile of Subfloor Excavation for Southeast Roof Support footing (from Mayer et al. 1971).

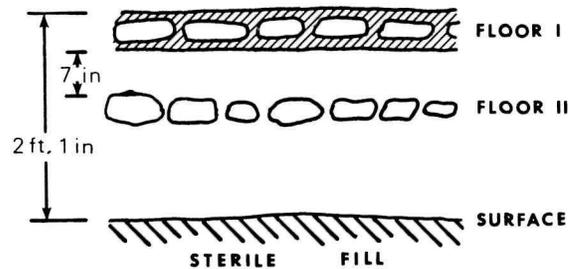


Fig. 11. Room 14, Profile of Subfloor Excavation for Southwest Roof Support Footing (from Mayer et al. 1971).

stone floors. Trench F appears to be related to another early room, although without investigating the outside walls, this cannot be proven.

Wall Construction. Unlike the west wall of Room 13, the east wall of Room 14 does not rest on a cobblestone foundation, but is shallowly set a few centimeters below floor I. Floors II and III go underneath the east wall (Fig. 12).

Beaubain (1937:194) suggested that the east wall of Room 13 was a double wall. The older wall was the west wall of Room 1. Mayer and others (1971:37-39) confirmed this and determined that the east wall of Room 14 was also a double wall. The first wall constructed formed the west wall of the plaza and the east walls of Rooms 15, 38, and 39. This double wall was observed in the south doorway jambs that had lime plaster on the west exterior of the early wall (Mayer et al. 1971:43), in the southeast corner of Room 14 (Fig. 13), behind the pilasters in Room 13, and in the inset construction of the original center doorway.

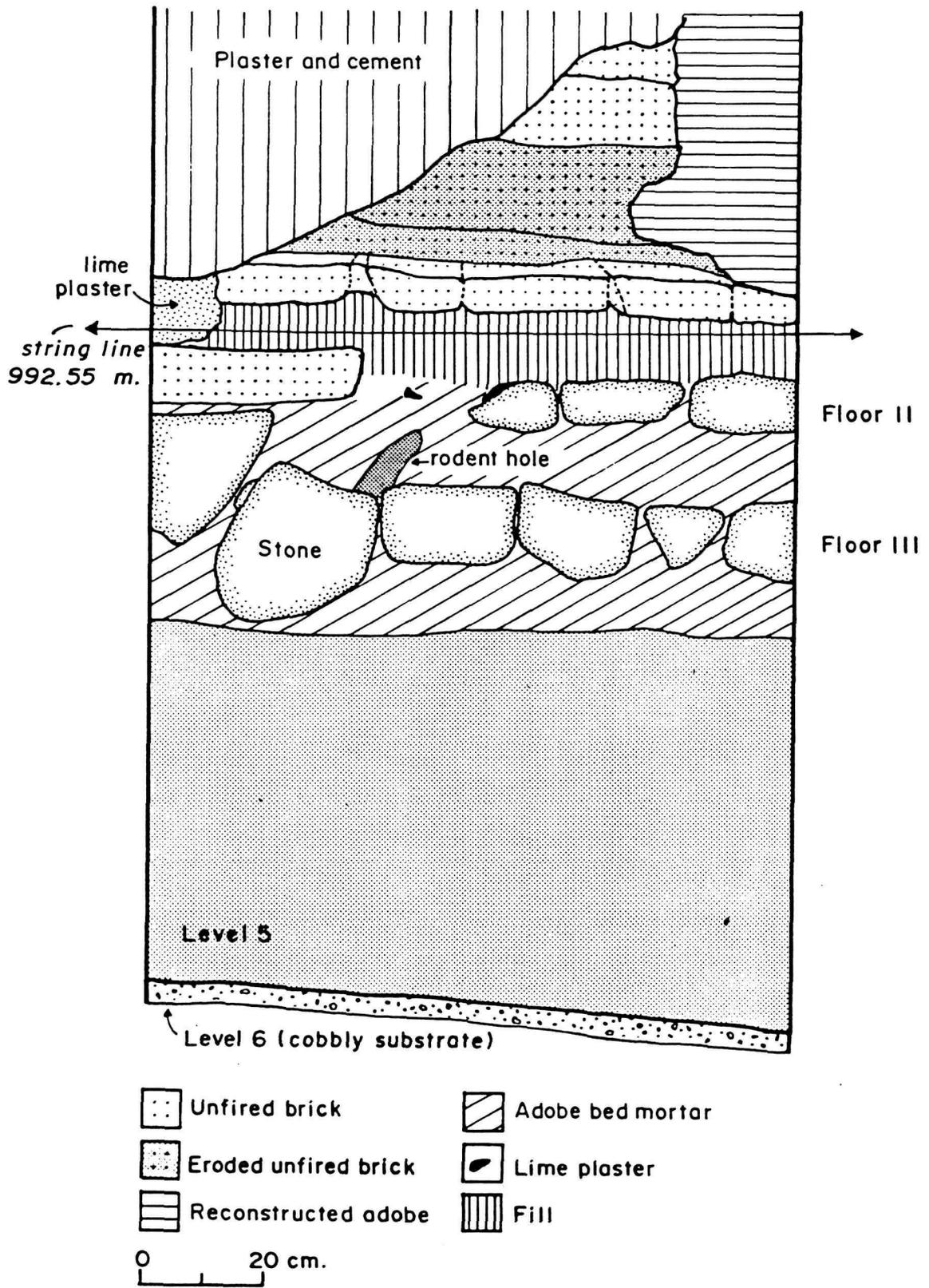


Fig. 12. Room 14, Trench F, East Wall Profile.

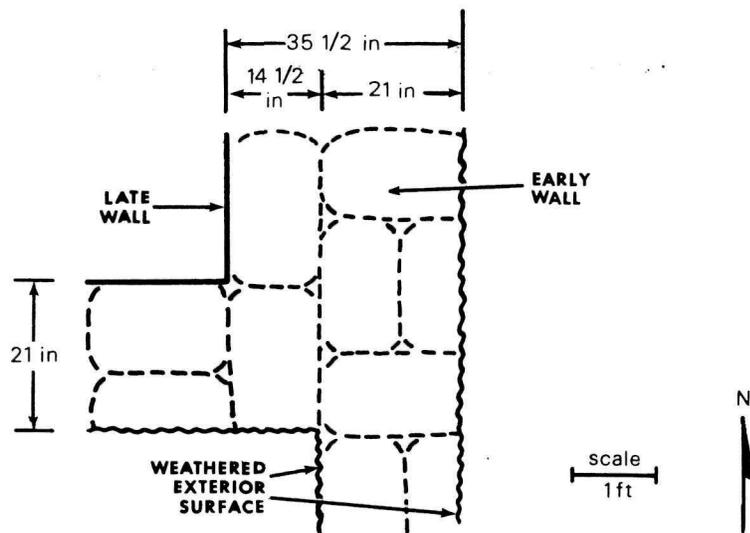


Fig. 13. Room 4, Construction detail of Southeast Corner (from Mayer et al. 1971).

When the granary was constructed, a thin wall incorporating five pilasters to support large vigas was built against the outside walls of Room 1 and the convento. The thick east wall was necessary to support a second story.

## MATERIAL CULTURE

Both indigenous and nonindigenous artifacts were found. However, as room fill in both trenches did not yield significant artifact numbers, chronological or spatial implications are tenuous.

### Ceramics.

In trench E, only indigenous ceramic types were recovered. Two Piman red-slipped and nine Piman plainware sherds were found in the fill above floor II; one Piman plain sherd was recovered from the bed mortar of floor II, and four Piman plain sherds were in level 5. In addition, two Piman plain sherds were recovered from feature 3.

In trench F, Mexican earthenwares formed part of the assemblage. One unglazed, and one lead-glazed earthenware sherd were found in the adobe mortar of floor II, along with five Piman plain and one Piman red-slipped ware sherds. Floor III yielded only two, and level 5, one Piman plain sherds.

Mexican lead-glazed earthenwares are thought to have first appeared in northern Sonora and the Pimeria Alta as early as ca 1730 or as late as ca 1780 (Barnes 1975:60; Caywood 1950:85). The ware is still manufactured today.

Metal. One small piece of unidentifiable scrap metal was recovered from the use surface of floor II in trench E.

Lithics. Only two pieces of chipped stone were recovered, both from the adobe mortar of floor III of trench E. One cortical flake of a fine-grained rhyolite, and one piece of banded chert decorticated shatter were found.

Faunal Remains. A surprising number of bones (75) were retrieved from the two deposits (Table 1). Most could only be identified as large mammal or ungulate, but cattle and chicken were recognized. The faunal inventory is consistent with other Tumacacori excavations (Brewer 1951; Caywood 1965; Barton this volume; Fratt 1981). All the excavations report abundant bone in Tumacacori deposits and indicate that the inhabitants relied on domestic, not wild, animals. The latter has also been demonstrated at nearby Tubac (Hewitt 1975).

Table 1  
TAXA REPRESENTED AT TUMACACORI DRAIN EXCAVATIONS

| <u>Taxon</u>               | <u>No. of Bones</u> | <u>Butchering Marks</u>                 |
|----------------------------|---------------------|---|
| indeterminate large mammal | 62                  | 1 copper-stained;<br>1 burnt;<br>6 sawn |
| Artiodactyl                | 2                   | 1 cut                                   |
| <u>Bos taurus</u>          | 2                   | 1 burnt and sawn                        |
| <u>Bos/Equus</u>           | 5                   | 1 sawn                                  |
| Rodentia                   | 2                   |   |
| <u>Canis sp.</u>           | 1                   |   |
| <u>Gallus gallus</u>       | <u>1</u>            |   |
|                            | <u>75</u>           |   |

Floral Remains. Analysis of six flotation samples of earth and plaster show a disappointing yield of floral material (Table 2). Recent uncarbonized items predominate. Carbonized remains consist of a single wheat caryopsis, a small sample of 12-rowed corn, and small charcoal pieces identified as mesquite and possibly one piece of ocotillo.

Wheat was one of the many European cultigens brought into Arizona by Father Kino, though evidence suggests it also may have been traded in prior to Kino (Castetter and Bell 1942:114). Twelve-rowed corn was commonly cultivated in southern Arizona prior to European contact and is still grown on the Papagueria and in northern Mexico.

Both wheat and 12-rowed corn have been recovered from other Tumacacori deposits (Hendry 1931:111-112; Fratt, this volume). These remains corroborate Spanish accounts of the two crops being grown in the mission vicinity. But, the sample size from the excavations is too small to do other than document the cultigens' presence.

Slag. Sixteen samples of melted mineralogical material were submitted to the Western Archeological and Conservation Center's Materials and Ecological Testing Laboratory for determination of origin. Four of these samples were analyzed for copper and silver by atomic absorption spectrophotometry.

No silver in detectable amounts was found, and copper amounts were well within those normally found in soil. Inefficient eighteenth cen-

Table 2  
FLOTATION RESULTS FROM THE GRANARY AT TUMACACORI

| <u>Bag No.</u> | <u>Provenience</u>  | <u>Volume</u> | <u>Uncarbonized Remains</u>   | <u>Carbonized Remains</u>                    |
|----------------|---------------------|---------------|---|--|
| 3              | Trench F<br>Level 3 | 1,400 ml      | Mesquite leaflets, insect parts,<br>amaranth seeds  | One wheat grain, charcoal                    |
| 2              | Trench F<br>Level 2 | 500 ml        | Mesquite leaflets, insect parts, <u>Lepidium</u><br>pods, composite achene, grass fragments | Charcoal                                     |
| 6              | Trench E<br>Level 3 | 600 ml        | Insect parts, fecal pellets, amaranth seeds   | Charcoal                                     |
| 8              | Trench F<br>Level 3 | 1,300 ml      | Rootlets, insect parts, fecal pellets,<br>amaranth seed, <u>Mollugo verticillata</u> seed   | Charcoal                                     |
| 11             | Trench E<br>Level 5 | 1,600 ml      | Rootlets  | Charcoal                                     |
| 16             | Trench F<br>Level 5 | -             | None  | Four corncob fragments,<br>one grain of corn |

tury smelting methods result in much higher copper and silver content in smelting slag than found in our samples. Documented melted adobe brick from Tumacacori shows the same conspicuous quartz and feldspar masses that appear in our samples. Because these masses are so large, it is doubtful that the source material had been finely ground, as would be expected in smelted ore. Also, most copper ores do not contain the large amounts of iron found in our samples. This high iron content accounts for the low melting point of the material, probably around 2,000°F.

It was concluded that all slag samples are overfired adobe brick, not metallurgical residue.

## SUMMARY

Several of the excavation's research objectives were fulfilled. Floors were linked to both the east and west walls. A complicated building sequence of fill, plastered use surfaces, and bricks or cobblestones embedded in foundation mortar emerged. The granary structure was one of the latest buildings in Tumacacori's convento complex. An earlier room, possibly predating the convento, exists but is badly disturbed.

Undisturbed room fill still exists, but true trash levels are not present. Each new construction phase obliterated most of the floor below which makes the determination of room function difficult. Pot rests and a second story, presumed to be a loft, indicate a storage room. The artifact remains, however, do not confirm this. If vessels were stored here, one would expect quantities of sherds. However, because each floor was leveled to prepare the next one and because surface fill was removed by previous excavators, negative evidence may not be conclusive. Floral remains were disappointingly meager. Because little fill exists, further excavation is unlikely to yield significant ethnobiological material.

The use of slag as a thermal insulator between floors does suggest a need for moisture retardation. Clay would be the worst possible material for a granary floor. The care and labor shown in the laying of each floor sequence also points to the deliberate preparation of a room with a specific function requiring a dry, level floor.

There are a few remaining research problems concerning construction details which will only be understood after excavations designed to answer these questions have been conducted. One of these problems is the nature and extent of the early room. Broad-scale excavation, not only inside Room 14, but also outside in area 41c and in Room 15 would be necessary. Unfortunately, so many disjointed excavations have already occurred that it is now difficult to evaluate area sequences.

## RECOMMENDATIONS

The history of Tumacacori archeology has been one of the exigent demands of stabilization. Architectural sequence has been stressed and artifactual data neglected. Inferences concerning room function have been speculative, not substantive. In the last decade, stabilization projects have necessitated subfloor excavations of eight roof footings and two well points. One-fourth of the granary's subsurface deposits have now been removed. All debris from the upper story is gone. Further excavation is unlikely to uncover new information. With so little material left, it is time to urge preservation. Future stabilization measures should be confined to existing disturbed areas.

## REFERENCES

- Attwell, Walter G., and Gene H. Gordon  
1935 Report on Proposed Ruins Stabilization Mission San Jose de Tumacacori. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Barnes, Mark  
1975 Mexican Lead-Glazed Earthenware Ceramics. Ms. on file, Arizona State Museum Library, Tucson.
- Beaubein, Paul  
1937 Excavations at Tumacacori, 1934. Southwestern Monuments Special Report 15:183-220.
- Becker, Michael J.  
1962 Stabilization Capping of the Granary Wall, 1962. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Brewer, Sallie  
1951 Report on Archeological Trenching at Tumacacori National Monument, May 1951. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Caperton, Tom  
1970 Field Notes. Tumacacori National Monument, 1970 Stabilization. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Castetter, Edward F., and Willis H. Bell  
1942 Pima and Papago Indian Agriculture. *Inter-American Studies* 1.
- Caywood, Louis R.  
1950 Hispanic Pottery as a Guide in Historical Studies. *In* For the Dean. Erik K. Reed and Dale S. King, eds., pp. 77-97. Tucson: Hohokam Museums Associations.
- 1965 1964 Archeological Excavations at Tumacacori National Monument, Arizona. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- 1966 Tumacacori Excavations. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Crosby, Anthony  
1976 Preliminary Report on the Preservation Project at Tumacacori National Monument. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.

- Fratt, Lee  
 1981 Tumacacori Plaza Excavation, 1979, Historical Archeology at Tumacacori National Monument, Arizona. Western Archeological and Conservation Center Publications in Anthropology No. 16. National Park Service, Tucson.
- Hendry, George W.  
 1931 The Adobe Brick as a Historical Source. Agricultural History 5:110-127.
- Hewitt, James M.  
 1975 The Faunal Archeology of the Tubac Presidio. In Excavations at the Tubac Presidio. L. O. Shenk and G. A. Teague, eds., pp. 195-234. Arizona State Museum, Cultural Resource Management Section, Archeological Series 85. Tucson.
- Jackson, Earl  
 1962 Research Report, Tumacacori Construction Diorama. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Kayser, David  
 1965 Field Notes. Tumacacori National Monument, 1965 Excavations. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Mayer, Martin T., Tom Caperton, and Sam Hendorson  
 1971 Stabilization Report, Tumacacori National Monument. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- National Park Service, Tumacacori National Monument  
 n.d. The Repair and Restoration Work of 1921. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Powell, H. M. T.  
 1931 The Santa Fe Trail to California, 1849-1852. San Francisco: The Book Club of California.
- Shenk, Lynette O.  
 1976 San Jose de Tumacacori: An Archeological Synthesis and Research Design. Arizona State Museum, Cultural Resource Management Section, Archeological Series 94. Tucson.

PART III

EXCAVATION IN THE SOUTH CONVENTO  
OF MISSION TUMACACORI

by  
LEE FRATT

Contribution by  
John Whittaker

## ACKNOWLEDGEMENTS

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## INTRODUCTION

Archeological excavation of the south wing of the Franciscan convento at Mission Tumacacori was conducted in the fall of 1980, prior to modification of the structure's protective shelter. The archeological project entailed excavation of the four corners of the protective shelter enclosing the convento's ruins. Following the removal of the shelter's foundation, the exposed convento ruins were studied and recorded. The cloister and Rooms 42 and 60 of the south convento were affected by the excavation. The cloister (Areas 43a, b, and c) once separated the convento's south wing from the mission patio (Fig. 1). The wing, divided into rooms, once extended east from the baptistry's east wall, forming the boundary between the mission convento and the plaza.

The only aboveground structural remains of the convento's south wing are Rooms 44 and 45 (Fig. 1). As a result of exposure, the ruins were deteriorating at an alarming rate when, in 1955, a protective shelter was constructed, completely enclosing the ruins (Vivian 1955:240). Although the shelter did protect the ruins, it was not very attractive. In conjunction with the stabilization project for the monument, plans were made to modify the structure in order to improve its appearance and make it more harmonious with the mission's setting.

Mission Tumacacori is an archeological resource and therefore important not only for its historical significance and visible ruins, but also for its potential to yield information about past lifeways in southern Arizona. Although much of the site had been previously excavated, records of these past projects are, for the most part, incomplete or missing; consequently, little specific information about the site's archeology is available. We have few data about the south convento's subsurface deposits and features or the actual extent of disturbance. Recent excavations in other areas of the site have shown that intact mission period deposits are present. Records indicated that subsurface features were likely to be encountered in that area of the south convento to be affected by the stabilization project. To ensure that no archeological resources were inadvertently destroyed during the removal of the protective shelter foundations, excavations undertaken during the stabilization project were monitored.

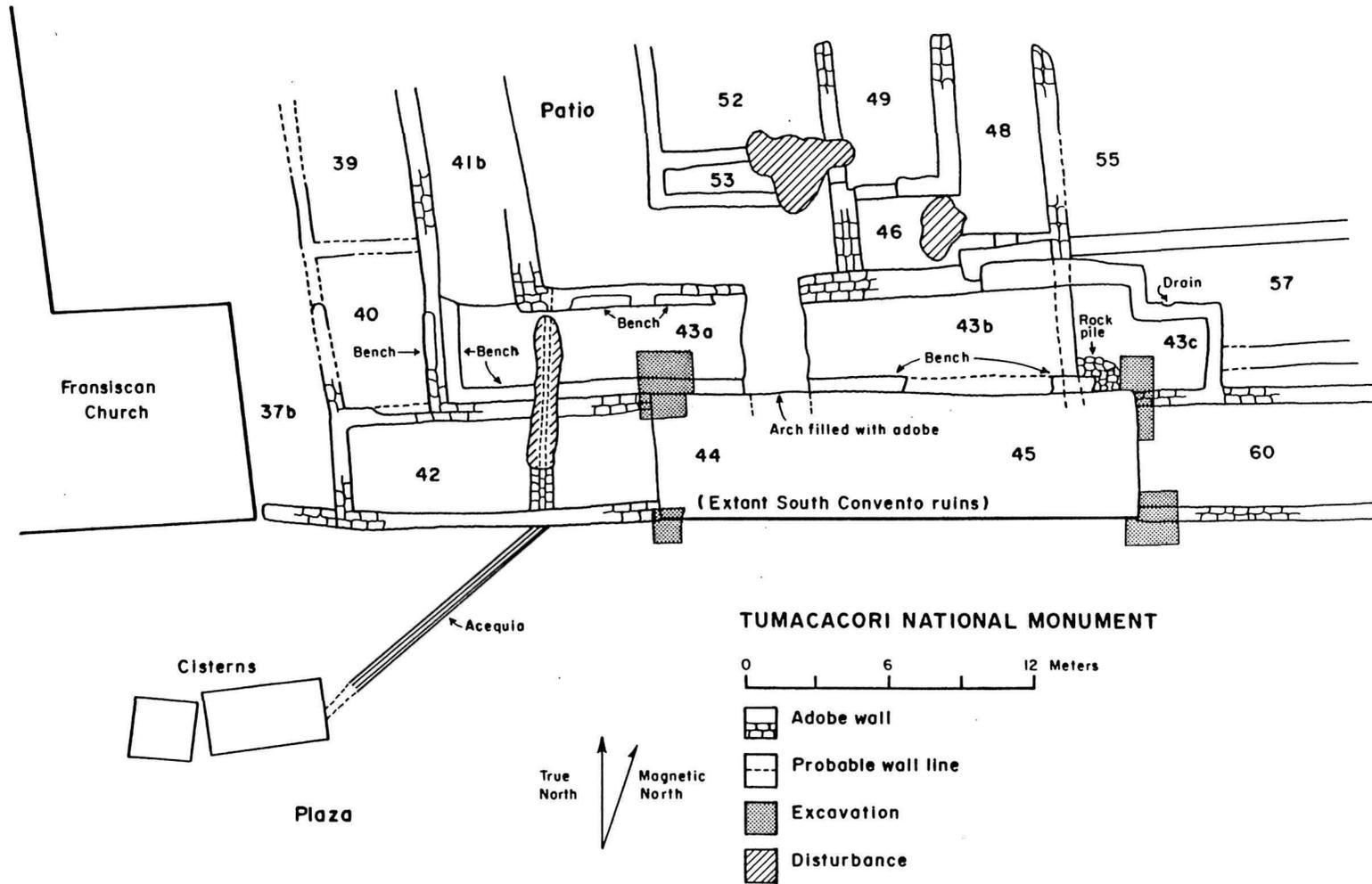


Fig. 1. Plan of South Convento Area Showing Numbered Rooms and 1980 Excavation (Modified from Tovrea 1935).

The excavation of the south convento was a test of the archeology of that area. Reports show that the ruins had sustained damage and that their associated subsurface deposits and features had suffered extensive disturbance. Lacking specific information about the archeology of the south convento and considering the excavation's scope, we decided that the project's main goals would be to obtain information about the condition of the subsurface remains and features. We hoped that excavation would yield useful data on convento room and cloister construction. We were especially interested in ascertaining whether or not any mission period deposits remained in the area, since such deposits had been found during excavations at Tumacacori in 1979 and early 1980.

Excavations were conducted in the south convento from September 8 through October 24, 1980. The author served as crew chief, and Maurice Montgomery acted as assistant archeologist. We received occasional assistance from the three members of the stabilization crew and from a member of the monument's Young Adult Conservation Corps staff. Michelle Whitmore, Tumacacori Administrative Technician, also lent her kind assistance. Work encompassed 55 person-days.

All four areas affected by the stabilization project were opened, features and deposits were studied and recorded, and cultural materials were recovered. Although disturbance fill resulting from vandalism and 20th century repair and modification of the structure was the main deposit excavated, mission period deposits were also encountered. Architectural features exposed included walls, floors, the cloister bench, and an unidentified soil adobe structure. As expected, the architectural features exposed yielded the most information. Remains of two floors, and possibly a third, were found in Room 42. The subsurface wall ruins indicate that Room 60 was added onto Room 45. Construction of the south convento's north wall predates construction of the cloister floor and bench. Data recovered also suggest that in order to build a level cloister floor, sandy soil was deposited in the cloister area, thereby burying at least three courses and the foundation of the south convento's north wall. Indigenous and nonindigenous artifacts as well as bone were recovered. Information from the deposits furthered our knowledge of the site's stratigraphy, and data were obtained on the extent of disturbance in this part of the mission. No evidence of pre-

Spanish contact occupation of this part of Tumacacori was found, although evidence of occupation prior to the construction of the south convento was present.

## HISTORY OF THE SOUTH CONVENTO

The south wing of the Franciscan convento, thought to have been built between 1807 and 1821, was abandoned in 1848 along with the rest of the mission (Shenk 1976:59, 18). As shown in Fig. 1, it included five rooms (numbered 42, 44, 45, 60, and 61) and a cloister (Areas 43a-c) (Tovrea 1935). An acequia apparently once extended beneath Room 42 and Area 43a (Shenk 1976:32). As mentioned above, the only extant ruins of this part of the convento are Rooms 44 and 45. Although some of the cloister's ruins may have stood as late as the 1860s and 1870s (Shenk 1976:33) (Fig. 2), only a portion of the floor and a soil adobe arch, thought to be part of the arcade, in the north wall of Room 44 remain. Few speculations about the functions of Rooms 44, 45, 60, and 61 have been made. Twentieth-century disturbance has been severe in this area, and excavations have been limited. Room 42 is part of an area in which private quarters for the priests, guest rooms, and reception salas may have been located (Shenk 1976:32). A covered cloister once extended along the north, west, and south sides of the patio (Shenk 1976:32). The cloister bench, adjoining the convento north wall of the south convento wing and adjacent to the edge of the patio, once extended along most of the convent's south wing.

Following abandonment, the south wing was sporadically reoccupied and as a result underwent modification and other forms of disturbance. At some time, the arch in the north wall of Room 44 was filled in. From 1900 to 1923, the ruins were used as a schoolhouse and residence for the teacher. Reportedly, at this time, the wall dividing Rooms 44 and 45 was built. The ruin's walls were repaired and whitewashed, and doors, windows, a fireplace, and a tin roof were installed (Southwestern Parks and Monuments Association 1970:14). During the 1930s, the south wing was used as the monument office, and three buttresses were added to support the sagging south wall (National Park Service 1936:129) (Fig. 3).

Numerous excavations have left their mark at Tumacacori. The site's archeological integrity has been disturbed by poorly documented archeological and stabilization activities as well as by treasure hunters and vandals, who began digging and plundering the mission almost as soon as it was abandoned (Shenk 1976:21). Shenk (1976:22) states that

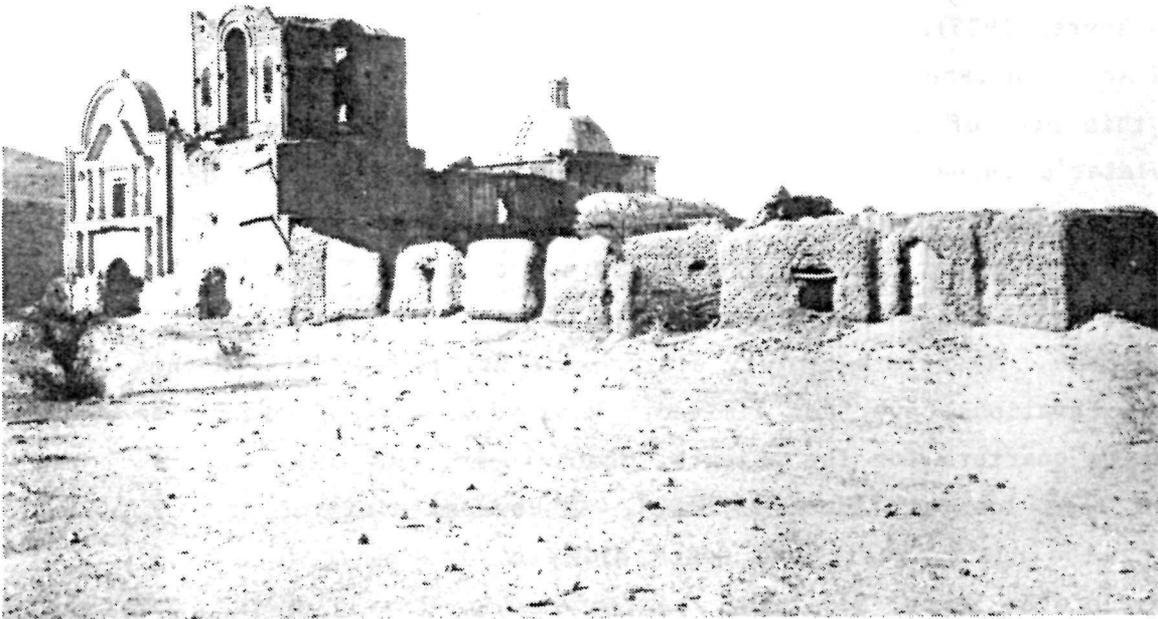


Fig. 2. South Convento and Church, as it  
Appeared in the 1890s, from the Southeast.

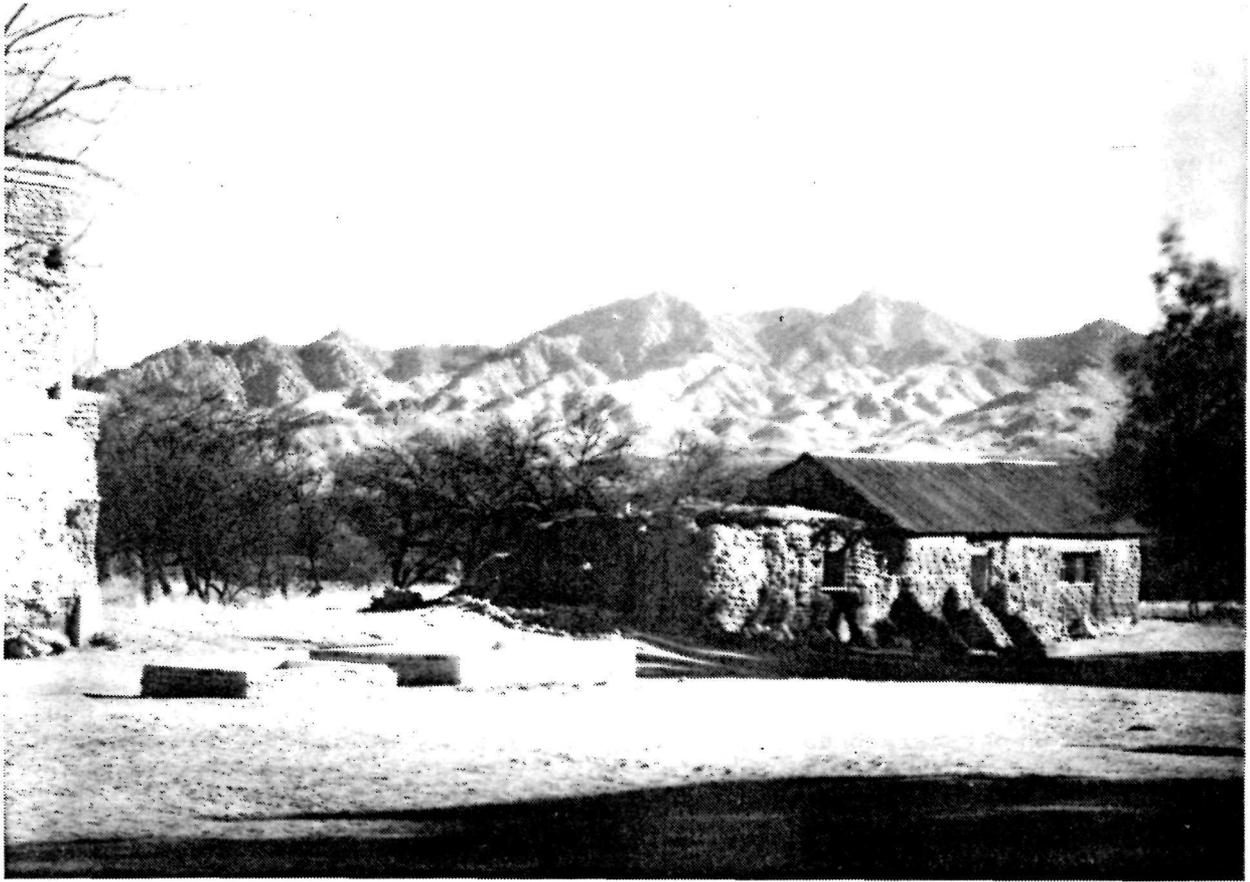


Fig. 3. South Convento Wing as it Appeared  
in the 1930s, from the Southwest.

before the mission had obtained national monument status, "every room in the convento and most of the church itself were regularly vandalized, [and] disturbed by treasure hunters." Apparently, treasure hunting continued even after 1905, since two treasure hunters were allowed to dig along the convento's foundations in the summer of 1934 (Shenk 1976:18; National Park Service 1934:66). A treasure hunter's hole, reportedly excavated to a depth of about 7 feet below floor level, was found in Area 43c during the 1934-35 archeological investigations (Beaubien n.d.: 32).

At least three major archeological and stabilization projects have directly affected the ruins of the convento south wing and related sub-

surface deposits. Paul Beaubien trenched around all of the south convento's walls in 1934-35 and exposed sections of the cloister floor in Area 43. Beaubien was directed, however, not to excavate below floor level in any intact areas (Beaubien n.d.:6; Shenk 1976:27). Unfortunately, the only available report of his project does not detail actual excavation extent, and it is not known how wide or deep his trenches were or exactly where they were dug (Beaubien n.d.). In 1955, construction of the protective shelter, which enclosed the extant ruins of Rooms 44 and 45, required excavation of a foundation trench (Vivian 1955:240). This project necessitated damage to some features as well as extensive subsurface disturbance. The only available record of Vivian's excavations is a series of photographs. In 1965, Louis Caywood supervised excavation of the interior of Room 60 and portions of the cloister (Area 43a). Although a project report and field notes providing some detailed information on excavation extent and results exist, all maps and profiles have apparently been lost (Caywood 1965; Kayser 1965). The extensive disturbance and sparse documentation of previous activity at the site combine to make archeological investigations at Tumacacori a challenge in data recovery and interpretation.

## EXCAVATION METHODS

All four corners of the protective shelter enclosing the ruins of the south convento were excavated (Fig. 1). After the stabilization crew removed the shelter's foundations with jackhammers and sledge hammers, we exposed the convento ruins. We excavated to the basal level (ground surface before intensive prehistoric or historic occupation of the site or construction of structures) in all four corners. The rectangular excavation units were designated according to their compass position and their relation to the south convento architectural features identified by Beaubien (Beaubien n.d.; Tovrea 1935) (Fig. 1). From here on the units will be called the southwest corner, the northwest corner, the northeast corner, and the southeast corner.

Since the original holes for the new concrete footings were too small for adequate archeological investigation, we expanded the excavation at the northeast, southeast, and southwest corners as needed, measuring excavation extent after the completion of the investigations. The dimensions of the excavation units were as follows:

Southwest: 1.25 m x 1.0 m and between 1.1 m and 1.4 m below grade.  
Northwest: 2.0 m x 2.4 m and 1.1 m below grade.  
Northeast: 1.9 m x 0.7 m and 1.4 m below grade in Room 60; 1.3 m x 1.2 m and 1.6 m below grade in Area 43c north of Room 60.  
Southeast: 1.1 m x 1.3 m and 1.4 m below grade in Room 60; 2.1 m x 1.0 m and between 1.4 m (east) and 2 m (west) below grade south of Room 60.

After encountering Area 43b cloister floor remains in the northwest corner, we delineated the excavation unit with nails and string to better control data recovery. Two square meters of Area 43b cloister floor were exposed to ensure that the brick pattern and floor construction were adequately recorded. The test pit below the floor level measured 1.5 m x 1.5 m.

Vertical controls were established from two main elevation datum points; additional elevation datum points were established as needed. These two datum points are related to the main elevation datum, labeled "Kino," used in the 1979 excavation of Tumacacori's plaza (Fratt 1981:

38). Actual elevation of datum 1 (at the northeast corner) is 993.075 m (3,258.1 feet) above sea level; that of datum 4 (at the benchmark between the south convento ruins and the church) is 993.482 m (3,266.7 feet) above sea level. Datum 1 was established with transit and stadia rod, and elevations were determined with line levels and tape during excavation and profiling. Distances were measured with tapes. Since a topographic map showing all physiographic and cultural features of the site had already been made, excavation units were simply added to it.

Excavation proceeded in arbitrary and natural/cultural levels when appropriate. Since each corner was treated as a separate excavation unit, strata and features were numbered sequentially in each corner as encountered. Previously disturbed fill was excavated either as one level or in arbitrary 20 cm levels, depending on what was most appropriate for the excavation unit. Since the impacted area was known to have sustained disturbance from the 1934-1935 archeological project and the 1955 stabilization work, disturbance fill was excavated as a single, un-screened level until the bottom of the protective shelter's foundation was reached. The author troweled through the disturbance fill backdirt, making notes on soil and contents and collected a random sample of cultural material from the fill in each corner.

Picks, shovels, hammers, and chisels were used to remove architectural features and fill. Architectural features were defined with trowels, whisk brooms, and other small tools. A 1/4-inch wire mesh screen was used to recover artifacts. Artifacts less than 2 cm<sup>2</sup> in size were discarded unless they were diagnostic or complete objects. Very small or badly deteriorated pieces of bone were also discarded. Recovered artifacts, bone, soil samples, and samples of architectural debris (fragments of fired adobe, floor tile, lime mortar, and plaster) were bagged and labeled.

Excavation procedure differed slightly in each corner, depending on the strata and the architectural features encountered. In the southwest corner, excavated first, only disturbance fill and the basal level were encountered. In the northwest corner, excavated next, part of Area 43b cloister floor, apparently intact, was encountered. After the disturbance fill overburden had been excavated, the fired adobe and lime mortar cloister floor was carefully removed with hammer and chisel in order to

recover as many whole bricks as possible. The bricks were damp and crumbly, however, and the mortar was harder than had been expected; consequently, the bricks were all damaged during removal. Deposits below the cloister floor level were excavated in stratigraphic levels until the basal level was reached.

In the northeast corner, excavation was continued to the bottom of the shelter's foundations, through 60 cm of known disturbance fill. Subsequent excavation and screening of the fill were conducted in 20 cm arbitrary levels, exposing Room 60's north wall, until the basal level appeared in the south wall of the excavation unit. Although a large treasure hunter's hole was reportedly located in this corner, the excavations proceeded with caution, since intact cloister floor had appeared in the northwest corner. Records of previous work in the area indicated that the cloister had extended east at least as far as the end of Room 45 (Area 43c) (Beaubien n.d.:31-33). Only disturbance fill was excavated in this corner, confirming the presence of the reported treasure hunter's hole. Deposits of apparent mission period material, however, appeared below the exposed north face of Room 60's north wall fragment. To expose the wall's south face, excavation was undertaken in Room 60.

Excavation procedure in the southeast corner was similar to that followed in the northeast corner. On the basis of the depth of cultural material exposed in the northeast corner, it was decided to expand excavation in the southeast corner shortly after digging commenced. Since the horizontal extent of Vivian's trenches was not known, all southeast corner fill, except the disturbance fill dug initially, was excavated and screened in 20 cm arbitrary levels until the basal level was reached. Cultural material from apparently undisturbed areas was bagged separately. As in the northeast corner, excavation was undertaken in Room 60, north of the fragment of the convento's south wall, to expose the wall's south face. After disturbance fill had been removed, as a single, unscreened level, an apparently intact portion of the floor of Room 60 was revealed. Excavation below the floor proceeded in stratigraphic levels until the basal level was reached.

Vertical measurements of features and deposits that were profiled were obtained with line level and tape from an elevation datum. Exposed adobe walls were drawn by first recording elevations of the top of the

wall fragment, the ground surface, the top of the foundation rocks, and the excavation bottom, and then measuring and recording adobe brick and mortar thicknesses. Deep deposits in the northeast and southeast corners outside Room 60 were also profiled in this fashion. The profiling error is  $\pm 5$  cm. Floor plans were made when features or constructed floors were present. A sketch map was drawn of a small segment of Room 45's north wall cobble foundation, exposed when the wall was removed.

Prior to recording, excavation unit walls and architectural features were brushed with whisk brooms and paintbrushes and sprayed with water. Adobes and mortar joints were often difficult to distinguish because most of the walls were badly deteriorated and soil development had started. When adobes and mortar joints could not be visually distinguished, they were tested with a 50-percent solution of hydrochloric acid. At Tumacacori, it was found that culture bearing strata, lime plaster and mortar lenses, adobe mortar joints, and adobe pad foundations reacted to hydrochloric acid, but that the soil adobes themselves did not react. The basal level was also nonreactive, as there is no naturally occurring caliche in this area. Because these features do react selectively, the use of hydrochloric acid to test archeological features and deposits is a reliable technique for distinguishing architectural features and differentiating deposits at the site.

All architectural features exposed and excavation unit faces showing undisturbed culture bearing deposits were drawn to scale on graph paper. Following profiling and completion of investigations, black-and-white and color photographs were taken of all undisturbed deposits and exposed architectural features. Notes and measurements were recorded for cultural deposits and for the basal level in excavation unit walls not profiled or photographed. All samples and artifacts were taken to the Western Archeological and Conservation Center in Tucson for cleaning, processing, analysis, and permanent storage. Field notes, maps, and profiles are in the Center's archives.

## EXCAVATION RESULTS

Excavation exposed the northeast and southeast corners of the convento ruin, north and south wall fragments of Rooms 42 and 60, part of Room 60's floor, and a section of the cloister (Area 43) (Fig. 1). Disturbed fill and apparently undisturbed mission period deposits were encountered overlying the basal level. Bone and historic indigenous and nonindigenous artifacts were recovered, and samples of soil, rock, and architectural debris (fired adobe, lime plaster and mortar, floor tile) were taken and submitted to the Materials and Ecological Testing Laboratory at the Western Archeological and Conservation Center for analysis. This section contains descriptions of architectural features and deposits exposed in each of the four excavation units.

### Architectural Features and Deposits

Discussions of disturbance fill and the basal level appear first and are followed by descriptions of architectural features and deposits exposed in the southwest, northwest, northeast, and southeast corners. Levels and architectural features discussed are labeled on the profile drawings of each excavation unit. Dates of the various deposits are based on the deposits' position in the depositional sequence and on their relation to architectural features; dates of architectural features are derived from historical documentation.

Disturbance Fill. Records indicate that all four areas excavated had been disturbed and that the extent of disturbance was at least as deep as the protective shelter's foundations (found to be 60 to 80 cm below grade). The disturbance fill was lighter in color than the basal level, exhibiting a matrix consisting of a loose, soft, distinctly reddish brown soil. This deposit contained a mixture of historic indigenous and nonindigenous artifacts and bone, as well as very dense architectural debris (fired adobe, lime mortar and plaster fragments, pieces of asphalt, and cement chunks). Also present were gravel and rocks. The rocks could be natural, but they could also be from damaged or destroyed architectural features, particularly in the northeast corner. The disturbance fill showed evidence of heavy rodent and insect activity. In the northeast corner, the fill was quite damp and became damper

with depth. When tested, the moisture content was 17 percent, which is high for Tumacacori (Tony Crosby: personal communication). Disturbance fill in the northeast and southeast corners contained deteriorating spots of lime mortar, charcoal, and variously colored (black, blue, gray, yellow, and brown) lenses of a fine, dense, friable material. Caywood and Beaubien found lenses of similar material during excavations in Room 60 and its vicinity (Caywood 1965:83, 89; Beaubien n.d.:51-52). These two excavators suggested they were manure lenses and that this area may have been used for corrals and stables (Beaubien n.d.:52; Caywood 1965:75). Three samples of these lenses were analyzed. All were found to be some kind of manure.

Basal Level. Appearing at the bottom of the excavation, this distinctly dark brown, gritty/sandy, rocky soil did not react when tested with hydrochloric acid and was always darker than the overlying cultural deposits. Artifacts occasionally appeared in the upper centimeters of this stratum although in a smaller quantity than in the overlying cultural deposits; in fact, decreased artifact density was one of the indications that the basal level had been reached. Artifacts appearing in the basal level are probably the result of insect or rodent activity. Alternatively, their presence could be due to drift or to the presence of people at the site before 1753, the date of initial permanent occupation (Shenk 1976:14).

Southwest Corner. This corner, excavated first, served as the excavation test unit. We exposed part of the south face of Room 42's south wall, removing disturbance fill and the basal level (Fig. 4). The wall was severely eroded; adobe courses and mortar joints were barely discernible. Individual adobe brick outlines and mortar joints were too indistinct to draw, and we did not test them with hydrochloric acid, since the impact of stabilization activity on the architectural features in this corner was minimal. The wall was constructed of soil adobes cemented with a soil mortar and laid on an adobe pad (layer of soil adobe securing the rocks) and rock/cobble foundation. Foundation rocks measured in profile varied from 4 cm x 6.5 cm to 9 cm x 28 cm in dimension. The wall foundation directly overlay the basal level. Any original culture-bearing deposits in this corner had been destroyed by previous activity. The top of the basal level appeared 1 m below grade and

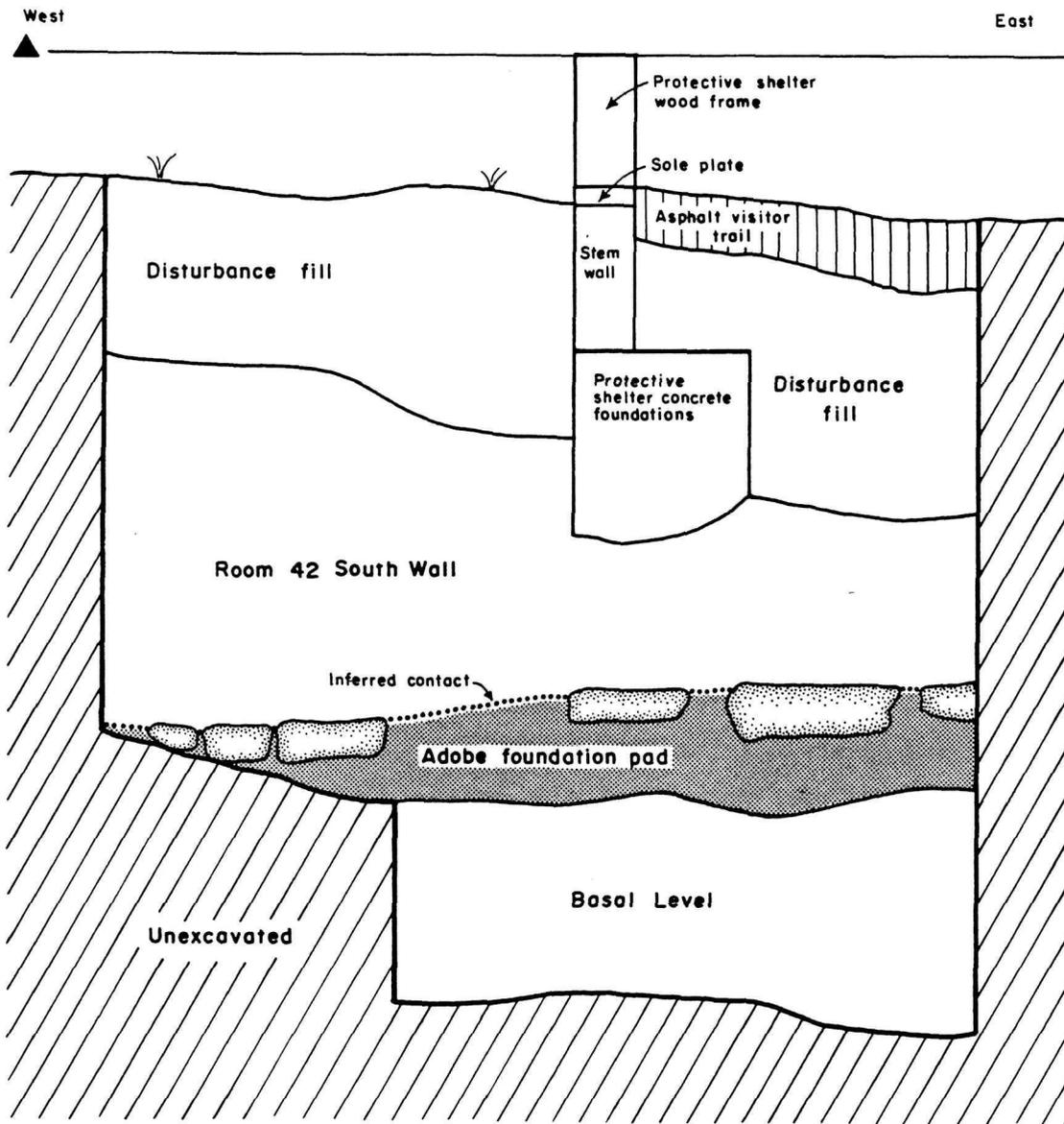


Fig. 4. Southwest Corner, North Face Profile.  
Datum is 83.5 cm below "Kino."

was very hard (hard-pack was 10.5 cm thick). This hard layer could be natural, or it could represent a use surface compacted by construction or some other activity in the area. Beneath the initial compaction, the level was loose and soft. No artifacts were recovered from the basal level.

Northwest Corner. A section of the cloister floor and bench overlying another apparent floor and four cultural deposits were exposed as well as part of the north wall of Room 42 and two floors with an underlying cultural deposit. Although the cloister floor was intact, the bench and the Room 42 wall fragment were damaged and severely eroded.

The cloister (Area 43a) floor, of fired adobe construction exhibiting a herringbone pattern, was revealed in the northern two-thirds of the excavation unit (Fig. 5). Overlying this floor were about 70 cm of disturbance fill. The section of floor exposed was in excellent condition, although the lime mortar joints were eroded in some spots and the southern rows of fired adobes near the bench were worn. Some of these bricks were worn down 1-2 cm below the level of adjacent bricks. This wear pattern suggests that traffic may have been heavier in this part of the corridor, perhaps because of the bench. The lime mortar bed in which the bricks were secured was 3 cm thick and was laid atop level 1. The last row of bricks at the southern end of the floor directly adjacent to the bench consisted of broken pieces. Apparently, whole bricks were broken to form the pieces needed; irregularly shaped bricks were not manufactured individually. A ridge in the lime mortar at the floor's southern end showed the bench location. Also present were patches of red lime wash from the decorative red band painted on the bench at its juncture with the floor.

The cloister bench and the north wall of Room 42, exposed in the southern one-third of the excavation unit, were deteriorated. Both were severely eroded and had sustained extensive damage from previous stabilization activity. A cross section of the cloister bench was visible in the west face of the excavation unit (Fig. 6). Only a couple of bench soil adobe courses remained. Underneath the wall courses was a 3.5 cm thick adobe mortar pad foundation that overlay level 1. The cross section indicated that the fired adobe on top of the bench was secured by a

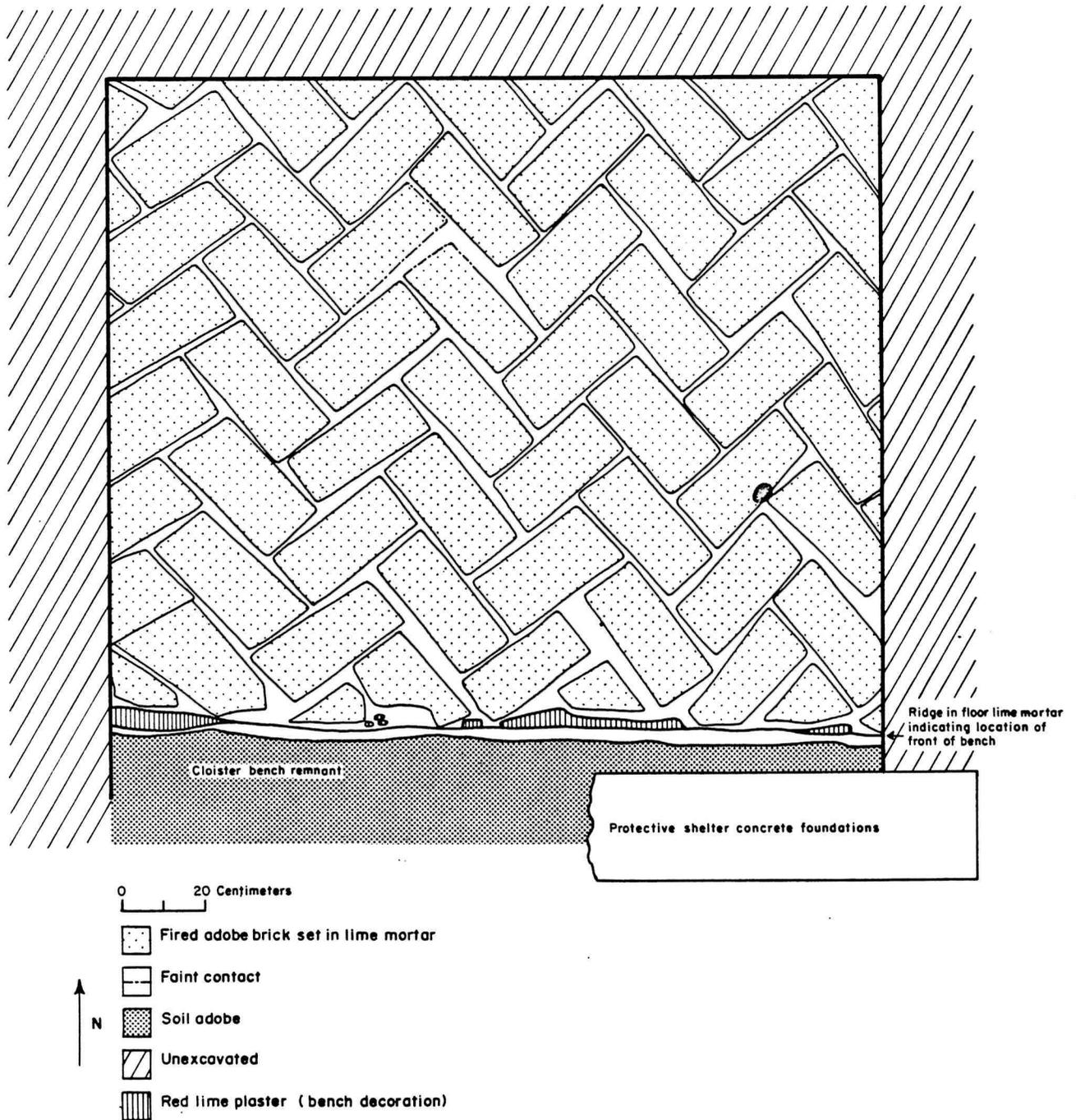


Fig. 5. Northwest Corner, Cloister Floor of Fired Adobe Bricks.

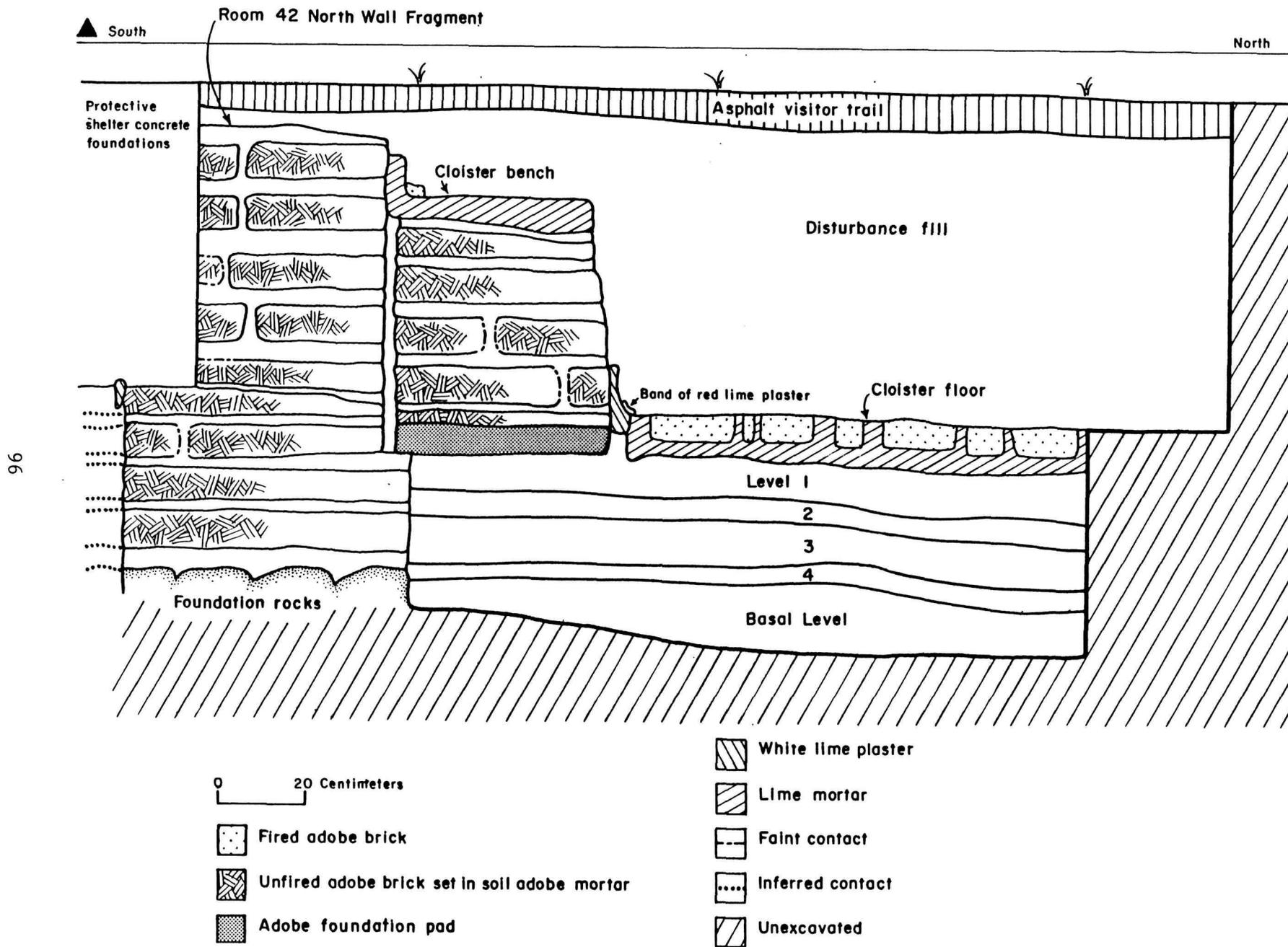


Fig. 6. Northwest Corner, West Face Profile.  
Datum is 42.8 cm below "Kino."

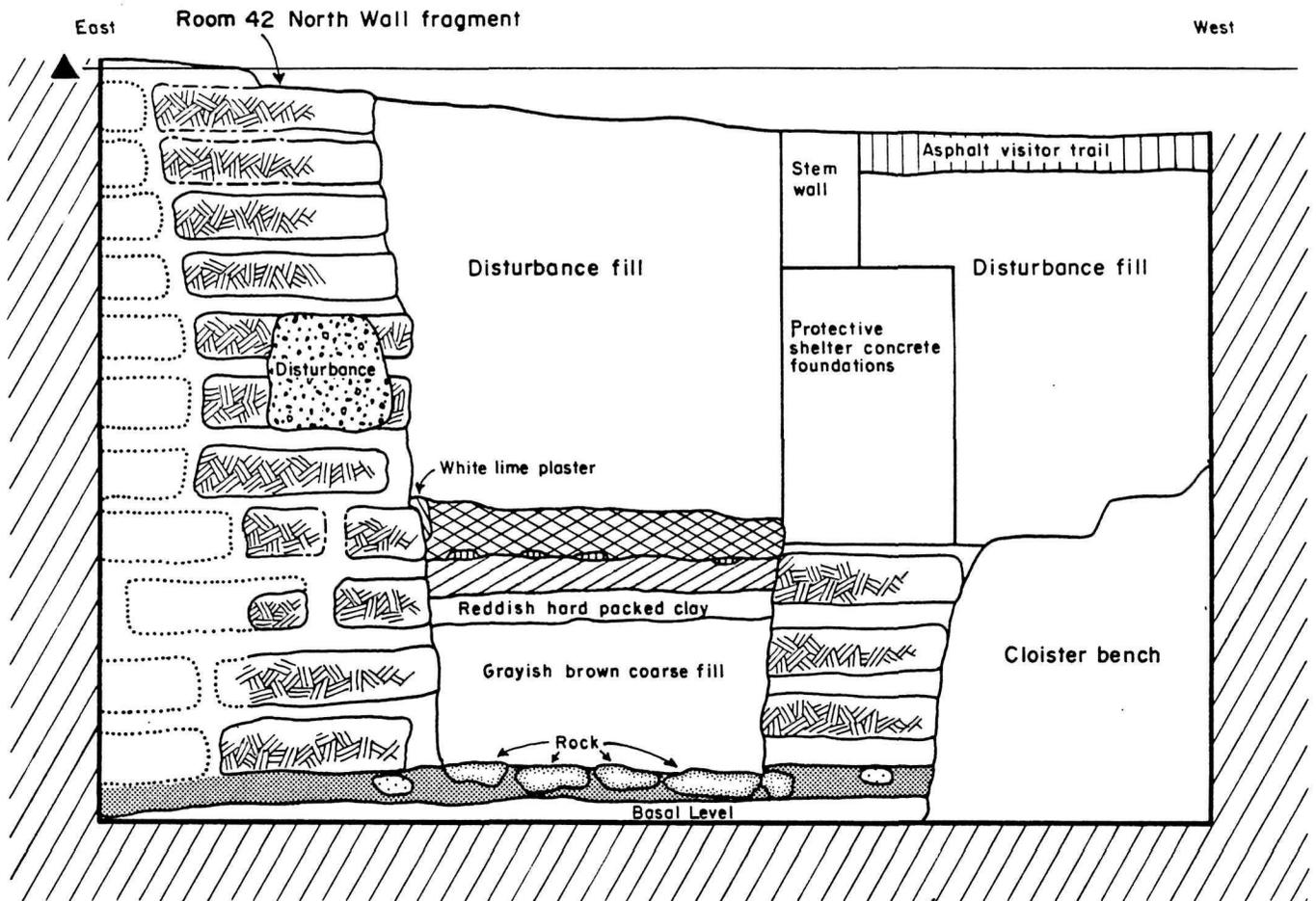
lime mortar pad 4-7 cm thick. The bench itself was 50 cm wide and composed of four courses of soil adobe and mortar on an adobe pad foundation. Apparently the bench exterior had been covered with a white lime plaster wash and then decorated with a red, lime wash band painted on the base. An adobe mortar joint attached the bench to the convento north wall. The top part of the bench, consisting of fired adobe in lime mortar, was plastered directly to the wall.

The north wall fragment of Room 42 (Fig. 7) was made of soil adobes measuring 30 cm x 20 cm x 8 cm or 30 cm x 30 cm x 8 cm. The wall fragment was so badly eroded that only horizontal joints could be easily distinguished. The vertical joints were very unclear and the adobes were light gray and slightly warped. The soil mortar joints, usually lighter than the adobes, contained fragments of crushed fired adobe that may have been added for strength. A fragment of lime plaster adhering directly to the soil adobes was found on the wall's north face.

After removing a damaged section of the convento wall, we exposed some of the interior of Room 42, including the lime plaster on the south (interior) face of the wall and two or possibly three floors. The earlier floor apparently consisted of white and red lime plaster applied directly onto a lime mortar foundation, and extended to the soil adobe wall. We could not determine whether the red plaster had completely covered the floor and wall or was only a decorative band painted at the juncture of the wall and floor. Overlying the lime plaster floor was a later fired adobe and lime mortar floor. This floor adjoined the wall. The exposed portion of this second floor consisted of two courses of fired adobe embedded in lime mortar; we could not determine, however, whether the whole floor was constructed in this fashion or just the area of the juncture between the floor and wall.

It could not be determined whether the layer of reddish, hard-packed clay underlying the lime mortar of the red and white lime plaster floor was itself a floor since little of it was exposed and it could only be studied in profile. However, a feature described as a red clay floor was exposed in Room 39 during the 1965 excavation (Kayser 1965: 18). This reddish, hard-packed clay layer predates both of the overlying floors.

Underlying the earlier, reddish, hard-packed clay was a loose,



0 20 Centimeters

 Unfired adobe set in soil adobe mortar

 Fired adobe

 Adobe foundation pad

 Fired adobe fragments in lime mortar

 Lime mortar

 Faint contact

 Inferred contact

 Unexcavated

 Red lime plaster

Fig. 7. Northwest Corner, South Face Profile.  
Datum is 42.8 cm below "Kino."

grayish brown fill containing charcoal fragments, bone, and indigenous (Piman plainware) and nonindigenous (unidentified blue-on-white majolica) ceramics. Above the later (second) fired adobe and lime mortar floor was homogeneous disturbance fill from previous excavation (in Room 42) (Kayser 1965:37-39). The convento's wall cobble and adobe mortar foundation, 1.1 m below grade, was exposed when the wall was removed; it consisted of river cobbles and rocks embedded in an adobe pad and overlay the basal level.

Beneath the cloister floor and bench, at least one use surface, an adobe floor, and four deposits came to light (Fig. 6). Level 1 consisted of a mottled, tan, sandy, and friable layer of soil that was probably deposited as a foundation for the cloister floor. The floor's lime mortar bed separated easily from the surface of level 1. This deposit, from 6 to 11 cm thick, was laminated and peeled off in thin layers when excavated. It contained some charcoal flecks and almost no cultural material.

Level 2 was quite distinct from level 1, consisting of a hard, mottled, orangish gray brown matrix streaked with charcoal and containing small rocks. Level 3 consisted of a coarse, sandy/rocky, light brown soil. In the northeast corner of the excavation unit, a charcoal and ash lens containing burned rocks and bone appeared in level 3.

Level 4 consisted of a hard, mottled, brown layer of soil. The mottling is probably due to rodent activity. Floor 2, apparently adobe, appeared at the top of level 4 in the north part of the excavation. Some small bone fragments were embedded in the floor. The deposit itself contained bone, indigenous ceramic sherds, fired adobe fragments, charcoal, and many rocks. An east-west oriented depression, varying from 23 cm wide in the east to 14 cm wide in the west and about 5 cm deep, appeared in this stratum, 90 cm below grade. The edge of this depression marked the southern extent of floor 2. The depression's uneven form and shallow depth indicate that it is probably a rodent burrow or the result of natural drainage rather than a man-made feature.

Too little material was recovered from the four subcloister floor deposits to date them. The fact that they appear under an intact, presumably mission period floor strongly indicates, however, that they were formed sometime between 1753 and 1821. The few artifacts recovered are

consistent with this date range.

Northeast Corner. We excavated both the north (Area 43c) and the south (Room 60) fragment of the convento's north wall (Fig. 1), exposing the wall itself and an unidentified soil adobe and mortar feature. Excavated deposits consisted only of disturbance fill. Beneath the wall fragment, however, were five cultural deposits disturbed at the northern extent. The southern extent of the deposits ended was the wall fragment and, they did not appear south of that feature. The grade in this part of the site slopes down toward the east and southeast, away from the convento ruins.

We excavated 1.6 m of disturbance fill north of the Room 60 wall fragment and 1.3 m south of that feature. As mentioned previously, the moisture content of the fill in this corner was very high. Excavations during this project confirm that the disturbance in this area is deep. The basal level was not reached in that part of the unit excavated north of the convento's north wall. South of that wall, the basal level appeared 1.2 m below grade, directly beneath the disturbance fill. Outlines of a trench, presumably the result of the 1955 excavation, measuring 66-70 cm wide and 93-100 cm deep, were most apparent in the excavation unit's west face. This trench was excavated from the ground surface.

The Room 60 north wall fragment was in very good condition, despite being very damp, and the mortar joints were generally easy to distinguish. Wall construction was identical to that found in the northwest corner, except that the soil adobe mortar joints did not contain fired adobe fragments. Five adobe courses remained above the wall's rock/cobble and adobe pad foundation (Fig. 8). A soil mortar joint connected the north walls of Rooms 45 and 60. The different materials used in the two walls, indicated by their different color and texture, suggest that they were built at different times. The wall adobes and mortar joints of Room 45 appeared to be more regular than those of Room 60. Also, Room 45 soil adobes were light tan and did not have lime plaster wash on the mortared ends as did the dark gray wall adobes of Room 60. Room 60 foundation stones were also smaller than those of Room 45. Caywood (1965:77, 79, 87, 112) suggested that lime plaster wash on the mortared ends of soil adobes indicates reuse. It is interesting to note that the

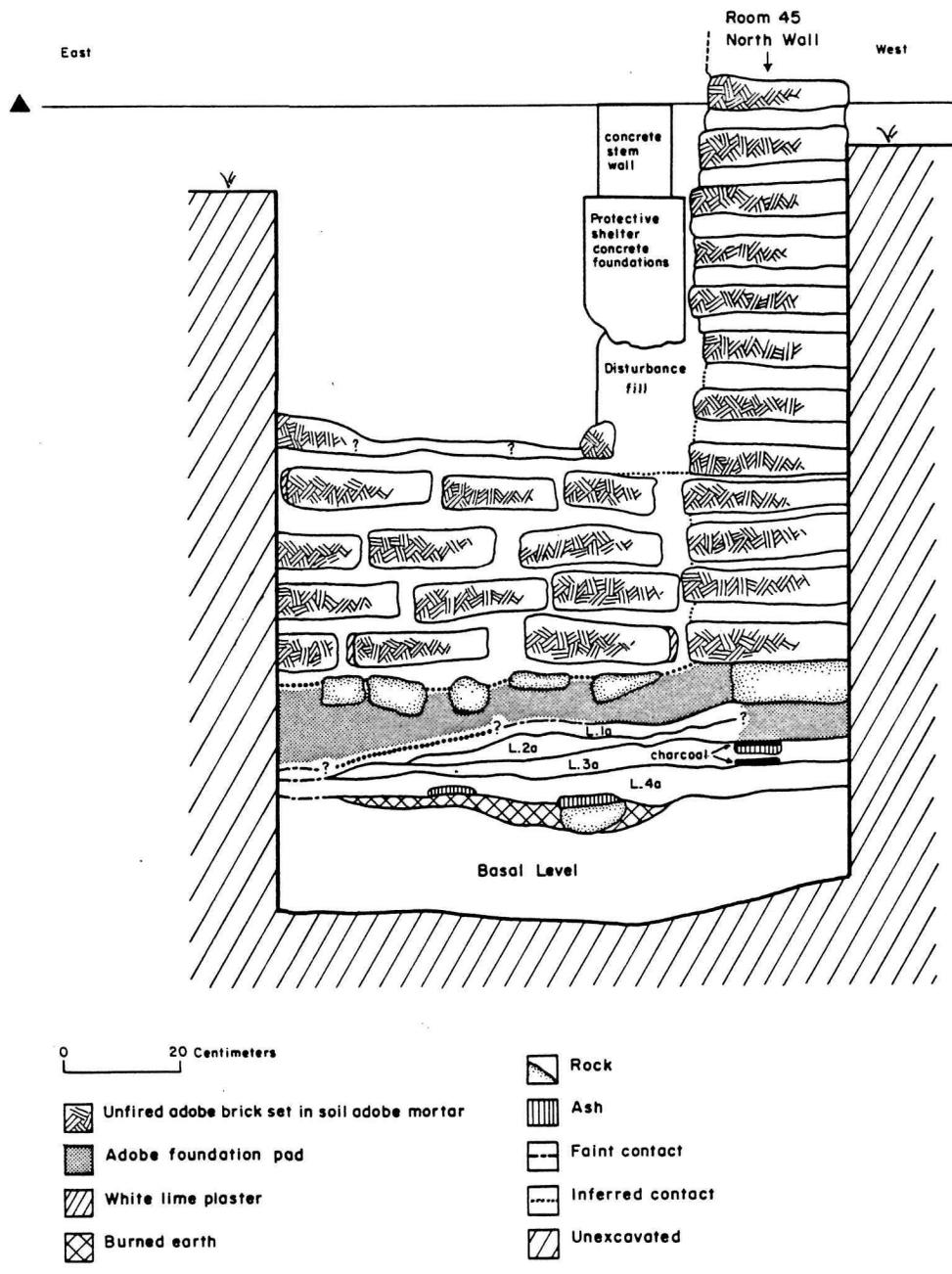


Fig. 8. Northeast Corner, South Face Profile.  
Datum is 74.5 cm below "Kino."



Fig. 9. "Fired Adobe Structure" Exposed in Room 60 During the 1955 Excavation.

top of the exposed fragment of Room 60's north wall is lower than the cloister floor segment exposed for public display (in Area 43b immediately west of the northeast corner excavation unit, [Fig. 1]), indicating that part of the wall was buried during cloister construction.

South of Room 60's north wall fragment, inside Room 60, we encountered a feature constructed of soil adobe and mortar. A few cobbles appeared below the feature and above the basal level at the approximate level of a foundation; we could not determine, however, whether the cobbles actually were a foundation or just part of the basal level. The top of the feature appeared beneath disturbance fill, 70 cm below grade, and the feature measured 48 cm in height. Although the feature could not be identified, it may well be part of the fired adobe structure that was exposed and photographed by Gordon Vivian during his excavations (Fig. 9).

Five strata appeared below the wall fragment in the area excavated north of the fragment (Area 43c) (Fig. 8). These strata were visible in the profile of the south face of the excavation unit, below the wall's

north face. Because excavated levels were designated numerically, the south face strata levels were distinguished with an "a."

Level 1a, a light brown, sandy soil, appeared from 1.1 to 1.5 m below grade. It disappeared in the eastern part of the excavation unit after being present for 50 cm. Level 2a, a lighter brown, sandy deposit, also disappeared in the eastern part of the excavation unit after appearing for 72 cm. This level contained ash and charcoal streaks. Levels 1a and 2a fade into, and are apparently associated with, the wall foundation in the western part of the excavation unit. Level 3a, consisting of mottled gray soil, was present throughout the south face of the exposed excavation unit but disappeared at the eastern end. The dark gray soil is adobe, and it appears both as a layer and as chunks in the deposit, suggesting a destroyed floor or wall or some other feature. The light soil is soft and sandy.

Level 4a, about 1.25 m below grade, consisted of a brown, fine grained, clay-like soil that contained some charcoal and thin ash lenses. A layer of in situ burned earth appeared below level 4a, directly overlying the basal level (Fig. 8). The soil, a light orange red color, was very hard, and a rock, also apparently burned in situ, was present. A utilized flake of rhyolitic jasper fell out of the wall during excavation and was the only artifact recovered from these deposits beneath the north wall of Room 60. An ash layer about 2 cm thick appeared between the burned layer and level 4a.

Levels 1a and 2a probably are associated with the wall fragment foundation; levels 3a and 4a probably are not. The ash and charcoal lenses appearing in these latter two levels indicate that they could be associated with the underlying burnt earth layer. Whether or not these three deposits are associated with foundation construction is unclear; however, they definitely predate it.

Southeast Corner. Areas both north and south of the exposed south wall fragment of Room 60 were excavated (Fig. 1). The wall fragment and an intact portion of Room 60's floor were exposed. Below the floor was another possible use surface and three cultural deposits overlying the basal level. Disturbance fill and a deposit containing wall fall were excavated south of the wall fragment. The disturbance fill consisted of a loose, reddish brown matrix containing indigenous and nonindigenous

artifacts, architectural debris, bone, and charcoal fragments that were easily distinguishable from the other deposits in this excavation unit. Apparently undisturbed ground, encountered in the southern part of the excavated unit, south of the wall and beginning 60 cm below grade, was harder and more compact than the overlying disturbance fill. We separated material recovered from these hard areas from that found in the disturbance fill.

In most of the southeast corner, disturbance fill, attributable to 20th century activity, extended to 83 cm below grade. In the unit's western half, however, this deposit extended to 195 cm below grade (Fig. 10). It appeared in the profiles of the unit's south and north faces, apparently extending beneath the convento wall. This suggests that an earlier north-south running trench intersected Vivian's east-west trench that was dug along the convento's south wall. This feature did not appear, however, in that part of Room 60 excavated north of the wall. Insufficient artifacts were recovered from the lower part of the disturbance fill to suggest a date for this feature, and there was no indication that it resulted from more than one depositional event. Since it does not continue beneath the wall fragment, it is probably the result of 20th century activity at the site. It may be an exploratory hole excavated by Vivian to find the wall foundations, or a treasure hunter's hole. The possibility that it is a mission period feature cannot be discounted, however, since we were unable to expose it completely. Beneath the disturbance fill in the western part of the southeast corner, a hard, light reddish tan, sterile soil appeared. This stratum underlay the usual dark brown, gritty, sandy basal level.

The exposed south wall fragment of the convento was in much worse condition than the north wall fragment, being far more eroded. Adobes and mortar joints were very difficult to distinguish. No difference in color between Room 45 south wall adobes and Room 60 south wall adobes was ascertained, but that could have been the result of the poor lighting in this corner which washed out color. The soil in the southeast corner was very dry unlike that in the northeast corner although the wall construction seemed identical. Walls were built of mortared soil adobes on a rock/cobble and adobe pad foundation. The south wall fragment of the convento overlies culture-bearing deposits. Room 60's south

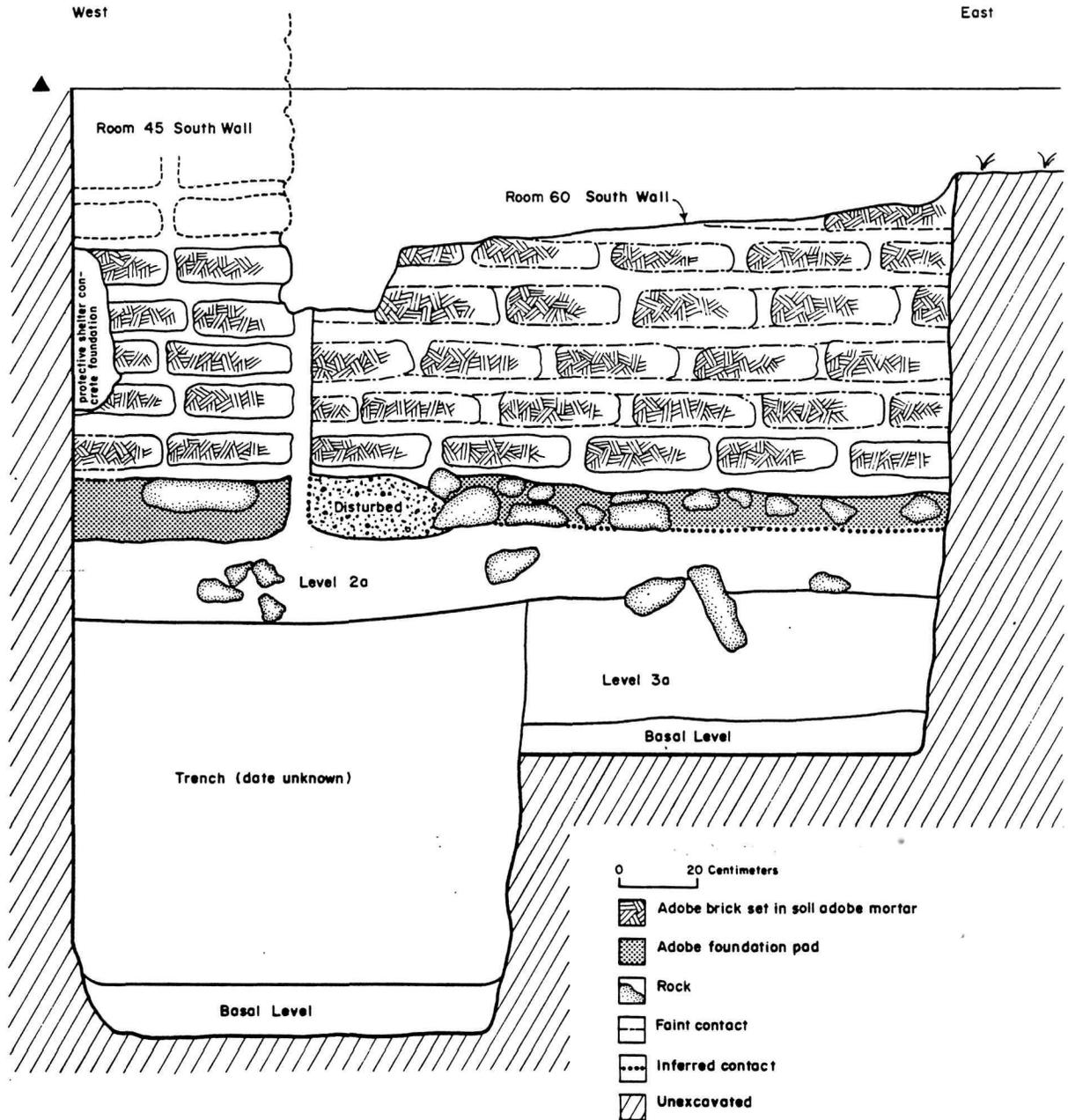


Fig. 10. Southeast Corner, North Face Profile.  
Datum is 94.5 cm below "Kino."

wall abuts that of Room 45, the two being connected by a mortar joint.

Besides the disturbance fill, we recovered material from three other deposits in the area excavated south of the convento wall (outside the convento). Because of the tremendous amount of disturbance and the extensive mixing of strata caused by heavy ant and rodent activity, as well as the limited area excavated and small quantity of artifacts recovered, these other three deposits could not be attributed to any particular period of the site's occupation.

Level 1a appeared from the ground surface to 80 cm below grade. The level consisted of a grayish brown soil containing unfired whole and partial soil adobes, plaster and charcoal fragments, and rocks. This level consisted mostly of wall fall, the most obvious piece of which was visible in the excavation unit's southeast corner. The soil adobes in the wall fall were dark gray and had lime plaster wash on their mortared joints, as did the adobes in the Room 60 north wall fragment exposed in the northeast corner. Therefore, it seems likely that the wall fall is probably from Room 60's south wall.

Level 2a consisted of light, grayish brown, hard-packed fill containing small rocks and some small adobe chunks. This level appeared below the rock and adobe pad foundation of the convento's south wall. The top of the level was very hard and may have been a use surface. Underlying level 2a was a darker hard-packed layer also containing some small adobe chunks. This level, level 3a, overlay the basal level, which appeared from 1.35 to 1.45 m below grade. The top few centimeters of the basal level contained cultural material, though in much less quantity than was found in the overlying culture-bearing levels. The appearance of this cultural material in the basal level probably results from the heavy rodent and insect activity in this unit.

After removing 60 cm of disturbance fill in Room 60 north of the room's south wall fragment, we found an apparent adobe floor, floor 1, adjoining the interior (north face) of the wall. Although too little of this feature was exposed to enable the excavators to definitely identify it as an adobe floor, its gray, hard-packed soil did not react when tested with hydrochloric acid. Its general appearance was more that of a floor than of wall fall, although the possibility that the feature is wall fall cannot be discounted. During the 1965 excavation, a hard-

packed clay floor was found 8 in. below the ground surface (Kayser 1965: 18, 64). No profiles from this excavation are available, and apparently all measurements of stratum depth were taken from the ground surface. Because regrading and erosion since 1965 have undoubtedly changed the ground surface in Room 60, it cannot be determined whether or not the floor exposed by Kayser and floor 1 are the same. Floor 1 was eroded, and the fairly rough, uneven surface exhibited patches of lime plaster. These patches could be Room 60 wall plaster that fell onto the surface, or they could be remnants of lime wash that once covered the floor. On the other hand, they could be remnants of a lime mortar bed for a fired adobe floor. Floor 1 was 3-10 cm thick and had an eastern down-slope.

Level 1, 9-16 cm thick, appeared underneath floor 1. This deposit consisted of a loose, brown fill speckled with fragments of lime plaster and contained a high density of architectural debris, including limestone and other rocks with adhering lime mortar. At the bottom of level 1 was a dense layer of jumbled fired adobe and lime mortar fragments, suggestive of the remains of a floor. Level 1 could be wall fall, the remnants of Vivian's unidentified "fired adobe structure" (Fig. 9) discussed above or the remains of an earlier floor that was torn up and resurfaced to form floor 1.

Level 2, 3 to 5 cm thick, underlay level 1. The top consisted of a hard-packed, light brownish yellow soil that became loose and gravelly/gritty with depth and contained charcoal flecks. The hard-packed top of this layer could be a second floor or use surface, or it could be an area compacted by a fired adobe and lime mortar floor overlying it. Underlying level 2, a dark brown, gritty soil layer streaked with a light brown, sandy soil appeared. Level 3, 8 to 10 cm thick, contained a low density of indigenous sherds, bone, charcoal fragments, and architectural debris (soil adobe fragments, lime plaster and mortar fragments). It overlay the basal level.

Strata exposed in the southeast corner were obscured by heavy rodent and insect activity as well as by disturbance from previous excavation. Level 1a, excavated in the area outside (south of) the convento, is associated with deterioration of the structure. Levels 2a and 3a are probably associated with mission period occupation and the build-

ing's construction. Floor 1, exposed in Room 60, postdates the construction and initial occupation of that room. We could not determine, however, whether or not it represents post-mission abandonment occupation of the structure. Level 1 may represent the room's mission period floor. If so, then levels 2 and 3 would represent mission period occupation.

Deposit Dates. Disturbance fill resulting from 20th century preservation activity was encountered in all four corner excavation units. Uncertain proveniences are those that could not be attributed to any particular time period or identified as disturbance fill. Mission period deposits are: in the northwest corner - levels 1a, 1b, 1c, 2, 3, and 4, floor 2, and the bench and basal level; in the northeast corner - level 4 in Room 60 and the burnt earth layer; in the southeast corner - floor 1 and levels 1-3 in Room 60.

## MATERIAL CULTURE

Artifacts recovered are divided into two main assemblages on the basis of manufacturing technology. Indigenous artifacts are those made with the use of materials and techniques that either were familiar or could have been familiar to the native population prior to European contact. Nonindigenous artifacts, on the other hand, reflect the manufacturing technology of European industry during and after the 18th century. Although the use of manure temper by native potters is thought to date from the Spanish introduction of the horse, manure tempered Piman wares are classified as indigenous artifacts because manure was available and could have been used in ceramic manufacture prior to Spanish contact (Fontana et al. 1962:57).

The fired adobe slag core recovered is described and discussed separately with the nonindigenous assemblage because the material was introduced by the Spanish. Although the object was manipulated by an indigenous technology (that of flaking stone), and the materials to make adobes were available to the prehistoric indigenous population, there is no evidence that fired adobes were used by the Piman peoples before Spanish contact (Robinson 1976:154).

Discussion of artifact distribution through time will proceed according to conventions already adopted in the discussion of features and deposits. Artifacts will be discussed according to their appearance in both disturbed and mission period proveniences. Nonindigenous artifacts with broad ranges for dates of manufacture are presumed to date no earlier than 1691, when Father Kino initially made contact with groups along the middle Santa Cruz River. It is possible, however, that nonindigenous artifacts appeared in this area prior to 1691, since Spanish exploration of the Southwest began before that time.

### Indigenous Assemblage

Indigenous artifacts comprise 50 percent of the cultural material recovered. Ceramics, lithics, and a shell artifact were found. Indigenous (Piman) ceramics form 87 percent, ground and flaked stone artifacts 12 percent, and shell artifacts 1 percent of this assemblage.

Ceramics. Two hundred and thirty-two sherds of indigenous ceramics

were recovered. This group includes Piman plainware, Piman red-slipped ware, and Piman red-on-brown ware sherds. No whole or reconstructible vessels were recovered. Although most of the sherds were small, making form identification difficult, jars, bowls, and plate sherds were identified. Sherds identified as being from bowls could actually be from bean-boiling pots. Ethnographic study indicates that there were apparently no restrictions on the use of particular vessels, and that specific forms served various purposes as needed (Fontana et al. 1962:48).

The problems of analyzing historic indigenous ceramics of Papague-ria have been dealt with previously and are only summarized here. The major problem is that it is virtually impossible to: (1) distinguish between the plainwares and red-slipped wares of the Papago, Pima, and Sobaipuri peoples, and (2) distinguish Piman plainwares and red-slipped wares of the prehistoric, protohistoric, and historic periods on the basis of form and technology. These problems are further complicated at Tumacacori because all three peoples are known to have resided at the mission. Therefore, the ceramics are here labeled "Piman wares," and no attempt is made to attribute them to any one of these three indigenous groups (Shenk and Teague 1975:60; Fratt 1981). The decorated Piman wares are assumed to have been made by Papago or Pima potters (Fratt 1981). The main attribute distinguishing historic from prehistoric wares is manure temper.

Sherds recovered are briefly described below. Fratt (1981) has described in detail Piman wares recovered from a previous excavation at Tumacacori. The indigenous sherds recovered from this excavation are similar to those recovered from previous excavations (Fratt 1981; Barton, this volume; Simpson, this volume). Table 1 summarizes the types and forms of the wares recovered, measurements, rim sherd characteristics, and the location of soot. Table 2 shows the excavation distribution of the sherds. All diameter measurements are approximate. Terminology and classification are from Shepard (1956); rim form description is after Colton (1953:44-45).

Piman plainware. Eighty-four percent of the indigenous ceramics are Piman plainwares. Of the body and rim sherds recovered that could be identified as to vessel form, 26 percent are definitely from jars, 21 percent are definitely from bowls, and 53 percent are possibly from

Table 1  
PHYSICAL CHARACTERISTICS OF INDIGENOUS CERAMIC SHERDS

| Sherds                  | Diameter<br>(cm) | Rim<br>Form | Location of Soot, Number of Sherds |                  |                                     |                  | Total<br>Number<br>of Sherds<br>Recovered |
|-------------------------|------------------|-------------|------------------------------------|------------------|-------------------------------------|------------------|---|
|                         |                  |             | Rim                                | Exterior<br>Body | Exterior<br>and<br>Interior<br>Body | Interior<br>Body |   |
| Piman Plainware         |                  |             |                                    |                  |                                     |                  | 194                                       |
| Jars                    | 12 to 22.5       | E           | 2                                  | -                | -                                   | -                | 12  |
| Bowls                   | 17 to 18         | S           | 1                                  | -                | -                                   | -                | 10  |
| Plates                  | 15.5 to 23.3     | E, S        | 1                                  | -                | -                                   | -                | 25  |
| Unidentified Body       | -                | -           | -                                  | 13               | 1                                   | 3                | 147                                       |
| Piman Red-Slipped Ware  |                  |             |                                    |                  |                                     |                  | 32  |
| Jars                    | -                | -           | -                                  | -                | -                                   | -                | 1   |
| Bowls                   | 16 to 27.5       | S           | -                                  | -                | -                                   | -                | 3   |
| Plates                  | -                | E           | -                                  | -                | -                                   | -                | 5   |
| Unidentified Body       | -                | -           | -                                  | 1                | 1                                   | -                | 23  |
| Piman Red-on-brown Ware |                  |             |                                    |                  |                                     |                  | 6   |
| Plates                  | 22.5 to 26.5     | S           | -                                  | -                | -                                   | -                | 4   |
| Unidentified Body       | -                | -           | -                                  | -                | -                                   | -                | 2   |

Rim Form Abbreviations: E = Everted; S = Straight

Table 2  
 PROVENIENCE OF INDIGENOUS ARTIFACTS AND BONE  
 (Number recovered)

| ARTIFACTS                     | Disturbance<br>Fill | Uncertain | NE CORNER |                         |       |         | SE CORNER (Room 60) |         |         |       | NORTHWEST CORNER |         |         |         |             |          |             | EXCAVATION<br>TOTAL |         |       |       |
|-------------------------------|---------------------|-----------|-----------|-------------------------|-------|---------|---------------------|---------|---------|-------|------------------|---------|---------|---------|-------------|----------|-------------|---------------------|---------|-------|-------|
|                               |                     |           | Level 4   | Burnt<br>Earth<br>Layer | Total | Floor 1 | Level 1             | Level 2 | Level 3 | Total | Level 1          | Level 2 | Level 3 | Level 4 | Basal Level | Level 1a | Level 1b, c |                     | Floor 2 | Bench | Total |
| Piman Plainware               | 157                 | 11        | 1         | -                       | 1     | 1       | 1                   | -       | 5       | 7     | -                | -       | -       | -       | -           | -        | 12          | -                   | 6       | 18    | 194   |
| Piman Red-Slipped             | 26                  | 3         | -         | -                       | -     | -       | -                   | -       | -       | -     | -                | -       | -       | -       | -           | -        | 1           | 1                   | 1       | 3     | 32    |
| Piman Red-on-brown            | 6                   | -         | -         | -                       | -     | -       | -                   | -       | -       | -     | -                | -       | -       | -       | -           | -        | -           | -                   | -       | -     | 6     |
| Ceramics Total                | 189                 | 14        | 1         | -                       | 1     | 1       | 1                   | -       | 5       | 7     | -                | -       | -       | -       | -           | -        | 13          | 1                   | 7       | 21    | 232   |
| Ground stone                  | 1                   | 1         | -         | -                       | -     | -       | -                   | -       | -       | -     | -                | -       | -       | -       | -           | -        | -           | -                   | 1       | 1     | 3     |
| Flaked stone                  | 15                  | 2         | 1         | 1                       | 2     | -       | -                   | -       | 1       | 1     | -                | -       | -       | -       | -           | -        | 1           | -                   | -       | 1     | 21    |
| Stone Artifacts Total         | 16                  | 3         | 1         | 1                       | 2     | -       | -                   | -       | 1       | 1     | -                | -       | -       | -       | -           | -        | 1           | -                   | 1       | 2     | 24    |
| Shell Artifacts               | -                   | 1         | -         | -                       | -     | -       | -                   | -       | -       | -     | -                | -       | -       | -       | -           | -        | -           | -                   | -       | -     | 1     |
| Indigenous Artifacts<br>Total | 205                 | 18        | 2         | 1                       | 3     | 1       | 1                   | -       | 6       | 8     | -                | -       | -       | -       | -           | -        | 14          | 1                   | 8       | 23    | 257   |
| Bone                          | 115                 | 8         | -         | -                       | -     | -       | -                   | 2       | -       | 2     | 41               | 3       | 1       | -       | 15          | -        | 7           | -                   | 7       | 74    | 199   |

plates. Sixteen percent of the Piman plainware sherds recovered have traces of soot, mostly on the exterior (Table 1). Soot was found on 17 percent of the jar sherds, 10 percent of the bowl sherds, and 4 percent of the plate sherds. Grease stains or sooting on body and rim sherd exteriors is presumed to indicate that the vessel was used for cooking. The absence of soot indicates that the vessel was used as an eating utensil (tableware) or for storage (Shenk and Teague 1975:68). Intentional interior smudging appears on some of the plainware sherds. One sherd, possibly from a plate, may have been worked. Three body sherds have black spots or "splatters" on their interior surfaces. It has been suggested that these "splatters" are carbonized saguaro syrup that splashed onto the containers used for boiling saguaro juice or are black paint (Fontana et al. 1962:107). Since none of these splattered sherds are sooted, as would be expected on vessels used for cooking, it seems more likely that the "splatters" are paint residue or some other substance. Samples of the "splattered" substance were tested for their water solubility by attempting to dissolve them in hot water. Although the small sample size prevented definite identification of the substance, the fact that the material did not dissolve indicates that it is not sugar. One plainware sherd recovered has textured decoration on its exterior; it does not have soot, and the form of the vessel cannot be identified.

Piman red-slipped ware. These wares are distinguished from plainwares by the red slip added to interior and/or exterior surfaces. Fourteen percent (32 sherds) of the indigenous ceramics recovered are red-slipped. Two sherds, one slipped on the interior, one slipped on the exterior, and both unsooted, had "splatters" on the interior.

Piman red-on-brown ware. Six sherds, all from disturbance fill (2 percent of the indigenous ceramic assemblage) show painted red designs (Table 2). Sherds are decorated either on the interior only or on both the interior and the exterior. No design elements or motifs were identifiable. Although designs executed in narrow and heavy lines are known to have been popular at different times, the sherds recovered are too small to enable differentiation on this basis.

Discussion. As in other Tumacacori excavations (Fratt 1981; Simpson, this volume), the largest group of artifacts recovered was the

indigenous ceramics. Excavation in the convento yielded sherds from tablewares, cooking vessels, and storage vessels. Sherds from bowls, plates, and jars were found. Objects were undecorated or decorated with painted designs or texturing. The relative percentages of Piman ware types recovered parallel data from the plaza excavation (Fratt 1981: Table 4); plainwares predominate among the indigenous wares in both assemblages.

Too few indigenous ceramic sherds were recovered, and the extent of the area excavated was too limited for any useful chronological and spatial interpretations to be derived. Only 12.5 percent of the Piman ware sherds recovered came from mission period contexts (Table 3), which yielded Piman plain and red-slipped wares. Although no Piman red-on-brown sherds were recovered from these deposits, the total recovered from the entire excavation was too low for this to be meaningful.

Stone Artifacts: Description by John Whittaker. This extremely limited assemblage of 24 pieces shows an emphasis on one raw material, but also the use of nine different materials:

- (1) reddish brown, fine to coarse, silicified mudstone, elsewhere called "rhyolitic jasper" (Fratt 1981, this volume) (10 pieces);
- (2) red quartzite, relatively fine-grained (2 pieces);
- (3) fine red jasper (2 pieces);
- (4) fine yellow jasper (2 pieces);
- (5) coarse gray quartzite (1 piece);
- (6) black silicified limestone (1 piece);
- (7) pinkish gray chert, with areas of fine material in coarser body (1 piece);
- (8) red to pink rhyolite (4 pieces);
- (9) pumice (1 piece).

With the exception of the jasper, the raw materials are of rather poor quality, mostly grainy, flawed, or nonhomogeneous.

Most of the specimens collected are thick, irregular flakes, struck with hard-hammer percussion. A total of 17 flakes were recovered. Four flakes are less than 20 mm in maximum dimension; the others range from 20 mm to 52 mm in maximum dimension. Of 10 surviving platforms, one

Table 3  
SUMMARY OF INDIGENOUS ARTIFACTS AND BONE

| INDIGENOUS<br>ARTIFACTS | Uncertain<br>Provenience | Disturbed<br>Provenience | Mission Period<br>Provenience | Total Number<br>Recovered | Percent from<br>Mission Period |
|-------------------------|--------------------------|--------------------------|-------------------------------|---------------------------|--------------------------------|
| Ceramics                | 14                       | 189                      | 29                            | 232                       | 12.5 %                         |
| Stone<br>Artifacts      | 3                        | 16                       | 5                             | 24                        | 21 %                           |
| Shell<br>Artifacts      | 1                        | -                        | -                             | 1                         | -                              |
| Total                   | 18                       | 205                      | 34                            | 257                       | 13 %                           |
| Bone                    | 8                        | 115                      | 76                            | 199                       | 38 %                           |

shows faceting; the others are unprepared. Eleven flakes have some cortex: three of these have no flake scars on their exterior surfaces. Five of the 10 platforms are on cortex.

The raw materials from which these flakes were struck probably occurred only in small pieces of low quality, and the specimens show only the lowest level of flaking technology. This is consistent with most of the lithic material from this part of the Southwest. Most of the flakes had damaged edges. Flake edges are often irregular when poor materials are used, and further edge damage could result either from use or from natural processes such as trampling.

The following four flaked stone tools, all of them made on flakes, were identified:

(1) A small, basally concave, triangular projectile point of yellow jasper with inclusions, irregularly flaked and somewhat lopsided. This is a common late prehistoric to historic arrow point type in this area. Maximum dimensions: length, 17 mm; width, 8 mm; thickness, 3 mm.

(2) A small scraper made on a thick flake of red jasper, with 9 mm of steep retouch at the end of the flake and some irregular retouch around the rest of the flake. Maximum dimensions: length, 30 mm; width, 25 mm; thickness, 10 mm.

(3) A rough drill on a small triangular fragment of a thin flake, worked to a blunt point by irregular retouch mostly on the interior flake surface. Maximum dimensions: length, 21 mm; width, 20 mm; thickness, 2 mm.

(4) A large flake showing heavy use wear or extremely irregular retouch. Two opposed edges of this long flake are crushed and rounded, with short flakes removed at irregular intervals from both surfaces. This could have resulted from heavy use on a hard material. No striations are visible at 10x magnification, and the flake scars are randomly oriented. As only two edges are affected, the damage does not seem to be accidental. Maximum dimensions: length, 65 mm; width, 41 mm; thickness, 11 mm.

Three pieces of ground stone were also recovered:

(1) A fragment of a tabular rhyolite river cobble, ground smooth on one surface, especially toward the edge, probably by use as a mano.

(2) A plummet or "plumb bob" of pumice. This is a rough cone, 47

mm long and 20 mm in diameter, with a groove around the wide end 7 mm from the base. Haury (1976:293, Fig. 14.32) shows a similar artifact, of which eight were recovered at Snaketown. Stanislawski (1963:114, Fig. 22) reports two slightly larger specimens from Wupatki. This type of artifact is not uncommon in Hohokam and Sinagua sites.

(3) A rhyolite mano fragment, ground on one side, shaped, and bearing evidence of grinding on the other. This object is 14.5 cm long, 9 cm wide, and 5.5 cm thick.

\* \* \* \* \*

Discussion. The stone artifact assemblage recovered from the convento parallels that recovered from the plaza and is consistent with assemblages from other recent excavations (Fratt 1981; Simpson, this volume; Barton, this volume). With the exception of the pumice object, the same materials were present in the plaza and convento assemblages. Silicified mudstone (rhyolitic jasper) was the material most often used; artifacts made of this material comprise 50 percent of the convento assemblage. The majority (88 percent) of the stone artifacts recovered are flaked. Tools comprise 19 percent and manufacturing debris 81 percent of this group.

Provenience distribution of the stone artifacts is shown in Table 2. Only five stone artifacts came from mission period deposits (Table 3), too few to provide insights into space utilization or behavior at the site. The single projectile point recovered is similar to points recovered from nearby Tubac Presidio (Tubac type 2) and from the plaza excavation (Shenk and Teague 1975:76-78; Fratt 1981). The pumice plummet or "plumb bob" is very interesting, since it could be of prehistoric date. Its presence cannot be construed, however, to indicate prehistoric occupation of the convento area, because: (1) it was the only probable prehistoric artifact found, (2) it came from a disturbed provenience, and (3) it could have been picked up elsewhere as a curiosity and transported to the site anytime during the known occupation of Tuma-cacori.

Shell Artifacts. One shell fragment was recovered from a disturbed provenience. This specimen, a fragment from near the hinge of the

shell, is too small and nondescript to be definitely identified. It is probably Laevicardium elatum, although it could be Trachycardium panamense. Both species are marine shells that are found in the Gulf of California and on the Pacific coast. This specimen is most likely from the gulf (Lisa Huckell: personal communication).

#### Bone.

A total of 199 fragments of bone were recovered (Table 2). Included in this assemblage were remains of Bos taurus (domestic cattle), Odocoileus cf. hemionus (mule deer), Canis sp. (domestic dog, coyote, or wolf), Taxidea taxus (badger), Gallus gallus (domestic chicken), a sheep or pronghorn-sized artiodactyl, a marmot-sized rodent, and a large sucker or catfish (catostomid or ictalurid). Remains of Bos taurus and Odocoileus cf. hemionus, along with unidentifiable fragments, comprise only 38 percent of the faunal assemblage recovered (Table 3).

#### Nonindigenous Assemblage

Excavation yielded 63 ceramic, glass, and metal artifacts, comprising 12 percent of all artifacts recovered (Table 4). Samples of architectural debris were also taken. Ceramics and metal artifacts each comprise 35.5 percent and glass artifacts 39 percent of the nonindigenous artifacts from the convento. This assemblage includes Spanish, Mexican, and Anglo earthenwares as well as fragments of bottle and flat glass. Most of the metal recovered is hardware. Sixty-seven percent of the nonindigenous assemblage came from areas excavated by Beaubien, Caywood, and Vivian. Because of the assemblage's small size and the fact that a major portion was recovered from disturbed contexts, only a brief description and discussion of the artifacts appear below. Fratt (1981) provides a detailed discussion of nonindigenous artifacts recovered during a previous excavation at Tumacacori.

Ceramics. The 22 ceramic sherds recovered from the convento are consistent with the nonindigenous ceramic assemblage recovered during the Tumacacori plaza excavations (Fratt 1981). All of the ceramics from the convento are earthenwares, with majolica and Mexican lead-glazed earthenwares comprising the majority.

Table 4  
SUMMARY OF NONINDIGENOUS ARTIFACTS

| INDIGENOUS<br>ARTIFACTS | Uncertain<br>Provenience | Disturbed<br>Provenience | Mission Period<br>Provenience | Total Number<br>Recovered | Percent from<br>Mission Period |
|-------------------------|--------------------------|--------------------------|-------------------------------|---------------------------|--------------------------------|
| Ceramics                | 2                        | 15                       | 5                             | 22                        | 23 %                           |
| Glass                   | -                        | 15                       | 3                             | 18                        | 17 %                           |
| Metal                   | -                        | 21                       | 2                             | 23                        | 9 %                            |
| Total                   | 2                        | 51                       | 10                            | 63                        | 16 %                           |

The appearance of Hispanic earthenwares (majolica, "olive jar" earthenware, Mexican lead-glazed earthenware) in Pimeria Alta is the subject of some controversy. Most of the present information pertaining to their dates is based only on the recovery of these wares from sites with known dates of occupation. Since few studies or excavations have been conducted at the centers where these wares are known or presumed to have been manufactured, dates cited from the literature must be considered tentative. Anglo wares were available as early as the 1790s but did not enter southern Arizona in large numbers until after the 1854 Gadsden Purchase (Gerald 1968:54; Shenk and Teague 1975:102).

The single "olive jar" earthenware sherd recovered during the south convento excavations came from the cloister bench, a feature assumed to date from 1807 to before 1821. The Huejotzingo Polychrome, Aranama Polychrome, and Tumacacori Polychrome III sherds were recovered from Room 60 mission period deposits in the southwest corner. One of the Anglo earthenware sherds had been worked into a disk about 2.25 cm in diameter. Piman plainware sherds that had been worked into disk shapes were recovered during the Tumacacori plaza excavation (Fratt 1981). Fontana et al. (1962:41) suggest that such sherds may have been used as gaming pieces, and it is possible that similarly worked nonindigenous sherds served the same function during the later occupation of the mission. The sherd found in the convento was recovered from a disturbed provenience.

Because so few sherds of nonindigenous ceramics were recovered, and because only five of these came from mission period contexts, deriving chronological and spatial interpretations is virtually impossible. Since the five sherds are Hispanic ceramics, these data strengthen the conclusion derived from the plaza excavation that Hispanic wares were the dominant nonindigenous ceramic type at Tumacacori.

None of these nonindigenous ceramic sherds was sooted, which presumably indicates that the vessels were used for purposes other than food preparation; food consumption (table service) and altar service have been suggested (Fratt 1981). Only one of the sherds recovered, the "olive jar" earthenware sherd, was from a storage vessel; the other 21 sherds came from tablewares. The lack of sooting and the predominance of tableware forms in this nonindigenous ceramic assemblage are in keep-

ing with the characteristics of the assemblage recovered during the plaza excavation (Fratt 1981).

Glass. Eighteen glass artifacts, representing at least five objects, were recovered. A button and sherds of bottle (container) glass and flat glass were found. Most of the glass sherds are small; only "export beer"-style beer bottles were identifiable. Except for the button, no whole objects were recovered or reconstructible.

The 15 bottle-glass sherds comprise 83 percent of the glass assemblage. Sherds of green (5), amber (6), dark green (2), and flint or sun-turned amethyst (2) glass were found. Sun-turned amethyst refers to flint or clear glass that turns purple when exposed to sunlight. Fratt (1981) discusses the glass color terminology used. The two green glass sherds and two amber glass sherds recovered are from "export beer"-style beer bottles (Putnam 1965:205). The dark green glass sherds are from an unidentifiable beverage bottle.

The six sherds recovered for which a manufacturing technique could be determined were hand-blown into a mold. The mold seams on the base of a green (probably "export beer"-style) bottle base indicate the container was hand-blown in a two-piece mold. This partial base sherd has remnants of an unidentifiable maker's mark containing an "S" and at least two other letters. Four body sherds, two amber and two dark green, are from turn-molded bottles (Toulouse 1969a:531). Bottles made by this process may have been manufactured no earlier than ca 1881 by American bottle makers (Inter-State Publishing Co. 1886:577).

Two green flat glass sherds, measuring 2.3 mm (0.074 inch) and 1.9 mm (0.052 inch), respectively, were recovered from disturbed areas of 20th century activity. One sun-turned amethyst glass button was recovered from a mission period context. It measures 1.2 cm in width and 0.9 cm in length (about size 16).

As with the nonindigenous ceramics, too few glass artifacts were recovered for significant interpretations to be derived. Of the 18 glass artifacts recovered, only two sherds of container glass and the button (17 percent of the assemblage) came from mission period proveniences (Table 4). A green glass bottle sherd, found during removal of the bench of the convento's cloister, indicates that glass containers apparently were present at Tumacacori during the Franciscan missionary

period. It is unlikely that this sherd is intrusive since it was recovered from an architectural feature; however, there is the possibility that the sherd was incorporated during later repair of the bench. The proportions of the glass artifacts recovered parallel glass data from the Tumacacori plaza excavation; 19th and 20th century container sherds predominate within both assemblages (Fratt 1981:Table 16).

Metal. Twenty-three metal artifacts, comprising 36 percent of the nonindigenous assemblage, were recovered, ranging in condition from good to extremely poor. Only two metal objects were recovered from mission period contexts. The following is a brief description and discussion of the metal objects recovered from the convento; Fratt (1981) provides a more detailed description of metal artifacts from a previous Tumacacori excavation.

Two rivets, in extremely poor condition, were recovered. Both are two-piece iron and copper rivets, similar to the "flat stamped-steel types" that postdate 1860 (Shenk and Teague 1975:129). Head diameters measure 0.73 inch (1.85 cm) and 0.72 inch (1.8 cm), and shank lengths measure 0.32 inch (8 cm) and 0.3 inch (0.8 cm), respectively. Such rivets were used as clothing fasteners. Also recovered were three ferrous scrap fragments. One was found in a mission period deposit and may have been part of a tool or machine; the other two fragments are probably pieces from tin cans or buckets.

Most of the recovered metal is hardware. Three pieces of iron or steel baling wire, or fence wire were found. One machine-cut, square nail (size indeterminate), 10 wire nails (two 16d nails, one 4d nail, and seven 3d nails), and one nail too corroded to be classified as either wire or machine-cut square were found. The corroded nail came from mission period context.

Three objects identified as tools or parts of tools were recovered. One is a square nut for a 9/16-inch diameter threaded bolt (Sears, Roebuck and Company 1923:846). The second object is a fragment of iron strapping, 11.5 inches (29 cm) long and 1.5 inches (3.5 cm) wide, with holes in the middle and at both ends. The strapping presumably dates to the period when the south convento was used as a schoolhouse, since similar pieces, functioning as lintels, are present in the fireplace of Room 44, which reportedly was added at that time. Other pieces, used

for reinforcement, are in Room 44's north wall, thought to have been repaired and modified during the 20th century. The third object, made of iron or steel and measuring 2.4 inches (6 cm) long and 0.7 inch (1.7 cm) wide, may be a toe calk (Herskovitz 1978:83h, i; Sears, Roebuck and Company 1923:875). Toe calks are pieces of metal that project from the underside of mule and horseshoes, thereby improving traction (Herskovitz 1978:83). If the object recovered from the convento is a toe calk, it apparently was never welded onto a shoe.

Again, too few metal objects were recovered for significant interpretations to be derived. Only two pieces (9 percent) of the metal recovered came from mission period deposits (Table 4), and although both of these objects could date to the mission period, neither can be identified as dating only to that time. Proportionately, more metal was recovered during the south convento excavation (36 percent of the nonindigenous assemblage) than was recovered from the plaza excavation (26 percent of the nonindigenous assemblage). The proximity of the convento excavation to a 20th century structure is one reason for this difference, as most of the nails recovered are roofing nails used in building the protective shelter. The low percentage of metal artifacts recovered from mission period contexts is consistent with plaza excavation data, where only 19 percent of the excavated metal came from mission period deposits. Hardware dominated both assemblages (Fratt 1981:Table 18).

Architectural Debris. Samples of architectural debris were collected both from mission period deposits and from disturbed areas. Because the excavation extent was limited and few deposits could be attributed to the mission period, no attempt was made to acquire a statistically significant sample. Samples of fired adobe fragments (with and without adhering lime mortar), lime mortar fragments, fired adobe slag, floor tile fragments, wall plaster fragments, and limestone were collected.

Four samples of unfired adobes from wall fall were taken. These samples have adhering lime plaster suggesting that the adobes were reused (Caywood 1965:77, 79, 87, 112). One partial brick was recovered from the cloister floor. These bricks measured ca 30 cm x 15 cm (1 foot x 6 inches). As in the plaza, limestone was found both in mission period deposits and in disturbed contexts in the convento excavation. Lime-

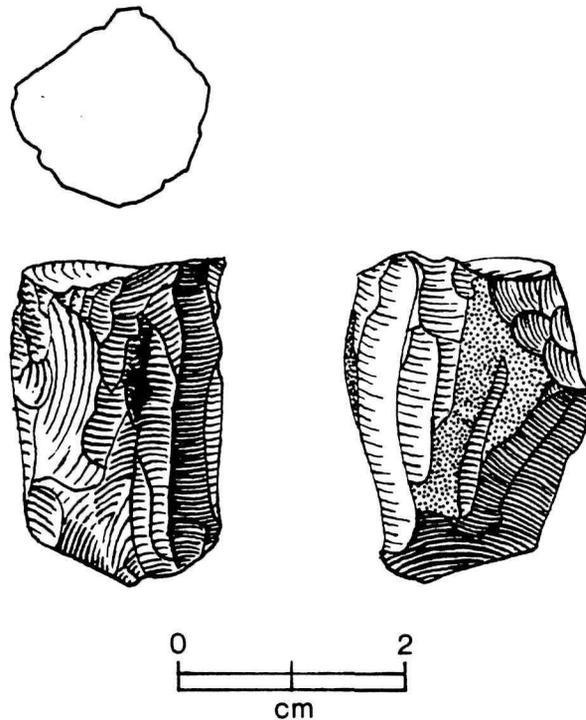


Fig. 11. Fired Adobe Slag Core.

stone (and other calcium carbonates), apparently processed on the site, was heated and crushed to make lime mortar and plaster (Fratt 1981).

Fired Adobe Slag Core. A fragment of a vitrified, dark red-and-black material was recovered from mission period contexts. Comparison with identical material from the plaza excavation that had been tested and identified indicates that this object is a piece of slag, probably produced by the overfiring of adobes, although it could also be a fragment of lining from a lime kiln or a blacksmith's forge (Fratt 1981; Brewer 1951). The specimen recovered from the south convento excavation is especially interesting because it has been flaked by percussion techniques (John Whittaker: personal communication) (Fig. 11).

Presumably, mission residents or people passing through the site were either experimenting with this new material for tool manufacture or were working it for pleasure. This artifact shows the manipulation of a nonindigenous material by indigenous techniques. In so doing, it is an excellent example of cultural adaptation, as it represents the interplay between retention of traditional practices and experimentation with new materials.

## DISCUSSION AND CONCLUSIONS

Excavation of the south convento at Tumacacori produced new information about the site, despite the fact that the extent of the excavation was very limited. The excavation yielded mostly architectural data, indicative of the construction methods used and the mission's building sequence. Most of the area excavated was disturbed, and few intact mission period deposits were found. Nevertheless, comparison of the artifact assemblage with that from the plaza excavation provided further information pertaining to the nature of deposits at Tumacacori, as well as valuable data on the extent of disturbance in this part of the site.

### Construction and Building Sequence

Differences in the size of foundation rocks and in the color and appearance of the adobes indicate that Room 60 was built at a different time than Room 45. The fact that the north and south walls of Room 60 abut the northeast and southeast corners of Room 45 indicates that construction of Room 60 postdates that of Room 45. Room 45's east wall served as Room 60's west wall, and the north and south walls of the two rooms were connected with a soil adobe mortar joint.

Remains of two and possibly a third floor were found in Room 42. If the reddish, hard-packed clay layer overlying cultural fill is a floor, it is the earliest of the three. A lime mortar floor, apparently plastered, and decorated with white and red lime plaster wash appeared next. The red decoration could have been applied as a band at the juncture of the wall and floor, or it could, at one time, have covered all or most of the wall or floor. The later floor, directly overlying the earlier red and white lime plastered floor, consisted of fired adobes set in lime mortar. The small section of this later floor that was uncovered consisted of two rows of bricks stacked atop each other and mortared together. We could not determine if the whole floor was constructed in this fashion or just that part of the floor that abutted the wall. The brick pattern could not be identified. The fired adobe and mortar floor of the cloister was laid on a specially prepared surface consisting of fine grained, sandy soil. The cloister bench, composed of

plastered, unfired soil adobes with a fired adobe and lime mortar seat, was built after floor construction had begun. Both the bench and the herringbone-patterned, fired adobe floor adjoined the north face of Room 42's north wall, and thus postdated that wall's construction (Fig. 6). An apparent adobe floor or compacted use surface (level 4 in the northwest corner) appeared underneath the cloister floor on a level with the wall foundations. This surface is contemporary with or predates the construction of the convento wall.

During excavation of the northeast corner, unusually deep wall foundations were exposed. If only the foundations of the wall had been buried, Room 42's adobe walls would have been at least 3.8 m (12.6 feet) high, unusually tall for a single story structure. Beaubien (n.d.:33) also noted this unusual depth of the walls below floor level in Area 43c, and suggested that the walls were constructed at ground level and then partially buried with fill to support the cloister brick floor at the proper height. His excavation revealed no steps in the cloister floor.

We speculated that at the time of construction the ground surface had an eastern downslope. To compensate for the difference in surface elevations between the east and west ends, the cloister was either stepped or the area backfilled to create a continuous level surface on which to lay the floor. We investigated the possibility that the area was backfilled prior to cloister construction by comparing the elevations of the cloister floor and the wall foundations which were laid directly on the ground surface.

The elevations of the cloister floor showed that the floor level decreased by 10 cm from west to east along the 20 m length of the above-ground ruins, an eastern downgrade of 0.5 cm per meter. The northeast foundation was 42.6 cm lower than the northwest corner foundation, an eastern downgrade of over 2 cm per meter. There were over 45 cm of fill between the cloister floor and the wall foundations in the northwest corner and 67 cm of fill between the two features in the northeast corner. These results suggest that fill was deposited to raise the floor to a single level, and that at least three courses of the eastern extent of the convento's north wall were covered by the fill. It is possible that the damp soil in the northeast corner is due to the buried adobe structure.

## Deposits

Definite evidence of site occupation prior to the construction of the convento's south wing was recovered. In all but the southwest corner, deposits underlying the south convento were present; the convento wall foundations in the southwest corner directly overlay the basal level. We did not recover enough diagnostic artifacts from these subfoundation deposits to date them. However, on the basis of their stratigraphic position relative to the basal level and to architectural features, the deposits presumably predate 1807-21 when this part of the Franciscan mission was thought to have been built. Whether the deposits date to the Jesuit or to the Franciscan occupations could not be determined. One artifact recovered, the plummet or "plumb bob," is commonly found in prehistoric contexts at other Southwestern sites. Since it was recovered from a disturbed provenience, it cannot indicate prehistoric occupation. All of the information obtained indicates that the convento area, like the plaza, was not occupied prior to 1691, when Kino first contacted the middle Santa Cruz River Pima, or, more likely, 1753, when the community of San Cayetano moved to Tumacacori's present location.

The northeast corner deposits underlying the wall foundations were destroyed by a treasure hunter's hole. Disturbance in the southeast corner has obscured deposits south of the convento's south wall, outside the structure. Apparently intact mission period deposits were exposed beneath the cloister floor in the northwest corner (levels 1-4) and beneath the apparent floor of Room 60 in the southeast corner (levels 1-3). Outlines of trenches in the disturbance fill, visible in the profiles of the northeast and southeast corners, indicate that the 1955 stabilization trenches were about 70 cm wide and 80-100 cm deep.

The range of cultural material recovered from the south convento resembles that found in other recent Tumacacori excavations (Fratt 1981; Simpson, this volume; Barton, this volume). Indigenous artifacts and bone made up the largest groups of cultural material recovered. Visual inspection showed that the density of architectural debris was very high in both disturbed and mission period deposits. The relative proportions of artifacts recovered from the south convento and plaza excavations were about the same, except with respect to metal which was found in greater amounts in the convento deposits. The main reason for this dif-

ference was the presence of the modern protective shelter. The artifacts recovered do not lend themselves to speculations about activity associated with the south convento because of the small assemblage recovered from mission period contexts and the great amount of disturbance in the area.

Apparent mission period deposits in the northwest and southeast corners yielded 28 percent indigenous artifacts, 9 percent nonindigenous artifacts, and 63 percent bone. The ceramics collected from mission period contexts in the northwest corner excavation (one sherd of "olive jar" earthenware and one sherd of Guanajuato green lead-glazed earthenware) do have slightly earlier date ranges than the three majolica sherds recovered from the same context (Room 60) in the southeast corner. Stone artifacts recovered from these deposits totaled eight items, and 25 Piman plainware sherds and three Piman red-slipped ware sherds were collected.

## SUMMARY AND RECOMMENDATIONS

Excavation in the south convento of Mission Tumacacori yielded new information pertaining to the construction methods and building sequence of this part of the mission complex, one of the most heavily disturbed areas of the site. The deposits provided further information about site stratigraphy and the extent of the disturbance. Although disturbance fill was the main deposit excavated, intact mission period strata were present. Because of the excavation's limited extent, the artifact assemblage recovered was very small.

Construction of Room 60 and the fired adobe and lime mortar floor of the cloister postdate Rooms 42, 44, and 45. The cloister bench was built after the floor was laid. The grade in this part of the site has an eastern downslope. In order to construct a level cloister floor, the area was backfilled, burying the foundations of the convento's south wall and the lower three courses of wall adobes. The walls of Room 60 abuted the eastern corners of Room 45, and the two walls were connected with adobe mortar. Walls were constructed by laying soil adobes in adobe mortar on a rock/cobble and adobe pad foundation.

Culture bearing deposits predating the construction of the Franciscan mission did appear. No cultural material outside the range of that found in other recent Tumacacori excavations was recovered.

The most important result of this project was the discovery that the south convento, an area indicated in the records as totally disturbed, contained intact deposits which yielded significant new information. Although the mission's potential for yielding archeological information is limited, such information is present. Since so much of the site is disturbed, the value of that information is greatly increased. Areas which at other sites would be considered low in research potential, cannot be ignored at Tumacacori. Because of the extensive disturbance and destruction, what remains of the mission must be preserved. Excavation, if absolutely necessary, should be conducted in a manner such that the maximum amount of available data is recovered.

Many questions about construction techniques and building sequence at Tumacacori remain unanswered (Shenk 1976:83-48; Jackson 1962:20);

further investigation of architectural remains may produce new information to solve these problems.

For example, it would be desirable to know whether or not the three features in Room 42 are actually floors and if they appear in other rooms of the Franciscan convento. Besides reflecting mission period building techniques, such details provide valuable clues about the building sequence of the convento. Further investigation of the intact mission period deposits, predating convento construction, may produce data on site function and culture history of this little known period.

As one of the few Spanish period sites in southern Arizona, every possible effort should be made to preserve and protect what remains of Mission Tumacacori.

## REFERENCES

- Beaubien, Paul  
n.d. Excavations at Tumacacori National Monument. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Brewer, Sallie  
1951 Report on Archeological Trenching at Tumacacori National Monument, May 1951. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Caywood, Louis R.  
1965 Field notes on file, Western Archeological and Conservation Center, National Park Service, Tucson.
- Colton, Harold S.  
1953 Potsherds: An Introduction to the Study of Prehistoric Southwestern Ceramics and Their Use in Historic Reconstruction. Museum of Northern Arizona Bulletin No. 25. Flagstaff.
- Fontana, Bernard L., William J. Robinson, Charles W. Cormack, and Ernest E. Levitt, Jr.  
1962 Papago Indian Pottery. University of Washington Press.
- Fratt, Lee  
1981 Tumacacori Plaza Excavation 1979. Western Archeological and Conservation Center, National Park Service Publications in Anthropology No. 16. Tucson.
- Gerald, Rex E.  
1968 Spanish Presidios of the Late Eighteenth Century in Northern New Spain. Museum of New Mexico Research Records No. 7. Santa Fe.
- Haury, Emil W.  
1976 The Hohokam, Desert Farmers and Craftsmen: Excavations at Snaketown, 1964-1965. University of Arizona Press.
- Herskovitz, Robert M.  
1978 Fort Bowie National Historic Site, Arizona: Identification and Analysis of Material Culture. Anthropology Papers of the University of Arizona No. 31. University of Arizona Press.
- Inter-State Publishing Co.  
1886 History of La Salle County, Illinois, Vol. I. Chicago: Inter-State Publishing Co.
- Jackson, Earl  
1962 Research Report Tumacacori Construction Diorama. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.

REFERENCES--Continued

Kayser, David

- 1965 Field Notes on file, Western Archeological and Conservation Center, Tucson.

National Park Service

- 1934 Southwestern Monuments Monthly Report, August. National Park Service, Coolidge, Arizona.
- 1936 Southwestern Monuments Monthly Report, May. National Park Service, Coolidge, Arizona.

Putnam, H. E.

- 1965 Bottle Identification. Jamestown, California: H. E. Putnam.

Robinson, William J.

- 1976 Mission Guevavi: Excavations in the Convento. The Kiva 42(2):135-175.

Sears, Roebuck and Company

- 1923 1923 Sears, Roebuck Catalogue. 1968 reprint. Joseph J. Schroeder, ed. Northfield, Illinois: Digest Books.

Shenk, Lynette O.

- 1976 San Jose de Tumacacori: An Archaeological Synthesis and Research Design. Arizona State Museum, Archaeological Series No. 94. Tucson.

Shenk, Lynette O., and George A. Teague

- 1975 Excavations at the Tubac Presido. Arizona State Museum, Archaeological Series No. 85. Tucson.

Shepard, Anna O.

- 1956 Ceramics for the Archaeologist. Carnegie Institution of Washington, Publication 609.

Southwestern Parks and Monuments Association

- 1970 Mission Church and Grounds, Tumacacori National Monument. Southwestern Parks and Monuments Association, Globe.

Stanislowski, Michael B.

- 1963 Wupatki Pueblo: A Study in Cultural Fusion and Change in Sinagua and Hopi Prehistory. Unpublished Ph.D. dissertation, Department of Anthropology, University of Arizona.

Toulouse, Julian Harrison

- 1969 A Primer on Mold Seams, Part I. The Western Collector 7(11):526-535.

REFERENCES--Continued

Tovrea, J. H.

1935 Tumacacori National Monument Ruins Survey. Map on file, Western Archeological and Conservation Center, National Park Service, Tucson.

Vivian, Gordon

1955 Stabilization Requirements for Southwestern National Monuments Part II. Ms. on file, Western Archeological and Conservation Center, National Park Service, Tucson.

