NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

NATIONAL REGISTER

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name AWATOVI RUIN
other names/site number [redacted]

2. Location

street & number [X] not for publication
city, town Hopi Indian Reservation [X] vicinity [redacted]
state Arizona code AZ county Navajo code 017 zip code 86039

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
[X] private	[ ] building(s)		buildings
[ ] public-local	[ ] district	5	sites
[ ] public-State	[X] site		structures
[ ] public-Federal	[ ] structure		2 objects
	[ ] object	5	4 Total

Name of related multiple property listing: NA

Number of contributing resources previously listed in the National Register 1

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this [ ] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property [ ] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of certifying official — Date

State or Federal agency and bureau

In my opinion, the property [ ] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

[ ] entered in the National Register.
[ ] See continuation sheet.
[ ] determined eligible for the National Register. [ ] See continuation sheet.
[ ] determined not eligible for the National Register.
[ ] removed from the National Register.
[X] other, (explain:) NHL Boundary Study

Signature of the Keeper — Date of Action 11/4/92

6. Function or Use

Historic Functions (enter categories from instructions)
Domestic; multiple dwelling - pueblo; religion; religious structures-church, mission; recreation/culture; works of art-murals; agriculture/subsistence; processing, agric. fields, terraces, storage, horticulture, irrig.

Current Functions (enter categories from instructions)
Vacant - Not in Use, Industry/processing/extraction; coal mines waterworks-reservoir, processing site - ceramic firing; Landscape; natural feature

7. Description

Architectural Classification (enter categories from instructions)
Other: prehistoric/historic pueblo/ Spanish mission complex

Materials (enter categories from instructions)
foundation Stone
walls Stone/adobe
roof Wood - log/branch and adobe
other

Describe present and historic physical appearance.

LOCATION

[redacted], is a large prehistoric/historic Western Pueblo ruin and seventeenth century Franciscan mission complex [redacted] The ruins of the pueblos of Kokopnyama, Chakpahu, Kawaika-a, Pink Arrow, Nesuftonga and Lululongturque [redacted] is the location of the occupied Hopi towns of Walpi and Sichomovi and the Tewa town of Hano (Map [redacted]

ENVIRONMENT

Geology and Hydrology

[redacted] which contains two coal seams, and is underlain by Mancos Shale. Decomposition of these formations provided the source for extensive silt and sand dunes critical to the successful practice of agriculture in this region. Nearby [redacted] suitable for farming and were used by the occupants of Awatovi for this purpose.

[redacted]

[X] See continuation sheet

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
[X] nationally [ ] statewide [ ] locally

Applicable National Register Criteria [X] A [X] B [X] C [X] D NATIONAL HISTORIC LANDMARK 1, 2, 4, 5 and 6

Criteria Considerations (Exceptions) [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

Areas of Significance (enter categories from instructions)
Archeology - prehistoric; historic - aboriginal, historic non-aboriginal; Exploration/settlement; religion; social history; invention; science; prehistoric art and architecture.

Period of Significance
A.D. 1200 through 1700

Significant Dates
A.D. 1629

Cultural Affiliation
Hopi (Native American)
Hispanic

Significant Person
See Below

Architect/Builder
N/A

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Awatovi Ruin is significant under National Register Criteria A, B, C and D, and National Historic Landmark Criteria 1, 2, 4, 5 and 6. Awatovi is the site of the first Spanish contact with the Hopi people in 1540 and of the establishment of Mission San Bernardo de Aguatubi in 1629. Awatovians were heavily involved in the Pueblo Revolt of 1680 which temporarily drove the Spaniards from New Spain. Following De Vargas' unsuccessful attempt to reconquer the Hopi in 1692, Awatovians allowed Spanish priests to enter the village, baptize villagers and reestablish the mission. These actions were at least partially responsible for the destruction of the pueblo by Hopi warriors in 1700. Awatovi Ruin is, therefore, outstandingly illustrative of the Native American-European contact conflicts in general and specifically in the Southwest during the period of Spanish rule (Criterion 1).

Significant individuals associated with Awatovi include representatives of early Spanish military expeditions, a number of Franciscan missionaries, native Hopi leaders, and more recently, noted 19th and 20th century explorers, adventurers and scientists (Criterion 2):

Individual	Date	Role
Pedro de Tovar	1540	Representative of Coronado Expedition who visited Awatovi.
Juan de Padilla	1540	Franciscan friar who accompanied Tovar to Awatovi.
Don Lopez de Cardenas	1540	Second Spanish Expedition to the Western Pueblos also visited Awatovi.

[X] See continuation sheet

9. Major Bibliographical References

[X] See continuation sheet

Previous documentation on file (NPS):
- [ ] preliminary determination of individual listing (36 CFR 67) has been requested
- [X] previously listed in the National Register
- [X] previously determined eligible by the National Register
- [X] designated a National Historic Landmark
- [ ] recorded by Historic American Buildings Survey # _____
- [ ] recorded by Historic American Engineering Record # _____

Primary location of additional data:
- [X] State historic preservation office
- [ ] Other State agency
- [X] Federal agency NPS NHL Files
- [X] Local government Hopi Tribe
- [X] University Arizona State University, Department of Anthropology
- [ ] Other

Specify repository: _____

10. Geographical Data

Acreage of property [redacted]

UTM References

	Zone	Easting	Northing
A			
B			
C			
D			

[X] See continuation sheet

Verbal Boundary Description

[X] See continuation sheet

Boundary Justification

[X] See continuation sheet

11. Form Prepared By

Revised and edited by Helene R. Dunbar, IAS-WRO August 24, 1990

name/title Sally Ann Dean, Archeologist, Interagency Archeological Services Branch

organization National Park Service, Western Region date March 14, 1990

street & number 450 Golden Gate Ave., Box 36063 telephone (415) 556-5190

city or town San Francisco, state CA zip code 94102

★U.S.GPO:1988-0-223-918

[redacted]

[redacted]

initials of six individuals (EK, WK, JA, DT, AF, IA) and the date, 9-28-34, scratched into the wet concrete. [redacted]

Native vegetation [redacted]s typical of the steppe life zone, and consists mainly of grasses, small shrubs and juniper and pinyon trees in the vicinity of Awatovi. Two large, dependable springs provide water for agricultural and domestic use. [redacted]

AWATOVI RUIN

Some above-ground adobe and stone structures remain in a ruined state; however, the major remains of the pueblo are preserved in subsurface cultural deposits. The eastern portion of the pueblo contains the remains of both prehistoric and historic habitation room blocks and the mission complex, while the Western Mound portion is confined to prehistoric habitation room blocks. Presently, the Western Mound is discernible as a low mound of rubble. The stone walls and roofs have fallen and the rooms have been filled with a mixture of blown silt and sand. Scattered exposures of the upper portions of the walls are visible in the sediments (Photograph 4). The eastern portion of room blocks is also discernible as a low rubble mound; however, remnants of excavated stone and mud walls remain in the area of the Mission Complex (Photographs 5 and 6).

The surface of the Ruin is strewn with potsherds and whole and broken stone tools. Evidence of both scientific excavation and illegal relic collection remains as scattered pits, holes and trenches (Photographs 7 and 8); however, the surface of the Ruin is largely intact. Many of the illegal excavations have been filled recently with culturally sterile sediments by members of the Hopi Tribe.

[redacted]e.

The Awatovi Expedition of the Peabody Museum of Archaeology and Ethnology of Harvard University campsite is now a historic archeological site. Its remains [redacted] The remains of concrete steps and tent platform foundations are visible, along with trash deposits and lithic and ceramic artifacts which were obtained during the excavations and probably were analyzed and left at the site.

Early Studies

The first published references to Awatovi Ruin occurred in the late 19th century in the writings of explorers and adventurers John G. Bourke, Adolph Bandelier, Alexander M. Stephen, Victor Mindeleff and J. W. Fewkes, who visited the Jeddito Valley and recorded their observations. Mindeleff (1891) noted "The ruin of Awatubi is known to the Navajo as Talla Hogan, a term interpreted as meaning 'Singing House' and thought to refer to the chapel and mission that at one time flourished here...". He observed of the Ruin that "...the completeness of destruction is such that over most of its area no standing wall is seen, and the outlines of the houses and groups are indicated mainly by low ridges and masses of broken-down masonry, partly covered by drifting sands." He noted, however, that the remains of the mission complex in the southeastern side of the pueblo, were better preserved, with some wall fragments standing to a maximum height of 8 feet above the ground surface. The sketch map which he made of the Ruin appears to represent only the eastern mound portion of the site (Photograph 9; Figures 1, 2; Map 3).

Based upon Hopi legends and early Spanish documents, Bandelier (1892) published the first detailed account of the destruction of Awatovi, which he believed had taken place in late 1700 or early 1701. A participant in the Hemenway Expedition of 1892, Fewkes (1893) sought to verify through archeological investigation the Tusayan legend of the destruction of A-wa'-to-bi, in the Hopi language, "the place of the Bow People." Accompanied by Alexander Stephen, Fewkes spent ten days at the Ruin during which he "...made a reconnaissance and a few excavations...to gather from archaeological researches whatever data could be found to shed light on the disaster which overthrew one of the most populous of the Tusuyan pueblos about two hundred years ago." Stephen obtained the following version of the legendary destruction of Awatovi from Sa'-li-ko, a member of the Snake phratry of Walpi, whose hereditary office of Ma-zrau'-mon-wi came to her through an ancestor who survived the Awatovi destruction (Fewkes 1893:364- 366):

> Wi'-ki and Si'-mo and the other chiefs have told you their stories, and surely their ancestors were living here at Walpi when A-wa'-to-bi was occupied. It was a large village and many people lived there, and the village chief was called Ta-po'-lo, but he was not

at peace with his people and there were quarreling and trouble. Owing to this conflict only a little rain fell, but the land was fertile and fair harvests were still gathered. The A-wa'-to-bi men were bad. Sometimes they went in small bands among the fields of the other villagers and cudgeled any solitary workers they found. If they overtook any woman they ravished her, and they waylaid hunting parties, taking the game, after beating and sometimes killing the hunters.

There was continued trouble in A-wa'-to-bi, and Ta-po'-lo sent to the Oraibi chief, asking him to bring his people and kill the evil A-wa'-to-bi. The Oraibi came and fought with them, and many were killed on both sides, but the Oraibi were not strong enough to enter the village and were compelled to withdraw. On his way back the Oraibi chief stopped at Walpi and talked with the chiefs there. Said he: "I cannot tell why Ta-po'-lo wants the Oraibi to kill his folks, but we have tried and have not succeeded very well. Even if we did succeed, what benefit would come to us who live too far away to occupy the land? You Walpi people live close to them and have suffered most at their hands; it is for you to try." While they were talking Ta-po'-lo had also come, and it was then decided that the chiefs of all the villages should come together at Walpi to consult. Couriers were sent out, and when all the chiefs had arrived Ta-po'-lo declared that his people had become po-wa'-ko (sorcerers), and hence should all be destroyed.

It was then arranged that in four days large bands from all the other villages should prepare themselves and assemble at a spring not far from A-wa'-to-bi.

A long while before this, when the Spaniards lived there, they had built a wall on the side of the village that needed protection, and in this wall was a great, strong door. Ta-po'-lo proposed that the assailants should come before dawn and he would be at this door ready to admit them, and under this compact he returned to his village. During the fourth night after this, as agreed upon, the various bands assembled at the deep-gulch spring, and every man carried, besides his weapons, a ko-pi'-tco-ko (torch) and a bundle of greasewood. Just before dawn they moved silently up to the mesa summit, and, going directly to the east side of the village, they entered the gate, which opened as they approached.

In one of the courts was a large kib-va, called Pu-vyun-o-bi, and in it were a number of men engaged in po-wa'-ko rites. The assailants at once made for the kib-va, and, plucking up the ladder,

they stood around the hatchway shooting arrows down among the entrapped occupants. In the numerous cooking-pits fire had been maintained through the night for the preparation of food in a feast upon this appointed morning, and there they lighted their torches. Great numbers of these and the bundles of greasewood being set on fire were then cast down the hatchway, and firewood from stacks upon house terraces was also thrown into the kib-va. The red peppers, for which A-wa'-to-bi was famous, were hanging in thick clusters along the fronts of the houses, and these they crushed in their hands and flung upon the blazing fire in the kib-va to torture their burning occupants. After this, all who were capable of moving were compelled to travel or drag themselves till they came to the sand-hills of Mi-con'-in-o-vi and there the final disposition of the prisoners was made.

My maternal ancestor had recognized the Ma-zrau'-mon-wi and saved her at a place of massacre called Mas'-ki, and now he asked her whether she would be willing to initiate the women of Walpi in the rites of the Mam-'zrau. She complied, and thus the observance of the ceremonial called the Mam'-zrau-ti came to Walpi. I cannot tell how it came to the other villages. This Ma-zrau'-mon-wi had no children, and hence my maternal ancestor's sister became chief and her badge of office or ti'-po-ni came to me. Some of the other A-wa'-to-bi women knew how to bring rain, and such of them as were willing to teach their songs were spared and went to different villages. The Oraibi chief saved a man who knew how to cause the peach to grow, and that is why Oraibi has such an abundance of peaches now. The Mo-con'-in-o-vi chief saved a prisoner who knew how to make the sweet so-wi'-wa (small-eared corn) grow, and this is why it is more abundant here than elsewhere. All the women who had song-prayers and were willing to teach them were spared and no children were designedly killed, but were divided among the villages, and most of them went to Mi-con'-in-o-vi. The remainder of the prisoners, men and women, were again tortured and dismembered and left to die on the sand-hills, and there their bones are, and the place is called Mas'-tco-mo. This is the story told by my old people.

In his reconnaissance, Fewkes (1893) [redacted] In addition to the eastern ruin and mission complex mapped by Mindeleff (1891), Fewkes identified a western roomblock which he designated the Western Mound, a name which persists today. He believed the Western Mound to be earlier than the eastern ruins. Included in the eastern portion of the Ruin, a large, possibly multi-storied roomblock

with east and west wings was identified north of the mission complex (Map 4). Together with the mission complex, these roomblocks delimited a rectangular plaza area.

Although he did not prepare a detailed map, Fewkes' Plate 1 (Map 4) identifies the general location of his excavations in both the eastern and western roomblock areas. He noted the almost universal evidence of fire or "...a great conflagration..." in the rooms which he excavated as well as evidence that indicated that the pueblo had been occupied at the time of its destruction. Many of the excavated rooms in both the eastern and western roomblocks contained intact fire places, mealing troughs, and coiled and smooth ceramic wares. The walls of the rooms were constructed of stone covered on the interior with adobe plaster and the floors were generally paved with smooth stone. In a burned storage room stacked with charred corn, Fewkes also found a food bowl and a corroded iron implement, indicating that the pueblo had not been rifled at the time of its destruction. The presence of the iron implement attested to the probable use of the room during or following the establishment of the mission at Awatovi (Fewkes 1893).

Fewkes, searching for the "Po-wa-ko kib-va" mentioned in the legend, excavated an apparent subterranean room in the middle of the plaza north of the mission and identified as a "kib-va" by the Hopi workers assisting him with his excavations. Two test trenches were excavated exposing charred wood and other evidences of fire. The first trench, excavated from the surface to a depth of five feet, exposed the south wall of the kiva and a portion of a floor covered with flat stones. In the second trench, excavated from the middle of the first trench toward the center of the kiva, human bones were discovered at a depth of four feet six inches below the ground surface. Fewkes (1893:373) abandoned any further excavations in this area after "...observing the anxiety of the Hopi workmen...". Although insufficient excavation had taken place to prove absolutely the veracity of the legend, Fewkes was of the opinion that he had excavated the "Po-wa'-ko kib-va." No excavations were conducted in the area of the mission complex.

Fewkes' (1893) work did substantiate at least some parts of the legend: Awatovi had been occupied at the time of its destruction and had been at least partially destroyed by fire. That the teller of this version of the legend claimed to have inherited her badge of office from a survivor of the massacre, and that other descendants of survivors were inhabitants of present Hopi towns, seemed to support the contention that Awatovi was indeed destroyed by Hopi warriors.

The Awatovi Expedition

The most ambitious excavations and extensive studies of the Awatovi Ruin, however, were conducted by members of the Awatovi Expedition of the Peabody

Museum of Archaeology and Ethnology of Harvard University under the direction of J. O. Brew over a period of five years, from 1935-1939. The immediate areas of investigation included [redacted] (Montgomery et al. 1949). Members of the Expedition located 275 prehistoric archeological sites [redacted] excavated 21 additional sites which ranged in time from the 6th century AD to the early18th century, or in terms of cultural periods, from Basketmaker III through Pueblo V (Brew 1971:xviii). In the 1935 field season, Brew concentrated on a surface survey [redacted] The site of Awatovi was selected for further testing and a test trench was dug across the site (Map 6). Because Brew felt that Awatovi contained the longest record of occupation, he concentrated most of the later efforts there where, eventually "three considerable areas were excavated in the early, middle and late sections, and tests to bedrock were made at 25-to 50-foot intervals in the rest of the town. Approximately 1300 rooms and kivas were dug at Awatovi and 200 at the other sites" (Smith 1971:xviii; Map 7).

Excavation in the prehistoric Western Mound at Awatovi Ruin was conducted in 1936. The goal of the 1937 field season "...to clear the mission..." could not be accomplished in a single season due to the complexity and size of the mission complex in the eastern portion of the site (Brew 1949:xix). At this time, archeologist Charles A. Amsden made a fortuitous visit to the dig and informed the Expedition members of Ross Montgomery, an expert in the study of religious buildings and the Franciscan Order in New Spain who had aided in the reconstruction of Mission Santa Barbara, California. The Expedition secured the services of Montgomery, who took over the direction of the excavation of the mission complex. Montgomery was able to suggest the probable location of features, including the kiva under the main altar of the second church. He provided "...an anthropological interpretation...to present a conjectural reconstruction of the life of 17th century Spanish Awatovi as well as of its buildings" (Brew 1949:xx).

Prehistoric Complex

Although J. O. Brew never published a complete account of the Expedition's excavations of the prehistoric complexes in the Western Mound and eastern portion of the site, Smith (1952, 1971) and Woodbury (1954) provide some basic information on the general structure and stratigraphy of the prehistoric complex at Awatovi Ruin (Map 7).

Extensive archeological test excavations sampled the entire Ruin and provided evidence that the nearly 25 acres comprising the site contained the well-preserved, stratified remains of prehistoric structures and occupational debris as well as the remains of the historic mission complex (Brew 1952). To define

the cultural periods encountered in the excavations, the Expedition adopted the existing Pecos Classification:

Pueblo II - AD 900 - 1100
Pueblo III - AD 1100 - 1300
Pueblo IV - AD 1300 - 1600
Pueblo V - AD 1600 - present

The 1935 north/south oriented test trench excavated across the middle of the site established both horizontal and vertical controls for further excavations. A north/south-east/west grid system was laid across the site at 25-30 meter intervals to guide the placement of test units. Excavation units were usually rooms, however, with each room constituting a single test unit. The room fill was removed in 50 centimeter blocks. Bagged and labeled artifacts were then washed, sorted and counted and the collection was then "...winnowed... " to remove "...small or comparatively insignificant pieces..." (Smith 1971:14).

Results of the excavations of 1935-1936 documented that of the entire 25 acre site, no more than one third of the area was occupied at one time. The earliest occupation was a small masonry pueblo located at the extreme southwestern tip of Antelope Mesa. From a small beginning, the pueblo expanded east and north and was probably two stories high. This early pueblo was eventually filled with debris and abandoned. Another two story masonry pueblo was constructed over it and subsequently abandoned. The remains of these pueblos form the Western Mound, covering an area of about 2,500 square meters (Smith 1971).

Based upon the seriation of excavated ceramics, the Western Mound was shown to have been inhabited from the latter part of the 12th through the mid-15th centuries AD, or as expressed in cultural terms from Pueblo III through middle Pueblo IV. The ceramic record indicated, however, that the pueblo had grown at differing rates in several locations. Smith (1971:38) noted that there was "...No consistent correlation among floor levels, ceramic complexes, and masonry changes..." and concluded "... that change was gradual and that general abandonment of the entire area and its subsequent reoccupation by different people is not indicated."

In the southern aspect of the Western Mound, archeological excavations were taken to bedrock, approximately 25 feet below the surface. The lowest rooms were built directly on bedrock and contained the earliest remains recovered from Awatovi. The walls of these early rooms were constructed of roughly rectangular, laminated sandstone blocks from the upper strata of the Mesa. The blocks were shaped or selected for 90 ° angles and laid in double-courses filled with a rubble core. The double-faced walls were then plastered with adobe. The early rooms were filled with refuse and apparently leveled. They were covered by rooms with floors of sandstone slabs whose walls were constructed of

a single course of thin sandstone slabs, plastered on inner and outer surfaces with adobe. The walls of the uppermost rooms were most often "...directly upon and in nearly exact alignment with them [lower walls]" (Smith 1971:598; Photographs 10 and 11).

In his analysis of the ceramic wares of the Western Mound, Smith (1971) developed five ceramic groups based upon the association of decorated wares and their stratigraphic location within the mound. The groups, arranged from late to early are:

Group A	Awatovi Black-on-yellow; Jeddito Black-on-yellow; Sikyatki Polychromes
Group B	Jeddito Black-on-orange; Awatovi Black-on-yellow; Jeddito Black-on-yellow, and Sikyatki Polychromes
Group C	Tusayan Black-on-white; Jeddito Black-on-orange; Awatovi Black-on-yellow; Jeddito Black-on-yellow and Sikyatki Polychromes
Group D	Tusayan Black-on-white; Orange Polychromes; Jeddito Black-on-orange; Awatovi Black-on-yellow
Group E	Tusayan Black-on-white; Orange Polychromes

Smith (1971:589-590), describing the technology associated with the production of the various groups, noted that:

> "...there were at least three major and basic changes that took place in the pattern of ceramic technology in the Western Mound: (1) the replacement of white ware and its accompanying orange-polychromes with a new version of orange ware; (2) the transition from orange to yellow wares; and (3) the virtual abandonment of temper as a constituent of paste, but without significant changes in the clays or the firing methods employed. The most striking and abrupt of these changes seems to have been the first, marked by the inception of a new orange ware in the guise of Jeddito Black-on-orange. The suggestion has been made that the introduction of this orange ware came about as the result of substituting coal for wood as fuel".

Smith notes that wood has been the principal fuel used to fire pottery throughout the Southwest; however, at the villages [redacted] wood fuel was replaced by fossil fuel mined from the coal seams exposed [redacted] The use of coal by the

prehistoric [redacted] inhabitants for heating and cooking as well as for firing pottery has been documented by Hack (1942a). No black-on-white or northern polychrome sherds were found on the slag heaps and pottery firing areas below Awatovi, but large amounts of Jeddito Black-on-orange and later types were present (Smith 1971:592).

In addition to the change in firing fuel, a different clay was used in the manufacture of Jeddito Black-on-orange. The second change, referred to above, was more gradual and was accompanied by a return to the use of the first clay, associated with Group E wares. The third change from tempered to untempered pastes was also gradual.

When the ceramic wares were correlated with the changes in wall types, Smith (1971) found that the earlier walls were associated with the Jeddito Black -on-orange and earlier wares, while the newer walls were associated with Awatovi or Jeddito Black-on-yellow wares. Considering the data, he felt that "...change in occupation did occur at Awatovi..."; however, he was not convinced that abandonment followed by reoccupation was supported, as the styles of ceramic wares did not change. "But," he continued, "it does appear reasonable to suppose that some changes in the population of the village did occur, though probably not involving any great cultural change, but only a new period of growth incident to a rather sudden inflow of new people who were already closely related to the old residents" (Smith 1971:599).

Dendrochronological dates from charcoal or small poles or branches found in the fill associated with Group A ceramics fall between AD 1300-1301 and 1498. This establishes the abandonment of the Western Mound prior to Spanish contact. It also establishes the approximate dating of Jeddito Black-on-yellow to ± AD 1350, and suggests that the upper portion of the Mound was built in 150 years. Smith then proposed that if this were the case, it was reasonable to assume that the lower part of the Mound had also taken 150 years to accumulate and supported a founding date of ± AD 1150, or at least prior to AD 1200, for Awatovi (Smith 1971:602).

[redacted] a new pueblo was constructed during the later occupation or following the abandonment of the Western Mound village. The Eastern Pueblo contained several rows of roomblocks separated by streets and plazas. It was this pueblo which was visited by the Spanish in 1540 AD and near which the Franciscan mission was constructed in 1630 (Smith 1971). Results of the excavations conducted within the Eastern Pueblo and complete analyses of the recovered artifacts have not been published to date, although extensive records and collections are curated by the Peabody Museum, Harvard University.

The study of prehistoric stone implements recovered from the excavations in the Eastern Pueblo and Western Mound (Woodbury 1954) substantiated the agricultural base that had persisted for the last 1,400 years. Ritual evidence of the importance of agriculture was recovered in the form of "tcamahias," a type of hoe used only for ceremonial purposes in the 13th and 14th centuries. These ritual objects are limited in distribution and associated only with the Western Pueblo Hopi and Keres groups (Woodbury 1954:165-170). Stone artifacts recovered from a Pueblo V kiva provenience included a paint grinding stone, a grinding slab and a fragment of malachite which may have been utilized for preparing paint for kiva murals.

Thirty-four kivas were excavated at Awatovi and Kawaika-a which contained kiva murals of the 15th, 16th and 17th centuries. The Awatovi kivas are rectangular, and average from 4-6 meters in length, 2.5 to 4 meters in width and 2.5 meters in height. Floors are paved with sandstone slabs often overlying clean sand or coal ash, and the roofs are constructed with log beams (vigas) and smaller diameter wood lengths (latillas), which are covered with branches and adobe. Entrance is achieved through the roof via a ladder. A broad, sandstone-topped bench crosses one end, and the bench contains a ventilator. There are 1 or 2 firepits and a sipapu (a small hole in the floor which ceremonially represents the entrance to this world from below). The walls are formed of stone blocks plastered with "...copious amounts of mortar" (Smith 1952).

Most of the kiva walls were covered with 20+ layers of plaster, many of which were painted with murals of a ceremonial nature. Of the 100+ plaster layers found in Room 218 at Awatovi during the 1936 field season, 20-30 were painted with murals. These finish coats of plaster are 5 to 6 millimeters thick. The murals were painted onto dry plaster utilizing a fresco secco technique. The kivas may have been replastered and/or painted on a ritual schedule, when sooty, or by ritual obliteration so that they could not be viewed by the uninitiated (Smith 1952).

Colors used in the murals - yellow, blue, green, red, pink, orange, vermillion, brown, purple, maroon, grey, black and white - are highly symbolic. With the exception of carbon (black), the colors appear to be mineral pigments (Smith 1952). To record and study the murals, the plaster layers were peeled off one by one by the excavators. The boundaries of the paintings were sharp and linear and colors were seldom shaded (Figures 3 through 9).

Smith (1952) hypothesized that the murals: 1) may have substituted for the usual kiva altar and may have served the same function, 2) may have functioned in certain ceremonies, 3) may have served as backgrounds for altars, or 4) may have preceded the use of altars. Smith believes, however, that "...the Pueblo altar probably evolved indigenously, with special flamboyance during Pueblo IV, when it approached roughly its present form, and during that same period it was

supplemented and sometimes simulated by painted decoration on the kiva walls." He also noted that the change in wall construction style and the transition from orange to yellow wares was also correlated with the introduction of kiva murals. In addition, many of the design styles and elements of the kiva murals were found on contemporary ceramics.

Historic Complex

The excavation of the Franciscan Mission Complex in the southeastern portion of Awatovi Ruin and study of corresponding historic documents was begun in 1937 under the direction of J. O. Brew and continued under the direction of Ross Montgomery (Montgomery, et al. 1949). Brew researched the documents of the secular officials and religious of New Spain to provide a background for the excavation of the Mission Complex (Brew 1979).

Excavations carried out in 1937-1939 provided evidence which largely corroborated the legend of the destruction of Christian Awatovi and which richly augmented the understanding of daily life associated with the Mission Complex (summarized below from Brew 1949) (Photograph 12; Map 8). Evidence was found of a series of three churches. According to Brew's (1949) interpretation, the first church had been planned on a grand scale during the early days of Fray Francisco Porras' administration. This church was never constructed beyond the foundations which were found under the main plaza area of the town north of a smaller, second church dating to a later period.

The second church was constructed on top of ruined Hopi buildings. Although built on a lesser scale than the projected Church 1, Church 2 was substantial, with interior measurements of approximately 100 x 18 feet. The church had two large towers and the basilica faced east overlooking a large churchyard cemetery area, surrounded by a low wall (Figure 10; Map 9). To the left of the entrance porch was a separate baptistry which was balanced to the right of the porch by a reception room. Inside the entrance, stairs led to the choir loft balcony at the east end of the nave. The interior walls were brightly painted, as was the altar. Remnants of painted dadoes in imitation of Spanish tiles were found on the walls of the nave. The east end of the nave rested on a series of leveled prehistoric rooms which contained Sikyatki Polychrome ceramic wares.

The sanctuary at the west end of the nave contained the main altar and two side altars. The main altar was inset with a consecrated altar stone and a retable was behind the altar. When, during excavation, the remains of the main altar and most of the first sacristy were removed to effect the search for a kiva below, the bundled bones of a single human were found directly under the main altar. The bones were determined to be those of a young, unidentifiable European.

A kiva was found under the main altar one meter below the sanctuary floor (Photographs 13 - 16; Figure 11). It was filled with clean, white sand, and was complete except for a small area which had been damaged by the installation of the apse footing for the church. Montgomery (1949) felt that the position of the main altar above the kiva was intended to symbolize the superiority of the Christian faith over the native religion. The fourteen superimposed painted layers of kiva murals found on the kiva's west wall are the finest known examples of this art form. Another, smaller kiva with an intact roof was found to the west of the first, but was not excavated.

The sacristies were located to the north of the sanctuary. These rooms were used for the vestry, the storage of items needed by the priest, the storage and disposal of sanctified liquids and other similar tasks. The rooms were remodeled several times and finally expanded, with the conversion of the original sacristy into a friar's chapel for the private worship and meditation of a priest. A window was included in the friar's chapel to allow the priest to view the main altar during meditation and prayer (Photographs 17 and 18).

An office and schoolroom complex was found west of Church 2 with access to both the church and the friary through a corridor (Photographs 17 and 19). All of these rooms had wall benches which covered from 50 - 100 percent of the wall space. The walls were decorated with red dadoes and top borders. The lack of fill found in these rooms indicates their use to the end of occupation. There were no signs of post-rebellion alteration; however, debris resulting from the 1680 Pueblo Revolt could have been removed by Fathers Garaycoechea and Miranda in 1700. This was probably the area in which they stayed and in which they conducted business at that time. It was also directly adjacent to the east wing of the friary which had been cleared to house the temporary Church 3.

To the west of the office/schoolroom complex was the friary, a single row of rooms arranged around a cloister garth, or sacred garden, forming a quadrangle. The friary included the private rooms, or cells, of the friars and some common rooms. A large yard with storerooms was located west of the friary complex. The twelve to sixteen rooms of the friary suggest that it was built for a large staff which never materialized. A kitchen with a flagstone floor was attached to the southwest corner outside the friary. The southwest corner of the kitchen was heavily burned due to the type and location of the stove. The kitchen was conveniently located at the rear of the friary and adjacent to the storerooms, poultry yards and disposal areas. A room to the east of the kitchen may have been the refectory (dining room). Excavators found evidence of additional walls on the south and the west of the friary complex which were torn down after 1680.

The sacred garden, or garth, was probably bordered by a covered ambulatory. Under the center of the garth, excavators discovered two superimposed kivas. The lower kiva contained sherds of Sikyatki Polychrome, suggesting its use

during the Pueblo IV Period, while the upper kiva may have been in use when the Franciscans came to Awatovi in 1629. The upper kiva was filled with rubbish, however.

Excavators found that the east side of the friary had been converted to a third church. The floor of Church 3 was ridged with the remains of inner walls of the friary which had been removed (Map 10). There was no direct outside entrance to Church 3. Access was restricted to the old corridor from the office/schoolroom complex. Church 3 contained only a dais and an altar at the south end and next to these, a small sacristy. A baptismal font was located outside the entrance, immediately to the west (Photographs 20 and 21). Church 3 was obviously the temporary church used by Fathers Garaycoechea and Miranda in 1700.

Northeast of the Mission Complex, foundations of Spanish construction were found (Map 7). Montgomery (1949) identified these as the remains of the projected barracks/stables begun under Fathers Garaycoechea and Miranda in 1700, intended to be completed and inhabited by the military garrison which they had recommended. Montgomery suggests that the beginnings of this building may have contributed to the swift retaliation and the destruction of Awatovi at the hands of the Hopi.

Test excavations in the Eastern Pueblo located a wall east of the Mission Complex, and native houses extending from the south edge of the mesa to a second room block on the north side of a plaza opposite the Mission San Bernardo complex (Photograph 22). Three gates were found in the wall, stratigraphically separated, one of which may have been the gate through which the attacking warriors gained entrance to destroy the town.

Excavators found abundant evidence of the sacking and razing of much of the Mission Complex in connection with the Pueblo Revolt of 1680. The burial record is especially revealing. The excavated burials associated with Church 2 were mainly Christian with occasional native traits. A few burials were flexed, indicating a non-Christian interment. Of the 118 burials excavated, 43 were pre-Rebellion, 69 were post-Rebellion and 6 could not be determined. Burials were recovered from all parts of the church. Although only the eastern third of the nave was systematically excavated, it contained the highest number of burials, mainly from the pre-Rebellion era. Many post-Rebellion burials had been interred in the debris resulting from the razing of the church, and some may have been casualties of the Revolt. Once the overall patterns had been established, no further excavation of burials was attempted as the presence of coal ash in the earth led to the disintegration of the remains, and the amount and diversity of the grave furniture was limited. Six burials contained only Christian grave goods while 59 contained a mixture of Christian and native items.

Following the Pueblo Revolt of 1680, the churchyard was used as a sheep corral. The long, narrow nave of Church 2 had been razed and was filled with dirt, ashes and broken and discarded artifacts. Excavators found evidence that the schoolroom/office complex had been reoccupied and rehabilitated for use by the Hopi. Several rooms were used as sheep corrals. Rooms had been divided and the doorways made smaller to conserve heat in a manner typical of Hopi construction. The friary garth served as a plaza area in Post-rebellion times. No post-Rebellion rooms were found in Church 3, however, indicating its abandonment following the destruction of Awatovi. In the friary yard, the remains of the mission bell were found associated with additions and modifications to the Spanish roomblock made by the Hopi during post-Rebellion times. These post-Rebellion additions also contained a mixture of Spanish and Native artifacts and an abundance of sheep manure suggesting their reuse as livestock pens (Map 10).

Most of the ceramic wares recovered in the excavations of the Mission Complex were manufactured at Awatovi. Although the native technology essentially remained the same, wood replaced coal as a ceramic firing fuel. Some stylistic changes resulted from Spanish influences, including new bowl and jar forms, plates and the use of a circular clay base on the bottom of some dishes. Foreign imported pottery was scarce, but included blue and white Chinese porcelain and Spanish white glazed wares. Most of the imported pottery was blue, white and green glazed wares from Puebla and other towns in Mexico (Woodward, in Montgomery et al. 1949:95).

Construction techniques common throughout the missions of New Spain were noted at San Bernardo de Aguatubi by Montgomery (1949). Three types of wall construction were used: rubble/ashlar, tamped earth and stone, and adobe units (like bricks). Of these, the first was most prevalent at San Bernardo. The second was used only in the barrack/stable foundations. The third was used mainly in remodeling. The Spanish walls were thicker than the Hopi, and the rooms and doors were usually larger.

In general, mission buildings were plastered on the exterior with adobe. Whole vigas (log roof beams) and savinos (smaller poles) were used to support the roofs, which were usually flat and plastered with adobe. The walls were carried up above the surface of the roof and formed parapets which were sometimes crenelated. There was a clerestory above the sanctuary with selenium or mica window panes. Wood was used for lintels, door and window frames, posts, bolsters and beams. Interior walls were plastered with adobe and probably with gypsum or a whitish clay plaster. Wood was used as fuel in plastered stone fireplaces and stoves. Plumbing and drains were constructed and hardware of brass, wood, leather and wrought iron was used.

In Church 2, portable wooden confessionals were probably used. There were bells in the towers. No chairs, benches or pews were present in the church. The

altar met the lesser specifications of church law for a church that was blessed, not consecrated.

Interiors were painted with bright colors and intricate designs (Smith 1949:293). A reddish-brown, sandy plaster was placed over stone masonry to form a flat surface. The Hopi used this as a surface for their kiva murals; however, in the mission complex, the Franciscans had them add another whitish clay layer upon which the Hopi artists painted. Colors used in the mission complex included: yellow, blue, green, red, pink, vermillion, brown, maroon, orange, black and white. All designs were of a geometric or conventionalized floral nature based upon Spanish designs alien to the Hopi. These were painted most often in a repetitive tile pattern. Detail was usually in small color blocks outlined in black. Replastering, utilizing the reddish-brown coat with white overplaster, was used to cover old paintings with new paintings rendered on the fresh surface. Occasionally some walls were left white.

There were four categories or types of painted decorations used in the Mission Complex: 1) dadoes or wainscots with solid bands of color, 2) all-over design covering entire walls or above dadoes with occasional horizontal top borders, 3) continuous floral designs in wide bands on the altar face, and 4) black outline tracery (imitation of wrought-iron grillwork?). There were eleven Type 2 designs in the sacristy, nave and sanctuary of Church 2. Type 3 was executed on the altar faces of Church 2 in a running pattern of vines, leaves and flowers in a band 15-18 centimeters in width, and was probably meant to simulate altar cloths. All paintings were crude and asymmetrical, at variance with the better executed kiva murals.

Agriculture

An important aspect of the Peabody Museum Awatovi Expedition was Hack's (1942) physiographic study of the Hopi region from 1937-1939. The following brief history and description of Hopi agriculture as practiced by the inhabitants of Awatovi is taken from this study. Hack identified three depositional, climatic terraces which provided evidence of periods of more effective moisture. During the deposition of the Jeddito (pre-4,000 BC), the Tsegi (3000 BC - AD 1200), and the Naha (since AD 1300) Formations, agriculture would have been favored (Hack 1942:45). Between these fill episodes were periods of erosion and dissection. Sand dune deposits of the Tsegi Formation contain charcoal from Pueblo I and II use of the area, and Pueblo II and III remains are common on the top of the Tsegi Formation; therefore, Hack proposed that the Pueblo III remains were deposited prior to AD 1100 (Hack 1942:42). North of Awatovi, Pueblo II and III remains in ancient dune sand were being eroded, at the time of Hack's study, and Hack believed this to provide evidence of dune stability prior to Pueblo III. Between the deposition of the Tsegi and Naha Formations, there was an erosional epicycle in late Pueblo III or early Pueblo IV.

The Naha Formation was being deposited during the height of site aggregation (Pueblo IV and probably part of Pueblo V) at Awatovi as it contains some Pueblo III and abundant Pueblo IV ceramics. The formation reached its highest level prior to AD 1700, and was still at this level in 1908, when the epicycle of erosion, current at the time of Hack's study, began (Hack 1942:53).

Hack hypothesized that the farming conditions in the Jeddito area were probably at their best in the first millenium AD. During the Tsegi-Naha erosional epicycle, they would have been degraded and, while improved in the period of the deposition of the Naha formation, were never as good as during the period of the Tsegi Formation deposition (Map 11). He suggested that these conditions may have been a factor in the abandonment of most of the large [redacted] were more favorable during the Naha period of deposition. Thus, while population on Antelope Mesa grew during Pueblo III through IV, there were fewer villages in Pueblo IV with greater individual populations. When the Spanish arrived, Awatovi was probably the only large village still occupied, providing evidence of a population decline [redacted].

Hack noted that "the Hopi country is superior as a location for agricultural settlement to other nearby areas. The abundant dune sand provides a better ground-water supply, and inhibits arroyo cutting. The wide valleys provide large areas over which flood-waters can spread." He recognized the remains of ancient field systems on the basis of identifying lines of stone used as windbreaks to protect growing crops and by investigating the history of the watercourses (Map 12). The relation of ash heaps, the remains of pottery firing, to the agricultural fields suggested to Hack that these activities were carried on simultaneously (Hack 1942:71).

The Hopi developed specific techniques to utilize rainfall efficiently and to augment it with irrigation. Corn, beans, cucurbits and cotton were important crops in the prehistoric period. Over the centuries, the Hopi developed varieties of these cultigens which were specifically adapted to the local climate and geography. For example, Hopi corn is planted at an extreme depth of 10 - 15 inches and develops exceptionally long roots (15 - 20 feet) to reach and utilize moisture deep in the soil (Brew 1979). While reaching a mature height of only three to four feet each plant bears abundant ears (Hack 1942:20). The corn plants also have very small leaves, thus keeping the amount of water lost through transpiration to a minimum. The small size of the overall plant conserved both water and available arable soil. A special species of cotton, Gossypium hopii, was also developed, and provided the raw material for a longstanding, traditional manufacture of utilitarian and ceremonial garments for the Hopi and other Pueblo peoples (Hack 1942:17).

European cultigens - wheat and other grains, fruits and vegetables - were introduced by the Spanish and those found to be adaptable to the local environment and farming methods were added to the agricultural crop base. At the time of Hack's study, the major crops grown by the Hopi were, in descending order of percent grown: corn, peaches, apples, apricots, melons, beans, and garden vegetables (Hack 1942:19).

Four basic agricultural techniques were used based upon water supply: 1) flood-water, which included both floodplain and akchin techniques, 2) rainfall, 3) seepage, and 4) irrigation. Each technique exploited a specific soil/water regime. Of the four, flood-water farming was the most important, accounting for 73% of the cultivated land at the time of Hack's study (Hack 1942:26).

All flood-water farming is dependent upon the concentration of rainfall. Flood-water farming involved the placement of fields where the crops would be watered by seasonal flooding in addition to direct rainfall. In floodplain farming, fields were located on the floodplains of large streams where seasonal flooding was more or less dependable and occasional rainfall later in the growing season might occur. The floodplains were rich in silt, and the water table was higher nearer the stream beds. These fields were vulnerable to flash flooding, however, and crops could be lost.

Shallow arroyos were well-suited to floodplain farming. [redacted] was utilized extensively for floodplain farming in the prehistoric period and is the only major wash near Awatovi which is shallow enough to overflow its banks. It is still farmed by descendants of Awatovians. Where shallow arroyos were not present, flood terraces of larger arroyos were favored (Hack 1942:26).

Hopi farmers also constructed trinchera fields in shallow arroyos to further utilize the floodplain technique. Stone walls were built into a series of terraces which held both soil and water (Hack 1942:26).

A second major type of flood-water farming was the akchin method, where crops were planted at the mouths of mid-sized arroyos or smaller tributary streams, at the point where the water slowed and spread and silt was deposited. Akchin fields were well-suited to the farming of corn and beans (Hack 1942:26) and are [redacted]

The locations where floodwater farming was a viable method were never static, however, as changing stream gradients throughout prehistory affected not only the locations and sizes of floodwater fields, but also dictated reliance on other farming strategies (Hack 1942:77; Map 11). Farming with floodwater irrigation was probably the single most important agricultural method in terms of productivity.

The mean annual precipitation in the vicinity of Awatovi is from 10 - 12 inches with precipitation concentrated in two wet seasons, summer and winter. The growing season ranges between 120 - 150 days (Hack 1942:9). The wind direction is predominantly from the southwest, and a series of free and fixed sand dunes are found on the surface [redacted] and in the surrounding valleys resulting from aeolian deposition (Hack 1942:42; Map 13).

This sand cover was extremely important to the water supply and the associated agricultural practices of the inhabitants of Awatovi for without it, most of the available moisture would have run off or evaporated. Prehistoric Awatovians may have kept the sand dunes clear of native vegetation to further conserve the water retained under the dunes for agricultural use (Hack 1942:13).

The farming of sand dune fields is unique to the Hopi region and depends upon the special quality of the dunes to trap and hold water which originates on the mesas and higher hills at depth. Rainwater seeps through the sand to impervious layers where it is perched and available for the roots of cultivated crops. The sand cover keeps the water from evaporating. Sand dunes are common on the mesa tops and on their bases where climbing dunes form and seepage is also available. Although seepage areas often look like "dry" fields, this agricultural technique is important in the cultivation of beans, peaches, apricots and apples, as well as corn (Hack 1942:32).

Sand dune farming was also relied upon to provide a significant contribution to the overall farming productivity. There is much evidence for prehistoric sand dune farming on the north side of the Jeddito Valley, below Antelope Mesa. Sand dunes fields were often manipulated by farmers who left "...elaborate stonework remains..." where lines of brush had been fastened for wind protection. These stone features are found in abundance at the locations of ancient fields (Hack 1942:33) and are particularly common below Awatovi (Hack 1942:71) (Map 14). One stone-lined field dates from the 13th century AD (Hack 1942:70-71), and it is common to find stone-lined fields adjacent to and apparently associated with sites where prehistoric ceramics were coal-fired [redacted] 1942:74; Map 12).

Where a sufficient, dependable flow is available, the areas around springs are farmed, usually for rare or relatively valuable crops. These crops are planted in small plots, rows or single basins which are irrigated from the spring flow (Hack 1942:26).

[redacted]

that seeps and smaller springs were found in the sand dunes themselves. While camped at Awatovi, Fewkes (1893:368) reported that "...a fine spring [redacted]

[redacted] [by Hopi workmen] while in camp." Thus, the modern springs may not provide a reliable measure of the water which was available from this source during prehistoric or historic periods of occupations.

The number and distribution of agricultural fields at any time were based on minute variations in the local physiography which would contribute to the success of any type of farming. Thus, any change in climate could have an immediate effect on the entire system of agriculture. Among the present-day Hopi, each village has its own land assigned to matrilineal clans which are planted and cultivated by the husbands, brothers and sons. Each clan has lands in different physiographic areas to guard against crop failure (Kennard 1979). The inhabitants of Awatovi were apparently able to cope with climatic change by diversifying their agricultural methods and by utilizing all of the physiographic areas. [redacted]

The gardens irrigated by waters [redacted] are also being farmed by the matrilineal clan descendants of the Awatovians. [redacted] with the underlying impervious shale. The Spring flows at a rate of five to ten gallons per minute, feeding a complex of reservoirs, ditches, and garden plots (Hack 1942:36; Photographs 29 and 30; Map 15). This relative abundance of water is used to irrigate delicate and desirable plants, such as carrots, turnips, cabbage, onions, chile, peaches, apricots, apples, tobacco, and cotton and dye plants for ceremonial uses. At the time of Hack's survey, there was a total of only 11 acres of spring-irrigated garden plots in the entire Hopi system, attesting to the scarcity and value of such gardening areas (Hack 1942:37).

Approximately 25 garden plot owners utilize [redacted]. The water flows down slope from the spring in stone-lined ditches to a series of stone-terraced plots, or trincheras, filled with soil and planted in furrows or basins. It is possible that some of the stone irrigation features (reservoirs, ditches, and trincheras) present [redacted] gardens today could have been constructed during the Spanish mission period. Hack could find no other comparable stonework to indicate prehistoric irrigated trincheras [redacted] however, it is probable that newly introduced European cultivars which required regular and plentiful irrigation would have been farmed here as they are today (Hack 1942:37).

Coal - Mining and Use

In addition to his investigations of agriculture in the Hopi region, Hack (1942a) also studied the evidence for prehistoric coal mining and use in the

region. [redacted] (Hack 1942a:4). Coal from these exposures was mined by the prehistoric inhabitants of Awatovi and used as fuel for household heating and cooking and to fire ceramics (Map 16). Evidence of the use of coal was found in abundant ash heaps and mining waste dumps on the bench and also as coal ash in the firepits of excavated houses and kivas in the Western Mound (Hack 1942a:7). Coal ash was also abundant in the fill of other Hopi Pueblo III and IV ruins, along with wood ash, indicating that both fuels were used. In Hopi kivas dating to the Pueblo IV period "...two firepits are always found," one with wood and one with coal ash (Hack 1942a:7).

Coal was used as a domestic fuel in the Jeddito area as early as Pueblo II (AD 900-1100). There is evidence for the mining of coal [redacted] from late Pueblo III, IV and early V periods, or roughly from the 12th through the 17th centuries, with the exception of the Spanish mission period AD 1629 - 1700 when wood and animal dung fuels replaced coal. Hack suggested that these latter fuels could have been utilized as a result of the dwindling supply of easy to reach coal in combination with the availability of pack animals and carts with which to haul wood which were introduced by the Spanish (Hack 1942a:18). The Spanish introduced sheep, and their dung was subsequently used for firing ceramics. The Spanish may have objected to the use of coal as a household fuel as the subituminous Awatovi coal has a definite sulfur odor upon burning.

Coal was mined prehistorically [redacted] both strip and open face underground techniques (Hack 1942a:8; Maps 16, 17). Of the two methods, strip mining was the more common, and accounted for most of the coal removed as it required only the removal of overburden. The coal was then sorted at the removal site. This method was very effective as long as the overburden was not extensive. Where the coal seam was exposed on a steep slope with extensive overburden, open face underground mining was undertaken.

[redacted] primitive form of the underground longwall technique was used "...in which the mining was carried in under the thick overburden of sandstone at the back of a strip mine. The overburden was held up by "gob" packed in behind the miner" (Hack 1942a:9; Figure 12). Hack estimated that approximately 9,600 square feet were mined and 300 tons of coal obtained by this method (Hack 1942a:17).

[redacted] An estimated 33,000 tons of coal were mined at Awatovi of perhaps 100,000 tons burned in all of the Jeddito towns. The lower coal seam produced 14-17 acre feet of coal (bone removed) and the upper seam, less than one acre foot. At the time of its most intensive output in the Pueblo IV Period, approximately 450

pounds of coal were produced daily (Hack 1942a:17). Based upon the size and number of the heaps with associated sherds, Hack estimated that 250 - 300 tons of coal had been used for firing ceramics (Hack 1942a:17). The rest was used as domestic fuel at Awatovi.

[redacted] provided additional information on the use of coal during the prehistoric period. Eighty-five red and white ash heaps were located [redacted]. The upper seam produced ash with a reddish hue while the lower seam produced a white ash (Hack 1942a:12). The ash heaps were usually about ten feet in diameter, up to three feet high and were roughly conical. Many contained fragments of ceramic wares, indicating the use of the area to fire pottery.

No Tusayan Black-on-White sherds were found in the ash heaps; however, sherds from the Pueblo IV period (AD 1300-1600) ceramics were abundant, identifying this period as the earliest in which coal was used for ceramic firing at this site (Hack 1942a:7). Bartlett (1935) felt that coal firing of ceramics was probably the most important factor in the shift from the production of black-on-white to black-on-yellow wares (Hack 1942a:41-44).

CONTRIBUTING AND NONCONTRIBUTING PROPERTIES

Contributing properties within the Landmark include:

[redacted]e

Noncontributing properties within the Landmark are:

[redacted];

Antonio de Espejo	1583	Later Spanish Expedition that visited Awatovi.
Francisco Porras	1629	Franciscan who arrived at Awatovi and named future mission San Bernardo de Aguatubi.
Francisco de Espeleta	1680	Hopi educated by Franciscan friars of Awatovi; later a leader of 1680 Revolt; also a factional leader who called for destruction of Awatovi in 1700.
Don Diego de Vargas	1692	Charged with reconquest of the Western Pueblos following the 1680 Pueblo Revolt.
Ta-po'-lo	1700	Rival chief of Awatovi at the time of its destruction.
Sachvantewa	1700	" "
Adolph Bandelier	1890-92	Compiled first detailed account of the destruction of Awatovi.
Victor Mindeleff	1891	First detailed map of Awatovi Ruins (Map 3).
J.W. Fewkes Alexander M. Stephens	1892	Hemenway Expedition: archeological investigation to verify destruction of Awatovi.
John O. Brew	1935-39	Awatovi Expedition: one of earliest scientific interdisciplinary studies in the American Southwest.

The ruined pueblo is an excellent representative of the phenomenon of 13th to 14th century site aggregation which followed the 12th to 14th century abandonment of large areas of the Southwest by prehistoric Anasazi farmers. It contains the archeological record of the development of the material culture of the ancestral Hopi as well as the changes in the material culture and architecture which resulted from the period of European contact and missionization. The associated agricultural field systems and coal mines are exemplary of regional prehistoric adaptions and the subsequent development of specific adaptive technologies. As the pueblo was attacked by surprise, and not abandoned, the artifacts of daily life are preserved in the ruin. The ruin is, thus, a time capsule of missionized native life and is especially significant under Criterion 4.

The kiva murals exposed by the Peabody Museum excavations and described by Smith (1952) are among the finest representations of Native American art in the Americas. In addition, they graphically illustrate the ceremonialism of the prehistoric Western Pueblo peoples. Many of the design elements utilized in the kiva paintings are also found on the decorated ceramic wares produced by the occupants of Awatovi and are illustrative of the greater culture. The kiva murals are, therefore, of national significance in terms of both artistic and historic merit.

The coal mining areas, including the ceramic firing sites, and agricultural sites are of exceptional historic significance as examples of adaption to a specific environment. In addition, they illustrate the influences of the Spaniards upon the native culture, and thus, are historically significant. Together, the kiva murals and the mining and agricultural resources are significant under Criterion 5.

Awatowi Ruin is significant under Criterion 6 for its potential to provide information on a multiplicity of scientific research topics. The scientific investigations undertaken by the Peabody Museum of Anthropology and Ethnology of Harvard University from 1934 to 1939 were important to the development of the archeological discipline. The expedition staff included a number of scientists and scholars whose disciplines had not been utilized routinely in archeological studies. The contributions of these specialists to the project provided a firm basis for the subsequent inclusion of interdisciplinary specialists in archeological investigations. The Peabody Museum project may, therefore, provide information on the history and development of the discipline of anthropology.

A full reporting of the Awatovi Expedition's work has not been completed or published. As a result, records and collections obtained by the Expedition and curated by the Peabody Museum offer exceptional opportunities for study. The

collections, and the remaining unexcavated portions of the Ruin, are a research data bank for scholars of the prehistoric and historic Hopi and Spanish Colonial periods.

The prehistoric kiva murals and ceramic wares of Awatovi suggest that its inhabitants made significant contributions to the world-renowned artistic development of the Hopi. In addition, the kiva murals present an outstanding opportunity to study and interpret the ceremonial life of the prehistoric inhabitants of Awatovi. The Ruin contains the potential to provide further information from undiscovered resources remaining in the unexcavated portions of the site.

The unexcavated archeological remains of the prehistoric and historic pueblos and the mission complex are outstanding representatives of the Pueblo III through V and Spanish Colonial periods of construction. The remains of the Pueblo V native village are especially important as they contain, in addition to the buildings, a stratified record of the material changes and adaptions resulting from the period of European contact and missionization. As the native village was depopulated at the time of the final destruction of the third mission, there have been no intrusive, later occupations of the site to confuse the record of this period. The evidence to investigate the various legends of the destruction of Awatovi probably remains in the unexcavated eastern village area.

Of the five large aggregated 13th to 14th century villages [redacted] Awatovi alone survived into the Spanish period; therefore, the Ruin contains unique information to address 13th to 14th century Anasazi settlement abandonment/aggregation and sociopolitical/organizational questions of Southwestern archeological research. The coal-fired Jeddito Yellow, Awatovi Black-on-yellow and Sikyatki Polychrome wares produced at Awatovi are central to the study of these problems and others involving migration and trade in the Southwest.

The coal mining and agricultural resources have the potential for providing information on prehistoric technologies and adaptions to the arid environment of the Southwest. The potential for evidence of Spanish influences on irrigation gardening is, perhaps, unique.

In summary, Awatovi Ruin is an outstanding resource which represents the following National Historic Landmark themes, subthemes, facets and subfacets (U.S. Department of the Interior 1987):

I. Cultural Developments: Indigenous American Populations

B. Post-archaic and Pre-contact Developments

8. Southwestern Farmers

C. Prehistoric Archeology: Topical Facets

1. Prehistoric Architecture/Shelter/Housing

2. Prehistoric Technology

12. Prehistoric Settlements and Settlement Patterns

16. Agriculture/Plant Domestication/Horticulture

D. Ethnohistory of Indigenous American Populations

1. Native Cultural Adaptions at Contact

e. Native Adaptions to Southwestern Environments

2. Establishing Intercultural Relations

e. Defending Native Homelands

f. Defending Native Religious Systems

g. Introduction to Foreign Religious Systems

h. New Native Military Alliances

3. Varieties of Early Conflict, Conquest or Accomodation

a. Transfer of Technology to Native Peoples

1) Domestic Plants and Animals, Cultivation and Husbandry

b. Forced and Voluntary Population Movements

3) New Inter- and Intra-group Alliances

c. The New Demographics

1) Disease and Massacres: Their Cultural and Biological Effects

2) Depopulation of Terrain

d. Changing Settlement Types

5) Missionized Settlements

II. European Colonial Exploration and Settlement

A. Spanish Exploration and Settlement

3. Southwest

XIII. Science

D. Social Science

1. Anthropology

PREHISTORIC ARCHEOLOGICAL SIGNIFICANCE

Settlements and Settlement Patterns

During the last half of the 13th through the 15th centuries, the settlements and settlement patterns of the prehistoric Anasazi peoples of the Southwest changed dramatically. As early as the Pueblo II period, roughly between AD 900 - 1100, the Western Anasazi province of the Pueblo culture experienced a rapid population increase which was followed by the virtual abandonment of the occupied territory over the next three centuries (Cordell 1984; Plog 1979; Map 19). In the Kayenta Anasazi culture area of northern Arizona [redacted] village aggregation began around AD 1150 and large pueblos were built between AD 1250 and 1300 [redacted] 1979; Cordell 1984; Plog 1979). At AD 1100, occupation in the Hopi area was characterized by small hamlets and pueblos and isolated farmsteads. The major cultural affiliation for the Hopi area seems to have been with the Kayenta Anasazi to the north (Brew 1979:514):

> From the middle of the thirteenth century, for 100 years, the population on the Hopi mesas grew and grew as the populous centers [redacted] were abandoned...Consequently, during the last half of the thirteenth century and the first half of the fourteenth a striking change is noted not only in the size of sites but also in their

> contents ... Traits previously foreign to the [Kayenta Anasazi] area became integral parts of the culture. [redacted] was particularly noticeable in pottery...The Hopi country became one of the three major centers of Pueblo life during the fourteenth, fifteenth, and sixteenth centuries, along [redacted]

Hopi legends describe migrations which involved a series of locations prior to final settlement on the Hopi Mesas. Hale and Harris (1979) suggest on the basis of linguistics, the identification of the ancestral Hopi with the Kayenta Anasazi; however, distinctive Little Colorado Whiteware ceramics produced at sites along the Little Colorado River in the Chevelon-Chavez Province in the 12th, 13th and 14th centuries are clearly ancestral to Hopi ceramics (Nequatewa 1967; Plog 1979; Map 19). Following the abandonment of most of the Kayenta Anasazi culture area, the only remaining villages were those of the ancestral Hopi [redacted]

That Awatovi was probably settled first by the Kayenta Anasazi has been disputed. Fewkes (1899), Hough (1903) and Hargrave (1935) felt that the occupants of the Jeddito pueblos and Sikyatki were a different people from the Hopi. Smith (1971), however, cites evidence from Daifuku (1961:62) that the earliest inhabitants of Antelope Mesa were a "...fusion population with elements from both south and north...". Ellis (1967) believes that to the original Kayenta Anasazi population were added groups from [redacted] Smith, following his exhaustive study of the ceramics of the Western Mound at Awatovi concurs, in general, with Ellis:

> In middle Pueblo III, when Awatovi appears to have been established, its major affiliations were almost certainly with the people who were then living [redacted]. Perhaps at the beginning, and certainly soon afterward, marked cultural influences from the [redacted] as well as others from the direction [redacted].

Cordell (1984) notes that, following the initial phenomenon of aggregation, a redistribution of earlier aggregated populations took place to even larger sites between AD 1275 and 1540 as exemplified by the sites of Awatovi and Kawaika-a [redacted]s and the Homolovis in the Chevelon-Chavez province. The Peabody Museum excavations at Awatovi determined that the town (Western Mound) was well-established by the late 12th or early 13th century (Brew 1979).

The occupation of the large [redacted] sites of Awatovi, Kawaika-a, Chakpahu, Nesuftonga, Kokopnyama and Lululongturque began in the Pueblo III period, apparently during the 13th century and reached its greatest extent during the 14th and 15th centuries (Brew 1952:xii). By the beginning of the 16th century, [redacted] villages had been abandoned, with the exception of Awatovi and Kawaika-a. By the mid-16th century, Awatovi alone remained to receive the first Spanish explorers (Eggan 1950; Woodbury 1954).

Research Problems

Research interest in the regional settlement patterns, including aggregation/abandonment of large, multistory masonry villages has been consistent throughout the history of anthropological work in the Southwest. It has been especially intense in the most recent decades, however, and has tended to concentrate in the Western Pueblo region in many sites which are presumed to be ancestral to the modern Hopi. Based upon demographic data, Stephen Plog (1969) noted only four population movements for the entire period between AD 300 and 1700 - from Tsegi, Canyon de Chelly, Mesa Verde and the Upper Little Colorado to the Hopi mesas between 1250 and 1350. Research undertaken at Hopi ancestral sites in the Little Colorado region has sought to determine the socio-political organization of the prehistoric population as well as to investigate the reasons for the aggregation of population in these sites and the ultimate abandonment of the region (Cordell 1984; Upham 1982; Upham and Plog 1986).

Chavez Pass Pueblo (Nuvakwewtaqa), a large, aggregated village [redacted] was occupied prior to AD 1300, most intensely occupied in the early 14th century and abandoned in the mid-15th century. Upham (1982) has identified social ranking, with elite status based upon possession and control of highly desirable trade wares recovered from high-status burials at Nuvakwewtaqa. Upham noted that in the 14th century, there were nine settlement clusters, each with several large pueblos, within the Western Pueblo region. One of the clusters was in the Hopi area, and included [redacted] He feels that the ceramics at the sites indicate organizational ties between sets of settlement clusters and postulates several alliances based upon the occurrence and distribution of valuable trade items. Jeddito Yellow wares from the Hopi area were the most widely traded 14th century ceramics. Upham has proposed that as the Yellow wares occur differentially within the sites, particularly with high status burials, they provide evidence of differential access to highly valued trade items and an exchange network controlled by an elite. He has proposed the existence of several elite, trade-based alliances, of which a "Jeddito Alliance" includes the 14th century villages of the Hopi, the Middle Little Colorado, Anderson Mesa, Puerco and Verde areas. Upham (1982:201) hypothesizes:

> ...the collapse of the fourteenth-century regional system can be understood as a series of failures, either in agricultural production or in political management, that had a domino effect on the remaining polities in the system. This effect would prove most costly to population centers that were proximate to one another and that may have established dependence relationships with their neighbors.

Ethnographic data do not appear to support Upham's hypotheses; rather, they indicate "...status is reflected in differential access to and possession of ritual and ceremonial information..." (Cordell 1984). To explain this apparent disagreement, Upham (1982) argues that the effects of the European contact on the Hopi system were so devastating as to have disrupted the prehistoric system and resulted in the establishment of the ethnographically recorded social system. As Cordell (1984:350) notes, under this interpretation "...the modern Western Pueblo [Hopi, Zuni, Acoma] survived because they were peripheral and less economically dependent upon the remainder of the system."

This view of aggregation/abandonment is not shared by the researchers at Grasshopper Pueblo [redacted] which was occupied from the late 13th century and abandoned in the late 14th century (Graves et al. 1982). The research at Grasshopper Pueblo suggests that there was little or no change in the socio-political organization of the pueblo, no evidence of political hierarchy or an elite system, and that "...the instability and failure of the aggregated communities occurred because 'the political organization of these communities did not undergo significant development in the direction of increased complexity and differentiation,'" (Graves et al. 1982:210, in Cordell 1984:347). As a result "...the lack of a political structure that could have countered divisive trends within and among communities, intensified agricultural production, or controlled the exchange of goods led to regional depopulation" (Cordell 1984:206).

Neither the Grasshopper nor the Chavez Pass Pueblo studies address the destination of the populations following abandonment in more than a general way. It is accepted that at least some of the population of Chavez Pass Pueblo migrated to the Hopi area; what is not clear is why they chose this destination and were accepted by and integrated with a vigorous resident population. Eggan (1950) has suggested that the migrating Little Colorado populations may have had a socio-ceremonial system which was based upon matrilineal clan descent and residency and that such a system could maintain group integrity, as clan and phratry systems could be successfully integrated. Further research in both the Little Colorado and Hopi regions is necessary to understand not only the abandonment of the prior area, but also the focused aggregation in the latter. As Awatovi was already well-established prior to the addition of Little

Colorado, and perhaps other, populations, the site has tremendous potential to address this area of research.

It is obvious that the causes and results of population aggregation/abandonment have yet to be agreed upon, or perhaps identified. Since the distribution of Jeddito Yellow wares has figured so prominently in the current research, it would seem likely that data from Awatovi would provide important information to address research problems. That this premier trade ware was produced in quantity at Awatovi is attested by the number and size of the ash heaps containing Jeddito Yellow Ware sherds below the Ruin. In addition, the influence of the Little Colorado area upon the original Kayenta Anasazi ceramic tradition may be adduced and dated, providing additional information on the process of aggregation, and perhaps the social organization, at Awatovi. The study of the Western Mound and Eastern Pueblo may also contribute direct information on the process and rate of site aggregation, and the comparison of data from Awatovi, which was not abandoned, with data from sites which were (such as the remainder of the Antelope Mesa sites) could provide new information with which to address abandonment/aggregation problems. Upham and Plog (1986:236) felt that Awatovi might contain archeological evidence to adddress distinctions between consensual ["Grasshopper"] and cooptative ["Chavez Pass"] sociopolitical organization in the 14th century. In addition, they felt that the Eastern Pueblo might contain evidence of how the village's political organization may have changed as a result of European influences. The distributional data within the site are, thus, important to the examination of Upham and Plog's "Chavez Pass" theoretical model.

Aggregation/abandonment research is obviously an issue of great complexity and includes not only socio-political factors, discussed above, but also complex environmental factors, and the architectural, technological and social responses to environmental stress. For example, Euler et al. (1979:1089), drawing upon convergent archeological, geological, palynological, dendrochronological and radiometric data, found that many prehistoric cultural and demographic changes on the Colorado Plateaus coincided with environmental fluctuations defined by precisely dated geoclimatic and bioclimatic indicators. These coincidences support the interpretation that socioeconomic changes and population displacements were commonly triggered by environmental stress. A similarly focussed study of the Awatovian's responses to environmental stresses may also provide answers to settlement research problems (See Agriculture, Plant Domestication, Horticulture, Architecture, Shelter, Housing, and Technology below, and Hack 1942).

Agriculture, Plant Domestication, Horticulture

An agriculturally-based population has lived in the Hopi region for at least 1100 years, based upon evidence of soil and water control devices (Plog

1979:111). Considering that the Western Pueblo areas suffer a greater risk of departure from normal growing conditions and a resultant loss of crops than the Rio Grande Pueblos, the development of a successful agriculturally-based economy was an enormous feat. During this time, the Western Pueblo population has remained basically sedentary, although some hunting and gathering may have contributed to the subsistence base (Woodbury 1954).

As Plog (1979:160) noted "The Hopi did ultimately develop an agricultural strategy appropriate to the substantial variability in rainfall characteristic of the Colorado Plateau, yet by the time they did so, most portions of the plateau had been abandoned." The remains of the Awatovian's agricultural systems over the last 500 years are a significant record of man's response to changing physical and socio-political environments in the Southwest and reflect the population's responses to environmental stress.

The Awatovians were able to support an aggregated population in a marginal agricultural area by adapting their farming techniques and developing strains of cultigens peculiarly suited to the region. As described in Section 7, the roots of Hopi corn were bred to take advantage of the deep water table in the sand dunes and the size of the plant was stunted to allow it to survive both the drying and force of the wind in the flood-water, seepage, and rainfall fields. Gossypium hopii, Hopi cotton, was also bred for use in secular and ceremonial clothing. Various bean varieties were developed, each uniquely suited to one of the four agricultural techniques.

The socio-political and religious organization supported the agricultural system. The basic social unit was the matrilocal household. Matrilineal exogamous clans controlled both agricultural land and ritual. The tribewide Kachina cult also assured sufficient rain and general well-being. Each clan held lands in areas where each of the four basic agricultural techniques could be utilized, thus guarding against a total crop loss. In addition, the clans planted crops in both upland and lowland areas so that some crops would be benefitted in either a cold/wet or a warm/dry climatic regime (Martin and Plog 1973). The efficacy of this ancient system is attested to by the present day Hopi from First and Second Mesas, descended from Awatovi clans, who farm lands in Tallahogan and Bluebird canyons.

Research Problems

The prehistoric agricultural resources of Awatovi present significant examples of a unique, highly developed system of agriculture and horticulture which may have application to many current marginal agricultural areas throughout the world. The study of Awatovi's agricultural systems and cultigens could provide information on the development of plant strains uniquely suited to arid lands. That the original development of the strains was undertaken successfully in

prehistory suggests that these robust plants might be imported as successfully to third world countries with similar physiographies by utilizing Hopi farming techniques.

Pollen studies of intact deposits, both in the agricultural and village settings, may provide detailed information on the development of cultigen strains and may also contribute to a better understanding of climatic changes which may have affected the greater Southwest during the period of aggregation/abandonment. As the village deposits are usually datable by ceramic seriation, and often by dendrochronology, and may preserve plant remains, they are particularly valuable to studies of pollen and plant macrofossils. The Western Mound and Eastern Pueblo of Awatovi contain a continuous, 500 year record of pollen and plant macrofossils, including the important protohistoric/European contact boundary deposits.

Architecture, Shelter, Housing

Awatovi Ruin contains a continuous record of prehistoric occupation immediately prior to and during the period of population aggregation/abandonment of the 13th through mid 16th centuries. As it is the only Antelope Mesa pueblo to survive into the historic period, the record of architecture, shelter and housing it preserves is, perhaps, unique to the Hopi region. Although extensive excavations were undertaken by the Peabody Museum personnel in the Western Mound and Eastern Pueblo, the data and analyses of the prehistoric architecture have never been published; therefore, the intact architectural remains of Awatovi ruin are highly significant for the research values which they contain.

Research Problems

Smith (1952, 1971) found evidence of a change in the style of wall construction in the Western Mound which was correlated with a change from Jeddito Black-on-orange and earlier wares to Awatovi Black-on-yellow wares and the introduction of kiva mural painting. Further investigation of the architecture associated with this change could be undertaken to determine the date and possible cultural implications of the change. Is there evidence for the immigration of a different cultural population, based upon architecture, or does this change appear to have developed within the resident population?

At the time of the abandonment of the Western Mound, approximately A.D. 1498, does the architecture of the newly constructed Eastern Pueblo provide evidence of the immigration of a different cultural population? If so, what immigrant populations are represented? Does the architecture of the Eastern Pueblo differ from that of the Western Mound, and if so, how? Data from dendrochronological and radiocarbon studies may be used to answer the chronological aspects of these questions.

Does the architectural record from Awatovi Ruin support either the "Grasshopper" or the "Chavez Pass" model of socio-political organization? Whether, as Upham and Plog (1986) believe, Awatovi Ruin contains evidence to support their hypothesis of the growth of cooptative socio-political organization during the aggregation/abandonment period, further research may provide significant information to the general understanding of the aggregation/abandonment phenomenon throughout the Southwest. If the "Chavez Pass" model is to be supported, one would expect to find architectural evidence of this highly stratified system of elite control, especially in the household organization and storage areas of the Eastern Pueblo.

Kiva Murals

The kiva murals are a highly significant aspect of the architecture at Awatovi, in terms of research potential and aesthetic quality. Hibben (1975: xiii) has suggested that kiva art is "...an art form which is probably the earliest found within the boundaries of the United States, except for petroglyphs and pictographs." As noted by Smith (1952, 1979) the kiva murals are among the finest examples of indigenous Native American art. Not only are they exquisite renderings, they provide evidence unobtainable from any other source of the richness and complexity of the ancestral Hopi religion. The value to Southwestern anthropological research of the kiva murals cannot be overestimated. The murals "...constitute a constant feature of kivas throughout the occupancy of the village" (Smith 1952) and thus preserve a record of the ritual and artistic development of the Awatovians.

Smith (1952:57) summarized the known occurrences of kiva murals within the Southwest. The earliest kiva murals occurred early in the Pueblo II period at Alkali Ridge, Utah; Montezuma County, Colorado; and Chaco Canyon, New Mexico, indicating "...the apparent limitation of the art during P [Pueblo] II to the northern and eastern parts of the San Juan drainage." This suggests that the painting of kiva murals was an early development in the Kayenta Anasazi culture area.

During the Pueblo III period, the area of known kiva and secular murals expanded to the southwesterly San Juan drainage in the Canyon de Chelly as well as to the Upper Little Colorado and northwest Rio Grande areas. In Pueblo IV, during the abandonment/aggregation period, kiva mural painting centered in the Jeddito Valley, Rio Grande and Zuni areas (Smith 1952: 67).

In 1935, coincident with the Peabody Museum Awatovi excavations, murals were discovered in a kiva during the excavation of the Rio Grande pueblo of Kuaua, north of the town of Bernalillo, New Mexico (Dutton 1963). During the 1954-1962 excavations at Pottery Mound, west of Albuquerque, New Mexico, murals were discovered on the walls of seventeen kivas (Hibben 1975). In all of the sites,

including Awatovi and Kawaika-a, the murals were dated to the Pueblo IV period, roughly AD 1350 - 1500, on the basis of associated ceramics.

In his analysis of the Awatovi and Kawaika-a kiva murals, Smith (1952:149) saw "...an artistic kinship between the Jeddito murals on the one hand and the somewhat earlier pottery of the Upper Little Colorado area...". He thought, however, that the Kuaua murals resembled those of Jeddito more closely that any others known to date. It is clear now, that the Pottery Mound murals are probabl ycloser in resemblance to those of Awatovi than those of Kuaua. The Pottery Mound murals contain design elements of Sikyatki Polychrome ceramics, as do those of Awatovi; however, the Kuaua murals do not and are, therefore, thought to be earlier (Dutton 1963). The Pottery Mound murals contained many representations of "Anasazi Maidens" with the typical maiden's hairdo, coiled over the ears (whorled), present in the Awatovi murals and traditionally worn by Hopi maidens. Maiden's hair whorls were found in one Kuaua mural, however (Dutton 1963:130). Smith (1952) identified the ritual use of feathers in the Jeddito murals and Hibben (1975:96) concurs that "There is little doubt that Pottery Mounds usage [of feathers] parallels that in the Hopi area." Feathers are also an important ritual element of the Kuaua murals. In drawing a further parallel, Hibben (1975:20) found that the Pottery Mound kivas could be compared to the present-day Hopi kivas of the same type. The colors and method of plastering of the Pueblo IV period kiva murals are similar and the kivas containing the murals are all square in construction.

Research Problems

Smith (1952:164, 315) recognized that "The ultimate [research] problem...is that of the history of cultural interchanges between the several Pueblo and non-Pueblo groups in the Southwest" and that "...one of the most important questions to be answered is that of the time sequences involved and the fixing of dates for the several complexes of material culture that can be defined." There is evidence of a strong tradition of religious art and general similarities in its content and execution suggest a widely shared prehistoric pueblo religious tradition (Cordell 1984:343). The research potential of the remaining intact Awatovi kivas to address these topics is high. As all of the investigated Jeddito kivas contained murals, it is expected that the remaining kivas will also. Recovery of further kiva murals would expand the known data base and allow for comparative inter-/intra-site studies of cultural interchange.

The information contained in the Awatovi murals is of especial signficance as it is known that several distinct populations migrated to the Hopi area during the abandonment/aggregation period. Regionally distinctive design and/or ritual elements may be found in the murals which may address this problem, including some details which cannot be found archeologically - hair and clothing styles, perishable items. Identification of specific rituals by present-day Hopi may

provide an affirmation of their clan histories or provide ritual information which may have been lost following Awatovi's destruction.

Smith (1952) felt that his relative dating of kiva murals by kiva fill ceramic seriation supported the relative chronology of stylistically segregated "Layout Groups." It is possible, however, that Smith's "Layout Groups" may not be chronologically related solely, but rather may result from the use of specific kivas by specific clans and/or societies for specific ceremonies requiring specific "Layouts Groups." Although kiva murals have been and will probably continue to be dated on the basis of the stratigraphic seriation of ceramic types in the kiva fill, it may be possible to directly date small, organic inclusions in the plaster layers upon which the murals are painted, or organic carbon used for black color through the use of accelerator radiocarbon determinations, and thereby to more securely date the rendering of the mural. Thus, the initial occurrence of design elements could be dated and relationships of the design elements followed through time. Such questions as "Were the Kuaua murals earlier than the Jeddito and Pottery Mound murals, or did they simply lack influence from the Little Colorado River populations?" may be investigated.

The large number of kiva murals which undoubtedly exist at Awatovi constitute a buried treasure of tremendous significance, especially considering all of the other research problems that the information which they contain may be used to address. In addition, the continued research of kiva murals would contribute further to the existing collection of this exquisite Native American art.

Technology

The technological and artistic excellence of ancestral Hopi ceramics has seldom been equalled in the Southwest, or indeed the United States. That the Jeddito Yellow wares were the premier trade ceramic of the Pueblo IV period in the Southwest is undisputed. The quality of the ceramics was probably closely tied with the coal firing utilized from the inception of the production of Jeddito/Awatovi Black-on-orange wares until the mid-17th century Spanish mission period. The ceramic and coal mining technologies are, thus, closely related. Nowhere is this more apparent than in the ceramic sequences and the associated ash heaps and coal mines at Awatovi (Map 16). The controlled oxidizing atmosphere and high temperature of coal firing, together with the use of a pure clay with no temper, produced the distinctive, soft yellow color and high quality of the Jeddito Yellow wares. The beautiful and distinctive designs of the Sityatki Polychromes are the culmination of the technical and artistic florescence in the ancestral Hopi ceramics.

In the 13th and 14th centuries, a few ceramic types were widely traded and their design elements were copied on locally produced wares (Cordell 1984). In central Arizona, in the Sinagua culture area above the Mogollon Rim, the period

between AD 1050 - 1450 was characterized by local hiatuses and village aggregations. Plog (1983a, in Cordell 1984:118) suggests that some "...local areas developed strong patterns which influenced the ceramic assemblages and settlement configurations in other local areas. Further, the locations of strong patterns shifted over time..." AD 1050-1100, Winona villages;...AD 1125-1200, the Chevelon drainage;...AD 1270 southeast to large aggregated sites, including Chavez Pass Pueblo. Associated ceramics at Chavez Pass included local White Mountain Redwares as well as Jeddito Yellow trade wares. The Pinedale style of White Mountain Redwares, common between AD 1300-1375, is considered ancestral to Hopi ceramics.

Until approximately AD 1300, Hopi ceramics were a regional variation of the Kayenta-influenced wares common in the Southwest (Brew 1979:516-517):

> Then, with the advent of the fourteenth century, came an artistic explosion. The black-on-white designs, beloved of archeologists but relatively undistinguished, were superseded by brilliant black-on-orange designs and orange polychromes. These in turn were superseded by black-on-yellow types quite different in design layout and execution from any other Pueblo ware. By the addition of red to this, a polychrome [Sikyatki Polychrome] was produced...the late prehistoric Hopi yellows and polychromes are characterized by startling sweeping curvilinear motifs; bird, animal, floral, and human representations; and religious masks and ceremonial scenes. Their freedom of rendition is completely at variance with the canons of all other prehistoric Pueblo schools of pottery design, except for the contemporary Mimbres ware in western New Mexico, which shared some, but far from all, of its freedom from established tradition.

Prehistoric coal mines have been found only in the Black Mesa region of Arizona (Hack 1942a), of which the Hopi Mesas are the southwestern extension. At site AZ:D:9:2, coal fragments were found in the hearth of a Basketmaker III pithouse (approximately AD 500 - 600) (Ward, in press; Gumerman et al. 1972:24) and there is what appears to be coal ash in several Pueblo II sites. The incidence of early yellow sherds is coterminous with the Black Mesa coal fields (Gumerman et al.:24), consistent with Hack's (1942a) findings in the Jeddito area.

Of the Jeddito coal mines, the Awatovi mining area is certainly the largest and appears to have been the most actively worked (Hack 1942a:17). Coal was mined continuously at Awatovi for 300 years utilizing the strip, longwall and room-and-pillar methods (Hack 1942a:8-9).

Coal was not only used for the firing of ceramics; it was also used for cooking, heating and as a source of pigment. Coal ash was used as a bed for

flagstone floors. The use of coal in the kivas apparently had some ritualistic significance, as both wood ash and coal ash occur in separate kiva hearths (Brew 1979:517).

Awatovi Ruin contains an unbroken record of the prehistoric technological advances in ceramics production and coal extraction and use as developed by the ancestral Hopi. It is also an outstanding example of native cultural adaption to the Southwestern environment.

Research Problems

A descriptive study and analysis of the ceramics of the Eastern Pueblo is essential to the investigation of many research topics. As ceramic studies form the major chronological and cultural determinants in much Southwestern research, the completion of studies of the Awatovi ceramics would be a highly significant contribution. As noted above, research at Awatovi Ruin is expected to address settlement-subsistence, population and demography, trade and communication, adaptive strategies, cultural-stylistic problems, and especially the transmission and/or reception of inter-/intra-pueblo cultural traits. Ceramic research at Awatovi is expected to play a significant role not only in these research areas, but also in studies of the development of technologies and artistic styles. The entire ceramic record of the 13th - 17th century abandonment/aggregation period is present at Awatovi and further ceramic research would undoubtedly contribute to a greater understanding of this phenomenon.

Brew (1979) has noted that there is no known evidence of why coal came to be used by the ancestral Hopi or why its use was abandoned at the inception of the Spanish mission period. He has hypothesized that coal may have been used initially by the Hopi as wood was rather scarce and it was probably easier to use coal than to cut and haul wood with the existing stone technology. Further, he has suggested that use of coal was discontinued because the readily available coal had been mined and the Spanish-introduced iron axe, cart and donkey would have facilitated the collection of wood. Also, sheep dung was close and plentiful in the Awatovi corrals (Brew 1979:518). Research is necessary to confirm or reject these hypotheses, or to investigate unidentified causes.

HISTORIC SIGNIFICANCE

Spanish Exploration and Settlement in the Greater American Southwest

The Jesuits and the Franciscans

Because of the stories of the golden cities of Cibola, the eastern pueblos of New Mexico became a strong focus of Spanish interest earlier than the Chihuahua/Sonora region in northern Mexico. Coronado's violence fell on the Pueblo villages seventy years before Spanish soldiers from Durano put down the Tepehuan revolt. Missionization of the Pueblo Indians was under way ten years before the Jesuits began work with the Tarahumaras, nearly twenty years before the first baptisms among the Yaqui, and almost one hundred years before Father Kino established the Dolores mission among the upper Pimas. Spicer (1962:152) tells us:

> Marked differences characterized the Spanish approach to the northern as compared with the southern Indians. One important contrast lay in the planned program for colonizing the valley of the Rio Grande, in contrast with the unsystematic infiltration of Spanish settlers into New Biscay and Sonora. Another difference which had important consequences was the attempt to institute political control at a single stroke over the whole of New Mexico in contrast with the century of slow, if unsteady, advance of political control in the south. A third difference was the placing of the missionary program in the hands of the Franciscans rather than in those of the Jesuits, and the simultaneous institution of missionary and civil authority, in contrast with the southern plan of missionary advance before imposition of political control. These differences in the Spanish approach were so great and so important in their consequences that the north and the south must be considered to be two quite distinct contact areas.

Thus in the greater American Southwest two frontiers were in the process of development at the same time; one in the south where the missionary side of the Spanish advance on a tribe by tribe basis was Jesuit, and one in the north where military colonizing expeditions included Franciscans who were to command the missions. Where Jesuit contacts to the south had been with diverse hunter-gatherer tribes whose houses were strung out for miles along stream courses, the Franciscans encountered in the Rio Grande area of New Mexico a large number of villages of similar character. These autonomous villages were nucleated with several two- or three-story houses and contained several hundred inhabitants. Irrigation agriculture was well-developed and the mainstay of life. The familiar Spanish program of reduction of the Indians into compact settlements

of the basic Spanish rancheria pattern did not apply where villages were already reduced to compact villages.

The Western Pueblos

Although initial contact with the Zunis was made in 1539 by Esteban, a member of Cabeza de Vaca's expedition, and contacts with both the Zuni and Hopi were made by Coronado's party in 1540-41, the western pueblos remained frontier margins of the colony being built up on the Rio Grande until missionizing efforts began in 1629.

To reach the Province of Tusayan and the Moqui, as the Spaniards called the Hopi region and its inhabitants, one travelled north and west from Hawikuh, a Zuni pueblo. Of the villages of the Moqui (present day Hopi) people, Awatovi was situated in the most southeasterly position and was probably the only occupied pueblo on Antelope Mesa at the time. Thus, it would have been the first village to be encountered by Spanish explorers (Map 1).

In 1540, General Francisco Vasquez de Coronado dispatched Pedro de Tovar with seventeen horsemen and several footmen to find the Province of Tusayan, said by the Zuni Indians to consist of seven villages. That this was the last of the pueblo "provinces" to be discovered by the Spaniards is undoubtedly the result of the physical isolation of the Hopi area from the more heavily populated Rio Grande Valley. The most important goal of Tovar's journey was to find a route from New Mexico to the "South Sea" (Gulf of California). Tovar was accompanied by a Franciscan friar, Juan de Padilla. The Spanish first contacted the Moqui at Awatovi, where following a brief skirmish, presents were given and Tovar moved on to other Hopi towns to the west. While among the Moqui (Hopi), Tovar learned of a great river to the west. The report of the river stimulated a second expedition in 1540 to the Province of Tusayan by Don Garcia Lopez de Cardenas to seek a river passage to the Gulf of California. Cardenas was well received in Tusayan and was provided with Moqui (Hopi) guides. His party discovered the Grand Canyon of the Colorado River, but was unable to find a route across.

The Hopi were apparently forgotten by the Spaniards until 1583 when an expedition led by Antonio de Espejo was received in friendship at Awatovi. Espejo responded by taking possession of the pueblo for His Majesty of Spain. Although the Hopi were now subjects of His Most Catholic Majesty, they were again left to themselves for fifty years, as the attention of the Spaniards was focused on the consolidation of the Rio Grande region (Montgomery et al. 1949).

In 1629, however, 30 Franciscan friars were sent from Mexico City to the seat of the Spanish colonial government in Santa Fe to facilitate the conversion of native populations. This influx of religious allowed for the conversion of the

Western Pueblos of the Zuni, Acoma and Hopi. For the Hopi, this was a crucial link in the chain of events which would ultimately end in the destruction of Awatovi (summarized from Montgomery et al. 1949; Brew 1979).

It is important to recognize that, aside from the goal of conversion of the heathen to the Catholic faith, there was no reason for the Spaniards to establish a foothold in the Hopi towns. Trade was not a serious objective, as the Hopi produced no large surpluses of food, nor any native products or raw materials which were of especial value to the Spaniards, nor were there other population centers nearby which might be economically exploited. To the Spaniards, the Province of Tusayan was an isolated outpost, so much so that, unlike the Rio Grande Valley, no hispanic settlements were ever established in the region. The Spanish presence was limited solely to the religious and their support systems, and to occasional military and traders.

The history of Spanish Franciscan contact with the Hopi region is, thus, unique in the overall history of Spanish exploration and settlement of the Southwest. While the initial exploratory phase of Spanish contact was consistent with that of the Rio Grande Valley, Spanish interest in the area soon flagged, allowing the traditional Hopi lifestyle to continue for fifty years, relatively unaffected by European contact.

As the first of the Hopi pueblos to be contacted by Europeans, Awatovi Ruin is significant for the central role that its inhabitants played. This large, successful village, the only remaining town on Antelope Mesa, home of the powerful Bow and Arrowshaft clans, received the Spaniards in friendship and in doing so, may have provided the assurances that supported the sending of missionaries to the Hopi in 1629-30. Had the Awatovians repulsed the initial Spanish contacts, the Hopi chapter in the history of the Southwest may have been rewritten.

Research Problems

While historians have dealt with Spanish military history as well as the social, political and religious activities of the Jesuits and the Franciscans, archeologists have not yet addressed cultural patterns that may be apparent in Jesuit and Franciscan contact sites, especially in terms of settlement patterns and material culture (see Missionized Settlements below). Awatovi, as the principal outpost of the Franciscan missionizing effort in the Western Pueblos, remains the most important site of its type for these investigations.

The nature and extent of change in the material culture of the Hopi as a result of initial European explorations also could be investigated in Awatovi's Eastern Pueblo. It is to be expected that such "gifts" as were received by Awatovians

from the Spaniards would be highly prized and therefore would be likely to be preserved in archeological deposits. It may also be possible to determine if, or when, the Spanish culture began to affect the traditional Hopi material culture prior to the coming of the friars and the establishment of Mission San Bernardo de Aguatubi.

Intercultural Relations

Introduction to the Religious System of Spain

When the Franciscan friars brought the Catholic faith to the Hopi, Awatovi was once again the village upon which their first efforts were concentrated. That Awatovi was the site of the establishment of the first mission among the Hopi is of great significance to the subsequent history of the Spanish conquest in the Southwest.

Two friars of the Order of the Friars of the Regular Observance of Saint Francis, commonly known as Franciscans, Francisco Porras and Andres Gutierez and a lay brother, Cristobal de la Concepcion, arrived at Awatovi on August 20, 1629, the feast day of Saint Bernard of Clairvaux, and according to custom, named their future mission San Bernardo de Aguatubi. The Franciscans were initially resisted in their efforts at conversion by the Awatovians until a purported miracle was performed by Porras. As described by Benavides (1630;1916), the Hopi brought a boy of twelve to thirteen years who had been blind from birth and challenged Porras to place his cross on the child's eyes and cause him to see. If this could be done, they would accept the Christian message and convert to the Faith. Porras put the cross to the boy's eyes and his blindness was cured. This convinced many of the Awatovians to convert and they urged that all Hopi become Christians and be baptized. According to Benavides, Porras was concerned that the "miracle's" authenticity had not been established and he did not want to have the story of the miracle spread to other Spaniards. The word was spread, however, by the Hopi and "...with this great miracle the conversion arose like foam" (Benavides 1630, 1916). Brew (1979:519-520) felt that "...if the citizens of Awatovi 71 years later, in 1700, believed that such a miracle had occurred it would help to explain the unusual strength of their Christianity in comparison to that of the remainder of the Hopi." Whether or not Porras' "miracle cure" in fact occurred, the conversion of a large portion of Awatovi's inhabitants did result, in time, from the Franciscans' efforts. The conversions were met with fear and dismay by the rest of the Hopi who foresaw the disruption of the essential ritual cycles of the Awatovi clans and the resultant disaster that this could cause to the entire Hopi way of life.

Two more missions were established among the Hopi, at Oraibi and Shongopavi, and two visitas at Walpi and Mishongnovi. Christianity at these villages was not

as thoroughly established as at Awatovi, however, and the missions were demoted to visitas and only occasionally visited by priests (Montgomery et al.; Brew 1979). As Christian Awatovi was eventually destroyed by the inhabitants of these villages, the success of the conversions there may be questioned. Either in numbers or in strength of conviction, conversions subsequent to Awatovi's were insufficient to resist the influence and control of the traditional Hopi religion. Porras' eventual death in 1633 by poisoning at the hands of traditional Hopi confirms the perhaps hidden, but high, level of resistance to conversion of the Hopi in general. Whatever the case, Porras was apparently able, dedicated and a good administrator and was probably responsible for the construction of the foundation of Church 1, Church 2 and the Mission Complex.

The relationships of the Hopi and their Franciscan priests were varied. Although enjoying apparent success with many of the inhabitants at Awatovi, there was friction between the Spanish Franciscans and the Hopi Awatovians. Fray Alonso de Posada, assigned to Awatovi from 1653-1655, may have been involved with a Hopi woman and may have had three native men killed in a coverup attempt. Documentary testimony obtained in the Spanish investigation of this incident reveals, however, that in 1662, Guardian Fray Jacinto Mompean and Fathers Jose de Espeleta, Fernando de Monroy and Miguel de Guebara were at Awatovi, indicating the presence of a large staff at Mission San Bernardo. The Relacion of Fray Geronimo de Zarate Salmeron (1664) provides the information that "The pueblo of Aguatobi has a church, a convento and a visita called Gualpi [Walpi], and it has 900 souls under its administration."

Thus, the site of Awatovi is especially significant in that Awatovians may be said to exemplify the general acceptance of the Christian religion in the Southwest on the one hand, and on the other hand, to depart radically from the rest of the Hopi who apparently rejected it.

Research Problems

That the native religion was adversely affected by the Christian conversions at Awatovi is well supported by archeological evidence, such as the abandoned kivas found beneath the altars of Church 2. It is not known how thoroughly the population of Awatovi accepted conversion, nor to what degree the Hopi religion there was affected by it. Research within the Eastern Pueblo may address these problems. For example, is there evidence for the reestablishment of the abandoned kivas elsewhere in the Eastern Pueblo? Is there evidence for the continuation of the full native ritual cycle following 1629, or for the termination of some of the rituals? Can the termination of specific rituals be identified and dated? Are specific areas of the Eastern Pueblo dominated by Christian/Spanish-influenced artifacts? Do specific areas of the Eastern Pueblo lack evidence of such artifacts? What are the common and unique material remains of the practice of Christianity in the native community? Awatovi Ruin

has the greatest potential for answering these and other research questions of any site in the Hopi region as it has not been affected by abandonment or reuse and was, apparently, the most thoroughly Christianized of all of the Hopi villages.

Transfer of Technology to the Native Population - Plants, Animals, Cultivation and Husbandry:

While the Spaniards undoubtedly contributed much in terms of the introduction of new technologies to the Hopi, it should be noted that several of the most highly developed technologies of the ancestral Hopi, ceramics, mural painting and coal mining, declined in quality and/or disappeared. As Awatovi Ruin was the site of the large Mission San Bernardo complex, maintained throughout the period of Spanish occupation, it retains significant evidence of the acceptance of new technologies and the adaption of existing native technologies to Spanish purposes. Probably the most valuable additions to the native technologies were the Spanish wood- and stone-working techniques and assemblages. Important among these were iron knives, axes, adzes, mattocks, picks, crowbars, saws, chisels, planes and augers. The Hopi built and decorated churches and other buildings in the mission complexes, and made furniture and ceramic wares for the kitchens and refectories under the direction of the Spaniards.

Of less importance, but certainly eagerly accepted, were iron agricultural implements including picks, mattocks, and hoes. Although the Spaniards brought new cultigens to the Hopi, including wheat and other grains, fruits (notably peaches) and vegetables, most of them were incorporated into the existing native agricultural system. For example, sand dune planting of peach orchards was found to be especially effective and continues to this day.

One agricultural technique, the use of spring-irrigated terraces, or trincheras, may have been introduced by the Spaniards. Placed on hillsides below springs or seeps, the terraces are irrigated by controlled gravity flow. An outstanding example of this technique, the Tallahogan Gardens below Tallahogan Spring, were farmed by Awatovi clans during the Spanish period and are still farmed by their descendants today. The crops raised in the Gardens are generally those which are rare or tender and can most benefit from the water provided through irrigation and the consistent flow from the spring, such as fruits, vegetables, cotton and dye plants. If this technique is a Spanish introduction, it is not one of those which may be considered of great importance, however, as when Hack (1942:37) surveyed the Hopi region, less than 12 acres total of irrigated gardens were grown.

The introduction of domesticated animals provided a ready source of high quality protein that had not been available to the ancestral Hopi. In addition, the introduction of sheep provided a new fiber, wool, for the Hopi weavers. It is

not yet clear, however, to what extent the Awatovians utilized the cattle, sheep, fowl and other domestic animals introduced by the Spaniards. Given the marginal agricultural environment, it does not seem likely that sufficient feed for a large number of domestic animals would have been available and that there might have been such a high level of competition for available feed that the environment began to be significantly degraded as a result. Hack (1942:66-67) noted that the current epicycle of regional erosion began in 1908 and hypothesized that a change in the vegetative cover was probably responsible. He identified overgrazing by livestock as a possible cause, but noted, however, that only the most recent erosional epicycle could be attributed to this agent and that earlier erosional epicycles might be attributed to agricultural activity.

In addition to domestic animals and new plants, the Spaniards introduced a wealth of European goods to the Hopi. A triennial wagon train brought the products of Mexico City, Puebla, Europe and the Orient to the Province of Tusayan.

Research Problems

The archeological deposits of the contact and historic period at Awatovi undoubtedly contain significant information with which to address the research questions involving the nature and extent of transfer of European technologies to the ancestral Hopi. Given the tight chronological controls at the site, it should be possible to obtain unique information regarding the rate of technological acceptance and spread from the conquering to the conquered group. Research could explore ways in which the Spanish technologies were modified to fit and to augment the existing, successful Hopi technologies, and seek an explanation for the degradation and/or abandonment of highly successful technologies. Did these technological changes come about as the result of the cultural biases of a conquering group, or were there also some basic reasons within the native culture that selected for adoption, modification or abandonment of existing technologies? That iron tools would be adopted by the Hopi seems obvious; what is less understandable is the degradation of the native ceramic technology.

Similar questions may be asked of the farming and husbandry technologies. To what extent were the ancestral Hopi affected by the introduction of domestic animals? How was the native diet affected by the introduced animals and cultigens? To what extent was the native farming system affected by the new cultigens and technologies? What is the evidence for the Spanish introduction of irrigated trinchera gardening?

Finally, evidence may be studied to address questions regarding the inception of the recent regional erosional epicycle to determine its cause(s). Study of

the Awatovi Ruin system may provide unique information with which to investigate these questions, as the last large population on Antelope Mesa was eliminated with the destruction of the village thus allowing for better preservation, and therefore collection, of fragile data.

New Native Military Alliances:

The Pueblo Revolt of 1680 was not the first revolt of the native peoples of the Southwest against rule of the Spaniards; however, it unified all of the Eastern and Western Pueblos for the first and only time.

The Revolt began on August 10, 1680 under the general leadership of a San Juan Pueblo man, Pope, with the death of Padre Pio of Tesuque Pueblo and was closely followed by the slaughter of 21 of the 33 Franciscan friars in the territory and 400 colonists. A siege was laid on Santa Fe that lasted nine days and ended with the flight of the remaining Spaniards to El Paso del Norte, Texas, on August 21 (Sando 1979:194-195).

Of the events of August 10-13 in the Hopi towns, little is known except that all of the Franciscan friars on the Hopi Mesas were killed, two at both Oraibi and Shongopovi, and at Awatovi, Fray Jose de Figeroa who had been at San Bernardo de Aguatubi since 1674. At Mission San Bernardo, Church 2 was sacked and destroyed and the Hopi moved into the friary, converting it to a native pueblo roomblock.

Fray Jose de Espeleta, the priest who had served at Awatovi from 1663 to 1672, had raised and educated a Hopi boy, Francisco de Espeleta, whom he apparently held in such high regard as to bestow his patronymic on the lad. Francisco apparently did not return this high regard for his mentor, as he became a Hopi leader in the Pueblo Revolt.

In 1681 - 1682, an attempt at reconquest of the Province of New Mexico was repulsed by the still united Pueblos; however, according to Simmons (1979:186) "...ingrained particularism and strong traditions of village autonomy led to dissolution of the unity that had crested briefly in the summer of 1680." Captain-General Diego de Vargas was able to undertake the reconquest of the Rio Grande Pueblos in 1692-93 "...largely because the Pueblos had split into warring factions among themselves" (Simmons 1979:186).

> This, their one successful expression of solidarity, was a triumph for the Pueblos. Yet for most of them it lasted less than 20 years. The Spaniards came back stronger than ever. But not to the Hopis. The struggle lost by the Christian God in Tusayan in 1680 stayed lost. The kachinas won and the kachinas have held the field since. From that time on, Spaniards appeared on the Hopi mesas only as

unwelcome visitors, except at Awatovi, and Awatovi did not live long to enjoy the reunion (Brew 1979:521).

In 1692, de Vargas attempted the reconquest of the Hopi towns. He was met outside Awatovi by belligerent Hopis, but controlled the situation by claiming that his visit was peaceful and promising punitive action if he was to meet with hostilities. This threat apparently worked, for the Hopi laid down their arms and the Spaniards proceeded to Awatovi. On November 20, a temporary church was reconsecrated and infants were baptized. One Awatovi leader accompanied the Spaniards to Walpi and acted as their interpreter. Walpi, and subsequently all the rest of the Hopi towns, accepted the visits of the Spaniards without open hostility. De Vargas left Awatovi on November 24, 1692. He had not been totally repulsed by the Hopi, yet he had not affected a successful reconquest.

Awatovi Ruin is, thus, a unique memorial to both the the unity of the Pueblo peoples at the time of their triumph over the Spaniards in the Revolt of 1680, and to the subsequent disunity within the Hopi communities during the attempted reconquest.

Missionized Settlements:

From the first encounter with the Spaniards in 1540, until the coming of the priests to Awatovi in 1629, the prehistoric village lifeways were probably not greatly affected. Following the establishment of Mission San Bernardo, however, the village and its inhabitants were subjected to continual cultural pressures resulting from the intrusion of the Spanish religion and culture. The Spanish influence on the Hopi settlement system was first evident within Awatovi as sections of the native village were razed to build the Mission San Bernardo complex. The Mission Complex proxemics and architecture were probably as typical of the Franciscan missions of New Spain at that time as the isolated location of the Hopi area would allow. The series of churches and their supporting structures, both planned and constructed, are significant examples of the Spaniards' idealized and standardized conceptions of mission architecture and their response to local environment and events.

The extent to which the settlement pattern of the native village of Awatovi was affected by Spanish influences is not known; however, the immediate rehabilitation of the mission complex buildings to native Hopi domiciles following the Pueblo Revolt of 1680 suggests that the overall native architecture and settlement patterns of Awatovi were little affected. The addition of livestock pens may have been one of the few exceptions.

Research Problems

With the exception of Awatovi, all of the Antelope Mesa pueblos had been abandoned before the arrival of the Spaniards, and the rest of the hispanicized Hopi towns were moved to new, more easily defended locations on the mesa tops following the Pueblo Revolt of 1680. Ironically, the destruction of Awatovi at the hands of its neighbors, has insured that its remains are the best known and preserved example of a missionized settlement in the Hopi region. Research could provide answers to questions regarding the nature and extent of Spanish influence on native settlement patterns. It would be of great interest to determine whether the entire Eastern Pueblo, or only certain parts of it, reflected the influence of missionization. The opportunity also exists for comparisons of the native missionized village with the mission complex.

Although the Franciscan Mission Complex was excavated and studied by the Peabody Museum Awatovi Expedition, many questions remain. Subsequent archeological and documentary research at Spanish mission complexes throughout the Southwest suggests that there are many unanswered questions resulting and remaining from the Awatovi research. For example, the sequence of building of the three churches at Awatovi may differ from that suggested by Montgomery et al. (1949). On the basis of work recently completed at the Salinas, New Mexico missions and elsewhere, Ivey (1989, 1990, personal communication) believes that it is more likely that Church 2 was actually the first church constructed at Awatovi and that during the period of use of Church 2, work was begun on a larger church (Church 1 foundations). Although the initiation of construction of the larger church cannot be firmly placed at this time, the Pueblo Revolt in 1680 would have ended any further construction efforts. Church 3 is, thus, the only firmly dated of the three churches in the construction sequence. In addition, it is probable that there were many other structures at Awatovi Ruin which were built and utilized for support of the Mission San Bernardo complex which were not excavated by the Expedition and remain available for study.

Montgomery et al. believed that the domination of the Spanish faith over the Hopi religion was exemplified in the fabric of the town by the superposition of the altar of Church 2 over filled kivas (Figure 11). This interpretation does not seem to be borne out at other Spanish missions. Ivey (1990, personal communication) suggests that the substantial sand kiva fill may have been placed to support the large, heavy foundations for Church 2 (Photograph 16) rather than for psychological effect, a hypothesis which appears to be supported by the records of the Expedition. Thus, further excavation and documentary research are needed to address these and many other research questions with regard to the architecture and lifestyle of the Spanish Franciscans at Awatovi.

Due to the rapidity of Awatovi's demise, the usual deleterious effects of abandonment or continued use on the archeological record should have been

eliminated and a clearer picture of both the mission and the missionized village should be obtainable.

Defense of Native Homelands and Religious System:

Following De Vargas' 1692 attempt at reconquest through 1699, the Hopi towns which were located in the valleys or on accessible terraces were abandoned and relocated to defensible mesa tops. Francisco de Espeleta continued his leadership role by aiding and accepting refugee populations from the reconquest of the Rio Grande pueblos and succeeded in blocking the Spanish in their occasional attempts to reconvert the Hopi to Christianity. According to Euler and Dobyns (1971:34):

> The Hopis permitted missionaries to visit their towns, and preach from time to time. Yet when two Franciscans whom the Spaniards themselves described as 'carried away by...their apostolic zeal,' spent several days at Awatovi in 1700, Espeleta mobilized 800 warriors to threaten the priests and rough them up...Espeleta allowed the missionaries several days of reconversion so successful that they left to make preparations for re-establishing the Awatovi mission. Once they departed safely, Espeleta attacked Awatovi with reportedly only 100 men, executed the males and distributed the women and children to other settlements, thus laying the foundation for matrilineal clan claims to lands in the Antelope Mesa area even today.

This telling of the tale of the destruction of Awatovi has many elements in common with the earlier versions collected by Bandelier (1892) and Fewkes (1893). According to the records of New Spain, Fray Juan de Garaycoechea reopened the mission at Halona (Zuni Pueblo) and then traveled to Awatovi in May, 1700, in the company of another priest, Fray Antonio Miranda, eager to continue the conversion of the Hopi and to welcome the believers back to the fold. The priests were well received at Awatovi and conducted numerous baptisms at Mission San Bernardo. With the aid of the Hopi converts, a space was cleared between the former church and friary and a church with an altar and a baptismal font was dedicated. This rather makeshift church was to be used until a new church could be constructed.

The priests noted that many of the Hopi from other villages were extremely hostile to their return and reported to their superiors that a garrison of soldiers would be necessary to firmly reestablish Christianity among the Hopi. The success of the Hopi coalition, the presence of Rio Grande Pueblo recalcitrants and the cooperation with the Navajo, Apache, and Paiutes against the Spanish suggest that this assessment was probably correct. To this end, the priests directed the construction of foundations for a barracks and stable close

to the mission complex and the Eastern Pueblo (Montgomery et al. 1949). The priests then returned to New Mexico, probably at the end of summer, for there were no priests at Awatovi at the time of its destruction.

Waters (1963) presents additional details which bring together the various versions of the destruction of Awatovi. In October, 1700, following the return of the priests to Santa Fe, the Oraibi chief traveled to Santa Fe to request religious toleration from Governor Cubero. Cubero refused and the Hopi then requested that the priests visit one village each year for six years. This request was also denied. Thus, an attempt to ameliorate the problems caused by Awatovi's acceptance of the Christian faith was not successful.

Further, problems between the residents of Awatovi and other Hopi villages which had existed before the advent of the Spanish were continuing to cause friction. Awatovi, "the place of the bow," was founded by the Bow Clan which then moved to Oraibi, while a sister clan, the Arrowshaft Clan, remained at Awatovi. The participation of both clans was necessary, however, to the performance of the ritual of the Two Horn Society. The conversion of large numbers of the Awatovi villagers threatened the continuity of this and other required Hopi ceremonials. Ill feeling also existed between Awatovi and Oraibi as a result of ceremonial races. In addition, the Awatovi leaders, Tapolou and Sachvantewa were rivals. Tapolou warned the villagers about the dangers of the foreign religion but was unable to convince the converts. He went secretly to the chief of Oraibi and asked that the converts be killed, as they were betraying faith in their native religion.

In October or November of 1700, prior to the Wuwuchim (the first of the great ceremonies beginning the annual ceremonial cycle), a secret meeting was held by representatives from the villages of Oraibi, Walpi, Shongopovi and Mishongnovi. It was decided that Awatovi should be destroyed. At the prescribed time, Tapolou let in the attackers and Awatovi was attacked with weapons and fire. The survivors were taken to the sand hills below Mishongnovi where many of them were killed. The women and children who were not baptized and knew important rituals and clan songs were spared and divided between the villages of Oraibi, Walpi, Mishongnovi and Shongopovi. Members of the Bow, Badger, Sun, Tobacco and Rabbit clans went to Oraibi, perpetuating some of the Awatovi rituals. The following day, warriors returned to completely destroy Awatovi (Waters 1963:259-265).

Wilson (1972:127), summarizing the historic Spanish record relevant to Awatovi, noted that Escalante's Extracto de Noticias (1692) recorded "...efforts at conversion and negotiations with the Hopis up through October 1700,...the story then jumps to early 1701 and [Governor] Cubero's expedition, no reason for the latter being given." A document written by Governor Cubero, dated 1701, was discovered in the Biblioteca Nacional in Madrid, Spain, and translated by

Wilson. In the document, Governor Cubero refers to "...the matter of the campaign which I carried out during the months of June and July in the province of Moqui [Hopi] against the apostate Indians there, following the annihilation which they committed upon the converted Indians of the pueblo of Aguatabi..." (Wilson 1972:129).

Olson (1966) reported the excavation of a mass burial site, NA-8502, located on the left bank of Polacca Wash approximately 10 miles south of the Hopi villages. Olson described the site as a large pile of long bones and other body elements surrounded by the skulls of the individuals. The remains were later analyzed by Turner and Morris (1970) who found that 30 individuals of all ages and sexes had been "...killed, crudely dismembered, [and] violently mutilated...about 370 years ago." They felt that the site location, dismemberment, and radio carbon age (370 ±95 rc yrs BP) of the remains suggested that this was the massacre site, Mas'-tco-mo (Fewkes 1893), of some of the captives taken by the warriors following the destruction of Awatovi. Turner and Morris noted that the legendary site of Mas'-tco-mo is in the direction of the mass burial; however, accounts varied as to the distance. The radiocarbon date of approximately AD 1500 to 1700 agrees well with the historic documents which refer to the massacre.

It is interesting to note that the Hopi apparently expected Spanish retaliation following the destruction of Awatovi, and in late 1700, invited Tewa refugees from the Rio Grande Pueblos of the Galisteo Basin to establish Tewa Village (Hano) on First Mesa, guarding the trail to Walpi, (now the first village to be encountered on the trail from Zuni). The wisdom of this move was attested to when, in 1701, 1706 and again in 1716, the Spaniards attacked the Hopi-Tewa towns at Walpi, Payupki, and Walpi and Tewa Village. Each time the attack was repulsed and the unification of the Hopi-Tewa proved effective.

That the Hopi were eventually successful in defending both their native homelands and religious system against the cultural and physical incursions of the Spaniards cannot be denied. The extent of their loyalty to their native way of life is nowhere better exemplified than at Awatovi Ruin where the Hopi were willing to sacrifice an entire village and most of its inhabitants to assure the continuation of the practice of their native lifestyle and religion. It matters little whether the acceptance of the Christian faith by many of the Awatovians was the sole cause or whether friction between the Hopi villages and the perception of witchcraft at Awatovi was also to blame, the town was destroyed in defense of the religious system. As there was no other reason for the Spaniards to occupy the Hopi Mesas, the destruction of Awatovi was successful in ridding the Hopi of both the Spanish religion and presence among themselves. To this day, there is no functioning Roman Catholic church or parish on the Hopi Reservation.

Awatovi Ruin is an outstandingly important representative of the defense of their homelands and religion by Native Americans. The Ruin remains abandoned, and the site and the cause of its destruction are known to all Hopi. The Ruin is, therefore, as much an example as a historic site. The Hopi clans which trace their ancestry to Awatovi are still viable and continue to participate in the use of their lands and the practice of their religion.

Research Problems

The extent of conversion to Christianity among the inhabitants of Awatovi is not known and the legends of its destruction are clear in identifying the evil ways of the town's inhabitants and their practice of witchcraft against their neighbors. Further research in the Eastern Pueblo could provide information to investigate the relative importance of these probable causes for the village's destruction. That an Awatovi leader was instrumental in the village's destruction implies that at least some Awatovians were also concerned with the internal apostasy.

Adams (1981) in his work associated with restorations at Walpi, noted that from 1690-1730, all evidence of Spanish influence disappears from Hopi ceramics in a "...symbolic rejection of Spanish culture." Further archeological research is necessary in the Eastern Pueblo to determine whether this was also true at Awatovi. Such data might be examined to address the extent of retention of Spanish influence at Awatovi following the Pueblo Revolt of 1680.

Forced and Voluntary Population Movement and the Depopulation of Terrain:

Although the events of the Spanish occupation were probably the major cause of the abandonment of the last large village on Antelope Mesa, the evidence for the depopulation of other such villages in recent prehistory surrounds Awatovi in the form of the six abandoned Antelope Mesa towns. The reason(s) for these abandonments is not known; however, Hack (1942) has postulated a degradation of the local environment roughly equivalent to the period of their abandonment. That they were also initially occupied and experienced aggregation during this same period is puzzling. Thus, paradoxically, environmental degradation may have forced the populations to leave voluntarily. It has been assumed generally that the Antelope Mesa towns were voluntarily abandoned, but if so, the destination of their populations remains a mystery.

Of Awatovi alone, the reason for population movement is known. There is hard evidence that the survivors of the original attack were forcibly removed, that those who were uncooperative or considered a further danger to the Hopi were killed, and that those who were cooperative and/or of essential importance to the continuation of the religious rituals were spared and accepted into the remaining Hopi villages.

The ordeal of Awatovi is thus preserved not only in the site of the Ruin, but in those descendants of the survivors of the Awatovi clans. As an example of forced population movement as a result of European influences, Awatovi Ruin is highly significant.

Research Problems

Data from further research at Awatovi Ruin may be used to address the problems of voluntary or forced abandonment of large, aggregated villages in the 13th through 17th centuries. If other Antelope Mesa villages were abandoned due to some stress, it would seem logical that they might in whole or part migrate to Awatovi, which supported a large population into the historic period. Further research both at Awatovi and the abandoned villages would be necessary to determine whether abandonment in the villages might be reflected by a population increase at Awatovi. Alone, this would be insufficient proof to do anything more that suggest that this might be the case; however, in combination with research in cultural traits (mentioned above) information might be assembled to address abandonment/aggregation problems.

Research at Awatovi might also be undertaken to determine whether there was a trend toward voluntary depopulation prior to the Spanish period. Such studies would probably include environmental as well as demographic research.

New Inter-/Intra-group Alliances:

Awatovi Ruin dramatically illustrates the formation of new inter-/intra-group alliances within the Southwest Pueblo cultures in response to the threat of cultural disruption at the hands of the Spaniards. The usual Hopi response to social stresses, the most recent of which are the direct result of European influences, is the fissioning of villages. The basic group here is the individual village, and the formation of intragroup village alliances is usually based upon differences of opinion over the appropriate response to a particular stress. When agreement cannot be reached at a village level, one allianced group will leave and establish a new village or take up residence in another village which is sympathetic to the alliance's views. Should this process continue to affect a single village, the size of the population could be so reduced as to impair the village's viability as a separate community resulting eventually in abandonment of the parent community. The intragroup alliance system ensures that stresses may be resolved and that the clans and their religious and landholding responsibilities are maintained relatively intact and functional to the benefit of the Tribe.

The destruction of Awatovi, however, resulted from an intertribal alliance group of Hopi villages which included at least one known inhabitant of Awatovi, Tapoulo, an important ritual leader. This intertribal type of organization

severely limited the choices in response to the stress which existed between the Awatovians and the rest of the Hopi villages. Fissioning was not a viable response to the problems facing the intertribal alliance. It was necessary to the religious cycle of the Hopi that the Awatovi clans, whose members alone held knowledge of essential rituals, be preserved. It was also necessary that the Hopi Tribe be purged of those individuals who were posing an unacceptable threat to the same religious system. The problem facing the intertribal alliance was straightforward - how to preserve the essential rituals yet rid the alliance of those elements which were dangerous to its continuance. The solution to the problem was equally straightforward and its efficacy unquestionable.

Massacre: Cultural and Biological Effects:

The massacre at Awatovi is unique in the history of the European conquest in the Southwest. It is highly questionable whether such an event would have occurred had not the Spaniards violently attacked the Hopi culture, especially the religious practices upon which their existence depended. Awatovi Ruin represents the ultimate sacrifice by a Native American tribe to regain their culture and religion from the effects of European conquest.

The direct cultural effect of the massacre was to reestablish the Hopi culture free from the direct domination of the Spanish religion. It ensured the continuation of the Hopi religion and internal sociopolitical system and freed the Hopi from the forced labor system of the Spaniards in support of the Mission complex.

The Hopi did not cease to have contact with the Spanish provincial government, however. In 1742 Fray Francisco Delgado managed to secure the return of 350 Tiwa and Hopi from the Hopi Mesas to the missionized pueblos of Jemez and Isleta. Following a severe drought in 1777, the Hopi sent a delegation to Governor Juan Bautista de Anza requesting aid. The Governor provided food, which was accepted; however, further Spanish involvement in Hopi affairs was not (Simmons 1979:190).

The Hopi continued to use the technologies introduced by the Spaniards which could be integrated successfully with their native technologies. The use of coal as a fuel was not readopted; however, the ceramic technology from 1690 on resembled that of the contemporary Tewa and Keresan pueblos and all vestiges of Spanish influence in form or design elements disappeared. Hopi ceramic technology eventually experienced a renaissance with the rediscovery and production of the exquisite Sikyatki Polychrome wares by the Hopi-Tewa potter from Tewa Village, Nampeyo, in the 19th century.

The ancient Hopi agricultural system was little affected. The use of the introduced cultigens which could be adapted to the Hopi system was continued;

but, with the exception of fruit trees, these plants have had little overall effect economicallyor culturally. The triumvirate of corn, beans and cucurbits still reigns supreme in Hopi agriculture.

The biological effects of the massacre are less well known. Certain of the clan lineages were preserved through the massacre's survivors and their descendants reside in the present-day Hopi villages. Although the resident population of Antelope Mesa was either killed or redistributed following the massacre, the land use was continued by clan descendants. The effects of the massacre on the environment would probably be discernible only in the immediate vicinity of Awatovi, therefore, by the return of native vegetation.

SCIENTIFIC SIGNIFICANCE

The Awatovi Expedition of the Peabody Museum of Archaeology and Ethnology of Harvard University of 1935-1939 made many highly significant contributions to the developing discipline of American archeology and was probably one of the seminal projects to the development of the discipline of historic archeology. Of the project, Martin and Plog (1973:31) in "History of Archeological Excavation 1880 - 1970," noted that "Awatovi...stands as one of the best digs in the Southwest...careful planning, capable supervision, excellent staff, and fine laboratory analysis and cataloguing work...it stands out as a model."

Perhaps one of the most significant contributions to the developing archeological discipline was the recognition on the part of Expedition Director John O. Brew that a multidisciplinary approach was necessary to "...avoid the error charged, unfortunately often with justice, against archaeology in the past, of ignoring the wealth of information available in the numerous ethnological, historical, physiographical, and sociological studies of the Southwest, information of inestimable value for imparting life and meaning to the dust and debris of archaeology" (Brew 1942:v). The Expedition included in its field program "...numerous studies outside the confines of ordinary archeology. It was the basic policy of the Expedition to encourage the co-operation of students in other branches of learning who believed that their techniques could appreciably augment the strictly archaeological approach to the problems of prehistory. The policy has been justified beyond all expectation" (Brew 1949:vii).

Watson Smith recorded painted tiles from the Mission Complex. His paper contains a preliminary analysis of the manufacture and use of tiles in New Spain engendered by lack of research data to compare with Awatovi Ruin's painted tile wainscots (Smith 1949). Hack (1942, 1942a) studied the physical environment of the region to elucidate the agricultural and coal mining activities of Awatovi Ruin's inhabitants, while Smith (1952, 1971, 1972, 1978) studied the kiva murals and the ceramic wares from the prehistoric complexes. The Expedition's team

also included many specialists whose work, while not always resulting in separate publications, was instrumental to the success of the overall effort: geologists, surveyors, cartographers, photographers, dendrochronologists, ceramic technologists, artists, ethnobotanists, petrographers, cataloguers, and stone, bone and ceramic wares analysts.

During the five field seasons, 1935 - 1939, the accomplishments of the Awatovi Expedition were as follows (Brew 1942:vii-viii):

1. 21 sites were excavated entirely or in part, extending chronologically from approximately the 6th century, A.D., to the early part of the 18th century, A.D.

2. At those 21 sites, approximately 1500 rooms were excavated, 1300 of them at the pueblo of Awatovi, 200 of them at other sites on Antelope Mesa and in the Jeddito Valley.

3. The total number of sites located and mapped was 296, including historic Hopi and Navaho sites. A surface survey was made of each one, including sketch maps of the large sites and artifact collections wherever such material was available.

4. A seventeenth-century Franciscan missionary establishment, San Bernardo de Aguatubi, was excavated, including: three churches, two of which were over 100 feet long; a friary arranged in a quadrangle around a sacred garden; the church offices and instruction rooms; and a barracks-stable.

5. At Awatovi, in addition to large-scale excavations, 65 small tests were made in parts of the site not dug extensively. As a result it is possible to date the periods of occupation at all parts of the site.

6. Two hundred and forty wall paintings were recorded in historic and prehistoric kivas. The best of these murals were peeled off the walls and preserved in the original. The remainder were photographed and drawn to scale by Watson Smith and his assistants. The colors were recorded by comparison with a Maerz and Paul color dictionary and samples of each color were preserved.

7. 11,700 artifacts of stone and bone were excavated and catalogued. Because of the great quantity, a large part of the descriptive and analytical studies of this material were made in a laboratory at the Awatovi camp.

8. 8500 pottery specimens were excavated and catalogued. In addition, over half a million potsherds were washed, classified and recorded by Mrs. C. B. Cosgrove and her assistants in the pottery tent. The largest number was handled during the 1938 season when 243,871 potsherds passed over the classifying tables.

9. Technological studies of the pottery were made by Miss Anna O. Shephard of the Carnegie Institution of Washington. Her work included the collection of local clays and firing experiments in which the local prehistoric wares were duplicated.

10. Although perishable material is seldom preserved in Southwestern sites except in the dry caves a surprising amount was obtained at Awatovi, including basketry, fragments of cloth, and pieces of carved wood from the ecclesiastical buildings.

11. Thorough physiographic and geological studies were made in the Jeddito region and extended in some instances to include the entire Hopi country and the whole of Black Mesa. This work is the subject of the following report by Dr. Hack.

12. Extensive prehistoric coal mining operations were discovered, mapped, and excavated in part.

13. Detailed ethnobotanical studies were made by Mr. Volney H. Jones of the University of Michigan. These included the analysis of the plant remains found in the excavations, a survey of the present wild plants of the region, and a study of plant material encased in the adobe bricks used in the construction of the 17th century Franciscan buildings. The plant remains preserved in the bricks have given valuable information about the introduction into the Hopi country of various European plants brought into the Southwest by the Spaniards.

14. Approximately 2000 tree-ring specimens were dated by Mr. E. T. Hall, Jr. Most of these were fragments of timbers used in construction.

15. Air photographs were taken of the region, including pictures of the modern Hopi towns and field systems.

The Awatovi Expedition, thus, was the first fully multidisciplinary project in American archeology. Of especial note was the use of aerial photography for site recording, perhaps the earliest formal use of remote sensing in archeology.

Although he had had no formal archeological training, Ross Montgomery was, perhaps by default, one of the earliest American historic archeologists, as the director of the excavation of the Mission San Bernardo de Aguatubi complex. Montgomery was able to apply his knowledge of the religious buildings of the Franciscan Order in New Spain to the excavation and interpretation of the historic remains. The resulting report, Franciscan Awatovi: the Excavation and Conjectural Reconstruction of a 17th Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona (Montgomery, Smith and Brew 1949), is a landmark publication in the discipline of historic archeology.

The archeological remains of the Peabody Expedition campsite are significant as they are representative of the field camps of the period and may be compared with current field camps and their support services. They are also significant as the site of one of the highly influential projects to the development of scientific archeology in the United States.

BIBLIOGRAPHY

Adams, E. Charles
1981 The View from the Hopi Mesas. In The Protohistoric Period in the North American Southwest, A.D. 1450-1700, David R. Wilcox and W. Bruce Maise, eds. Arizona State University Anthropological Research Papers 24:321-325. Tempe.

Bandelier, A. F.
1890-1892 Final Report of Investigations among the Indians of the Southwestern United States Carried on Mainly in the Years from 1880 to 1885 (2 vols.). Papers of the Archaeological Institute of America, American Series 3 and 4. Cambridge, Massachusetts.

Bartlett, K.
1935 Prehistoric Mining in the Southwest. Museum Notes 7. Flagstaff: Museum of Northern Arizona.

de Benavides, Alonso
1916 The Memorial of Fray Alonso de Benavides, 1630. Mrs. Edward E. Ayer, trans. Frederick W. Hodge and Charles F. Lummis, ann. Chicago: Privately Printed. (Reprinted: Horn and Wallace, University of New Mexico Press, Albuquerque, 1965.)

Bishop, R. L., V. Canouts, S. P. DeAtley, Alfred Qoyawayma, and C. W. Aikins
1988 The Formation of Ceramic Analytical Groups: Hopi Pottery Production and Exchange, A.C. 1300-1600. Journal of Field Archaeology 15:317-337. Boston: Boston University.

Brew, John O.
1935 A Preliminary Report of the Peabody Museum Jeddito Expedition of 1935. Unpublished Manuscript on File with the National Park Service, Western Region.

1937 The First Two Seasons at Awatovi. American Antiquity 3(2):122-137.

1939 Preliminary Report of the Peabody Museum Awatovi Expedition of 1937. American Antiquity 5(2):103-114.

1941 Preliminary Report of the Peabody Museum Awatovi Expedition of 1939. Plateau 13(3):37-48.

1942 Preface. In the Changing Physical Environment of the Hopi Indians of Arizona (Reports of the Awatovi Expedition 1), by John T. Hack. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 35(1):v-x. Cambridge, Massachusetts.

1949a The History of Awatovi. Pp. 1-43 in Franciscan Awatovi: the Excavation and Conjectural Reconstruction of a 17th Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona, by Ross G. Montgomery, Watson Smith and John O. Brew. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 36. Cambridge, Massachusetts.

1949b The Excavation of Franciscan Awatovi. Pp. 45-108 in Franciscan Awatovi: the Excavation and Conjectural Reconstruction of a 17th Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona, by Ross G. Montgomery, Watson Smith and John O. Brew. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 36. Cambridge, Massachusetts.

1952 Foreward. In Kiva Mural Decorations at Awatovi and Kawaika-a, with a Survey of Other Wall Paintings in the Pueblo Southwest, by Watson Smith. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 37:vii-xii. Cambridge, Massachusetts.

1961 Foreword. In Jeddito 264: A Report on the Excavation of a Basket Maker III - Pueblo I Site in Northeastern Arizona with a Review of Some Current Theories in Southwestern Archaeology (Reports of the Awatovi Expedition 7), by Hiroshi Daifuku. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 33(1):vii-x. Cambridge, Massachusetts.

1971 Foreword. In Painted Ceramics of the Western Mound at Awatovi (Reports of the Awatovi Expedition 8), by Watson Smith. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 37:xvii-xviii. Cambridge, Massachusetts.

1979 Hopi Prehistory and History to 1850. In Southwest, Handbook of North American Indians 9:514-523, A. Ortiz, ed. Washington: Smithsonian Institution.

Bolton, Herbert E., ed.
1952 Spanish Explorations in the Southwest, 1542-1706 [1908]. New York: Barnes and Noble.

Cordell, Linda S.
1984 Prehistory of the Southwest. New York: Academic Press.

Daifuku, Hiroshi
1961 Jeddito 264: A Report on the Excavation of a Basket Maker III - Pueblo I Site in Northeastern Arizona with a Review of Some Current Theories in Southwestern Archaeology. (Reports of the Awatovi Expedition 7) Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 33(1). Cambridge, Massachusetts.

Dean, Jeffrey S.
1970 Aspects of Tsegi Phase Social Organization: A Trial Reconstruction. In Reconstructing Prehistoric Pueblo Societies, pp. 140-174, William A. Longacre, ed. Albuquerque: University of New Mexico Press.

Dutton, Bertha P.
1963 Sun Father's Way, the Kiva Murals of Kuaua, A Pueblo Ruin, Coronado State Monument, New Mexico. Albuquerque: University of New Mexico Press.

Eggan, Fred
1950 Social Organization of the Western Pueblos. Chicago: University of Chicago Press.

Euler, Robert C. and Henry F. Dobyns
1971 The Hopi People. Phoenix: Indian Tribal Series.

Euler, Robert C. and George J. Gumerman, eds.
1978 Investigations of the Southwestern Anthropological Research Group: The Proceedings of the 1976 Conference. Flagstaff: Museum of Northern Arizona.

Euler, Robert C., G. J. Gumerman, T. N. V. Karlstrom, J. S. Dean and R. H. Hevly
1979 The Colorado Plateaus: Cultural Dynamics and Paleoenvironment. Science 205(4411):1089-1101.

Fewkes, J. Walter
1893 A-WA-TO-BI: An Archeological Verification of a Tusayan Legend. American Anthropologist 6(4):363-375.

1898 Archaeological Expedition into Arizona in 1895. In 17th Annual Report of the Bureau of American Ethnology for the Years 1895-1896, Pt. 2:519-742. Washington.

Gifford, James C. and Watson Smith
1978 Gray Corrugated Pottery from Awatovi and Other Jeddito Sites in Northeastern Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 69. Cambridge, Massachusetts.

Graves, Michael W., Sally J. Holbrook and William A. Longacre
1982 Aggregation and Abandonment at Grasshopper Pueblo: Evolutionary Trends in the Late Prehistory of East-central Arizona. In Multidisciplinary Research at Grasshopper Pueblo, pp. 110-121, William A. Longacre, Sally J. Holbrook and Michael W. Graves, eds. Anthropological Papers of the University of Arizona 40. Tucson.

Gumerman, George J.
1975 Alternative Cultural Models for Demographic Change: Southwestern Examples. In Population Studies in Archaeology and Biological Anthropology: a Symposium, pp. 104-115, Alan C. Swedlund, ed. Memoirs of the Society for American Archaeology 30. Salt Lake City, Utah.

Gumerman, George J. and Euler, Robert C., eds.
1976 Papers on the Archaeology of Black Mesa, Arizona. Carbondale and Edwardsville: Southern Illinois University Press.

Gumerman, George J., Deborah Westfall and Carol S. Weed
1972 Black Mesa: Archaeological Investigations on Black Mesa, the 1969-1979 Seasons. Prescott College Studies in Anthropology 4. Prescott, Arizona.

Hack, John T.
1942 The Changing Physical Environment of the Hopi Indians of Arizona (Reports of the Awatovi Expedition 1). Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 35(1). Cambridge, Massachusetts.

1942a Prehistoric Coal Mining in the Jeddito Valley, Arizona (Reports of the Awatovi Expedition 2). Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 35(2). Cambridge, Massachusetts.

Hale, Kenneth and David Harris
1979 Historical Linguistics and Archeology. In Southwest, Handbook of North American Indians 9: 170-177, A. Ortiz, ed. Washington: Smithsonian Institution.

Hargrave, Lyndon L.
1935 The Jeddito Valley and the First Pueblo Towns in Arizona to be Visited by Europeans. Museum Notes 8(4):17-23. Flagstaff: Museum of Northern Arizona.

Hibben, Frank C.
1975 Kiva Art of the Anasazi of Pottery Mound. K. C. Publications: Las Vegas, Nevada.

Hough, Walter
1903 Archeological Field Work in Northeastern Arizona: The Museum - Gates Expedition of 1901. In Report of the United States National Museum for 1901, pp. 27 9-358. Washington, D.C.

Ivey, James E.
1989 In the Midst of a Loneliness: the Architectural History of the Salinas Missions. Southwest Cultural Resources Center, Professional Papers No. 15. Southwest Regional Office, National Park Service, Santa Fe, New Mexico.

1990 Personal communication.

Kennard, Edward A.
1979 Hopi Economy and Subsistence. In Southwest, Handbook of North American Indians 9:554-563, A. Ortiz, ed. Washington: Smithsonian Institution.

Lawrence, Barbara
1951 Part I: Mammals Found at the Awatovi Site. Part II: Post-cranial Skeletal Characters of Deer, Pronghorn, and Sheep-goat, with notes on Bos and Bison (Reports of the Awatovi Expedition 4). Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 35(3). Cambridge, Massachusetts.

Martin, Paul S. and Fred Plog
1973 The Archaeology of Arizona: A Study of the Southwest Region. Garden City, New York: Doubleday Natural History Press.

Mindeleff, Victor
1891 A Study of Pueblo Architecture in Tusayan and Cibola. In 8th Annual Report of the Bureau of American Ethnology for the Years 1886-1887, pp. 3-228 Washington.

Montgomery, Ross G.
1949 San Bernardo de Aguatubi, an Analytical Restoration. Pp. 109-288 in Franciscan Awatovi: the Excavation and Conjectural Reconstruction of a 17th Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona, by Ross G. Montgomery, Watson Smith and John O. Brew. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 36. Cambridge, Massachusetts. .

Montgomery, Ross G., Watson Smith and John O. Brew
1949 Franciscan Awatovi: the Excavation and Conjectural Reconstruction of a 17th Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 36. Cambridge, Massachusetts. .

Nequatewa, Edmund
1967 Truth of a Hopi: Stories Relating to the Origin Myth and Clan Histories of the Hopi. Mary-Russell F. Colton, ed. Northland Press: Flagstaff, Arizona.

Olsen, Stanley J.
1978 The Faunal Analysis: Bones from Awatovi, Northeastern Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 70(1). Cambridge, Massachusetts.

Olson, A.P.
1966 A Mass Secondary Burial from Northern Arizona. American Antiquity 31(4):822-826.

Parsons, Elsie C., ed.
1936 Hopi Journals of Alexander M. Stephen. Columbia University Contributions to Anthropology 23 (2 vols.). New York.

Plog, Fred T.
1974 The Study of Prehistoric Change. New York: Academic Press.

1979 Prehistory: Western Anasazi. In Southwest, Handbook of North American Indians 9:108-130, A. Ortiz, ed. Washington: Smithsonian Institution.

Plog, Stephen
1969 Prehistoric Population Movements: Measurement and Explanation. Unpublished Manuscript on File, Field Museum of Natural History, Chicago.

Redman, Charles L., Steven James and Diane Notarianni
1990 Awatovi Ruins of Antelope Mesa: Preservation and Development Plans. Department of Anthropology, Office of Cultural Resource Management, Report Number 78. Arizona State University, Tempe.

Reed, Erik K.
1938a Special report on Awatovi (Arizona). National Park Service, Southwest Region, Santa Fe.

1938b Supplementary Report on Awatobi, Arizona. National Park Service, Southwest Region, Santa Fe.

Sando, Joe S.
1979 The Pueblo Revolt. In Southwest, Handbook of North American Indians 9:194-197, A. Ortiz, ed. Washington: Smithsonian Institution.

Simmons, Marc
1979 History of Pueblo-Spanish Relations to 1821. In Southwest, Handbook of North American Indians 9:178-193, A. Ortiz, ed. Washington: Smithsonian Institution.

Smith, Watson
1949 Mural Decorations of San Bernardo de Aguatubi. In Franciscan Awatovi: the Excavation and Conjectural Reconstruction of a 17th Century Spanish Mission Establishment at a Hopi Indian Town in Northeastern Arizona, pp. 289-339, by Ross G. Montgomery, Watson Smith and John O. Brew. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 36. Cambridge, Massachusetts.

1952 Kiva Mural Decorations at Awatovi and Kawaika-a, with a Survey of Other Wall Paintings in the Pueblo Southwest. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 37. Cambridge, Massachusetts.

1970 Seventeenth-century Spanish Missions of the Western Pueblo Area. The Smoke Signal 21. Tucson Corral of Westerners: Tucson.

1971 Painted Ceramics of the Western Mound at Awatovi (Reports of the Awatovi Expedition 8). Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 37. Cambridge, Massachusetts.

1972 Prehistoric Kivas of Antelope Mesa, Northeastern Arizona (Reports of the Awatovi Expedition 9). Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 38. Cambridge, Massachusetts.

1978 Awatovi and Other Jeddito Sites. In Gray Corrugated Pottery from Awatovi and Other Jeddito Sites in Northeastern Arizona, pp. 7-40, by James C. Gifford and Watson Smith. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 69. Cambridge, Massachusetts.

Smith, Watson and Bernard Fontana
1970 Religious Sacramentals from Awatovi. Kiva 36(2)13-16.

Spicer, Edward H.
1962 Cycles of Conquest. Tucson: University of Arizona Press.

Swedlund, Alan C. and Steven E. Sessions
1976 A Developmental Model of Prehistoric Population Growth on Black Mesa, Northeastern Arizona. In Papers on the Archaeology of Black Mesa, Arizona, pp. 136-148, George J. Gumerman and Robert C. Euler, eds. Carbondale and Edwardsville: Southern Illinois University Press.

Turner, Christy G. II and Nancy T. Morris
1970 A Massacre at Hopi. American Antiquity 35(3):320-331.

U.S. Department of the Interior
1972 Report of Significance and Study of Alternatives: Proposed Awatovi National Historic Site. Prepared by the Southwest Region, National Park Service, in cooperation with the Hopi Tribal Council and the Bureau of Indian Affairs. Santa Fe.

1987 History and Prehistory in the National Park System and the National Historic Landmark Program. History Division, National Park Service, Washington, D.C.

Upham, Steadman
1982 Politics and Power: an Economic and Political History of the Western Pueblo. New York: Academic Press.

Upham, Steadman and Fred Plog
1986 The Interpretation of Prehistoric Political Complexity in the Central and Northern Southwest: Toward a Mending of the Models. Journal of Field Archaeology 13(2):223-238. Boston University.

Ward, Albert E.
1969 In Archaeology of the Black Mesa Coal Slurry Line, Arizona, 1969. Prescott Studies in Anthropology 5. Prescott College Press.

Waters, Frank
1963 The Book of the Hopi. Drawings and Source Material Recorded by Oswald White Bear Fredricks. New York: Viking Press.

Wendorf, Fred and Erik K. Reed
1955 An Alternative Reconstruction of Northern Rio Grande Prehistory. El Palacio 62(5-6):131-173.

Wheeler, Richard P.
1978 Bone and Antler Artifacts: Bones from Awatovi, Northeastern Arizona. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University 70(2). Cambridge, Massachusetts.

Wilson, John P.
1972 Awatovi -- More Light on a Legend. Plateau 44(3):125-130.

Woodbury, Richard B.
1954 Prehistoric Stone Implements of Northeastern Arizona (Reports of the Awatovi Expedition 6). Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University 34. Cambridge, Massachusetts.

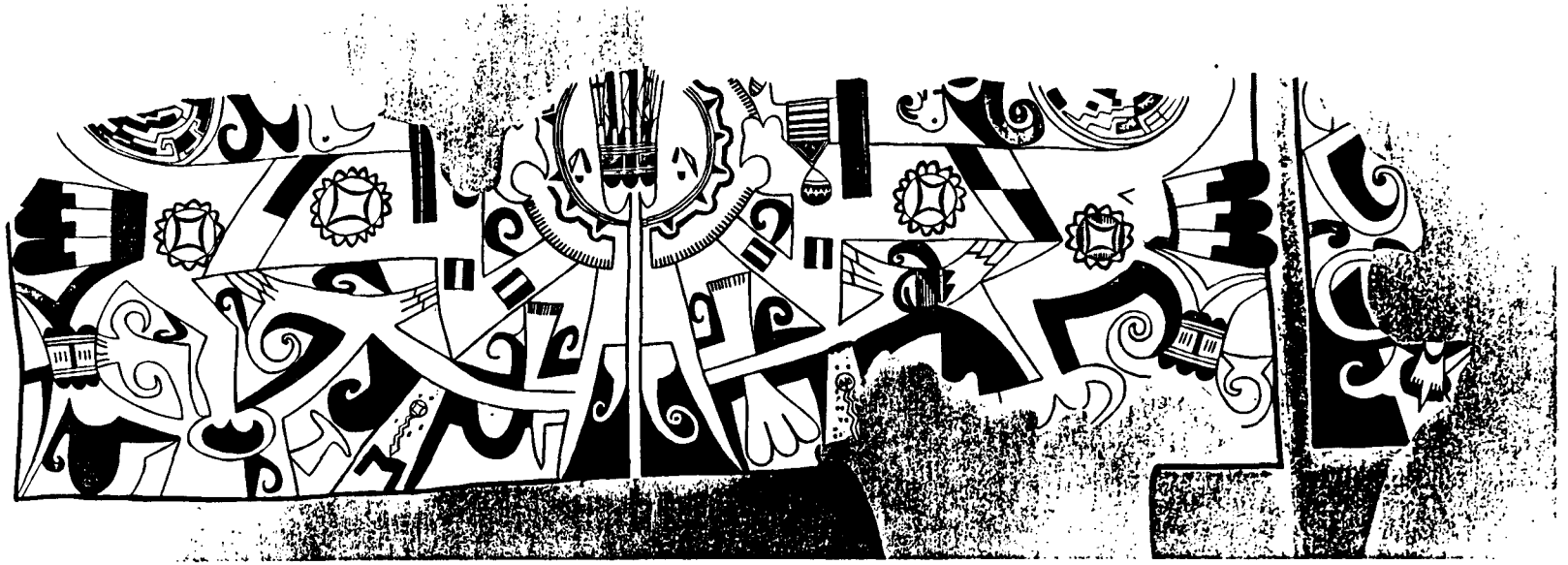

FIGURE 3

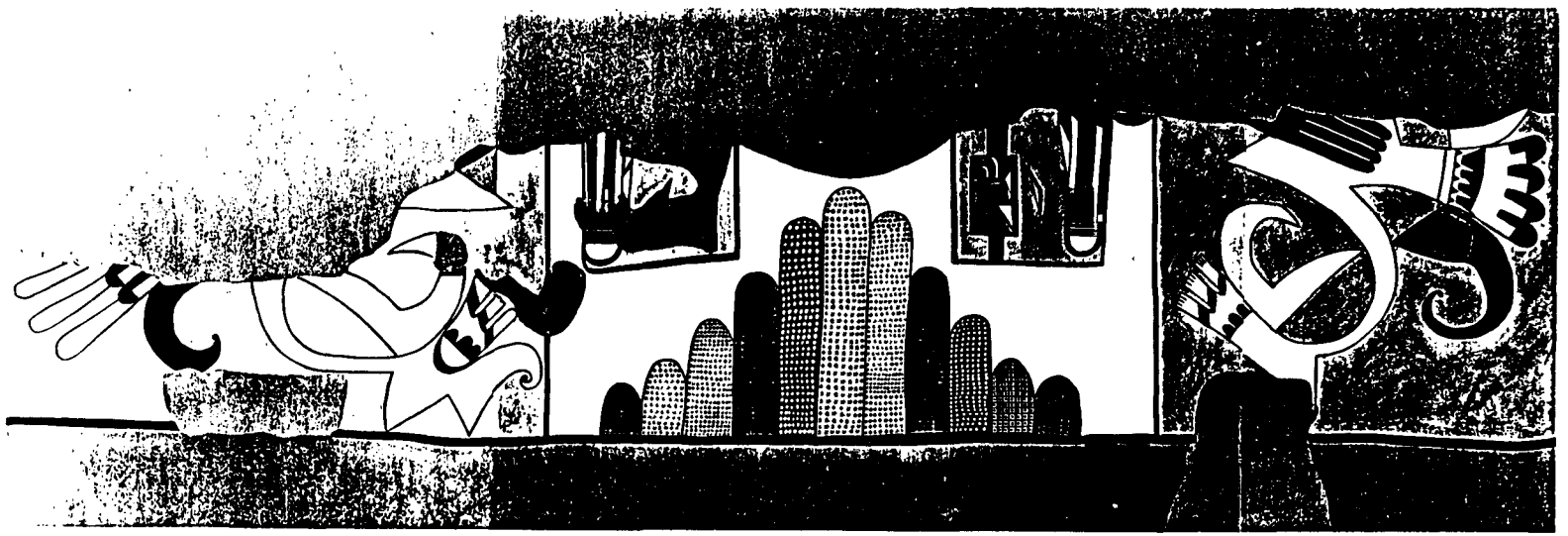

FIGURE 4

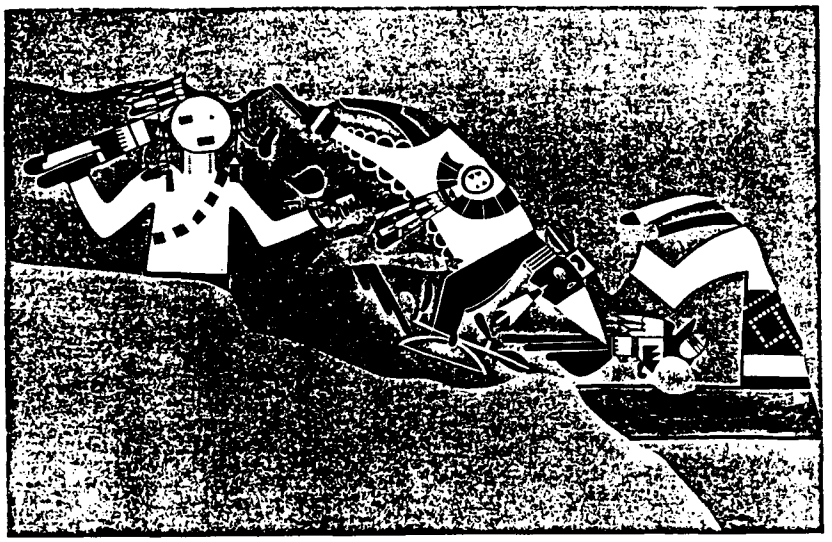

FIGURE 5

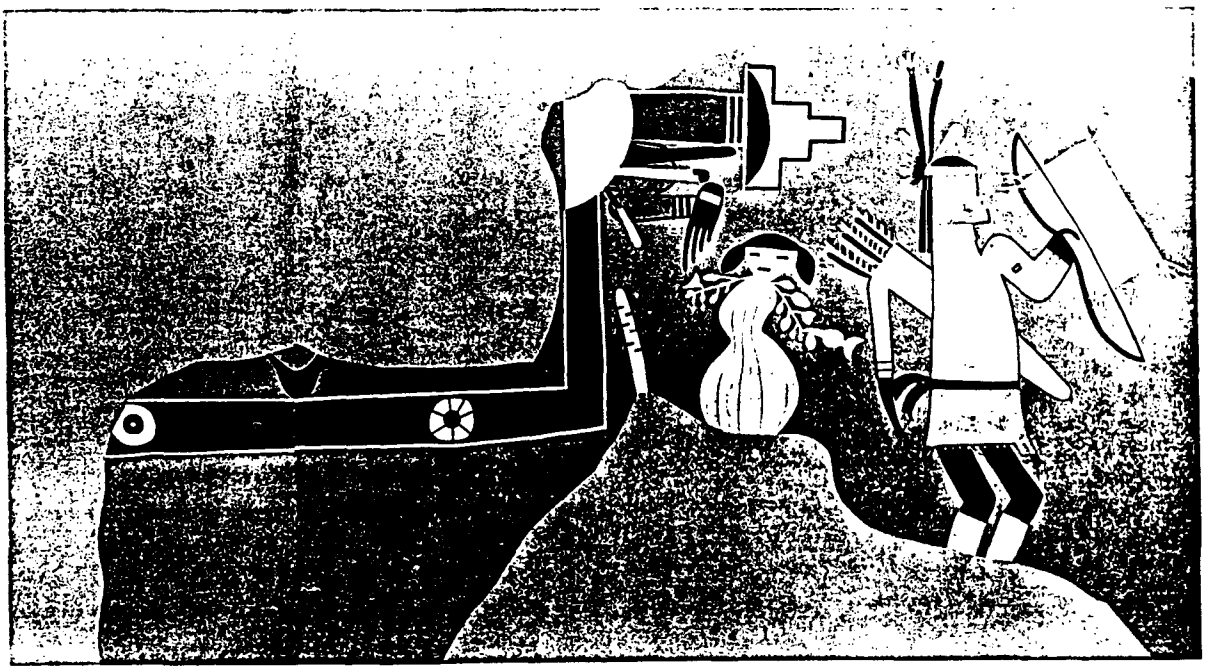

FIGURE 6

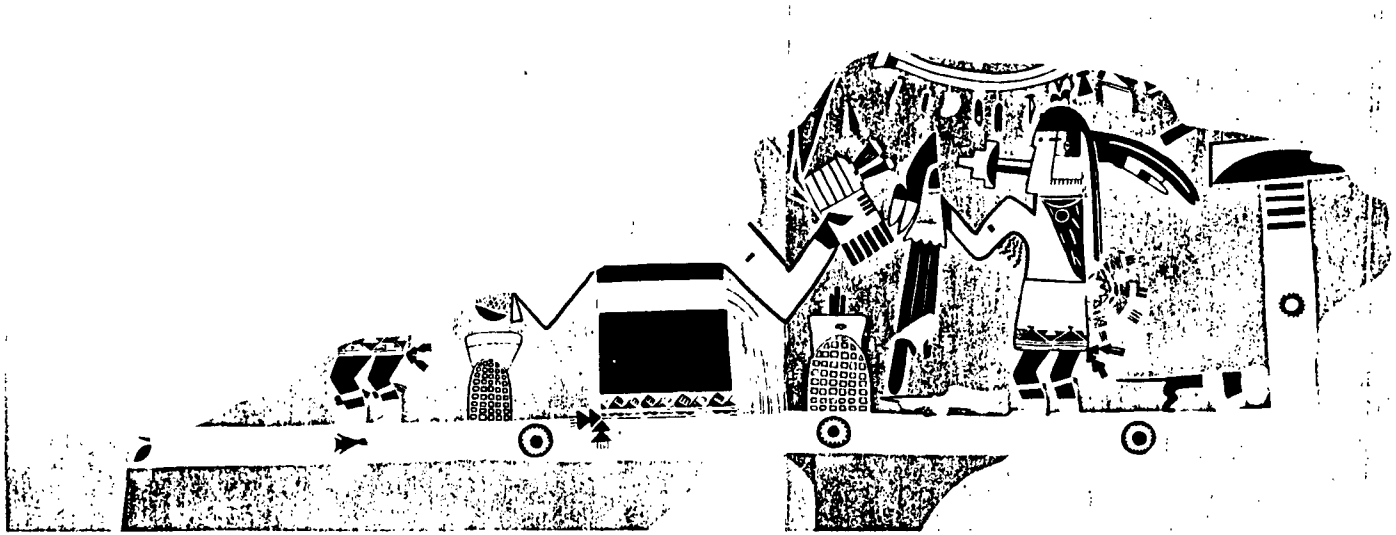

FIGURE 7

Awatovi, Room 788.

FIGURE 8

FIGURE 9