

# ARCHEOLOGICAL ASSESSMENT

OF  
BANDELIER NATIONAL  
MONUMENT

BY

C. BRITT BOUSMAN

ARCHAEOLOGY RESEARCH PROGRAM

SOUTHERN METHODIST UNIVERSITY



ARCHAEOLOGICAL ASSESSMENT OF

BANDELIER NATIONAL MONUMENT

by

C. Britt Bousman

Paul Larson

Frances Levine

ARCHAEOLOGY RESEARCH PROGRAM

SOUTHERN METHODIST UNIVERSITY

April, 1974

## ACKNOWLEDGEMENTS

The authors wish to note their appreciation to all of the people and institutions which contributed to the completion of this report. The National Park Service is to be commended for the sponsoring of the project and the guidance it offered throughout the project; especially helpful were Calvin Cummings and Ron Ice of the Santa Fe Office and George West of Bandelier National Monument. C. T. Snow and David Snow at the Laboratory of Anthropology were very helpful in recording site locations and copying manuscripts.

Lewis Shiner, Bob Hyatt, and Karen Doehner drafted the maps, and Hubie Achor prepared the photographs. Alan Skinner and Meg Rohrt offered advise and criticism throughout the project. Meg Rohrt typed the manuscript.

## TABLE OF CONTENTS

Acknowledgements	i
Table of Contents	ii
List of Figures	iii
List of Tables	iii
Introduction	1
Environment	4
A History of Archaeological Work	10
Chronology	15
Recommendations	20
Abstracts	23
Bibliography	50

## LIST OF FIGURES

Figure 1.	Bandelier National Monument Map.	2
Figure 2.	Site Location Maps for Frijoles and Otowi Sections.	3
Figure 3.	a. Desert Shrub Zone in Capulin Canyon. b. Subalpine Zone near Obsidian Ridge.	6
Figure 4.	a. Tyuoni Ruins in Frijoles Canyon. b. Reconstructed Kiva in Ceremonial Cave.	11
Figure 5.	a. Pictographs at Painted Cave in Capulin Canyon. b. Shrine of the Stone Lions.	14
Figure 6.	a. Tsankawi Ruins. b. Incised Trail Leading to Tsankawi Ruins.	19

## LIST OF TABLES

Table 1.	Floral Resources at Bandelier National Monument.	7
Table 2.	Faunal Resources at Bandelier National Monument.	9

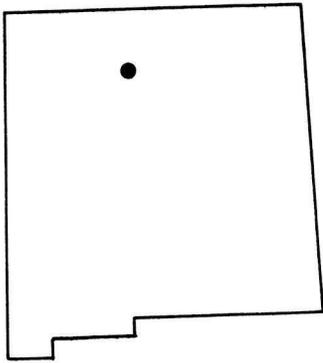
## INTRODUCTION

In April of 1973 the Archaeology Research Program at Southern Methodist University undertook five projects to conduct literature and field survey assessments of the archaeological resources at five National Parks and Monuments. This report describes the results of an archaeological assessment of Bandelier National Monument.

The objectives of this project were to synthesize the known literature on the prehistoric occupation at Bandelier, define the major deficiencies in the literature, and discuss what might be done to correct these deficiencies. The objectives were accomplished by the following methods:

1. Compiling a thorough bibliography of all published reports concerned with the archaeology of the study area;
2. Spending one week in the field locating and evaluating sites;
3. Reviewing all literature dealing with Bandelier and abstracting each work;
4. Identifying topic areas which are instrumental toward understanding the cultural systems of all prehistoric inhabitants;
5. Recommending how these deficiencies can be corrected;
6. Preparing a synthesis of the known archaeology at the study area.

The final purpose of this report is that it serves as a tool which will allow the National Park Service to estimate the nature and intensity of a research project which would provide a detailed, comprehensive knowledge of the prehistoric occupation at Bandelier. This research project would not require total completion by one institution; in fact, the quality of information would be higher if various qualified institutions contributed to the total project. This type of project requires that an overall research design be compiled before field work is started and that an overseeing institution, namely the National Park Service, contract with other institutions to solve the various problems which have been explicitly defined in the research design.



BANDELIER  
NATIONAL MONUMENT  
NEW MEXICO

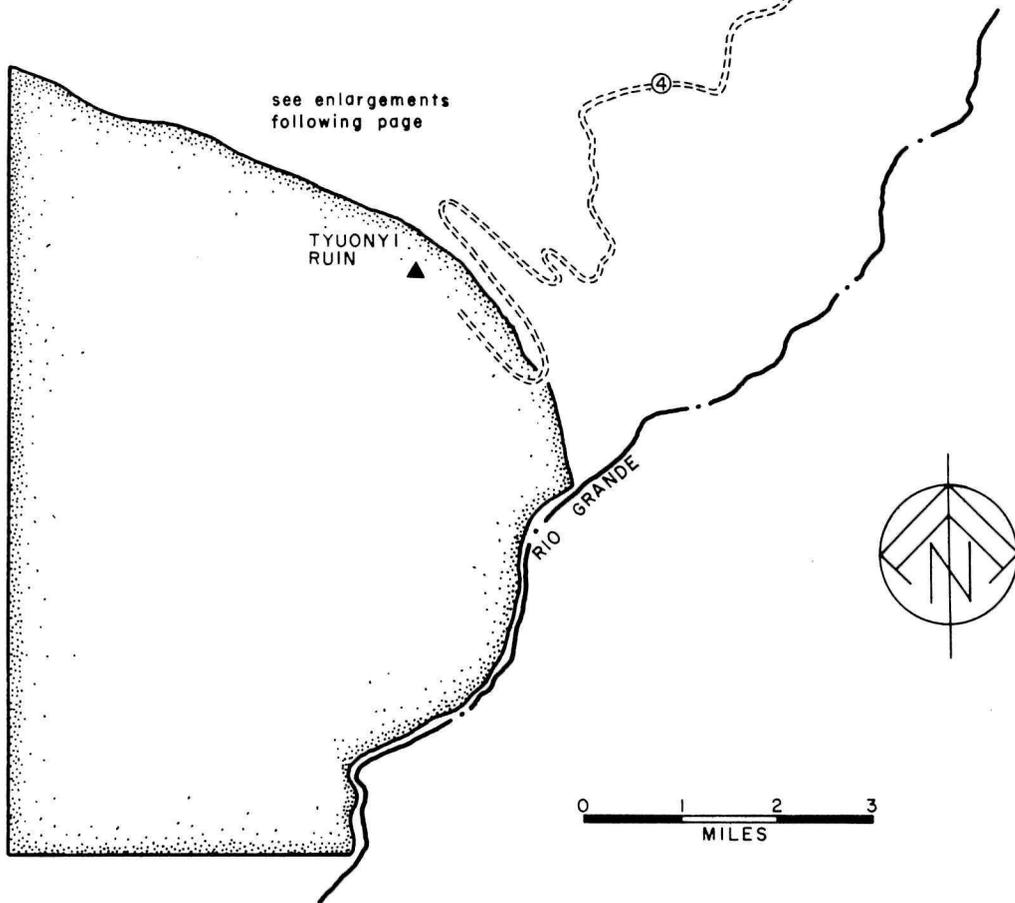
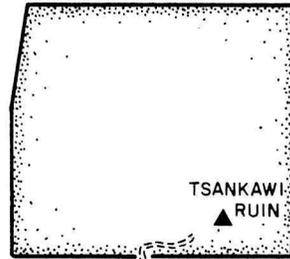
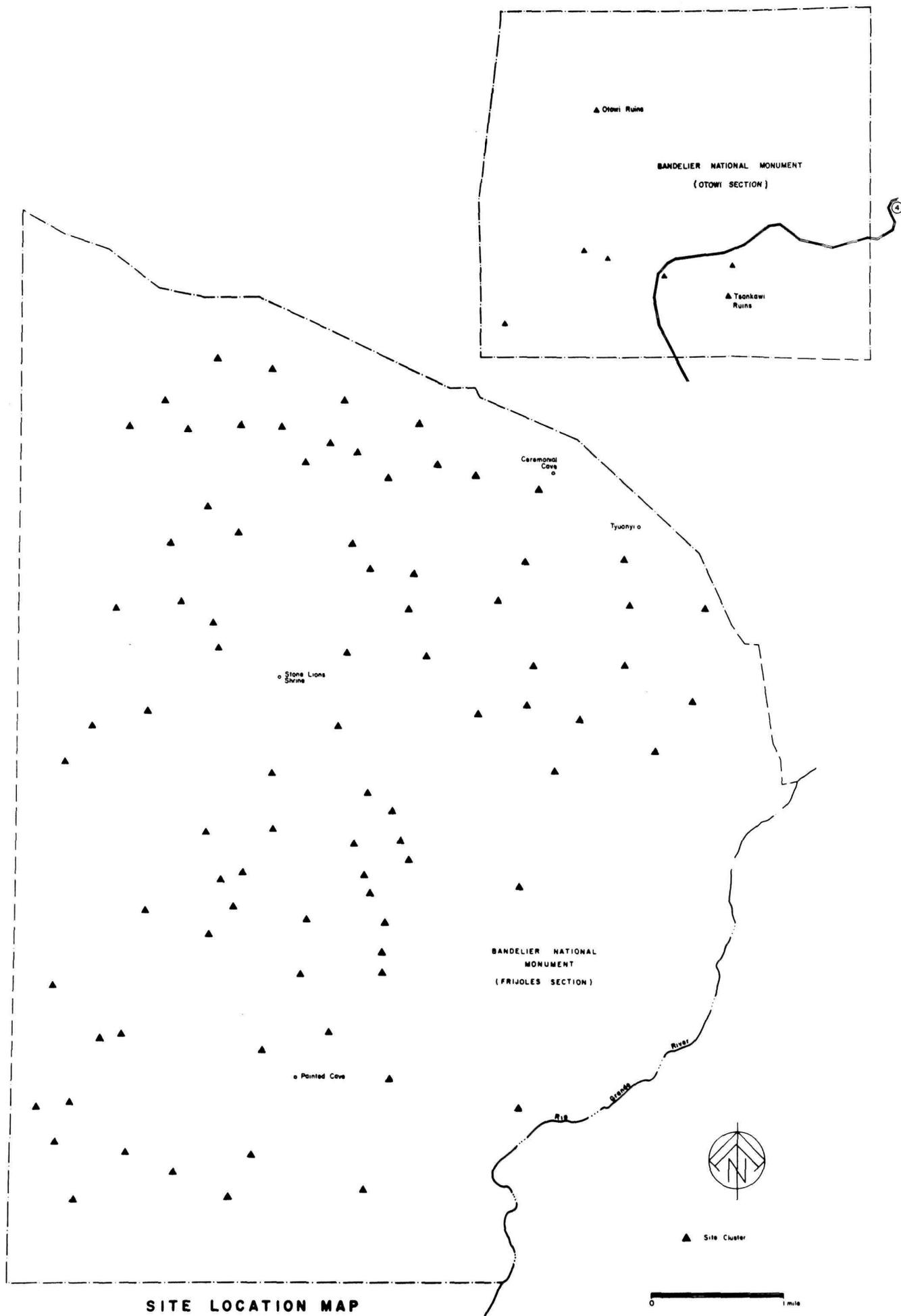


FIGURE 1



SITE LOCATION MAP

FIGURE 2

## THE ENVIRONMENT

Bandelier National Monument is located on the Pajarito Plateau in the Jemez Mountains. The Monument consists of 29,681 acres bounded by the Rio Grande on the east, State Highway 4 on the north, the Santa Fe National Forest on the west, and the Canada de Cochiti Grant on the south. Bandelier is dissected by three major canyon systems, the Frijoles, Alamo, and Capulin Canyons, which flow southeasterly into the Rio Grande. The Monument ranges in elevation from 5,000 feet m.s.l. at the Rio Grande to approximately 7,000 feet m.s.l. in the backcountry. The Pajarito Plateau is a 40 mile shelf formed by volcanic activity in the Jemez Mountains at Valle Grande, which is a caldera. The geological deposits are composed of a basalt flow dated to the early Pleistocene or late Pliocene which is overlaid by a deposit of pumice fragments and mineral grains. Capping the Plateau is a layer of tan welded volcanic tuff. The streams have cut into the deposits and have deposited alluvial sediments in the valley floodplains.

Five ecological zones are present in Bandelier National Monument: 1) Desert Shrub; 2) Grasslands; 3) Piñon Woodland; 4) Broad Leaved Woodland; and 5) Subalpine. The Chaparral zone is located on the dry ridges, slopes, and canyon bottoms in the southeastern portion of the Monument. This zone is characterized by big sagebrush, rabbitbrush, Eriogonum, cholla, True Mountain Mahogany, Apache Plume, Smooth Sumac, Skunkbrush Sumac, Utah White Oak, Piñon Pine, One-seed Juniper, currant, and cherry. The grasslands found in canyon bottoms and in isolated patches on the mesa tops are characterized by Muhley grass, Brome grass, and grama grass. The Piñon Woodland, the largest zone, is characterized by Piñon Pine, True Mountain Mahogany, One-seed Juniper, Alligator Juniper, Rocky Mountain Juniper, Utah White Oak, cherry, and Quaking Aspen. In the moist canyon floodplains are Cottonwoods, Box Elder, Birch, Hoptree, and Alder. These types of flora characterize the Broad Leaved Woodland zone. The Subalpine zone is situated on the deep soil mesas in the north and east at the higher elevations. This type of life zone is comprised of Ponderosa Pine, Douglas Fir, White Fir, Limber Pine, Engleman Spruce, and Muhley grass.

The animal life forms present in Bandelier National Monument are not as restricted to the various distinct zones as are the floral species; for this reason, a general list of faunal forms present in the Monument is given. The animals occurring at Bandelier include porcupines, squirrels, mule deer, black bears, woodrats, rabbits, beavers, bobcats, foxes, coyotes, mountain lions, turkeys, rattlesnakes, and rainbow and brook trout.

Prehistoric man certainly knew and utilized the natural resources of the area; however, how and which resources were used is unknown.

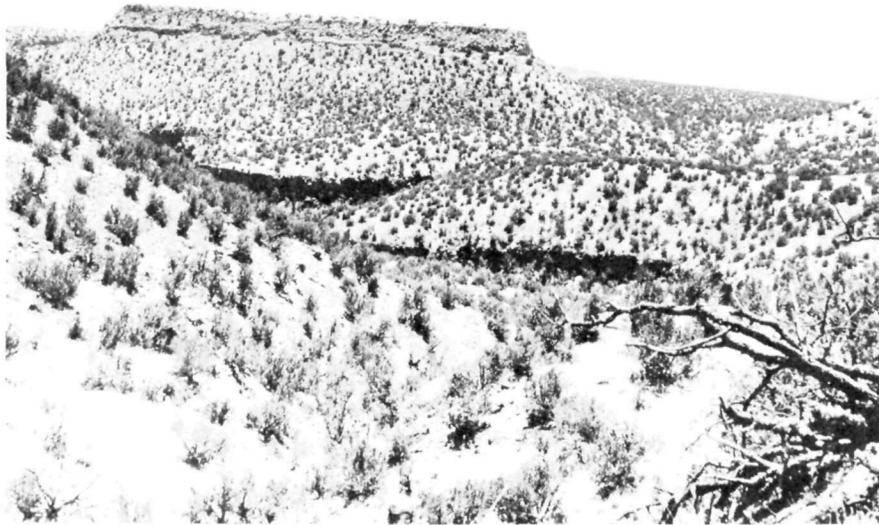


Figure 3a. Desert Shrub Zone in the Lower Capulin Canyon near the Rio Grande.



Figure 3b. The Subalpine Zone near Obsidian Ridge.

Table 1. Floral Resources at Bandelier National Monument.

Desert Shrub Zone

Pinon pine (Pinus edulis)  
One-seeded juniper (Juniperus monosperma)  
Currant (Ribes cereum)  
Cherry (Prunus salicifolia acutifolia)  
Sagebrush (Artemisia tridentata)  
Rabbitbrush (Chrysotham graveolens)  
Eriogonum (Eriogonum hieracifolium)  
Cholla (Opuntia fulgida)  
Mountain mahogany (Cercocarpus parvifolius)  
Apache plume (Fallugia paradoxa)  
Smooth sumac (Rhus glabra)  
Skunkbrush sumac (Rhus trilobata)  
Utah white oak (Quercus utahensis)

Grassland Zone

Muhley grass (Muhlenbergia sp.)  
Brome grass (Bromus porteri)  
Grama grass (Bouteloua prostrata)

Pinon Woodland Zone

Pinon pine (Pinus edulis)  
Mountain mahogany (Cercocarpus parvifolius)  
One-seeded juniper (Juniperus monosperma)  
Alligator juniper (Juniperus deppeana)  
Rocky Mountain juniper (Juniperus scopulorum)  
Utah white oak (Quercus utahensis)  
Cherry (Prunus salicifolia acutifolia)  
Quaking aspen (Populus tremuloides)

Broad Leaved Woodland Zone

Cottonwood (Populus angustifolia)  
Box elder (Negundo aceroides)  
Birch (Betulia fontinalis)  
Hoptree (Ptelea trifoliata)  
Alder (Alnus tenuifolia)

Subalpine Zone

Ponderosa pine (Pinus ponderosa)  
Douglas spruce (Pseudotsuga menziesii)  
White fir (Abies concolor)  
Limber pine (Pinus flexilis)  
Engleman spruce (Picea englemanni)  
Muhley grass (Muhlenbergia sp.)

Table 2. Faunal Resources (all zones) at Bandelier National Monument.

Porcupine (Erethron epixanthum)  
Squirrel (Sciurus arizonensis)  
Mule deer (Odocoileus hemionus)  
Black bear (Ursus americanus amblyceps)  
Woodrat (Neotoma albigula)  
Rabbit (Sylvilagus auduboni neomexicanus)  
Beaver (Castor canadensis frondator)  
Bobcat (Lynx canadensis)  
Fox (Vulpes fulva macroura)  
Coyote (Canis mearnsi)  
Mountain lion (Felis hipolestes aztecus)  
Turkey (Meleagris gallopavo merriami)  
Rattlesnake (Crotalus horridus)  
Rainbow trout (Salmo gairdnerii)  
Brook trout (Salvelinus fontinalis)

## A HISTORY OF ARCHAEOLOGICAL WORK AT BANDELIER

Adolph Bandelier visited the region of Bandelier National Monument on five different occasions during the 1880's. His work concentrated in the valley of the El Rito de los Frijoles, but included no excavations. He measured caves and ruins, collected artifacts, and noted details of construction. On several visits, Bandelier was accompanied by Charles Lummis who took the earliest photographs of this region (Bandelier 1892).

Archaeology formally began in this area with the work of Edgar L. Hewett (1904, 1909a, 1909b). His work in the summer of 1896 yielded a preliminary reconnaissance of the area from Santa Clara Canyon to El Rito de los Frijoles. The survey continued intensively for two seasons, and was followed by additional sporadic work until 1903. Hewett's Antiquities of the Jemez Plateau, New Mexico provided the first clear synthesis of archaeological remains for this region. Nevertheless, Hewett drew extensively on Bandelier's reports for the section on El Rito de los Frijoles. Caywood (1966) provides details of Hewett's early work at Bandelier National Monument. Hewett was employed as a superintendent at New State Normal in Greeley, Colorado during his early surveying activities. Later work was sponsored by Normal University (New Mexico Highlands University) and the School of American Research. Hewett was also active in the campaign to safeguard archaeological monuments of the Southwest.

After spending the 1907 season at Puyé, Hewett began the excavation of Tyuonyi in the summer of 1908. He excavated one of the three kivas within the courtyard, the great kiva adjacent to Tyuonyi and the small kiva in Ceremonial Cave. According to Hendron (1940), the latter kiva was reconstructed by Jesse L. Nusbaum in 1910 while he was a staff member of the School of American Research. Hewett also dug a series of trenches through the talus in front of Group D (Hewett's designation) and excavated some burials in a ruin just below Tyuonyi on the floodplain. Thirty-five rooms were cleared in a pueblo on the south rim of the canyon wall, "several rods of trenches" were dug at Yapashi (Pueblo of the Stone Lions), and some rooms were opened there. Work continued in 1909 with excavations at Group E, which yielded two villages. The



Figure 4a. Reconstructed Tyuoni Ruins in Frijoles Canyon. Note three kivas in plaza, two of which are unexcavated.

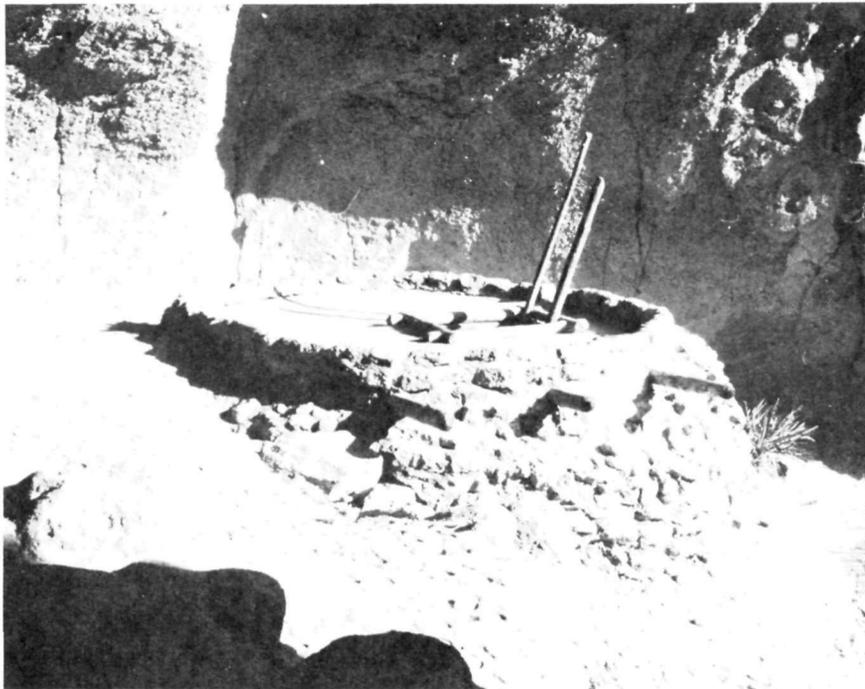


Figure 4b. Reconstructed Kiva in Ceremonial Cave, Frijoles Canyon.

"Snake House" was also excavated and a kiva with mural decorations on the wall was found. The "Sun House" was also excavated during this season. None of the above units were completely excavated or stabilized. Hendron (1940) provided a summary of Hewett's work and the stabilization activities until 1940, and apparently felt that the School of American Research continued excavation and stabilization after 1911. In support of this contention, he cited an article in El Palacio (1920) reporting the progress of K.M. Chapman and W. Bradfield in the reconstruction of the "House of the Sun Clan".

In December, 1933 archaeological work began again at Bandelier under the Civil Works Administration program. Reiter (1934) reported on the initial work which lasted until April, 1934. Tyuonyi was cleared of debris, mapped, and Rooms 133 and 491 were excavated. This season of work also protected a plaster painting at "Long House". A topographical survey of the canyon floor was accomplished and differences were noted with regard to Hewett's map. Finally, two 40 inch square test pits were placed in refuse mounds at Tsankawi. Reiter (1934) reported that the southeast rubbish heap was "trenched extensively by Hewett, and skeletons and pottery were removed. No sequence was established and a report was not written. Later, Kidder sunk a trench in both heaps, and his results were published although not in detail."

In 1937-38 stabilization work was continued under the auspices of the National Park Service using Civil Conservation Corps labor. Hendron (1940) reported "some incidental excavation and research in connection with the stabilization". The Great Kiva was the first ruin worked on during this season; Hendron (1940) said that Hewett had not completely excavated it, and excavation and stabilization were completed in the fall of 1937. The kiva of Ceremonial Cave was reconstructed for a second time during this period, and Tyuonyi was stabilized. Caywood (1966) reported that T. B. Onstott stabilized parts of the Tyuonyi ruin during 1947-48.

Excavations at Rainbow House began in 1948 and continued through the fall of 1950. The work was a field project of Adams State College of Alamosa, Colorado and was intended to last five years. With F. C. V. Worman directing the initial work, a total of 18 rooms were opened during the

three year period. Final excavations were conducted during the fall of 1950 with Worman acting as foreman. At this point, the remaining kiva and 28 pueblo rooms were excavated. Exploratory digging failed to turn up a second kiva. The final 7 plaza unit rooms were excavated at this time; some outside rooms of the pueblo were left unexcavated to support the reconstructed portions.

During the mid-1960's a survey of Bandelier National Monument and adjacent Cochiti Dam and Reservoir areas was conducted by the Museum of New Mexico for the National Park Service. The purpose of the survey was primarily to record sites that would be directly affected by the Cochiti Reservoir. However, adjacent mesa tops and connecting tributaries were surveyed which were located outside the maximum flood-pool. Dr. Charles Lange of Southern Illinois University surveyed areas on Bandelier National Monument land. The resulting report (Peckham and Wells 1967) gave only scanty locational data, with U.S.G.S. topographic maps included to give site locations.

A great deal of recent work has been done to the south of Bandelier in connection with the Cochiti Dam project. After the survey in 1962 (Lange 1968), numerous sites were excavated. In the fall of 1966 Polly Schaafsma spent one month in the Cochiti area recording rock art (Schaafsma 1971). David H. Snow has written excavation reports on three sites affected by the Cochiti Dam: L.A. 8720; L.A. 6178; and L.A. 591 (Snow 1971; 1973a; 1973b). Southern Illinois University has conducted surveys in the Canada de Cochiti and the Museum of New Mexico represented by David Snow has excavated in Bandelier.



Figure 5a. Pictographs at Painted Cave, Capulin Canyon. Some are apparently historic.



Figure 5b. Sculptured Lions at the Shrine of the Stone Lions.

## CHRONOLOGY

The northern Rio Grande archaeological cultural area, roughly rectangular in plan, extends from Isleta, New Mexico in the south, to the Colorado state line on the north, and from the New Mexico portion of the Canadian River on the east to the Rio Puerco and Rio Chama west of Albuquerque (Wendorf and Reed 1955:133). Bandelier National Monument is situated in the west central section of the northern Rio Grande archaeological culture area, and adjacent to the San Juan Anasazi cultural sphere.

Classification schemes proposed to trace cultural change for the entire Southwest, such as the Pecos (Kidder 1924), Roberts (1935), and Gladwin and Gladwin (1934) have had only limited success in outlining a cultural sequence for the northern Rio Grande. Wendorf (1954), Wendorf and Reed (1955), and Wetherington (1968) have proposed a more specific development sequence for this distinctive area of the Southwest. As with most typological schemes, their outline generalizes a local sequence and applies it to a larger, more complex regional picture. In spite of this obvious handicap, it remains a valuable heuristic device for viewing culture change. Further research is needed at Bandelier in order to produce a detailed reconstruction of cultural change through time in the Frijoles Canyon system.

Using Wendorf's chronology (1954) while bearing its limitations in mind, five periods are defined in the northern Rio Grande. They are: Pre-Ceramic Period (ca. 15,000 B.C.-A.D. 600); Rio Grande Developmental Period (A.D. 600-1200); Rio Grande Coalition Period (A.D. 1200-1325); Rio Grande Classic Period (A.D. 1325±-1600±); and Rio Grande Historic or Spanish Period. At Bandelier only the Rio Grande Developmental Period and the Rio Grande Coalition Period are well documented.

Extinct Pleistocene fauna associated with distinctive Folsom projectile points found in the Sandia Mountains has been advanced as evidence supporting a big game hunting subsistence economy in the northern Rio Grande (Hibben 1941, 1951; Hunt 1942). Later pre-ceramic sites claimed as the northern section of a pan-Southwestern "elementary" culture

(the Picoso culture) have been recorded in the Chama River drainage and at Isleta and Manzano Caves (Irwin-Williams 1967). Northern Picoso sites are defined on the basis of a diverse chipped stone tool technology, and a settlement pattern which is used to support inferences of a horticulturally based economy. Ethnic and cultural relations between early big game hunters, Archaic adaptations, and later archaeological periods are tentative. Within Bandelier National Monument, sites belonging to these early phases have not yet been reported in the literature.

Sites contemporaneous with Basketmaker III and Pueblo I of the San Juan Anasazi compose the Rio Grande Developmental Period. Because sites of this time period are rare in the northern Rio Grande, a situation that cannot be solely attributed to inadequate archaeological surveying, it has been postulated that cultures developed in more northern and western areas, then later spread eastward (Wendorf and Reed 1955:139).

Maize agriculture and settled village life developed and intensified in importance during this period. Material culture of the Early Developmental Period included gray ceramics with coarse sand temper, and occasionally geometric designs which were applied with mineral pigments. A wide array of chipped and ground stone tools has been associated with distinct food procurement and processing activities. After A.D. 600 the bow and arrow was introduced as a hunting innovation (Wing 1955:18).

Pueblo I sites, more numerous in the northern Rio Grande than earlier Basketmaker III manifestations, are distinguished by the addition of various decorated pottery types. Kana-a Gray, Alma Neckbanded, Kiatuthlana Black-on-White, and occasional sherds of La Plata Black-on-Red and Abajo Black-on-Orange are diagnostic of Pueblo I localities (Wendorf and Reed 1955:138; McGregor 1965:254-255). These San Juan Anasazi ceramic traditions were accompanied by Anasazi architectural styles. Although pit houses remained as the most common dwelling, adobe constructed pueblos and kivas increase in occurrence (McGregor 1965:312-313).

Dendrochronological dates clustering between A.D. 963-1194 correlate with the ceramic and architectural data, demonstrating an increase in the number of Pueblo occupation

sites extending east to the Canadian River and north to Taos. In addition, ceramic design techniques and the presence of distinctive elbow pipes indicate increased contact between northern Rio Grande and Plains-based cultures.

Archaeological sites characteristic of the Development Period have not yet been reported within Bandelier National Monument.

The Rio Grande Coalition Period includes two sub-periods, the Pindi and Galisteo Stages. The Pindi Stage (ca. A.D. 1200-1300), named for Pindi Pueblo near Santa Fe, included coursed adobe construction of multi-story pueblos, organic painted pottery, an enlarged stone tool inventory, and kiva floor drums (Wendorf and Reed 1955:145; Wetherington 1968: 97-98). The later Galisteo Stage (A.D. 1300-1350) seems to indicate an abrupt period of culture change and population movement in the northern Rio Grande (Wetherington 1968:98). A general population increase is accompanied by new ceramic styles, which may have been greatly influenced by distinctive Mesa Verde design elements and motifs. Beginning in the Galisteo Stage and continuing until historic time, the northern Rio Grande was the locus of a great population density and a distinctive flavor of pueblo culture.

The Rio Grande Classic Period (A.D. 1325±-1600±) is most important in relation to Bandelier National Monument. Regional variation, inferred from elaborate ceramic decorations and manufacturing techniques, as well as distinctive architectural details, have been used as supportive evidence of a general, widespread cultural florescence in the northern Rio Grande archaeological culture area (Wendorf and Reed 1955:153).

During this period, settlements in the northern Rio Grande appear to have been concentrated into large pueblo villages. Pecos Pueblo, located about 40 miles east southeast of Bandelier National Monument, is perhaps the best known Classic Period Rio Grande Pueblo. Within Bandelier, most of the large ruins (i.e., Tyuonyi, Rainbow House, and Long House) are attributed to this period. Although ground plans varied, the general pattern of multi-story pueblos with hundreds of rooms and numerous circular or D-shaped kivas surrounding courts and plazas was consistent throughout the northern Rio Grande drainage. Construction techniques included the

use of masonry blocks, adobe "bricks", and the addition of mud plaster and whitewash has been documented (Hendron 1940: 41).

Ceramic manufacture, decorative techniques, and overall form were quite diversified by this period. Red-slipped and glaze-painted wares, widely traded from Zuñi throughout the Rio Grande, were made locally beginning sometime in the early 14th century (ca. A.D. 1325-1350). Some researchers have interpreted this sudden introduction of "Glaze I" and "Biscuit" ware traditions as indicative of a migration from the west (McGregor 1965:414).

The stone tool industry of these sedentary agricultur-  
alists continued largely unchanged from earlier periods. The most noteworthy additions were elaborately formed ground stone tools. Corn, similar to a type still grown by northern Rio Grande pueblos, was abundant as were beans, curcurbits, and turkey (Hendron 1940:32-33).

Both the Pajarito Plateau and the Chama Valley were abandoned near the end of this period. Dendrochronology dates from the Pajarito bracket A.D. 1560-1585 as the time period in which most ruins were vacated. Drought and warfare have been suggested as the most obvious causes. Socio-political and socio-cultural explanations are more difficult to verify, but should be considered in the future as problem orientations for work on the northern Rio Grande Classic Period.

The historic period in the northern Rio Grande does not begin with initial European contact but with the establishment of European missions at San Gabriel de Tunge in 1598 (Wendorf and Reed 1955). Great culture changes took place with the introduction of metal tools, domesticated animals, and new food products. This period is of lesser importance to Bandelier National Monument since, from the evidence presently available, the Frijoles Canyon system was abandoned by the end of the 16th century.

Reconstruction based on ethnohistoric documents and linguistic studies have established connections between modern Rio Grande Pueblo groups and various archaeological sites in the northern Rio Grande. Future work at Bandelier could add much data to the early end of the general chronology now applied to this prehistoric-historic continuum.



Figure 6a. Unexcavated Tsankawi Ruins. Masonry walls are visible at the base of the mound.



Figure 6b. Incised Trail Leading to Tsankawi Ruins.

## RECOMMENDATIONS

The major deficiency in the known literature is that many facets of prehistoric man's existence at Bandelier National Monument clearly have not been studied, and a representative view of each facet is needed. The majority of the field work conducted at Bandelier was done during the first half of this century, and was concerned with excavating and stabilizing the large pueblo ruins. Very little is known about the smaller pueblo ruins, and even less of the non-pueblo sites within Bandelier. The problem of gaining an adequate view of each cultural period represented remains to be solved, but a few basic steps should be taken to expedite the matter.

A research design or Comprehensive Park Plan should be formulated as an organizational tool which would interlock the various methodologies and theoretical considerations that should be utilized in gaining a representative view of all prehistoric cultural systems present at Bandelier. It should remain flexible and reworkable in light of new problems and situations. The Plan should be a program of detailed prehistoric research which includes site surveying, ecological studies, and site testing and excavation.

The site survey should be a comprehensive and detailed study which records all archaeological sites in a systematic manner. The survey should also be concerned with preserving the non-renewable archaeological resources at Bandelier. Thus, the survey should be non-destructive in nature.

These criteria put certain limitations on the types of studies which may be conducted, but the archaeological resources at Bandelier must be considered for future generations and further research potential. A reliable chronology of the prehistoric occupations can be developed with this type of study; also a study of settlement patterns and how they change through time and space is possible.

The survey could be conducted in four months by three Research Archaeologists and fifteen student assistants. Artifacts would not be collected, but detailed notes and mapping should be produced for each site. It is estimated that one

Research Archaeologist and two student assistants would require one year to assimilate the data and produce a finished manuscript describing the results of the project. The final report should include a set of problem oriented hypotheses, which could be tested by excavation. Also a cost estimation of the proposed excavation project should be included.

A detailed ecological study of a multi-disciplinary nature is needed as it will yield a new perspective toward understanding the prehistory at Bandelier. The present and paleoenvironments should be studied by various specialists including paleontologists, geologists, botanists, zoologists, chemists, and physicists. The ecological studies should be organized so that they will mesh with the archaeological studies. These studies should be conducted simultaneously to promote feedback between the various specialists. Only when this type of information is known can the prehistory of Bandelier begin to be understood.

Site testing and excavating should follow the site survey if problems or questions concerning the prehistory are in need of clarification. If the site survey and ecological studies answer all the anomalies in the archaeological record and do not foster new ones, then site testing and excavating may be omitted.

The archaeological studies should be designed to allow the research to extend over a long period of time and to be conducted by various qualified agencies. This should not affect the high quality of research which is necessary for this type of project. In order for a reliable view of the prehistory at Bandelier National Monument to be formed, these types of studies must be conducted. Otherwise, the nature and importance of Bandelier will continue to be misrepresented.

SITE SURVEY  
PROPOSED BUDGET

Salaries and Wages

Off Campus

Principal Investigator (1) 1 month @ \$1000.	\$1000.
Research Archaeologist (3) 4 months @ \$650.	7800.
Student Assistants (15) 4 months @ \$2.50/hr.	24000.

On Campus

Principal Investigator (1) 2 months @ \$1000.	2000.
Research Archaeologist (1) 12 months @ \$650.	7800.
Student Assistants (2) 240 mandays @ \$2.50/hr.	4800.
Secretary 1000 hrs. @ \$2.75	2750.

\$50,150.

Employee Benefits \$2135.

Supplies and Services 3500.

Publication 3000.

Travel and Perdiem  
18 people @ \$18. 25920.

Vehicle Expenses  
4 Blazers @ \$15/day plus  
18¢ mile, estimated 50,000 miles 10800.

Equipment 750.

TOTAL DIRECT COSTS \$96,255.

Overhead

Off Campus	\$8954.40
On Campus	<u>9230.20</u>

TOTAL PROJECT COSTS \$114,439.60

## ABSTRACTS

This section contains a summation of each important report. Many of the manuscripts which are in the bibliography have not been abstracted because they were not deemed relevant or that work was inaccessible. The abstracts are ordered alphabetically by the author's last name, the reference is stated, and the abstraction follows below. The information contained in these works was utilized to draft the recommendations for further archaeological investigation.

Alliot, Hector

1912 Fouilles de Tyuonyi, Village Prehistorique des Tewas, Nouvelle-Mexique. Societe des americanistes de Paris Journal 9:111-116.

Alliot presents a general historical description of Hewett's work in the area. He also includes in this short article a reconstruction of the Grand Kiva and discusses kivas in some detail.

Anonymous

1900 An Ancient Stone City Discovered in New Mexico. Scientific American 83:92.

This article reports the excavation of ruin between Bland and Espanola by George S. Cote, F. C. Cote, R. W. Bullock, and G. S. Madden. The discovered building measured 560 x 400 feet and was originally 2-3 stories high (only 6-10 feet high at present). The author speculates that over 1200 rooms were contained in this structure. An iron smelter was found in one room with a pot sherd illustrating a building with smoke curling out of a smokestack. The author quotes Madden's theory of earthquake or invasion (approximately 500-600 years ago) to explain abandonment of the pueblo. The relics were sent to Northwestern University.

Anonymous

1928     Where the Mountain Lions are Resting. El Palacio  
          24:314-317.

This highly melodramatic account of the "Shrine of the Stone Lions" resembles Bandelier's writings. The author mentions Pueblo Quemado and the fact that obsidian and turquoise fragments have been found there. He concludes this article with a bit of legend concerning the fate of Pueblo Quemado and a philosophical commentary on the vagaries of life.

Austin, Mary

1924     The Land of Journey's Ending.

This book is a popular history and travelogue that devotes only a few pages to Bandelier National Monument, and it highly fanciful in its descriptions.

Bandelier, Adolph F.

1942     The Delight Makers. Dodd, Mead, and Co., New York.

Bandelier's lengthy text is a romantic novel set against the backdrop of the Rito de los Frijoles, with little archaeological interest except for ethnographic analogy.

Bandelier, A. F.

1892     Final Report of Investigations among the Indians  
          of the Southwestern United States, Part II.  
          Papers of the Archaeological Institute of America,  
          American Series IV.

Chapter IV is directly relevant to Bandelier National Monument as it deals with the "valley of the Rio Grande between the Rito de los Frijoles and the mouth of the Jemez River". Information concerning the flora and geology of the area is presented. Bandelier postulates that the population was greater than Puye on the basis of the extent of the ruins. He describes the site as having good protection from enemies

because the inhabitants could not be starved out or cut off from their water supply. Bandelier mentions that pottery, stone axes (primarily of basalt), arrow points, metates, and grinders were present. Obsidian nodules were also present as a raw material source. Pictographs are reported as being found in several localities. A variety of pot sherds are found including corrugated, plain black, black-on-white, black-on-red, and types decorated with coarse and thick glazed designs. Bandelier provides some detailed information concerning dimensions of the architecture and mentions the Potrero del Alamo as having "a small ruin standing at the foot of the Potrero del Alamo, having 24 cells of an average size of 3-5 m x 2-9 m constructed of parallelepipeds of tufa. Scarcely any pottery was to be seen". He also discusses the ruin of Potrero de las Vacas. This ruin is the same as Yapa-shi Pueblo. Bandelier describes some of the artifacts that he found there, namely "the coarsely glazed pottery, corrugated and black-on-white ceramics, and obsidian chips abound together with moss-agates and flint". The Shrine of the Stone Lions is also described in detail and includes a map of the site. Bandelier discusses the Cueva Pintado and gives its dimensions; of particular interest is his realization that "the pictographs represent some of the well-known symbols of the pueblos, such as clouds, sheet lightning, the sun, dancing shields, and male and female dancers ... besides these aboriginal daubs, there are modern ones of equal artistic merit, among which the cross is prominent". In a footnote Bandelier states that "I was informed that in former times, whenever a pueblo was abandoned, it was customary to paint a series of such symbols in some secluded spot near the site of the village. Whether this is true or not, I do not know". He continues with a discussion of the pottery types found and concludes with a discussion of Capulin Mesa.

Barnes, W. C.

1921 The Bandelier National Monument. American Forestry 27:563-574.

This article is a personal narrative of the author's vacation expedition to the Monument soon after it was established. Photographs of the ruins and surrounding area provide more information than the text. Claiming the prehistoric inhabitants as descendents of the lost tribes of Israel and

ancestors of present Pueblo groups, the author speculates on their settlement patterns, life style, and eventual abandonment of the ruins.

Beam, George L.

1909 The Prehistoric Ruins of Tsankawi. National Geographic Magazine 20:807-822.

A photographically illustrated description of the author's journey to Tsankawi, Navawi, and Otowi ruins on the Pajarito Plateau. The author included speculations on the sizes, functions, and inter-relationships of these ruins in the prehistoric past, as well as hypothesizes why they were abandoned - tribal warfare, earthquake or volcanic disturbance, or migration to scattered villages where present Pueblo groups reside.

Chapman, K. H.

1938 Pajaritan Pictographs, The Cave Pictographs of the Rito de Los Frijoles. In The Pajarito Plateau and Its Ancient People edited by Edgar L. Hewitt. University of New Mexico Press, Albuquerque.

Five summer field seasons (1915-1920) were necessary to gather numerous illustrations and photographs that recorded a wide range of motifs utilized by prehistoric artisans in accomplishing pictographs in caves of the Rito de los Frijoles. Birds were most common, being represented by 36 variations ranging from realistic to abstracted forms. Thirty-five geometric patterns, similar to those used on prehistoric pottery were also recorded. The designs were executed by pecking and incising into the rock face. If the negative areas contained a great deal of fire-blackening, the drawings were considered to be pre-Spanish. This study does not give the provenience of any of the illustrated pictographs, nor is there any attempt to correlate the geometric designs with any dated ceramic type.

Frisbie, T. R., B. M. Moore, and R. H. Spielbauer  
1970 The James Webb Young Ranch Survey, 1969; A Preliminary Report. Southern Illinois University Press, Carbondale.

A survey under the direction of Dr. Charles H. Lange, Southern Illinois University, was conducted on the eastern third of the James Webb Young Ranch (Canada de Cochiti Grant), north central New Mexico in 1969. One hundred fifty archaeological and historic sites were located and surface sampled.

Archaeological periods represented by 129 sites were defined on the basis of ceramic cross-dates. Basketmaker II-III and Pueblo I and II components occurred in few sites. Eighty-two sites were associated with Pueblo III ceramics and stone masonry. Twenty-three of these ruins consisted of single room masonry structures; thirty-four multi-room structures were also defined. Basalt, pumice, and/or tuff set with adobe were the principle building materials. The remaining 23 Pueblo III sites had no associated structures. Three distinct ceramic periods were segregated by type frequencies. Four Pueblo IV ruins were located during previous surveys. Forty-five Pueblo V (historic) ruins were located during the 1969 reconnaissance.

Initial analysis of settlement pattern and material culture suggested many problems for additional research. They include:

- 1) The application and correlation of more absolute dating techniques to answer questions relating to a general chronology for the area;
- 2) The definition and location of natural resource areas;
- 3) Interpretations based on inter- and intra-site settlement patterns;
- 4) The determination of prehistoric trade routes;
- 5) Reconstruction of the paleoecology;
- 6) The construction of socio-political models based on ethnographic analogy;
- 7) Establishing the relationship of the sites in this area to those at Bandelier National Monument;
- 8) The relationship of those prehistoric and historic sites to the present Cochiti, Santa Domingo, and San Felipe Pueblos.

In general, further survey and excavation will be aimed at defining the kind and degree of structural-functional variation through time and space at this locality.

Harris, H. H.

1906 Pajarito Ruins - Their Accessibility. Scientific American Supplement 62:25876.

The author reports on his vacation expedition to unnamed ruins in the Pajarito region. Although not as spectacular as Puye, Otowi, Tsankawi, and Navakwi, the sites he visited were more readily accessible and had been saved from vandalism.

Hewett, Edgar L.

1904 Archaeology of the Pajarito Park, New Mexico. American Anthropologist 6:5:629-659.

Work was begun in this area in the summer of 1896. A preliminary reconnaissance indicated that there were many ruins present and that these could be ascribed to Tanoan and Keresan parent stocks. Hewett's research was basically restricted to an area from Santa Clara Canyon on the north to Rito de Los Frijoles on the south. An archaeological survey was conducted for 2 intensive seasons and was followed up by annual additional work until 1903. The ruins were divided into 3 groups: Puye; Tchregga; and Tyuonyi. Individual groups were divided by Hewett into 3 types: A - open front dwellings; B - excavated dwellings with closed front; and C - pueblo-like cliff dwellings.

Of the three groups, the Tyuonyi group is the most southerly division of Hewett's survey area. Type B dwellings seem to be predominant. Ruins are also on the Potrero de las Vacas, Potrero de las Casas, the ruins of Haatse on Potrero Chato, Kuapa in Canada de Cochiti, and those ruins located on Potrero Viejo.

The Tchregga group contains all three types of ruins, with some Type B structures in an excellent state of preservation. Construction is with volcanic tuffa and small stones used for chinking. Viga supports are much smaller than those normally found in pueblo architecture. The most important ruins of this group are Otowi, Tsankawi, Navakwi, Tchregga, and several smaller ruins.

The Puye group is the best known of the survey area, and includes the ruins of Puye, Shufinne, and other smaller sites.

Hewett briefly discusses pictograph and petroglyph localities and divides the data into religious, totemic, and legendary material. He also separates constructional

information into outline, intaglio, and relief.

Hewett believes that agriculture was the principle economic resource even though abundant game was available.

The mortuary customs of this area are varied. Tchrega and Tsankawi manifest communal mounds, caves or crypts, intramural chambers, and under fireplace burial localities. The main cemeteries, however, usually lie just outside the courts. The mounds mentioned above are 50-100 feet in diameter. The corpses face downward and are flexed. Gravegoods are commonly items of domestic usage.

Hewett sees an evolutionary and chronological sequence at Pajarito Park that begins with Type A dwellings and develops into Types B and C. He believes that the small pueblos are older than the combined cliff and village pueblos, and that the large villages of Tchrega, Tsankawi, Navakwi, Otowi, Puye, and Shufinne were contemporaneous. He believes that these large groups resulted from the banding together of smaller units for mutual aid, and that geological, climatic, and other environmental influences determine such an evolutionary sequence. Hewett also sets forth his "laws of village development" which are:

- 1) site, influencing morphology of dwellings as to compactness, regularity, etc.;
- 2) accession of population from without;
- 3) evolution from within.

Hewett concludes by saying that he won't treat the question of the depopulation of the Plateau because that is primarily a question of subsistence.

Hewett, Edgar L.

1906 Antiquities of the Jemez Plateau, New Mexico.  
U.S. Bureau of American Ethnology, Bulletin 32.

In Hewett's introductory note he defines the geographical area and mentions 6 Indian reservations or grants that border of lie within his limits (San Juan, Santa Clara, San Ildefonso, Cochiti, Santo Domingo, Jemez). He then treats the physiography of the Jemez Plateau, which is bounded on the west by the Rio Puerco and unequally from northwest to southeast by the Rio Chama. Mountains characterize the regional topography; few permanent streams run through the area with an average rainfall of 10-15 inches.

Tsankawi is located 2 miles southeast of Otowi and has a fine view. The pueblo was built "to the orthodox rectan-

gular plan". There are 10 kivas at Tsankawi, considered to be a large number by the author since he estimates the maximum population at 300-400. Tsankawi is a composite pueblo made up to 4 virtually independent houses of about 200 rooms each. Sections of the pueblo were probably 3 stories high. Hewett also discusses an unnamed ruin located in the Canyon de los Alamos on a high ridge with a stream running parallel on the south side; he says that the inhabitants eventually merged with Tsankawi. These ruins consist of one rectangular pueblo of considerable size and a number of smaller clan houses scattered along the ridge to the west for about  $\frac{1}{2}$  mile, and Hewett assigns the ruins to the older class of ruins. Another unnamed pueblo is also mentioned situated on a low bench just north of Tsankawi mesa with the walls entirely reduced to rubble. He discusses Tyuonyi and quotes the story that it is supposed to be ancient Keres land. He also quotes Bandelier on Tyuonyi, La Cueva Pintada, Yapashi, and the Stone Lions.

This book also covers other ruins of the Pajarito Plateau not within the monument boundaries. In addition to a photograph of La Cueva Pintada, there are pictures of the Yapashi ruin and a rear view of the Stone lions. Hewett concludes that the ruins of the Jemez Plateau are numerous and of great scientific value. The pottery found included coiled and indented, smooth undecorated, incised, polished decorated, and polished decorated with red glaze ornamentation. Four shades of red were used and 2 shades were occasionally used on the same bowl. The technique or ornamentation was bold and representational motifs were rarely used, and a highly developed symbolism is found.

Hewett, Edgar L.

1909 The Excavations at Tyuonyi, New Mexico in 1908.  
American Anthropologist 2:3:434-455.

This report covers Tyuonyi and surveys other archaeolo-fical work in the area. Hewett feels that the 2 waterfalls at the lower end of Frijoles Canyon constituted a major barrier and that "one must climb to the mesa top by the old Navaho trail south of the Rito, follow this a mile or two toward the mountains, and then descend by an ancient rock trail into the gorge at the site of the old Tyuonyi villages. Another ancient trail enters the conyon from the north." The El Rito watershed can be traced 10 miles away to the Jemez Mountains and is

described as "never-failing". Hewett feels that this has always been the case. A census of the Frijoles ruins yields 4 community houses in the valley, 1 on the mesa rim near the northern brink of the canyon, and a series of cliff houses  $1\frac{1}{2}$  miles long on the base of the northern wall (the cavate lodges). Hewett feels that Tyuonyi was built at one time rather than sections being periodically added to earlier units. One of three kivas at Tyuonyi was excavated by Hewett and he equates the Sipapu with the fire-pit. Also, he is not prepared to identify the ventilator shaft as anything but a ceremonial entrance (contrary to the work of Fewkes at Spruce Tree House). Kivas are found contiguous to valley bottoms pueblos, in talus before the cliff villages, and in cliff walls.

Hewett also excavated at the Ceremonial Cave. He cleaned out the kiva there, finding matting and some grains of red corn. He mentions La Cueva Pintada but provides no details. Hewett had exploratory trenches carried in every direction about Tyuonyi which revealed no general community burying place. A series of trenches in front of the Group D cliff dwellings did yield some burials in the talus. Hewett also calls the Shrine of the Stone Lions the Shrine of Mokatch. Trenching was also done at the ruin of Haatse which is on a mesa top south of the Canada de la Questa Colorada.

Hewett, Edgar L.

1909 The Excavations at El Rito de Los Frijoles in  
1909. American Anthropologist 2:4:651-673.

This is a continuation of the 1908 excavations. Several areas were intensively dug including the "Sun House", Snake Village, and the great Ceremonial Cave. Restoration was begun at the Large Cave ruin as well.

A section on language origins based on the mythology is included, written by J. D. Harrington. He feels that all the Rito area ruins probably contributed small groups to old K'otyit, the documented ancestral home of the Cochiti which was destroyed by the Spanish.

Hewett, Edgar L.

1930 Ancient Life in the American Southwest. Bobbs-Merrill Company,

This is a popular account of Hewett's earlier excavations with a summary of the work done on El Rito de Los Frijoles, Tyuonyi being the focal point. Some earlier articles are closely paraphrased in this work. As of 1930, he still hasn't accepted the ventilator shaft of the kiva as anything but a ceremonial entrance.

Hewett, Edgar L.

1938 The Pajarito Plateau and Its Ancient People. Handbook of Archaeological History. School of American Research and the University of New Mexico, Albuquerque.

Hewett presents a comprehensive, non-technical description of the geological and archaeological history of the Pajarito Plateau. Numerous photographs, maps, and drawings are used to illustrate major features of both disciplines.

Approximately 25 ruins are described in terms of general inter- and intra-site settlement patterns. More specific information concerning architectural features was synthesized from the excavations of Puye, Otowi, and Tyuonyi ruins.

A chapter dealing with the "Continuity of Pajarito Culture" proceeds beyond simple description to reconstruction of ancient life ways. Chronological information is supplied from ceramic cross-dates and dendrochronology. Hewett discounts catastrophic events leading to a mass exodus from the Pajarito region. Instead, he postulates a gradual migration as water and tillable land become scarce.

Many similarities between contemporary Pueblo settlements and ancient Pajarito ruins are discussed. However, Hewett cautiously claims that only a tenuous relationship can be established between prehistoric and contemporary inhabitants of the Upper Rio Grande.

An appendix by Kenneth Chapman describes and classifies cave paintings on the Pajarito Plateau. A second appendix publishes both the Federal Antiquities Act of 1906 and a statement on the protection of antiquities in New Mexico.

Hewett, Edgar L, Junius Henderson, and Wilfred W. Robbins  
1913 The Physiography of the Rio Grande Valley, New  
Mexico, in Relation to Pueblo Culture. U.S.  
Bureau of American Ethnology, Bulletin 54.

This provides detailed geological, climatological, and botanical material. This information centers on the Monument area, but is also concerned with the larger area of which Bandelier National Monument is a part. The authors view El Rito de los Frijoles as one canyon of many that dissect the Jemez Plateau.

The main thesis of this work is that of climatic change and how this rendered the area uninhabitable. The evidence suggests different conditions a few centuries ago, with a more general distribution of springs and streams and sufficient precipitation for the cultivation of areas now unfit for agriculture and irrigation.

Kidder, A. V.

1915 Pottery of the Pajarito Plateau and Some Adjacent  
Regions in New Mexico. Memoirs of the American  
Anthropological Association 2:6.

Kidder's purpose in writing this article is to fill a gap in information from this particular area. Kidder is unsatisfied with the earlier works and is attempting to compile a definitive study of Pajaritan pottery types.

He divides the architectural ruins into two types, small scattered dwellings and large pueblos, and then attempts to describe the characteristic pottery association with each. The pottery of the small ruins includes black-on-white (the predominant form), red ware (uncommon), and corrugated ware of poor quality. He also describes the vessel forms and detailed attributes of each type.

The pottery of the great ruins is called by the generic name "Pajaritan Pottery". He states that this pottery differs from all others in technology and decoration. The specific types are red and glaze, Biscuit ware, incised ware, and black ware. He then discusses the shapes and decorative motifs.

Kidder is reluctant to relate the above pottery types to other cultural area. However, he does feel that certain affinities do exist with Tularosa and Kayenta.

Kidder, A. V.

1924 An Introduction to the Study of Southwestern  
Archaeology. Yale University Press, New Haven.

Kidder begins this classic work on Southwestern archaeology with a section on the historical information available concerned with the Pecos region; this material came entirely from secondary sources such as Bandelier, Bolton, Bancroft, Twitchell, and Winship. Kidder's feeling that a great chronological span was involved at Pecos led him to recommend excavations in 1915.

Part II of this book details 6 seasons of work at Pecos, which Kidder found to be much larger and more complicated than he initially supposed. Since fragments of pottery were very common throughout the various levels, Kidder made ceramics an index of changes through time.

Kidder then presents a general summary of Southwest archaeology. He first discusses modern pueblos and then the prehistory of geographical areas including San Juan, Northern Peripheral District, Rio Grande, Eastern Peripheral Area, Little Colorado, Upper Gila, Mimbres, Lower Gila, and the Chihuahuan Basin. Within the Rio Grande area, the Santa Fe region was the most carefully studied. Kidder refers to the work of N. C. Nelson in the Galisteo Basin and his seriation of pottery by stratigraphic levels. Kidder establishes 5 stages of architectural development within the Rio Grande region and correlated distinctive pottery types with each.

Kidder sums up the occupation of the Southwest by Indian groups by postulating the former existence of a nomadic people that resemble modern "digger" Indians. However, he admits that there is no archaeological evidence for such a group. He characterizes the Basketmakers as having employed agriculture but not yet fully sedentary. A date of 1500-2000 B.C. is postulated for the Basketmakers. Post-Basketmaker sites introduced pottery and pole-and-brush roof architecture to the Southwest. After a substantial chronological break, an enlargement of occupied territory and population is inferred. Kidder feels that the pre-Pueblo peoples were a "new race" (brachycephalic) that replaced the dolichocephalic Basketmakers. The pre-Pueblo population lived in surface habitations and the pit house began to change into the kiva form. Kidder states that the transition from pre-Pueblo to Pueblo is not well known, but that there seems to be a continuum. The San Juan area was the center of cultural diffusion for

Puebloan elements. Kidder attributes the later concentration of pueblos as "the result of hostile pressure from without rather than the effect of climatic change". Further, Kidder does not accept the desiccation theory of pueblo abandonment; he thinks that there was an infiltration of small groups from peripheral areas toward central points. By 1540 the entire population was in 60-70 towns strung along the Rio Grande from Socorro to Taos and westward through Acoma and Zuni to the Hopi villages. Kidder concludes with a discussion on the value of dendrochronology.

Lange, Charles H.

1959 Cochiti: A New Mexico Pueblo, Past and Present.  
University of Texas Press, Austin.

A study of the prehistory of the Cochiti region and an ethnography of the present pueblo is summarized from original research and from an extensive bibliography.

Cochiti, the northernmost Keresan speaking pueblo of New Mexico, is located on a terrace of the Rio Grande about 30 miles southwest of Santa Fe. Cochiti mythology carries the Pueblo people back to a time when they, along with other Pueblo tribes, occupied Frijoles Canyon within the boundaries of Bandelier National Monument. Ceramics found adjacent to the pueblo and within the larger area of the reservation date to at least A.D. 1225; additional archaeological data indicate the locality of the present pueblo to be at least 700 years old. Historic documents, mainly Spanish chronicles, make few references to Cochiti. Adolph Bandelier's journals from 1880-1882 probably contain some of the most useful historic information about Cochiti life. Additional information can be obtained from U.S. Government reports.

It is clear from the rest of Lange's study that Cochiti is in the midst of rapid culture change. Traditional values exist along with the rapidly adapted Anglo cultural innovations. Lange's exhaustive ethnography contrasts these two spheres.

Of particular interest to the archaeologist are village plans and detailed descriptions of material culture. In addition, appendices listing demographic data and discussing traditional social, political; and ceremonial interactions may be helpful in the reconstruction of prehistoric lifeways in the Cochiti region.

Lange, Charles H.

1968 The Cochiti Dam, Archaeological Salvage Project,  
Part I: Report on the 1963 Season. Museum of New  
Mexico Research Records, No. 6.

A proposed dam site in north central New Mexico near the present Cochiti Pueblo necessitated an archaeological evaluation of that endangered area. The Cochiti Dam Archaeological Salvage Project began with a preliminary survey of the proposed dam site and areas adjacent to the high water level. Alfred Dittert noted on that survey that sites primarily located on points of land overlooking arroyos contained few flakes of chipping debris. He also reported a lack of "Archaic-like" attributes, and occasional surface structures were located which had no associated material culture.

Additional survey and excavation projects began in June, 1963 and continued through 1965. This report summarizes 3 sites (L.A. 6461, L.A. 6462, and L.A. 6455) which were excavated during the 1963 field season.

Introductory information place the sites in the Upper Sonoran life zone. The Jemez Mountains, rising above the immediate vicinity of the sites, provided an additional "ecochiche" for prehistoric peoples to exploit.

The Alfred Herrera site (L.A. 6455) was separated by a north/south running arroyo. It was excavated and recorded in terms of an east/west section.

Pit rooms were the prevailing architectural structure of the eastern sector, with 12 excavated and recorded. Two surface storage rooms were also located, and one relatively large kiva was recorded in the northern portion of the eastern sector.

Within the western sector only one pit room was recorded. The major dwelling unit in this sector was a block of about 22 contiguous surface rooms constructed of adobe. Two kivas were reported in the western sector. Ceramic typology and relative chronology of this site is not discussed.

Detailed maps, plans, and photographs are used to illustrate excavation techniques and architectural features of all excavated sites.

L.A. 6461 consisted of 4 subterranean structures. Of these, two were fully excavated and found to be pit houses associated with late Kwahe'e period ceramics.

Excavations at L.A. 6462 were divided into 6 units. The unit excavations revealed the following features:

Unit I	1 pit house	Late Santa Fe Period
Unit II	3 pit houses, 1 kiva	Late Kwahe'e Period
Unit III	1 pit house	Early Kwahe'e Period
	Roomblock, 7 rooms and 1 kiva	Early Santa Fe Period
Unit IV	1 pit house	Mid-Late Kwahe'e Period
	Roomblock, 7 rooms	Santa Fe Period
	1 kiva	Santa Fe Period
	1 pit room	Early Santa Fe Period
Unit V	1 pit house	Early Kwahe'e Period
	2 pit houses	Middle Kwahe'e Period
	3 storage pits	Late Santa Fe Period
Unit VI	1 pit house	Middle Kwahe'e Period
	Roomblock, 2 rooms	Early Santa Fe Period
	1 kiva	Early Santa Fe Period
	1 pit room	Early Santa Fe Period

Separate chapters are devoted to the analysis of material culture, petroglyphic analysis of glaze-painted pottery, floral remains, faunal remains, and human skeletal remains.

Ceramic frequencies for each type represented at the excavated sites are discussed and major distinguishing attributes of these types are described. Correlations of dendrochronology and ceramic typology is attempted for site L.A. 6462 and L.A. 6455. At L.A. 6462, the Kwahe'e Period is dated at the first half of the 12th century A.D. and the Santa Fe Period is dated beginning circa A.D. 1280.

At L.A. 6455 the majority of the correlations clustered between A.D. 1358 and A.D. 1409 for features in component 1. Component 2 had a life span of 25 years in the last decade of the 15th century A.D. while component 3 features were most likely occupied from A.D. 1500-1525.

In chronological arrangement, L.A. 6461 is the earliest, then L.A. 6462, and finally L.A. 6455. Assessment of this chronology would not have been possible before the excavations and analyses provided by this project.

Lange, C. H. and Carroll L. Riley  
1966 The Southwestern Journals of Adolph F. Bandelier, 1880-1882. University of New Mexico Press, Albuquerque.

Bandelier's journals spanning the years 1880-1882 were edited to present a balanced picture of raw materials useful

to anthropologists and historians. During this period Bandelier confined his research to the northern Rio Grande area, visiting San Juan, Santa Clara, Cochiti, Taos, and other pueblos as well as archaeological sites.

Pertinent to Bandelier National Monument are observations, maps, and drawings Bandelier made on trips to El Rito de Los Frijoles in the autumn and winter of 1880. Generally, he concentrated on recording ground plans and describing architectural details at Tyuonyi and additional unnamed sites.

Laut, Agnes

1913 City of the Dead. In Through Our Unknown Southwest. McBride Company, New York.

A romantic narrative of the author's impressions of El Rito de Los Frijoles and adjacent ruins. Laut claims "Neolithic" peoples occupying the caves were not "monkey men" but a highly civilized society as evidenced by the presence of ceramics and woven cloth. In addition to vivid reconstructions of ancient lifeways, she includes references to more scientific endeavors carried out by Dr. E. L. Hewett. The article is most valuable for its historical data which includes descriptions on the hardship of travel through the Jemez Mountains during the early years of this century.

Lister, Robert

1940 Otowi Artifacts. Southwestern National Monuments Supplement, 272-277.

The following general list summarizes a descriptive tabulation of artifacts recovered during stabilization of Otowi ruins in the spring of 1939.

1 worked sherd	5 micaceous schist arrowshaft straighteners
7 clay pipes	
1 clay pendant	5 axes (4 granite, 1 basalt)
1 clay bell	2 stone pipes
1 bone bead	1 stone pendant
3 bone awls	12 arrow points (7 obsidian, 4 flint, 1 chert)
1 flint drill	

Lister, Robert

1940 Arrows Recovered from Long House Ruin, Bandelier National Monument. Southwestern National Monuments Supplement, 64-66.

Twenty-six fragments of cane or reed shafts, 27 wooden foreshafts, and 7 articulated specimens were discovered during stabilization activities at Long House Ruin in the autumn of 1939. All of the fragments appear to be coming from a crack in the cliff face above Long House.

Shafts range from  $1\frac{1}{2}$ - $4\frac{1}{4}$  inches long and from  $\frac{3}{16}$ - $\frac{1}{2}$  inch in diameter. Foreshafts measure  $1\frac{1}{2}$ - $7\frac{1}{2}$  inches long and average  $\frac{3}{16}$  inch in diameter. Articulated specimens range from 2 inch fragments to a fairly complete artifact measuring 20 inches in length. Gut and grass bindings are preserved on most of the articulated arrowshafts and foreshafts.

Lummis, Charles F.

1915 Rito de los Frijoles. In Some Strange Corners of Our Country. Century Press, New York.

A chapter entitled "Homes that were forts" describes some of the major ruins of the Southwest, including general reference to some prehistoric sites within Bandelier National Monument.

Rito de los Frijoles was described as the largest of all villages of caves. Puye and Shufinne, the most easily accessible large cave ruins of North America, served as multiple story dwellings for aboriginal inhabitants. The circular rooms of the structures ranged from 8-12 feet in diameter, had low arched ceilings, and plastered walls. Although they provided sufficient homes, in the event of an attack the residents were claimed to have retreated to a "large, square pueblo on top of the cliff".

Also reported from this area were life-size stone idols of mountain lions. On nights prior to hunting, Lummis claims the ancients performed a "wild" dance around the lions which "no white man has ever seen or will ever see."

Lummis, C. F.

1925 Mesa, Canyon, and Pueblo. Century Press, New York.

Three chapters of this classic travelogue of the American Southwest pertain to the archaeology of the Jemez Plateau. Pueblo settlement in this rugged canyon country is attributed to the migration of Plains buffalo hunters in the pursuit of agriculture. Taking advantage of the available natural caves and by learning to shape volcanic tuff, these "pilgrims" developed a "race of masons". Lummis traveled through Rito de los Frijoles photographing ruins. He postulates a site-settlement sequence progressing from cave dwellings to stone houses as the population became more sedentary.

The evolution of arts and crafts is discussed as accompanying the shift from nomadic buffalo hunting to sedentary life.

The archaeology of Jemez Plateau is mentioned with reference to Shu-fin-ne and Puye ruins, but they are not described in detail.

MacHarg, J. B.

1926 The Lions of Cochiti. El Palacio 20:5:99-104.

A tentative bibliography of sixteen annotated sources describing the stone lions near Cochiti is listed. MacHarg claims they have been described as "the most significant sculptured monument of Primitive America".

Mera, H. P.

1934 A Survey of the Biscuit Ware Area in North New Mexico. Laboratory of Anthropology, Technical Series, Bulletin 6.

Mera's general objectives are to define the extent of the "Biscuit area", its manufacturing centers, and provide miscellaneous information concerning the ceramic types. This monograph is based on an intensive reconnaissance of several years duration. He divides his region according to drainages and geographical features. His divisions are Chama, Rio Grande, Santa Cruz, Nambe, Pajarito, Santa Fe, and Pecos. Mera supplies current Tewa names for a number of his archaeological sites.

The center of the Biscuit ware area is defined as being near the junction of the Rio Grande and Rio Chama. The western boundary is the confluence of the Polvadera and Canones Creeks and the eastern limit (except for 3 sites in the Rio Pecos drainage) is the Santa Fe Mountains. The southern border is less clear and occurs at the interface with glaze wares somewhere just south of Santa Fe. The area described covers approximately 48 square miles and 58 sites. These sites are manifestly a "restricted cultural group".

Mera's emphasis on topographical distinctions led him to divide his sites into defensive, semi-defensive, and indefensive units. He admits that this is an arbitrary classification and that it is possible that he is exaggerating the differences between the semi-defensive and indefensive sites. He concludes that "it is within reason to believe that the valley sites were not, on the whole, exposed to any great danger of hostile invasion, at least when first occupied." Also of apparent significance is the fact that 14 of the 16 defensive sites are located in the periphery of the Biscuit ware area.

Mera recognizes 7 glaze ware periods and 4 for Biscuit.

Schaafsma, Polly

1971 Rio Grande Petroglyphs in the Cochiti Reservoir.  
Unpublished manuscript on file at National Park  
Service, Santa Fe.

The author recorded 17 petroglyphs sites in the vicinity of Cochiti Reservoir in the Rio Grande Valley. The Cochiti Reservoir petroglyphs represent a general Pueblo IV and V Rio Grande rock art style with a wide distribution over the Galisteo Basin, Pajarito Plateau, Upper Rio Grande Valley, and to some extent, the northern Jornada area. The petroglyphs are associated with walls, enclosures, dry-laid masonry rooms, and Pueblo IV and V pottery. The motifs represented include spirals, concentric circles, stick and lizard men which are documented from pre-Pueblo IV and V periods to recent periods. Masks, quadrupeds, shield figures, anthropomorphs, and serpents are characteristic of styles utilized from Pueblo IV and V periods to recent times. Also, petroglyphs motifs are represented from the late 19th century to present as demonstrated by livestock brands, names, dates, and private brands. The majority of symbols are concerned with Pueblo religion, but the relationship of these sites to the Pueblo religion system is not known. Schaafsma states that a trend was received in the 14th century "from the west", but does not elaborate.

Stevenson, James

1886 Ancient Habitations of the Southwest. American Geographical Society Bulletin 18:329-342.

The author claims no significant link had yet been established to correlate ancient habitations with living Pueblo tribes. In search of evidence to confirm or deny the association, Stevenson set out to explore ruins of Chaco Canyon. As the first white man to enter certain portions of the park, he named the now famous Canyon de los Muertos because of some burials found there.

In 1882 the author visited El Rito de los Frijoles. At that time Stevenson's guide told him the Cochiti Indians called it "Gunuye" or "the Place where Customs and Rites are Prescribed". He describes in gross generalities some architectural features of the cave in which he camped. Beyond historically documenting early visits to this rich prehistoric culture area, Stevenson's report contains little scientifically valuable information.

Stubbs, S. A. and W. S. Stallings, Jr.

1953 The Excavation of Pindi Pueblo, New Mexico. School of American Research, Monograph 18.

Pindi Pueblo (also known as Pueblo Quemado) is located on the north bank of the Santa Fe River some 6 miles southwest of Santa Fe. Recent stream cutting has destroyed about half of this large pueblo. Excavations of the remaining site took place between December, 1932 and June, 1933.

Pindi is one of the largest excavated sites in this area, dating from the 14th century A.D. Although the site is quite large, the authors claim it was never fully occupied. Excavations confirmed 4 periods in the settlement of Pindi with a continual shift from one end of the pueblo to the other.

The first occupation period, call the Pre-Pindi Period, occurred during late Pueblo II times. The overall plan of that settlement was a hilltop site consisting of pit houses and jacal structures. Chaco B/W, Kwahe'e B/W, Red Mesa B/W, and Puerco B/W pottery was associated with this period.

The following three stages, referred to as Building periods 1-3, span Pueblo III times (ca. A.D. 1250-1350). The First Building Period consisted of a roomblock containing 40 rooms and 3 kivas at the time of excavation. Additional

rooms and at least 1 kiva were destroyed by stream cutting at the south end of the room block.

The Second Building Period is marked by an expansion and alteration of the overall ground plan. A large number of rooms, kivas, and plazas were added. The Third Building Period added more rooms, some of which covered Period 2 units, and there are indications that the southern end of the site was abandoned. Numerous maps and profiles illustrate the above settlement shifts.

Ceramics from Pueblo occupation units were divided into two periods. The first shows concentrations of Santa Fe B/W accompanied by lesser amounts of Wiyo and Galisteo B/W. The second period shows a decrease in Santa Fe B/W and a marked increase of Galisteo and Wiyo B/W, plus two new types identified as Poge and Pindi B/W.

The remainder of the study consists of descriptions and illustrations of architectural details, material culture, and an analysis of design elements and motifs used in the manufacture of pottery. A short section on skeletal remains and burial customs list 90 individual burials.

Pindi is placed in the "Great Pueblo" period of Rio Grande prehistory by the authors.

Taylor, W. W.

1954 Southwestern Archaeology, Its History and Theory.  
American Anthropologist 56:4:1:561-570.

"Archaeology with a purpose", Taylor claims, did not begin in the American Southwest until 1880 when eastern based institutions began expeditions to the area. Taylor defines the Cushing-Fewkes Period as dating from 1880 to 1915, not because these men were the only investigators, but because their work is most characteristic of this span of time. The basic aims of their research were to connect living Pueblo Indians with their prehistoric ancestors. The work was based on the ideas that the culture of the Southwest was uniform and that the "multi-phyletic" nature of the archaeological data was not important, that culture change was due to migrations of a single groups of people through different environments, that little concern should be paid to temporal distinctions and sequences, and that most excavations should be geared to securing unusual specimens for museum collections.

In the second decade of the 20th century an influx of archaeologists trained in the procedures of stratigraphic

excavation entered the Southwest. The focus was on discerning temporal and spatial changes within the greater Southwest culture area. The development of dendrochronology was an aid in producing absolute chronologies in many parts of the Southwest.

Throughout the history of Southwestern archaeology there has been a preoccupation with artifacts and not people. Taylor reiterates his plea for an advance in method and theory in Southwestern research to take archaeology out of a 1930's frame of historical particularism and into a pioneer effort at socio-cultural explanations of prehistoric populations.

Tichy, M. F.

1941 Six Game Pieces from Otowi. El Palacio 48:1:1-6.

Six "unique" clay specimens of Biscuit ware were recovered from Otowi during excavations in 1916-1917. The author relates these artifacts to gaming pieces used among Pueblo Indians today, and to the discs used in quoits. They range from  $2 \frac{3}{8}$ - $3 \frac{1}{8}$  inches long,  $2 \frac{3}{16}$ -3 inches wide, and from  $\frac{3}{4}$ - $1 \frac{3}{8}$  inches in thickness; all have "typical" Biscuit ware paste and some evidence of use. One specimen is decorated with a black linear design on the top surface and another has fingernail indentations at one end. The remainder are undecorated.

Tichy, Marjorie F.

1947 A Painted Ceremonial Room at Otowi. El Palacio 54:3:59-69.

A frescoed ceremonial room was excavated at Otowi in 1917. A yellow mountain lion outlined in black was painted on a wall of one of the largest rooms in the 450 room prehistoric village. The author reports mountain lions motifs were common in the Pajarito region, and frescoed rooms frequent in the Southwest from A.D. 1100 to the 16th century. She also includes a short description and bibliographic references for other ceremonial rooms reported in Arizona, New Mexico, and Colorado.

Tichy, Marjorie F.

1947 A Ceremonial Deposit from the Pajarito Plateau.  
El Palacio 54:10:227-237.

Over 150 ceremonial objects were located during mining activities near Puye ruin. The prayer sticks, ceramics, and miscellaneous ceremonial artifacts came from two openings at the base of a knoll. Prayer sticks are classified into 3 categories based on shape: large (11); crooked (58); and pointed (85). Photographs of the most unusual objects are included.

Tichy feels that no definite date can be assigned to the deposit; however, she feels that the objects are a minimum of 200 years old. This estimate is based on the presence of yucca fiber cordage and natural pigment paints, and on the fact that informants claim the area is not presently used as a shrine.

Walk, Paul A. F.

1920 National Monuments of New Mexico: Bandelier  
National Monument, El Rito de los Frijoles.  
Art and Archaeology 10:1-2:7-13.

Bandelier National Monument, a part of a 2,000,000 acre national forest, is claimed to be the richest archaeological region of the United States. Brief, romantic descriptions are provided for the Ceremonial Cave, Tyuonyi, Pueblo Viejo, and Puye ruins.

Wendorf, Fred

1952 Excavations at Cuyamungue. El Palacio 59:8:265-266.

Cuyamungue, a historic pueblo located 15 miles north of Santa Fe, was excavated with the main objective being to study the effect of Spanish contact on the northern Rio Grande pueblos during the first 100 years of contact.

Archaeological data indicate the pueblo was occupied originally in the 13th century. From A.D. 1400-1500 an intensive occupation is documented. Shortly after this period it was abandoned, then reinhabited in the early 1600's, and finally completely abandoned by 1700.

Changes in material culture include the introduction of metal tools and domesticated animals which led to a marked change in Pueblo life.

Wendorf, Fred (Editor)

1953 Salvage Archaeology in the Chama Valley, New Mexico. Monographs of the School of American Research, No. 17.

This report covers excavations undertaken at the Leaf Water site (L.A. 300) and Te'ewi Pueblo (L.A. 252) during summer field seasons from 1950-51.

The Chama Valley lies in the extreme southern end of the Rocky Mountains physiographic province, and is an extension of the Rio Grande Structural Basin. Rio Chama is drained by the Rio Grande system. The Chama Valley exists in the Upper Sonoran life zone. A brief history of the Chama Basin is reported. Contact with Coronado's expedition in July, 1541 begins the recorded history of the Chama region. Documents exist which describe pueblos visited by early conquistadores, and throughout recorded history the southern Chama Valley appears to have been a trade and travel route rather than a settlement area for Indians and Spanish. This route served to connect the Rio Grande and San Juan areas.

The Leaf Water site is located in the lower Chama Valley where prehistoric inhabitants had a variety of natural resource areas available for exploitation. The overall plan of this 13th century pueblo was trapezoidal, measuring approximately 60 m across the long axis.

A general description of the excavated rooms included: 10 rooms exhibiting no floor or wall features, and of these 7 appeared to have been storage rooms while the remaining 3 are postulated as being work rooms; 11 living rooms distinguished by floor and wall details; 2 kivas; and 2 pit houses. Detailed drawings and photographs illustrate major features of the excavated rooms and their stratigraphic positions.

Material culture is tabulated on lists for the total site. Diagnostic tools such as ceramics, bone and shell tools, and worked antler are recorded by provenience. Ceramic types used to date this site include Santa Fe B/W, Wiyo B/W, and corrugated types. Three races of Southwestern corn were located during excavation, all belonging to the "nubbin" category of Zea maize.

Te'ewi Pueblo is located on an easily defensible mesa-like terrace (possibly a questa) above the west side of Rio Chama near the confluence of that river with Rio Oso. Floodplains and valley floor features below the pueblo provided suitable agricultural land for prehistoric inhabitants.

Excavations revealed the original ground plan to be a double plaza, square-sided figure "8". Although only partially excavated, 27 rooms, 4 kivas, and 10 shrines were examined. Details of room position and association with architectural features are provided. Speculation for room use is included based on the position and distribution of features in the structure.

The ceramic analysis identified the following ceramic sequence, dating the site from A.D. 1200-1500.

Tewa Polychrome  
Sankawi B/Cream (ca. A.D. 1500-1650+)  
Biscuit B  
Biscuit A  
Wiyo B/W (ca. A.D. 1275-1350)  
Santa Fe B/W (ca. A.D. 1225-1350)

Tables list the distribution of these types by room and distinguish between floor and fill locations. Additional tables, drawings, and photographs are used to describe the other excavated archaeological remains. Of particular interest are the wide varieties of ground stone tools, bone whistles, and flutes recovered throughout the site.

The Leaf Water and Te'ewi sites add data to the theory of florescence and decline of Pueblo occupation postulated for the Chama Valley from the 13th-16th centuries. Prior to this period it is claimed that non-Puebloan groups occupied the vicinity. The sudden decline of the Chama Valley occupation post-A.D. 1500 has been attributed to a collage of ecologically oriented theories. Migration seems to have been eastward toward the Rio Grande, where the contemporary Pueblo groups reside.

Wendorf, Fred

1954 A Reconstruction of Northern Rio Grande Prehistory. *American Anthropologist* 56:200-227.

This report contains essentially the same ideas as a more elaborate, later reconstruction proposed by Wendorf and Reed (1955). The difference between the two is that this study lacks the empirical archaeological data and bibliography of the later work.

Wendorf, Fred and E. K. Reed

1955 An Alternative Reconstruction of Northern Rio Grande Prehistory. *El Palacio* 62:5-6:131-173.

The northern Rio Grande archaeological region is "a roughly rectangular area extending from a line through Isleta in the south, and the Colorado line on the north; and from the Canadian River on the east, to the Rio Puerco and Rio Chama on the west" (p. 133). Occurring mostly within the Upper Sonoran life zone, the area is physiographically quite complex.

Only after A.D. 1250-1300 did this area become a major center of Pueblo population. Prior to that time, population was concentrated in the San Juan drainage. This shifting demographic pattern encouraged a chronological framework specifically for the northern Rio Grande region. Five major archaeological periods were defined, and are listed below.

Pre-Ceramic Period (15,000 B.C.-A.D. 600)  
Rio Grande Developmental Period (A.D. 600-1200)  
Rio Grande Coalition Period (A.D. 1200-1325)  
Rio Grande Classic Period (A.D. 1325-1600)  
Rio Grande Historic Period (A.D. 1600-Present)

Wing, Kittridge A.

1955 Bandelier National Monument, New Mexico. National Park Service Historical Handbook Series No. 23.

Ruins at Bandelier National Monument form a link between prehistoric inhabitants who occupied the Pajarito area from the 13th-16th centuries and the modern Rio Grande Pueblos. Pajarito Plateau (ca. 300 miles square), formed by the eastern slope of the volcanic Jemez Mountains, appears to have been densely populated in prehistoric times. Two types of occupations have been distinguished, cliff or cave dwellings and masonry or open pueblo structures. No evidence suggests that one type of structure antedates another.

Bandelier is divided into two sections, the Otowi section (9 miles square) and Frijoles section (33 miles square). Otowi and Tsankawi ruins are located within the smaller section of Otowi; principal ruins within Frijoles Canyon include Tyuonyi, Talus House, Long House, and a number of kivas and "ceremonial" caves associated with the pueblos. Cave kivas, constructed within natural caverns in the soft bedrock, are

peculiar to Bandelier National Monument.

The cultural history of Bandelier is presented within a general chronological framework of Southwestern prehistory, beginning with scant evidence for late Basketmaker occupation and terminating with Spanish contact in the late Pueblo period.

Evidence from adjacent areas seems to indicate Bandelier as a major immigration center during Pan-Southwestern droughts in the 13th century. The newcomers were farmers and collectors who had a wide variety of resources to exploit in Bandelier. Abundant soft rock provided building material, game provided food and clothing, and plants were used for a variety of needs.

## BIBLIOGRAPHY

### Alliot, Hector

- 1912 Fouilles de Tyuonyi, Village Prehistorique des Tewas, Nouvelle-Mexique. Society des americanistes de Paris Journal 9:111-116.

### Anonymous

- 1900 An Ancient Stone City Discovered in New Mexico. Scientific American 83:92.
- 1918 The National Monuments of New Mexico: The Bandelier National Monument. El Palacio 5:193-203.
- 1928 Where the Mountain Lions are Resting. El Palacio 24:314-317.

### Austin, Mary

- 1924 The Land of Journey's Ending. 78-188.

### Bandelier, A. F.

- 1883 Historical Introduction to Studies Among the Sedentary Indians of New Mexico (Part I) and Report on the Ruins of the Pueblo of Pecos (Part II). Papers of the Archaeological Institute of America, American Series I.
- 1890a Final Report of Investigations Among the Indians of the Southwestern United States, Part I. Papers of the Archaeological Institute of America, American Series IV.
- 1890b Contributions to the History of the Southwest Portion of the United States. Papers of the Archaeological Institute of America, American Series V.
- 1892 Final Report of Investigations among the Indians of the Southwestern United States, Part II. Papers of the Archaeological Institute of America, American Series VI.
- 1942 The Delight Makers. Dodd, Mead, and Company, New York.

- Bandelier, A. F. and Hewitt, E. L.  
 1937 Indians of the Rio Grande Valley. University of New Mexico and School of American Research. Albuquerque.
- Barnes, Will C.  
 1921 The Bandelier National Monument. American Forestry 27:563-574.
- Bartlett, A. Eugene  
 1925 Least Known America. Revell Company, New York.
- Baumann, Gustave  
 1939 Frijoles Canyon Pictographs. Writers' Editions, Inc., Santa Fe.
- Beam, George L.  
 1909 The Prehistoric Ruins of Tsankawi. National Geographic Magazine 20:807-822.
- Benedict, Ruth  
 1931 Tales of the Cochiti Indians. U.S. Bureau of American Ethnology, Bulletin 98.
- Caywood, Louis R.  
 1966 Excavation of Rainbow House, Bandelier National Monument, New Mexico. Southwestern Archeological Center.
- Chapman, Kenneth H.  
 1938 Pajaritan Pictographs, The Cave Pictographs of the Rito de Los Frijoles. Reprinted from Appendix I, The Pajarito Plateau and Its Ancient People by Edgar L. Hewitt. School of American Research and the University of New Mexico. Albuquerque.
- Chapman, Kenneth M.  
 1953 Pottery of Santa Domingo Pueblo: A Detailed Study of its Decoration. Memoirs of the Laboratory of Anthropology, Vol. I.  
 1970 Pottery of San Ildefonso Pueblo. School of American Research. University of New Mexico Press, Albuquerque.
- Dutton, Bertha P.  
 1938 The Jemez Mountain Region. El Palacio 44:19-21.

- Estabrook, Emma F.  
1932 Givers of Life. Marshall Jones Company, Boston.
- Fretwell, Patricia H.  
1954 Preliminary Report of Excavation of Fulton Site 190, Pajarito Plateau. Unpublished manuscript, Museum of New Mexico.  
  
1959 Final Report, Excavation of Fulton Site 190, Pajarito Plateau. Unpublished manuscript, Museum of New Mexico.
- Frisbie, F. R., B. M. Moore, and R. H. Spielbauer  
1970 The James Webb Young Ranch Survey, 1969; A Preliminary Report. Southern Illinois University Press, Carbondale.
- Gehlbach, F. R. and R. R. Miller  
1961 Fishes from Archaeological sites in Northern New Mexico. The Southwest Naturalist 6:1:2-8.
- Gladwin, W. and H. S. Gladwin  
1934 A Method for the Designation of Cultures and their Variations. Medallion Papers XV.
- Goad, Edgar F.  
1939 A Study of the Life of Adolph Francis Alphonse Bandelier. Unpublished Ph.D. Thesis, University of Southern California.
- Harris, Hugh H.  
1906 Pajarito ruins - their accessibility. Scientific American Supplement 62:25876.
- Hawley, Florence M.  
1950 Field Manual of Prehistoric Southwestern Pottery Types. University of New Mexico Bulletin, Anthropological Series 1:4.
- Henderson, J. and Harrington, J. P.  
1914 Ethnozoology of the Tewa Indians. U.S. Bureau of American Ethnology, Bulletin 56.
- Hendron, J. W.  
1937a The Stabilization of the Kiva in the Great Ceremonial Cave. Unpublished manuscript on file at Bandelier National Monument.

- 1937b The Stabilization of the Large Kiva, Frijoles Canyon, Bandelier National Monument, New Mexico. Unpublished report of the Southwestern Parks and Monuments Association.
- 1938a Archaeological Report on the Stabilization of Tyuonyi, the Rito de los Frijoles, Bandelier National Monument, New Mexico. Southwestern Monuments Monthly Report Supplement.
- 1938b The Stabilization of the Restored Talus House, the Rito de los Frijoles, Bandelier National Monument, New Mexico. Southwestern Monuments Monthly Report Supplement.
- 1940 Prehistory of El Rito de los Frijoles. Southwestern Monuments Association, Technical Series No. 1.
- 1943 Frijoles Canyon, Bandelier National Monument, New Mexico. Unpublished manuscript on file at Bandelier National Monument.
- 1945 Potsuui II, A Pueblo III site on the Pajarito Plateau. Unpublished manuscript on file with the National Park Service.
- 1946a Frijoles: A Hidden Valley in the New World. The Rydal Press, Inc., Santa Fe.
- 1946b We Found America's Oldest Tobacco. New Mexico Magazine 24:11.

Hewett, Edgar L.

- 1901 Prehistoric Archaeology. U.S. Department of the Interior, Annual Report.
- 1903 The Pajarito Park. U.S. Department of the Interior, Annual Report.
- 1904 Archaeology of the Pajarito Park, New Mexico. American Anthropologist 6:5:629-659.
- 1906 Antiquities of the Jemez Plateau, New Mexico. U.S. Bureau of American Ethnology, Bulletin 32.

- 
- 1908 Excavations at Puye in 1907. Papers of American Archaeology, No. 4.
- 1909a The Excavations at Tyuonyi, New Mexico in 1908. American Anthropologist 2:3.
- 1909b The Excavations at El Rito de los Frijoles in 1909. American Anthropologist 2:4.
- 1909c The Pajaritan Culture. Archaeological Institute of American Papers 3:334-344.
- 1916 The Proposed National Park of the Cliff Cities. Archaeological Institute of America, Papers of the School of American Archaeology, No. 34.
- 1930 Ancient Life in the American Southwest. Bobbs-Merrill Company, Indianapolis.
- 1938a The Pajarito Plateau and Its Ancient People. University of New Mexico and School of American Research, Albuquerque.
- 1938b Prehispanic Frescoes in the Rio Grande. Archaeological Institute of America, Papers of the School of American Research, No. 16.
- Hewett, Edgar L. and Bertha P. Dutton
- 1945 The Pueblo Indian World, Studies on the Natural History of the Rio Grande Valley in Relation to Pueblo Indian Culture. University of New Mexico and the School of American Research, Albuquerque.
- Hewett, Edgar L., Junius Henderson, and Wilfred W. Robbins
- 1913 The Physiography of the Rio Grande Valley, New Mexico, in Relation to Pueblo Culture. U.S. Bureau of American Ethnology, Bulletin 54.
- Hewett, Edgar L. and Wayne L. Mauzy
- 1953 Landmarks of New Mexico. The University of New Mexico and the School of American Research, Albuquerque.

Hibben, Frank C.

1941 Evidences of Early Occupation in Sandia Cave, New Mexico, and other sites in the Sandia-Manzano Region. Smithsonian Miscellaneous Collections 99:23.

1951 Sites of the Paleo-Indian in the Middle Rio Grande Valley. American Antiquity 17:1:41-46.

Hodge, Frederick W.

1932 Biographical Sketch and Biography of of Adolph Francis Alphonso Bandelier. New Mexico Historical Review 7:353-370.

Holmes, William H.

1905 Notes on the Antiquities of Jemez Valley, New Mexico. American Anthropologist 7:2:198-212.

Hunt, W. R., Jr.

1942 Folsom and Yuma Points from the Estancia Valley, New Mexico. American Antiquity 7:4:400-402.

Ickes, Anna W.

1933 Mesa Land. Houghton Mifflin, New York.

Irwin-Williams, Cynthia

1967 Picosa: The Elementary Southwest Culture. American Antiquity 32:4:441-457.

Jackson, Earl

1923 The Ruins of Tsankawi. Southwestern Monuments Monthly Report 213-217.

James, George W.

1915 Our American Wonderlands. A. C. McClury and Company, Chicago.

Jeancon, Jean A.

1923 Excavations in Chama Valley, New Mexico. U.S. Bureau of American Ethnology, Bulletin 81.

Judd, Neil M.

- 1962 1910 in El Rito de Los Frijoles. El Palacio  
69:3:138-141.

Kidder, A. V.

- 1915 Pottery of the Pajarito Plateau and Some Adjacent  
Regions in New Mexico. Memoirs of the American  
Anthropological Association 2:6.
- 1917 Notes on the Pottery of Pecos. American Anthro-  
pologist 19:3.
- 1924 An Introduction to the Study of Southwestern  
Archaeology. Yale University Press, New Haven.
- 1931 The Pottery of Pecos, Vol I. Yale University  
Press, New Haven.
- 1932 The Artifacts of Pecos. Yale University Press,  
New Haven.
- 1936 The Pottery of Pecos, Vol II. Yale University  
Press, New Haven.

Lange, Charles H.

- 1959 Cochiti: A New Mexico Pueblo, Past and Present.  
University of Texas Press, Austin.
- 1961 Archaeological Survey of the Canada de Cochiti  
Grant and Adjacent Portions of Bandelier and  
Cochiti. Museum of New Mexico Press, Santa Fe.
- 1968 The Cochiti Dam, Archaeological Salvage Project,  
Part I: Report on the 1963 season. Museum of  
New Mexico Research Records, No. 6.

Lange, Charles H. and Carrol L. Riley

- 1966 The Southwestern Journals of Adolph F. Bandelier,  
1880-1882. University of New Mexico Press, Albu-  
querque.

Laut, Agnes C.

- 1913 Through Our Unknown Southwest. McBride Company,  
New York.

Lister, Robert H.

- 1939a Stabilization of Long House, Bandelier National Monument. Unpublished manuscript on file at Bandelier National Monument.
- 1939b Stabilization of Otowi, Bandelier National Monument. Unpublished manuscript on file at Bandelier National Monument.
- 1940a Arrows Recovered from Long House Ruin, Bandelier National Monument. Southwestern National Monuments Supplement. pp. 64-66.
- 1940b Otowi Artifacts. Southwestern National Monuments Supplement. pp. 272-277.
- 1940c Stabilization of Cave Ruins, Bandelier National Monument. Unpublished manuscript on file at Bandelier National Monument.
- 1940d Stabilization of Frijoles Cave Ruins, Bandelier National Monument. Unpublished manuscript on file at Bandelier National Monument.

Lummis, Charles F.

- 1915 Some Strange Corners of Our Country. Century Press, New York.
- 1925 Mesa, Canyon, and Pueblo. Century Press, New York.

McGregor, John C.

- 1965 Southwestern Archaeology. John Wiley and Sons, New York.

MacHarg, J. B.

- 1926 The Lions of Cochiti. El Palacio 20:5:99-104.

Marriot, Alice

- 1948 Maria: The Potter of San Ildefonso. University of Oklahoma Press, Norman.

Maxon, James C.

- 1969 A Study of Two Prehistoric Pueblo Sites on the Pajarito Plateau, New Mexico. Unpublished Masters Thesis, University of Wisconsin.

Mera, H. P.

- 1933 Wares Ancestral to Tewa Polychrome. Laboratory of Anthropology, Technical Series, Bulletin 4.
- 1934 A Survey of the Biscuit Ware Area in Northern New Mexico. Laboratory of Anthropology, Technical Series, Bulletin 6.
- 1935 Ceramic Clues to the Prehistory of North Central New Mexico. Laboratory of Anthropology, Technical Series, Bulletin 8.
- 1940 Population Change in the Rio Grande Glaze-Paint Area. Laboratory of Anthropology, Technical Series, Bulletin 9.

Morley, Sylvanus G.

- 1910 The South House, Puye, New Mexico. Papers of the School of American Archaeology, No. 7.
- 1938 The Rito de Los Frijoles in the Spanish Archives. Appendix II in The Pajarito Plateau and Its Ancient People. University of New Mexico Press, Albuquerque.

Munk, Joseph A.

- 1920 Southwestern Sketches. G. P. Putnam's Sons, New York.

Nelson, N. C.

- 1913 Ruins of Prehistoric New Mexico. Natural History 13:63-82.

Onstott, Thomas B.

- 1948a Report on the Stabilization of Long House Ruin, Bandelier National Monument. Unpublished manuscript on file at Bandelier National Monument.
- 1948b Stabilization Records, Bandelier National Monument, Large Kiva. Unpublished manuscript on file at Bandelier National Monument.

- 1949 Archaeology, Geology, History, and Wildlife of Bandelier National Monument. U.S. Department of the Interior, National Park Service.
- 1952 Excavations at Tyuonyi, 1947-48. Southwestern Monuments Library.
- Peckham, S. L. and S. L. Wells  
 1967 An Inventory of Archaeological Sites at and in the Vicinities of Bandelier National Monument and the Cochiti Dam and Reservoir, New Mexico. Museum of New Mexico Press, Santa Fe.
- Pettitt, Roland A.  
 1972 Los Alamos Before the Dawn. Pajarito Publications, Los Alamos.
- Prince, L. Bradford  
 1904 The Stone Lions of Cochiti. Records of the Past 3:151-160.
- Radin, Paul  
 1942 The Unpublished Letters of Adolph F. Bandelier. Charles P. Everitt Company, New York.
- Reeves, C. C., Jr.  
 1972 Tertiary-Quaternary Stratigraphy and Geomorphology of west Texas and southeastern New Mexico. In Guidebook of East-Central New Mexico. New Mexico Geological Society, 23rd Field Conference.
- Reiter, Paul  
 1934 Final Report of the Archaeological Reconnaissance Party, Bandelier National Monument, New Mexico. Report on file with the National Park Service.
- 1940 The Stone Lions of Cochiti - and Zuni. Region III Quarterly 1:1.
- 1949 Sources of Upper Rio Grande Pueblo Culture and Populations. El Palacio 56:6:163-184.
- Renaud, E. B.  
 1938 The Snake Among the Petroglyphs from North Central New Mexico. Southwestern Lore 4:3:42.

Schaafsma, Polly

1971 Rio Grande Petroglyphs in Cochiti Reservoir.  
Museum of New Mexico Papers in Anthropology 16.

1972 Rock Art in New Mexico. New Mexico State  
Planning Office.

Smiley, Terah L.

1952 A Summary of Tree-Ring Dates from Some Southwestern  
Sites. University of Arizona Bulletin 22;  
Laboratory of Tree-Ring Research Bulletin No. 5.

Smiley, Terah L. Stanley Stubbs, and Bryant Bannister

1953 A Foundation for the Dating of Some Late Archeo-  
logical Sites in the Northern Rio Grande Area,  
New Mexico. University of Arizona Bulletin 24:3;  
Laboratory of Tree-Ring Research Bulletin No. 6.

Snow, David H.

1971 Cochiti Dam Salvage Project: Archaeological In-  
vestigations at L.A. 8720, Cochiti Dam, New  
Mexico. Laboratory of Anthropology Notes No. 87.

1973a Cochiti Dam Salvage Project: Archaeological Ex-  
cavation of the Las Majadas Site, L.A. 591,  
Cochiti Dam, New Mexico. Laboratory of Anthro-  
pology Notes No. 75.

1973b Cochiti Dam Salvage Project: Archaeological  
Excavation at the Torreon Site, L.A. 6178, Cochiti  
Dam, New Mexico. Laboratory of Anthropology  
Notes No. 76.

Starr, Fredrick

1900 Shrines Near Cochiti, New Mexico. American Anti-  
quity 22:4.

Stevenson, James

1886 Ancient Habitations of the Southwest. American  
Geological Society Bulletin 18:329-342.

Stubbs, S. A. and W. S. Stallings, Jr.

1953 The Excavation of Pindi Pueblo, New Mexico.  
Monographs of the School of American Research,  
No 18.

Taylor, Walter W.

- 1954 Southwestern Archaeology, Its History and Theory.  
American Anthropologist 56:4:1:561-570.

Tichy, M. F.

- 1941 Six Game Pieces from Otowi. El Palacio 48:1:1-6.
- 1947a Ceremonial Deposit from the Pajarito Plateau.  
El Palacio 54:10:227-237.
- 1947b Painted Ceremonial Room at Otowi. El Palacio 54:3:  
59-69.

Turney, John Francis

- 1948 Analysis of Material Taken from a Section of  
Group M of the Cliffs, Frijoles Canyon, Bander-  
lier National Monument, New Mexico. Unpublished  
Masters Thesis, Adams State College.
- 1950 Stabilization Records, Bandelier National Monu-  
ment, Large Kiva and Tyuonyi. Unpublished manu-  
script on file at Bandelier National Monument.
- 1955 Archeological Survey of the Otowi Section, Bander-  
lier National Monument. Unpublished manuscript  
on file at Bandelier National Monument.
- 1962 Bandelier Survey. Unpublished manuscript on file  
with the National Park Service.

Underhill, Ruth

- 1938 First Penthouse Dwellers of America. J. J. Augustin,  
New York.

Von der Lippe, George M. and Edward J. Widmer

- 1960 A Field Report on Uncontrolled Use of the Otowi  
Section of Bandelier National Monument. Unpub-  
lished manuscript on file at Bandelier National  
Monument.

Walk, Paul A. F.

- 1920 National Monuments of New Mexico: Bandelier  
National Monument, El Rito de los Frijoles.  
Art and Archaeology 10:1-2:7-13.

- Walter, Paul A. F.  
1916a The City that Died of Fear. School of American  
Archaeology, Paper 35.
- 1916b A Summer in the Pajarito. El Palacio 3:3.
- Wendorf, Fred  
1952 Excavations at Cuyamungue. El Palacio 59:8:  
265-266.
- Wendorf, Fred (editor)  
1953 Salvage Archaeology in the Chama Valley, New  
Mexico. Monographs of the School of American  
Research No. 17.
- Wendorf, Fred  
1954 A Reconstruction of Northern Rio Grande Prehis-  
tory. American Anthropologist 56:200-227.
- Wendorf, Fred and Erik K. Reed  
1955 An Alternate Reconstruction of Northern Rio  
Grande Prehistory. El Palacio 62:131-173.
- Wetherington, R. K.  
1968 Excavations at Pot Creek Pueblo. Fort Burgwin  
Research Center 6.
- White, Leslie A. and Ignacio Bernal  
1960 Correspondencia de Adolfo F. Bandelier. Instituto  
Nacional de Anthropologia e Historia Mexico.
- Wilson, L. L. W.  
1916 Excavations at Otowi, New Mexico. El Palacio  
3:2:29-36.
- 1918 Three Years at Otowi. El Palacio 18.
- Wing, Kittridge A.  
1955 Bandelier National Monument, New Mexico. National  
Park Service Historical Handbook Series No. 23.

Worman, Fredrick C. V.

1949a A Preliminary Report of the Adams State College 1948 Field Session in Archeology. Unpublished manuscript on file at Bandelier National Monument.

1949b Report of the Adams State College 1949 Field Session in Archeology. Unpublished manuscript on file at Bandelier National Monument.

1967 Archeological Salvage Excavations on the Mesita del Buey, Los Alamos County, New Mexico. Los Alamos Scientific Laboratory of the University of California, Los Alamos.

Wormington, H. M.

1969 Prehistoric Indians of the Southwest. The Denver Museum of Natural History, Popular Series No. 7.

Yarnell, Richard A.

1958 Implications of Pueblo Ruins on Plant Habitats. Unpublished masters thesis, University of New Mexico.

1965 Implications of Distinctive Flora on Pueblo Ruins. American Anthropologist 67:3.

