

CULTURAL, HISTORIC, RELIGIOUS, AND CEREMONIAL RESOURCES

CHAPTER 13

CHAPTER 13

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The Black Mesa Archaeological Project

In 1967, Peabody Coal Company contacted Dr. Robert C. Euler of Prescott College to perform initial cultural resource surveys in limited areas of the Black Mesa leasehold, and the Black Mesa Archaeological Project (BMAP) was born. During the following year, Euler employed a then recent University of Arizona Ph.D. recipient, George Gumerman, to conduct the first full-summer field program. The 1968 field program staff consisted of three supervisors, ten students, two cooks and three local residents. The field season lasted eight weeks. The Project continued to grow until 1982 when the 16th, largest and next to last field season was conducted by eight full time BMAP employees, 56 archaeologists, 125 local residents, and 8 support staff who expended 9,955 man-days in field and laboratory work.

Between 1968 and 1973, the Project continued to operate from a base at Prescott College. In 1974, Prescott College declared bankruptcy and Dr. Euler moved the administration of the Project to Ft. Lewis College, Durango, Colorado. In 1975, Dr. Euler took a position at Grand Canyon National Park, and the Project moved with Dr. Gumerman to Southern Illinois University in Carbondale, Illinois. The 17th and last field season was conducted in 1983. The Project continued through 1986 when all compliance-related activities were completed, and the Project was terminated after 20 years. The final interpretative archaeological report "10,000 Years on Black Mesa, Arizona: Prehistoric Culture Change on the Colorado Plateaus" (Powell et al., 1989) is presented in Appendix D, Volumes 24, 25, and 26 of this permit.

The BMAP has applied a vigorous research orientation to the task of mitigating the impacts of mining activities on cultural and historic resources. The length of the BMAP and the size of the study area (101 square miles) have made it possible to undertake regional approaches to investigating the prehistory of Black Mesa and for the evolution of research questions which have been reevaluated and reinterpreted. The BMAP has also been able to integrate prehistoric and historic research objectives into the research strategies.

Little was known of Black Mesa archaeology prior to 1968. Therefore, early efforts were directed towards developing a cultural history and identifying general relationships between Black Mesa cultures and their southwestern contemporaries. As details of the cultural sequence became clearer, research objectives emerged. These included the generation of a paleoclimatic model and the development of demographic and settlement pattern models. Because of a growing data base, early research goals were reoriented to involve a systematic approach to four major research categories: population dynamics; differentiation of intrasite and intersite activities; variation in the degree of social cultural integration over time; and energy flow in the Black Mesa region. New survey and excavation methods were initiated to complement the research categories. These methods included an ethnoarchaeological program, a ceramic attribute analysis system, lithic and ceramic exchange studies, statistically valid sampling strategies and recovery, and analysis of nonartifactual remains.

In the late 1970's, the project researchers began interpreting the models and the descriptive generalizations formulated in the early years. There was a growing realization that early models needed revision to reflect the growing awareness of complexity in the archaeological and paleoclimatic records. The newer models included the following as critical factors in cultural exchange: temporal trends in mobility; intensity and seasonal patterns of resource utilization; intensification of social interaction; and the interactive effects of human alteration of the Black Mesa environment. The various research efforts contributed to the development of theoretical models of sociocultural evolution and focused on the process of social intensification in an uncertain environment.

Surveys have identified 2,622 cultural and historic research sites on and immediately adjacent to the Black Mesa leases. Of these, 1,596 and 1,026 are prehistoric and historic sites, respectively. The location of these sites may be found on Drawings 85120 and 85121. The Project has excavated 156 prehistoric and 12 historic sites. The locations of excavated sites may be found on Drawing 85122 and Figure 1. The components excavated may be found in Table 1.

Approximately 1,345,000 artifacts consisting of approximately 1,246,600 ceramics, 87,500 lithics and 10,900 tools have been acquired for research purposes. Approximately 825 reconstructible vessels and 178 burials (partial and complete) have been salvaged. The collection is currently curated by the Center for Archaeological Studies, Southern

[illegible]

TABLE 1

Site Components Excavated By The
Black Mesa Archaeological Project
1968 - - 1983

Period	Components Excavated
Archaic	2
Basketmaker II	40
Basketmaker III	9
Pueblo I	33
Pueblo I - II	27
Pueblo II	39
Pueblo II - III	58
Pueblo III	4
Navajo	12
	224

Illinois University. The BMAP contracted with various institutions for specific research. Table 2 contains a listing of the contractors and their respective disciplines.

Numerous publications have resulted from the BMAP. A bibliography for the BMAP is included as Attachment 1. A concise summary of prehistoric and historic research on Black Mesa may be found in Research Paper Number 39, Excavations on Black Mesa, 1982, Southern Illinois University at Carbondale. Figure 2 has been reproduced from that report and presents a synopsis of Black Mesa prehistory. Attachment 2 contains several photographs from the BMAP.

Compliance Activities

Archaeological compliance activities were undertaken by the BMAP for Peabody Coal Company. The compliance work involved five major functions: identification of cultural resources on Peabody's leases; evaluation of significance for specific sites; preparation of mitigation plans; implementation of mitigation activities; and documentation of program activities and results. These functions were performed pursuant to Federal Antiquities Permits obtained by Southern Illinois University for both the Hopi and Navajo lands. Additionally, the Navajo Nation issued an antiquity permit and the Hopi Tribe granted permission for such work via a letter. Compliance activities have also been completed by the Navajo Nation Archaeology Department Northern Arizona University Branch Office (NNAU), SWCA, Inc. Environmental Consultants (SWCA), and the Hopi Tribe Cultural Preservation Office (HTCPO).

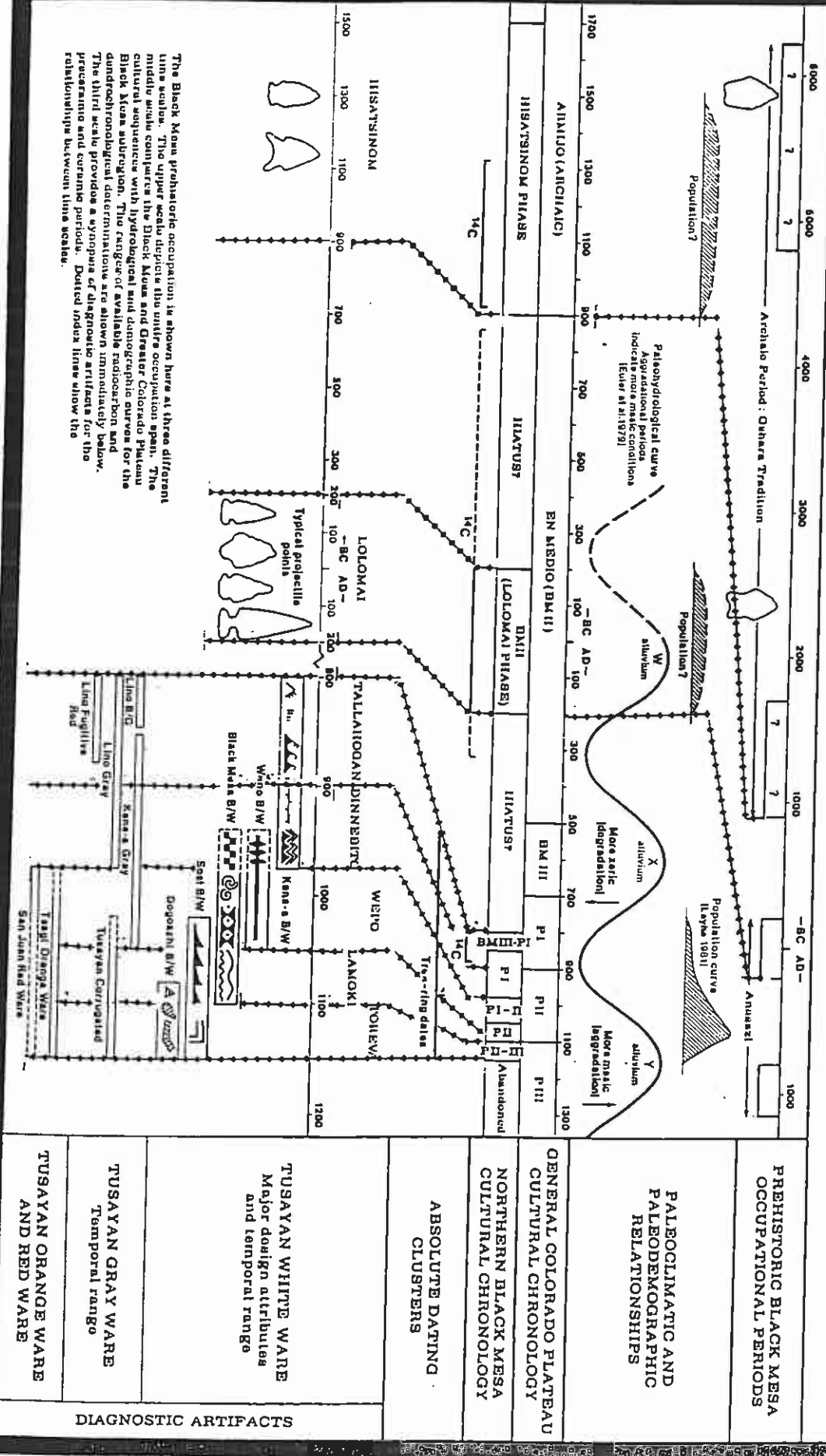
The procedure followed by the BMAP and Peabody personnel to satisfy applicable statutes and regulations began by surveying the Black Mesa leasehold to identify the location of cultural resources. Resources were then reviewed to determine their eligibility for inclusion in the National Register of Historic Places. Most Black Mesa sites were considered significant because of their potential to yield information important in prehistory or history. Eligibility evaluations were prepared and mitigation plans developed to recover data regarding the eligible sites. The mitigation plans were developed from research objectives for the BMAP area as a whole and were typically prepared annually. Following implementation of a mitigation plan, a preliminary report was prepared concerning data collection. A final descriptive report was completed 12 to 24 months following completion of mitigation activities. Completion of data collection

TABLE 2

Black Mesa Archaeological Project Contractors
1968-1983

<u>Discipline</u>	<u>Institution</u>
Tree-ring research	University of Arizona
Soils and geomorphology	Northern Arizona University
Ethnographic studies	Arizona State University
Lithic analysis	University of Massachusetts,
Ceramic analysis	Amherst
Paleonutrition	University of Michigan
Human osteology	University of Texas, El Paso
Ethnobotany	Texas A&M University
Faunal analysis	
Paleontology	

SYNOPSIS OF BLACK MESA CULTURAL HISTORY



The Black Mesa prehistoric occupation is shown here at three different time scales. The upper scale depicts the entire occupation span. The middle scale compares the Black Mesa and Greater Colorado Plateau cultural sequence with hydrological and demographic curves for the Black Mesa subregion. The range of available radiocarbon and dendrochronological determinations are shown immediately below. The third scale provides a synopsis of diagnostic artifacts for the prehistoric and ceramic periods. Dotted lines show the relationships between time scales.

FIGURE 2

(From Research Paper No. 38, Center for Archaeological Studies, SIU)

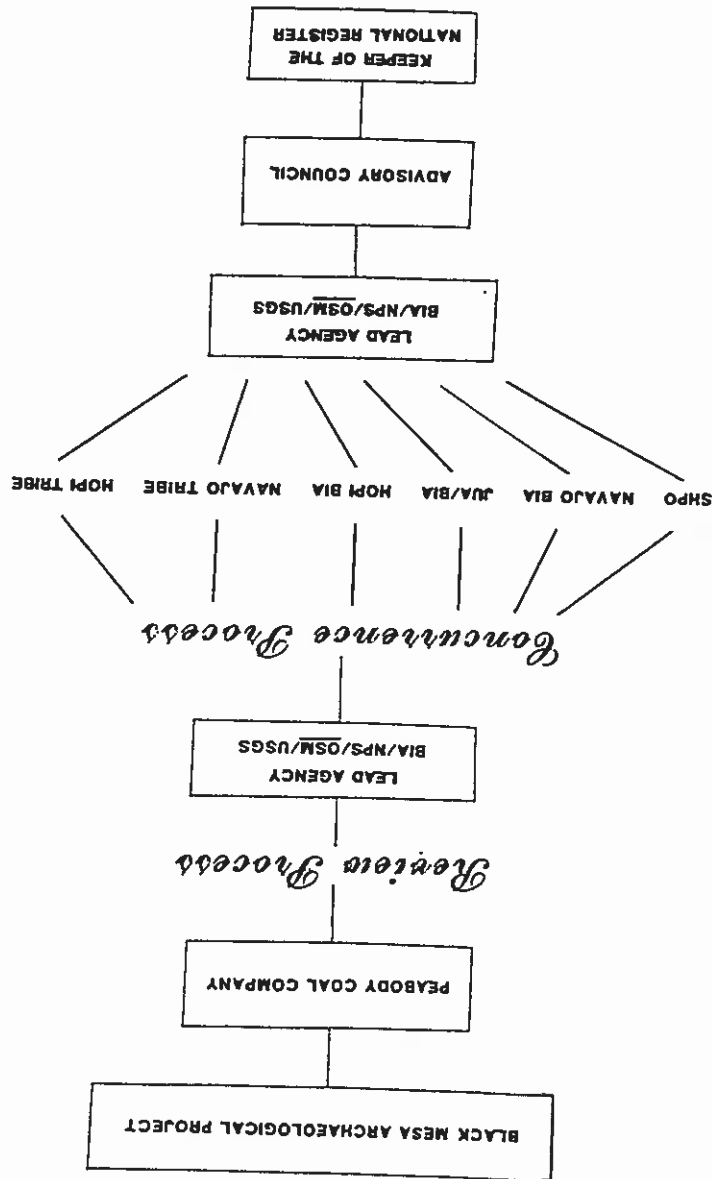
activities formed the basis of a recommendation that the sites were no longer eligible for the Register. Concurrence with the recommendation by reviewing governmental and tribal agencies provided Peabody the authority to proceed into the subject area with land disturbing activities. The agencies which have been involved with the above-described process are indicated in Figure 3. Since 1982, the lead agency regarding the BMAF has been the Office of Surface Mining Reclamation and Enforcement (OSM). Previous to 1982, the National Park Service (NPS) and the U.S. Geological Survey (USGS) played prominent roles.

In August, 1981, representatives from Peabody Coal Company, the OSM, and Southern Illinois University met to discuss past and current archaeological efforts, compliance activities, and future requirements relating to cultural resources for the Black Mesa mining complex. Proposed activities and procedures were outlined to insure compliance with all applicable regulations and law governing cultural resource considerations, provide Peabody with maximum operational flexibility, and result in a final statement of cultural resource clearance for the entire life-of-mine permit area. These activities and procedures were submitted by Peabody to the OSM on September 3, 1981, subsequently approved, and included as special stipulations 30 through 33 to Permit AZ-0001.

All of the aforementioned stipulations have been satisfied and the final interpretative report (Stipulation No. 31d) has been submitted to OSM (Appendix D, Volumes 24, 25, and 26, of this permit). With submittal of this final report, no further cultural resource work is required within the confines of the life-of-mine permit area, except as specified below. Additionally, that portion of the Black Mesa Multiple Resource Area confined within the boundaries of the presently delineated life-of-mine permit boundary has had the adverse impact satisfactorily mitigated and will no longer contain significant information. OSM has substantiated satisfactory mitigation to the Advisory Council on Historic Preservation and the Arizona State Historic Preservation Officer. With this concurrence, all parties are in compliance with Federal legislation and regulations and various memoranda of understanding/agreement. There will remain no encumbrance on Peabody Western Coal Company (PWC) for additional cultural resource work within the life-of-mine permit area as presently identified except for unanticipated cultural resource discoveries, burial recoveries, and traditional cultural property (TCPs) assessments or as conditioned in the permit approval. Future efforts will be coordinated among various parties including OSM, Hopi Tribe Cultural Preservation Office (HTCPO), Navajo Historic Preservation Department (NNHPPD), Black Mesa Review Board, the representative Chapter,

ELIGIBILITY DETERMINATION,
COMPLIANCE AND CLEARANCE

FIGURE 3



and/or concerned residents. PWCC will take into consideration the nature and location of known cultural resources when planning its operation should changes in the mining plan or related activities result in the disturbance of additional or different lands, within the permit boundary, than those identified in this Permit Application Package. PWCC will provide to OSM, as a part of any application for a permit revision to disturb additional or different lands, a listing of known cultural resources within the proposed disturbance area. The PWCC leases do not border on nor contain any State or Federal parks or protected lands.

Disposition of Human Remains

In reverence for the deceased and in the spirit of cooperation, The Hopi Tribe, The Navajo Nation, PWCC, and OSM are committed to the respectful treatment of all human remains located within the Black Mesa Mine Complex. OSM and PWCC will facilitate the burial, recovery and relocation process in consultation with the Hopi Tribe and Navajo Nation and their respective policies and procedures concerning the treatment of human remains and burials.

Whenever a burial, either prehistoric or historic, is discovered on Navajo or Hopi lands within the life of mine disturbance area, PWCC will contact OSM, NNHPD, HTCPD, the Black Mesa Review Board, the representative Chapter, and/or local residents to evaluate and discuss the origin, disposition, and relocation of the site.

For burials determined to be of Navajo origin and/or located on Navajo controlled surface, the site will be investigated and the disposition of human remains, if any, will be conducted in accordance with "The Navajo Nation Policy for the Protection of Vashchaas", Gravesites, Human Remains, and Funerary Items" (Navajo Nation, 1996). For prehistoric remains, the Hopi Tribe, as is the accepted procedure, will be requested by PWCC to conduct the reburial ceremonies.

Whenever a Hopi burial is located on Navajo controlled lands within the Black Mesa leasehold, and is threatened by mining operations thus requiring relocation, the relocation will be conducted in accordance with Hopi Tribal (family) wishes or procedures and under the direction of the HTCPD. PWCC will contact the NNHPD to inform them of their intent to relocate a Hopi burial from Navajo controlled lands and provide them with

general information on the relocation, including time frames and procedures to be utilized for the relocation. PMCC will inform the NNHPD of the completion of the burial relocation.

In the event that a Navajo burial is located on Hopi controlled surface within the Black Mesa leasehold and is threatened by the mining operations thus requiring relocation, "The Navajo Nation Policy for the Protection of Dishchaa': Gravesites, Human Remains, and Funerary Items" will be employed. PMCC will contact the HTCPD to inform them of their intent to relocate a Navajo burial from Hopi lands and provide them with general information on the relocation, including time frames and procedures to be utilized for relocation. PMCC will inform the HTPCD of completion of the burial relocation.

When a prehistoric or Hopi burial is reported or located on Hopi controlled surface and in an area that will be disturbed by mining, PMCC will contact the HTCPD and treat the burial as directed by the Tribe.

PMCC will bear the cost of required burial relocations and handle all attendant logistical matters. The location of known burials within the leasehold and identification of those that have been relocated may be found on the Land Use Map, Drawing 85100.

Identification and Relocation of Prehistoric Human Remains

PMCC has responded to passage of the Native American Grave Protection and Repatriation Act of 1990 (NAGPRA) by conducting burial-orientated excavations at all prehistoric archaeological sites on the leasehold that exhibit a high potential to contain human burials. The process of selection of such sites has been detailed elsewhere (Spurr, 1993) and will not be repeated here. In brief, all prehistoric sites that were identified on survey as having a kiva or midden were included in the sample of high-priority sites. This site identification procedure is also outlined in PMCC's response to Special Conditions 3 and 4 issued with Kayenta Mine Permit AZ-0001C on July 6, 1990 (PMCC, 1993). All sites proposed to be disturbed by future mining activities were evaluated. PMCC had previously completed cultural resource compliance pursuant to Section 106 of the National Historic Preservation Act of 1966 (NHPA) through sponsorship of the BMAP; therefore, the projects discussed below were designated and implemented in concert with NAGPRA.

NNAD-NAVU conducted excavations in 1993 to rapidly locate, disinter, and reinter human remains from prehistoric Anasazi sites within the PWCC leasehold on Black Mesa. The BMAP work was used to relocate unexcavated sites likely to contain human remains. Thirty-two sites were excavated completely in order to recover human burials. Field notes were recorded and site maps were drawn. The recovered human remains (32 individuals from 13 sites) were analyzed to assess age at death, sex, pathological or anomalous conditions, and, where possible, cause of death (Spurr, 1993). Immediately following the osteological analysis, the remains were reburied by representatives of the HTCP. The relocated Anasazi burial sites are shown on Drawing 85100; however, the location of the reburial is confidential to reduce the chance that the remains will be disturbed in the foreseeable future. Reburial locations recorded by PWCC using GPS survey techniques, are curated in the confidential files of the NNHPD Cultural Resource Compliance Section (NNHPD-CRCS).

In 1996, PWCC proposed to expand future mine operations into a 219 acre parcel of the J-19 coal resource area. The NNAD-NAVU developed a plan to rapidly disinter and reinter prehistoric human remains from three archaeological sites previously investigated and reported on by the BMAP. Field methods were similar to those used during the 1993 project, with some revisions to reflect the most recent Navajo Nation Policy for the Protection of Jishchaa' (Navajo Nation, 1996). Sixteen burials were recovered from two sites during this project (Spurr et al., 1998). These two sites are shown on Drawing 85100. After a brief in field analysis, all burials were reinterred at locations on the PWCC leasehold that will not be disturbed by future mining activities. The reburial locations are curated in confidential files of the NNHPD-CRCS.

On July 21-23, 1999, archaeologists from SWCA conducted investigations at Sites AZ:D:11:418, AZ:D:11:703, and AZ:D:11:704 at Kayenta Mine and Site AZ:D:7:89 at Black Mesa Mine. These four sites were previously identified, described, documented, and mitigated during the BMAP. All of these sites included middens, a feature that has a high likelihood of containing human remains. The four sites were located in areas where mining activities are planned in the near future, and the purpose of SWCA's work was to identify, remove, and rebury any human remains that might be present, in accordance with the NAGPRA. SWCA conducted this project under Navajo Nation Cultural Resources Investigation Permit No. C9920 and Archaeological Resources Protection Act Permit No. ARPA-NAO-99-005. Investigation of the ground surface and backhoe excavations exposed no human remains at any of the four sites. Project results are described in SWCA's letter to NNHPD dated August 23, 1999 and Report No. 99-85 (Ballagh et al., 1999a).

Anasazi Site AZ:D:11:503 was identified, described, documented, and mitigated during the BMAP. In October 1996, NNHPD approved the NAGPRA mitigation plan for this site. NNAD-NAU implemented field work at this site on October 29, 1996; however, their activities ended abruptly the following day when a local resident indicated the site had sacred and ceremonial value. One year later, bone material was identified on the surface at this site as observed by PMCC, NNAD-NAU, OSM, and a local resident. The bone material was reentered at this site by NNAD-NAU on November 3, 1997. The location of the human remains is shown on Drawing 85100. NNAD-NAU prepared final report No. 98-111 for this site and submitted it to NNHPD (Spurr, 1998). PMCC is still conducting meetings with the NNHPD, the Forest Lake Chapter, and local residences regarding the final disposition for this site.

Unanticipated Cultural Finds

As mining activities progress within the existing life-of-mine permit area, PMCC's employees maintain a watchful eye for unanticipated cultural finds. Whenever an unidentified find is located, appropriate PMCC management personnel are informed and within 24 hours, PMCC notifies OSM and the Navajo Nation pursuant to Kayenta Mine Permit AZ-00010 Condition 9 and in accordance with notification procedures of the Navajo Nation Burial Policy (Navajo Nation, 1996). Subsequently, no additional disturbance is allowed within 100 feet of the newly discovered site, security measures are implemented, and no artifact or other materials are removed. Notification letters are prepared and promptly sent to OSM and NNHPD to comply with permit condition, NAGPRA, and Jischaa' Policy.

On February 14, 1997, PMCC encountered human bones while stockpiling topsoil in the J-19 lease area. Representatives from NNAD-NAU, OSM, and PMCC recovered the disturbed human remains and associated artifactual materials from the stockpile on February 20, 1997. The burial recovery operation was conducted in accordance with the "Navajo Nation Policy for the Protection of Jischaa'" (Navajo Nation, 1996). The original location of the human remains is shown on Drawing 85100. The single individual and artifacts were reburied in a secure location on February 21, 1997 (Bungart, 1997a). A Hopi Religious Practitioner and an assistant conducted the reburial ceremony. The reburial location is curated in the confidential files of the NNHPD-CRCS.

On February 24, 1999, PMCC encountered human bones while salvaging topsoil in the J-16

Lease area. Appropriate verbal and written notification was provided to OSM and the Navajo Nation per the approved protocol identified by permit condition, NAGPRA, and following approval for the excavation and reinterment protocol by NNHPD on March 1, 1999, NNAD-NAU initiated detailed site description, excavation, and recording on March 2, and concluded the fieldwork on March 4, 1999. The remains of six individuals were recovered and identified as described in NNAD-NAU memorandum and Report No. 99-24 titled "NAGPRA Excavations at AZ:D:11:463 for Peabody Western Coal Company on Black Mesa, Arizona. The original location of the human remains is shown on Drawing 85100. All skeletal remains and a few clearly associated mortuary items were reburied on March 10, 1999 at a location that will not be disturbed by future mining activities. A Hopi Tribe Religious Practitioner and an assistant conducted the reinterment with assistance from NNAD-NAU (Spurr, 1999).

On June 9, 1999, isolated human bones were observed during a routine quarterly compliance inspection by employees of PMCC and representatives of the OSM, the Navajo Nation, and the Hopi Tribe. The site was located at Topsoil Stockpile J-19-11 near Anasazi Site AZ:D:11:414 located in the J-19 coal lease area of Kayenta Mine. The NNHPD, OSM, and the HTCPD were notified of the discovery by phone on June 10 and in writing on June 16, 1999. SWCA conducted this project under Navajo Nation Cultural Resources Investigation Permit No. C9911 and Archaeological Resources Protection Act Permit No. ARPA-NAO-99-004. Treatment of the recovered human remains was conducted in accordance with the "Navajo Nation Policy for the Protection of Jishchaa" (Navajo Nation, 1996). SWCA initiated detailed site description, excavation, and recording on June 22, 1999 and concluded the fieldwork on June 23, 1999. The remains of one individual was recovered and identified as described in the SWCA letter to NNHPD dated July 27, 1999 and Report No. 99-83 (Ballagh et al., 1999b). The original location of the human remains is shown on Drawing 85100. All skeletal remains were reburied on June 23, 1999 at a location that will not be disturbed by future mining activities. Representatives from the HTCPD were contacted to assist with the reinterment; however, they declined due to scheduling conflicts. On June 23, 1999, verbal approval was received from Leigh Kuwanwisiwma, HTCPD Director, for PMCC and SWCA to perform the reinterment.

Identification and Relocation of Historic Human Remains

In 1990, three possible historic grave sites were identified in advance of existing mining

operations at the U-19 and U-21 mining areas at Kayenta Mine. FWCC contracted with NNAD-NAU to comply with the Navajo Nation Policy on the Treatment of "Jishchaa'" (Navajo Nation, 1996). NNAD-NAU conducted considerable fieldwork on this project during 1996 and 1997 and Final Report No. 96-19 was submitted to the NNHPD on May 21, 1997 (Bungart, 1997b). The site locations are shown on Drawing 85100. The historic "brush burial" or "Grave #2" was exhumed and relocated as described in NNAD-NAU's final report submitted to NNHPD on June 1, 2000 (Bungart and Waburton, 2000). The historic "hogan burial" ("#110509" or "Grave #1") and the historic "tree burial" ("#990003" or "Grave #3") will be avoided during mining as described in Chapter 5, Attachment A and as shown on the Mine Plan, Drawing No. 85210, Sheet SE.

Religious and Ceremonial Concerns

FWCC maintains an office within the Human Resources Center at the Black Mesa Complex to which local residents, clans, or representatives of Tribal agencies may bring concerns relating to the FWCC mining operations. This office, that includes Native American employees, attempts to address such concerns in a fashion consistent with the nature of the concern and that portion of the mining operations related to the concern. The Black Mesa Review Board also maintains an office on Black Mesa, in daily contact with the Human Resource Center office, and is involved with religious and ceremonial concerns.

When a concern regarding a potential impact of the mining operation on religious or ceremonial activities, materials, or places is brought to the attention of FWCC or the Black Mesa Review Board, the following procedures are followed.

1. The nature of the concern is identified. For example, it is determined whether the concern relates to a place of religious or ceremonial significance because of a historical or present practice or whether the concern relates to materials that may be used in ceremonies or religious activities.
2. It is determined whether or not the FWCC mining activities will actually impact the place or materials of concern. If FWCC activities will not disturb the place or materials, this fact is explained to the concerned party or parties.

3. If the concern relates to the availability of materials used in ceremonial or religious activities (such as plants or minerals) and PWCC operations will disturb the site of such materials, then PWCC makes available resource specialists to assist the concerned party or parties in locating such materials in an area that will not be disturbed by mining. If it is necessary for a religious specialist (medicine man) to perform a ceremony to make the substitute materials acceptable, Peabody assists the concerned party or parties in obtaining such services. This approach should satisfy any concern relating to materials since, to the current knowledge of PWCC, there are no vegetation types or minerals unique to the areas to be disturbed by the mining operations.
4. If the concern relates to a location which is significant because of the occurrence of a ceremony or death and the PWCC operations will disturb the site, then PWCC assists the concerned party or parties in obtaining the services of an appropriate religious specialist to perform the ceremony or ceremonies necessary to mitigate or eliminate the concern.

Should PWCC and a concerned resident, clan, or Tribal representative not be able to reach agreement on the appropriate handling of a religious or ceremonial concern, PWCC will contact OSM and request that agency to act as an arbitrator.

CHAPTER 13

ATTACHMENT 1

BIBLIOGRAPHY

BLACK MESA ARCHAEOLOGICAL PROJECT

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Section 2

Senior Theses

Young, L.C. 1983. Basketmaker Bifaces: A Case Study from Black Mesa, Arizona. Senior Honor's Thesis, Department of Anthropology, University of Michigan, Ann Arbor.

Master's Theses

Section 3

- Bagley, K. 1979. Toward a functional classification of non-ceremonial structure on Black Mesa, northeastern Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Bearden, S.E. 1981. Preceramic settlement and subsistence on northern Black Mesa, northeastern Arizona: an initial evaluation. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Blomberg, B. 1981. Material correlates of increasing sedentism: the Black Mesa Navajo. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Cattin, M.A. 1978. The function of limited activity areas in subsistence-settlement systems on Black Mesa, Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Chandler, S. 1977. The process of lineage formation and Pueblo I social organization in north-eastern Arizona. Unpublished M.A. thesis, Department of Anthropology, University of Colorado, Boulder.
- Deutchman, H.L. 1976. Attribute analysis of Torona phase ceramic design variability. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Eckles, D. 1978. Source of bias in the analysis of faunal remains from Black Mesa, Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Fernstrom, K.W. 1980. The effects of ecological fluctuations on exchange networks, Black Mesa, Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Jacobi, K.P. 1986. An examination of population mobility through the mortuary record at Black Mesa, northeastern Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Karlstrom, E.T. 1986. Stratigraphic and pedologic evidence for a relatively moist early Holocene on Black Mesa, northeastern Arizona. Ms. in possession of the author.
- Klein, T. 1978. Perceiving social group size change on Black Mesa. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Kiesert, A.L. 1977. An analysis of intra-site ceramic design variability. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Layhe, R.W. 1977. A multivariate approach for estimating prehistoric population change, Black Mesa, northeastern Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Leonard, R.D., F.E. Smiley, and C.M. Cameron. 1985. Changing strategies of Anasazi lithic procurement on Black Mesa, Arizona. Ms. in possession of author.
- Mauldin, R.P. 1983. An inquiry into the past: Basketmaker II settlement on northeastern Black Mesa, Arizona. Unpublished M.A. thesis, Department of Anthropology, University of Texas, Austin.
- Miles, J.E. 1985. A functional analysis of Black Mesa ceramics. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Murphy, R.E., Jr. 1983. Pollen analysis of Anasazi sites at Black Mesa, Arizona. M.A. thesis, Department of Anthropology, Texas A & M University, College Station, Texas.
- Reed, P. 1981. Variability in gray ware ceramics, Black Mesa, Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.
- Seme, M. 1980. Analysis of faunal remains from archaeological sites, Black Mesa, Arizona. Unpublished M.A. thesis, Department of Biological Sciences, University of Texas, El Paso.

Sene, M. 1981. Methodology in archaeological faunal analysis, an example from Black Mesa, Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.

Sink, C.W. 1983. Site catchment analysis of selected habitation sites on Black Mesa, northeastern Arizona. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.

Sylenki, A. 1977. Explaining the relationship between surface and subsurface remains: a multivariate approach. Unpublished M.A. thesis, Department of Anthropology, Southern Illinois University, Carbondale.

Section 4

Meetings Papers

- Anderson, J.K. 1978. Research dealing with archaeomagnetic dating on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.
- Andrews, P.P. 1981. Pueblo I site variation and cultural change on prehistoric Black Mesa, Arizona. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.
- Baker, B.J., and C. Piantecini. 1983. Preliminary paleodemographic characteristics of the Black Mesa skeletal population. Paper presented at the 23rd annual meeting of the Northeastern Anthropological Association, Symposium on Bioarchaeology, Syracuse, New York.
- Bearden, S. 1979. Functional and spatial variation in Basketmaker II sites on Black Mesa. Paper presented at the 44th annual meeting of the Society for American Archaeology, Vancouver, British Columbia.
- Blomberg, B. 1981. Archaeological correlates of increasing sedentism: the Black Mesa Navajo. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.
- Blomberg, B. and S. Powell. 1983. An ethnoarchaeological approach to the detection of Navajo and Anasazi remains on Black Mesa, Arizona. Paper presented at the 16th annual meeting of the Society for Historical Archaeology, Denver, Colorado.
- Borger, J. 1979. Lithic evidence for a prehistoric trade route through Black Mesa. Paper presented at the 44th annual meeting of the American Society for Archaeology, Vancouver British Columbia.
- Braun, D.P., and S. Plog. 1980. Tribalization in prehistoric North America. Paper presented at the 1980 meeting of the American Anthropological Association, Washington, D.C.
- Calvin, M. 1978. The function of limited activity sites in prehistoric subsistence systems on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.
- Calvin, M. 1980. The primary-secondary site aggregate as an environmental and social adaptive mechanism on Black Mesa, Arizona: its statistical and substantive significance. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.
- Cordell, L.S., and S. Powell. 1983. Prehistoric subsistence variability in the northern South-west. Paper presented at the 48th annual meeting of the Society for American Archaeology, Pittsburgh, Pennsylvania.
- Dean, J.S. 1982. Dendroclimatic variability and demography, Black Mesa. Paper presented at the 47th annual meeting, Society for American Archaeology, Minneapolis, Minnesota.
- Dean, J.S., R.C. Euler, and G.J. Gummerman. 1983. Regional environmental models. Paper presented at the 48th annual meeting of the Society for American Archaeology, Pittsburgh, Pennsylvania.
- Deutchman, H.L. 1977. The use of discriminant analysis to interpret ceramic design element variability. Paper presented at the 42nd annual meeting of the Society for American Archaeology, New Orleans, Louisiana.
- Deutchman, H.L. 1978. The distribution of Tusayan White Ware among the Kayenta Anasazi. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.
- Douglas, C.L. 1978. Temporal variability in faunal procurement on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.
- Eckles, D.G. 1978. Explanation of intersite variability in faunal remains from sites on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Eckles, D.G. 1980. Abandonment of northeastern Black Mesa, Arizona: the temperature connection. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.

Fernstrom, K.W. 1979. The effect of subsistence stress on exchange networks. Paper presented at the 44th annual meeting of the Society for American Archaeology, Vancouver, British Columbia.

Ford, R.I. 1978. The significance of archaeological plant remains for interpreting prehistoric adaptations on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Ford, R.I. 1981. Ecological consequences of early agriculture in the Southwest. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.

Green, M. 1977. Analysis of chipped stone raw materials for Black Mesa. Paper presented at the 42nd annual meeting of the Society for American Archaeology, New Orleans, Louisiana.

Green, M. 1978. Variation in chipped stone raw material use on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Green, M. 1983. Chipped stone raw materials and the study of interaction: Black Mesa, Arizona. Paper presented at the 48th annual meeting of the Society for American Archaeology, Pittsburgh, Pennsylvania.

Gummerman, G.J. 1976. Examining prehistoric interaction on Black Mesa, Arizona. Paper presented at the International Congress of Americanists, Paris, France.

Gummerman, G.J. 1978. Population change and climate in the North American Southwest. Paper presented at the X International Congress of Anthropological and Ethnological Sciences, New Delhi, India.

Gummerman, G.J. 1979. The cultural dynamics and paleoenvironment of the Colorado Plateau. Paper presented at the International Conference on Climate and Prehistory, University of East Anglia, Norwich, England.

Hanson, C. 1978. Population structure and composition on Black Mesa, Arizona. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Hantman, J.L. 1981. A socioeconomic interpretation of ceramic design distributions in the prehistoric Southwest. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.

Hantman, J.L., and S. Plog. 1978. Predicting occupation dates of prehistoric Black Mesa sites: a comparison of methods. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Hardy, K.D., P.R. Plante, and S. Plog. 1980. The structure of prehistoric southwestern U.S. ceramic exchange systems: a Black Mesa case study. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.

Klein, T. 1978. Examination of change in social group size on Black Mesa. Paper-presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Kiesert, A.L. 1977. Analysis of intra-site ceramic design variability. Paper presented at the 42nd annual meeting of the Society for American Archaeology, New Orleans, Louisiana.

Kiesert, A.L. 1978. Regional variation on Black Mesa: a comparison of discrete areas. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Kiesert, A.L., and B. Kranzer. 1980. A modified nearest neighbor technique. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.

Layhe, R.W. 1977. A multivariate approach to population estimates and change, Black Mesa, northeastern Arizona. Paper presented at the 42nd annual meeting of the Society for American Archaeology, New Orleans, Louisiana.

Layhe, R.W. 1979. Demographic and settlement change, Black Mesa, northeastern Arizona: a computer simulation. Paper presented at the 44th annual meeting of the Society for American Archaeology, Vancouver, British Columbia.

Layhe, R.W. 1980. The distribution of prehistoric population: a locational analysis. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.

Leonard, R.D. 1985. Late Puebloan subsistence diversification: a product of sample size effects. Paper presented at the 50th annual meeting of the Society for American Archaeology, Denver, Colorado.

Leonard, R.D., C.M. Cameron, and F.E. Smiley. 1983. Diversification in Anasazi lithic assemblages: implications for the study of social and technological change on Black Mesa. Paper presented at the 48th annual meeting of the Society for American Archaeology, Pittsburgh, Pennsylvania.

Leonard, R.D., F.E. Smiley, and C.M. Cameron. 1984. Changing strategies of Anasazi lithic procurement on Black Mesa, Arizona. Paper presented at the 49th annual meeting of the Society for American Archaeology, Portland, Oregon.

Lerner, S. 1978. Analysis and functional interpretation of Black Mesa ceramics. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Martin, D.L. 1981. Subsistence change and biocultural stress in the Black Mesa Anasazi: a paleopathological approach. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.

Martin, D.L., A.C. Swedlund, and G.J. Armelagos. 1982. Population dynamics, resources, and skeletal biology on Black Mesa. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.

Mauldin, R., and M. Seme. 1981. Seasonality during Basketmaker II occupation, Black Mesa, Arizona. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.

McAllister, S.P. 1977. Artifact inventories as predictor of sedentism on Black Mesa. Paper presented at the 42nd annual meeting of the Society for American Archaeology, New Orleans, Louisiana.

McAllister, S.P. 1978. The effects of seasonality on site space utilization. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Miksic, C.H. 1976. Recent botanical investigations on Black Mesa, Navajo County, Arizona. Paper presented at the 41st annual meeting of the Society for American Archaeology, St. Louis, Missouri.

Murphy, R.E., Jr. 1982. Vegetational change on Anasazi sites, Black Mesa, Arizona. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.

Nelly, R.B. 1978. Community adaptation and change on Black Mesa. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Nelly, R.B. 1980. The prehistoric community: a theoretical, methodological, and comparative regional approach. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.

Nelson, B.A. 1978. The problem of hypercoherence in systematic reorganizations preceding the northern Black Mesa abandonment. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Nichols, D.L., and R.J. Huggins. 1982. Preliminary magnetic reconnaissance of preceramic sites in northeastern Arizona. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.

Nichols, D.L., and S. Powell. 1983. Physical environment, technology, and cultural change: the Black Mesa Anasazi. Paper presented at the 48th annual meeting of the Society for American Archaeology, Pittsburgh, Pennsylvania.

Nichols, D.L., and S. Powell. 1985. Demographic reconstructions in the American Southwest: the relationship between expectations and data. Paper presented at the 50th annual meeting of the Society for American Archaeology, Denver, Colorado.

- Barry, W.J., G.R. Burgett, and F.E. Smiley. 1985. The Archaic occupation of northern Black Mesa, Arizona. Paper presented at the 50th annual meeting of the Society for American Archaeology, Denver, Colorado.
- Placentini, C., and D.L. Martin. 1983. An examination of differential status and health for the prehistoric Anasazi from Black Mesa, Arizona. Paper presented at the 52nd annual meeting of the American Association of Physical Anthropologists, Indianapolis, Indiana.
- Placentini, C., and D.L. Martin. 1983. An examination of the differential status and health for the prehistoric Anasazi from Black Mesa, Arizona. Paper presented at the 23rd annual meeting of the Northeastern Anthropological Association, Syracuse, New York.
- Plog, S. 1979. Measurement error in the analyses of ceramic variation. Paper presented at the 44th annual meeting of the Society for American Archaeology, Vancouver, British Columbia.
- Plog, S. 1980. The evolution of social networks in the American Southwest. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.
- Plog, S. 1982. Organization and change in northern Arizona. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.
- Plog, S., and S. Povel. 1981. The scale and complexity of prehistoric exchange networks on the Colorado Plateau. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.
- Powell, S. 1982. Food storage and environmental uncertainty: an example from Black Mesa, Arizona. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.
- Powell, S. 1982. Technological responses to environmental uncertainty: an example from Black Mesa, Arizona. Paper presented at the Advanced Seminar, School of American Research, Santa Fe, New Mexico.
- Powell, S., and A.L. Klesert. 1979. Predicting structures on small artifact scatters. Paper presented at the 44th annual meeting of the Society for American Archaeology, Vancouver, British Columbia.
- Powell, S., and D.L. Nichols. 1983. Physical environment, technology, and cultural change: the Black Mesa Anasazi. Paper presented at the 2nd Anasazi Symposium, Farmington, New Mexico.
- Powell, S., and M. Semé. 1980. A reevaluation of interpretations of faunal inventories on small archaeological sites. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.
- Ravesloot, J., and D.L. Martin. 1980. Mortuary and paleontological analyses of burials from Black Mesa: implications for social and economic organization. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.
- Roberts, A.A. 1983. Archaeological interpretations of site function and the role of ethnographic data. Paper presented at the first symposium of the Society of Independent Anthropologists, Albuquerque, New Mexico.
- Semé, M. 1982. Measuring hunting selectivity in an archaeological context, an example from Black Mesa, Arizona. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.
- Semé, M. 1982. The effect of agricultural fields on faunal assemblage variation. Paper presented at the 47th annual meeting of the Society for American Archaeology, Minneapolis, Minnesota.
- Sink, C.W., and T. Jones. 1981. Cultural transition on Black Mesa: a single perspective. Paper presented at the 46th annual meeting of the Society for American Archaeology, San Diego, California.
- Smiley, F.E. 1984. The Black Mesa basketmaker: a reevaluation of the chronometry of the Tolomai phase. Paper presented at the 49th annual meeting of the Society for American Archaeology, Portland, Oregon.

Smiley, E.E., W.J. Parry, and G.J. Gummerman. 1986. Early agriculture in the Black Mesa/Marsh Pass region of Arizona: new chronometric data and recent excavations at Three Fir Shelter. Paper presented at the 51st annual meeting of the Society for American Archaeology, New Orleans, Louisiana.

Smith, M.F., Jr., and M.L. Hargrave. 1984. Economic inference from the container facilities: theory and Black Mesa evidence. Paper presented at the 83rd annual meeting of the American Anthropological Association, Denver, Colorado.

Smith, M.F., Jr., and J.E. Miles. 1984. Assessing function on southwestern vessels from Black Mesa. Paper presented at the 49th annual meeting of the Society for American Archaeology, Portland, Oregon.

Sylenki, A. 1978. A multivariate approach for examining the relationship between surface and subsurface remains. Paper presented at the 43rd annual meeting of the Society for American Archaeology, Tucson, Arizona.

Warburton, M. 1986. Navajo mobility and sedentism on Black Mesa, Arizona. Paper presented at the second Navajo Studies Conference, Flagstaff, Arizona.

Whitecotton, S.R. 1979. Efficient management in conservation archaeology. Paper presented at the 44th annual meeting of the Society for American Archaeology, Vancouver, British Columbia.

Whitecotton, S.R. 1980. Basketmaker II sites on Black Mesa, Arizona. Paper presented at the 45th annual meeting of the Society for American Archaeology, Philadelphia, Pennsylvania.

Ph.D. Dissertations

Section 5

- Ahlstrom, R.V.N. 1985. The interpretation of archaeological tree-ring dates. Ph.D. dissertation, University of Arizona, Tucson. University Microfilms International, Ann Arbor, Michigan.
- Deutchman, H.L. 1979. Intra-regional interaction on Black Mesa and among the Kayenta Anasazi: the chemical evidence for ceramic exchange. Ph.D. dissertation, Southern Illinois University, Carbondale. University Microfilms International, Ann Arbor, Michigan.
- Gilman, P.A. 1983. Changing architectural forms in the prehistoric Southwest. Ph.D. dissertation, University of New Mexico, Albuquerque. University Microfilms International, Ann Arbor, Michigan.
- Green, M. 1982. Chipped stone raw materials and the study of interaction. Ph.D. dissertation, Arizona State University, Tempe. University Microfilms International, Ann Arbor, Michigan.
- Hantman, J.L. 1983. Social networks and stylistic distribution in the prehistoric plateau Southwest. Ph.D. dissertation, Arizona State University, Tempe. University Microfilms International, Ann Arbor, Michigan.
- Kiesert, A.L. 1980. Elementary catastrophe theory in archaeology. Ph.D. dissertation, Southern Illinois University, Carbondale. University Microfilms International, Ann Arbor, Michigan.
- Layhe, R.W. 1981. A locational model for demographic and settlement system change: an example for the American Southwest. Ph.D. dissertation, Department of Anthropology, Southern Illinois University, Carbondale. University Microfilms International, Ann Arbor, Michigan.
- Leonard, R.D. 1986. Patterns of Anasazi subsistence: faunal exploitation, subsistence diversification, and site function in northeastern Arizona. Ph.D. dissertation, University of Washington. University Microfilms International, Ann Arbor, Michigan.
- Powell, S.L. 1980. Material culture and behavior: a prehistoric example for the American Southwest. Ph.D. dissertation, Arizona State University, Tempe. University Microfilms International, Ann Arbor, Michigan.
- Roeck, Thomas. 1985. Correlates of economic and demographic change: Navajo adaptations on northern Black Mesa, Arizona. Ph.D. dissertation, University of Michigan. University Microfilms International, Ann Arbor, Michigan.
- Smiley, E.E., IV. 1985. The chronometrics of early agricultural sites in northeastern Arizona: approaches to the interpretation of radiocarbon dates. Ph.D. dissertation, Department of Anthropology, University of Michigan, Ann Arbor.
- Warburton, M. 1985. Culture change and the Navajo hogan. Unpublished Ph.D. dissertation, Department of Anthropology, Washington State University, Pullman.
- Ware, J.A. 1983. A boundary oriented model of cultural change. Ph.D. dissertation, University of Colorado. University Microfilms International, Ann Arbor, Michigan.

Section 6

Published Research Papers and Books

Ambler, J.R. 1992. Design variation in Black Mesa Black-on-white from a site on Black Mesa. *Pottery Southwest* 19:3:1-5.

Bagley-Baumgartner, K. 1984. Toward a functional classification of nonceremonial structures on Black Mesa, northeastern Arizona. In *Papers on the archaeology of Black Mesa*, Volume II, edited by S. Plog and S. Powell, pp. 47-86. Southern Illinois University Press, Carbondale.

Bearden, Susan E. 1985. A study of Basketmaker II settlement of northern Black Mesa: excavations 1973-1979. *Center for Archaeological Investigations Research Paper No. 44*, Southern Illinois University, Carbondale.

Blomberg, B. 1983. Mobility and sedentism: the Navajo on Black Mesa, Arizona. *Center for Archaeological Investigations Research Paper No. 32*, Southern Illinois University, Carbondale.

Blomberg, B., and S. Powell. 1983. An ethnoarchaeological approach to the detection of Navajo and Anasazi remains on Black Mesa, Arizona. *The Kiva* 49(3-18), in press.

Canouts, V. 1983. Archaeological Resources and Historic Preservation. In *Surface Mining and Environmental Monitoring and Reclamation Handbook*, edited by L.V.A. Sendlein, H. Yazicigal, and C.L. Carlson, pp. 537-599. Elsevier, New York.

Christenson, A.L., and W.J. Parry. 1984. Excavations on Black Mesa, 1993: a descriptive report. *Center for Archaeological Investigations Research Paper No. 46*, Southern Illinois University, Carbondale.

Christenson, A.L., and M.J. Bender. 1994. A method for the chronological classification of Black Mesa sherd assemblages. In *Function and Technology of Anasazi Ceramics from Black Mesa, Arizona*, edited by Martin F. Smith, Jr., pp. 223-236. *Occasional Paper No. 15*, Center for Archaeological Investigations, Southern Illinois University, Carbondale.

Clarke, L. 1972. Social implications of Black Mesa: shifting functions of the kiva. *Student Anthropologist* (Prescott College) 4(2):6-24.

Clemen, R.T. 1976. Aspects of prehistoric social organization on Black Mesa. In *Papers on the archaeology of Black Mesa*, Arizona, edited by G.J. Gumerman and R.C. Euler, pp. 113-135. Southern Illinois University Press, Carbondale.

Dean, J.S., R.C. Euler, G.J. Gumerman, E. Plog, R.H. Healy, and T.N.V. Karlstrom. 1985. Human behavior, demography, and paleoenvironment on the Colorado Plateau. *American Antiquity* 50:537-554.

Deuchman, H.L. 1980. Chemical evidence of ceramic exchange on Black Mesa. In *Models and methods in regional exchange*, edited by R.E. Fry, pp. 119-133. *Society of American Archaeology Papers No. 1*.

Eckes, D. 1984. Intrasite variation in faunal remains on Black Mesa. In *Papers on the archaeology of Black Mesa*, Arizona, Volume II, edited by S. Plog and S. Powell, pp. 158-172. Southern Illinois University Press, Carbondale.

Euler, R.C. 1973. Attributes of prehistoric Pueblo settlement patterns on Black Mesa. *Proceedings of the 40th International Congress of Americanists*, Rome, Italy.

Euler, R.C. 1973. Exploring the past on Black Mesa. *American West* Vol. 10, No. 5.

Euler, R.C., G.J. Gumerman, T.N.V. Karlstrom, J.S. Dean, and R. Healy. 1979. The Colorado Plateau: cultural dynamics and paleoenvironment. *Science* 205:1089-1101.

Fernstrom, K.W. 1984. The effect of ecological fluctuations on exchange networks, Black Mesa, Arizona. In *Papers on the archaeology of Black Mesa*, Arizona, Volume II, edited by S. Plog and S. Powell, pp. 189-298. Southern Illinois University Press, Carbondale.

Ford, R.I. 1984. Ecological consequences of early agriculture in the Southwest. In *Papers on the archaeology of Black Mesa*, Arizona, Volume II, pp. 126-138. Southern Illinois University Press, Carbondale.

- Green, M. 1984. The relationship of source distance to conservation of chipped stone raw materials. In *Papers on the archaeology of Black Mesa, Arizona*, Volume II, edited by S. Plog and S. Powell, pp. 173-188. Southern Illinois University Press, Carbondale.
- Green, M. 1985. Chipped stone raw materials and the study of interaction on Black Mesa, Arizona. Center for Archaeological Investigations Occasional Paper No. 11, Southern Illinois University, Carbondale.
- Gummerman, G.J. 1973. A rural-urban continuum for the prehistoric Southwest: Black Mesa and Chaco Canyon. *Proceedings of the 40th Congress of Americanists*, Rome, Italy.
- Gummerman, G.J. 1975. Alternative cultural models for demographic change: southwestern examples. In *Population studies in archaeology and biological anthropology: a symposium*, edited by A.C. Swedlund, pp. 104-115. *Memoirs of the Society for American Archaeology* 30:104-115.
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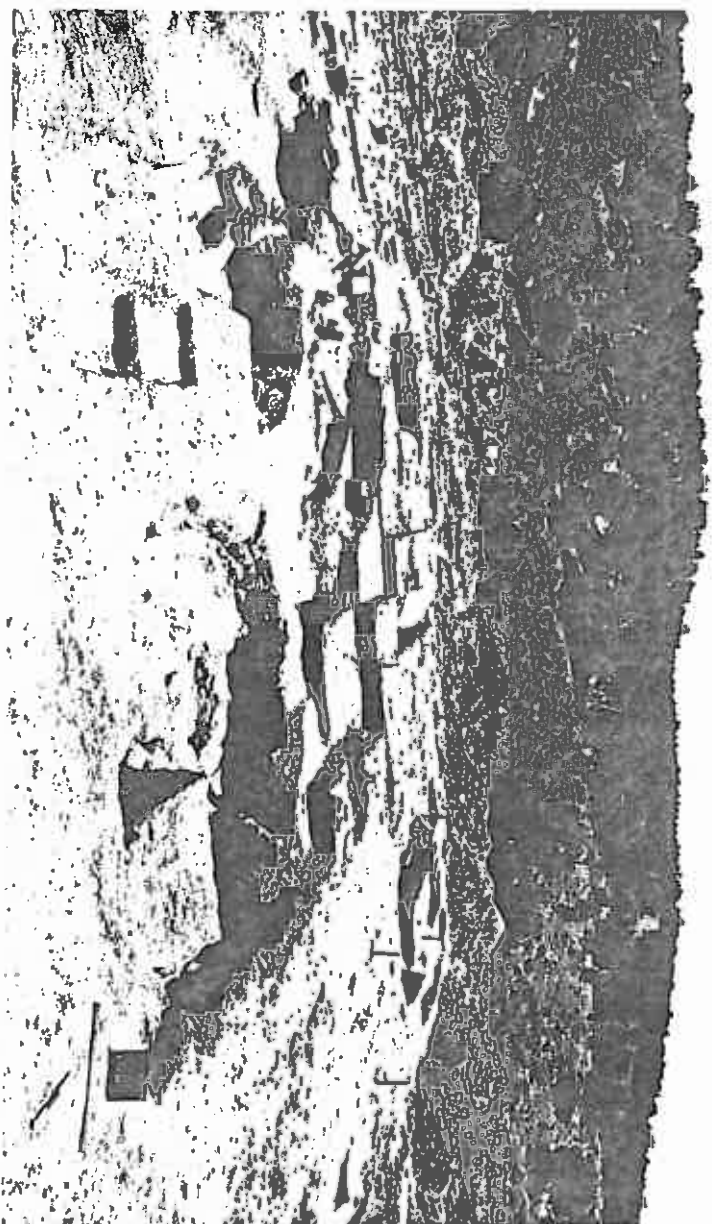
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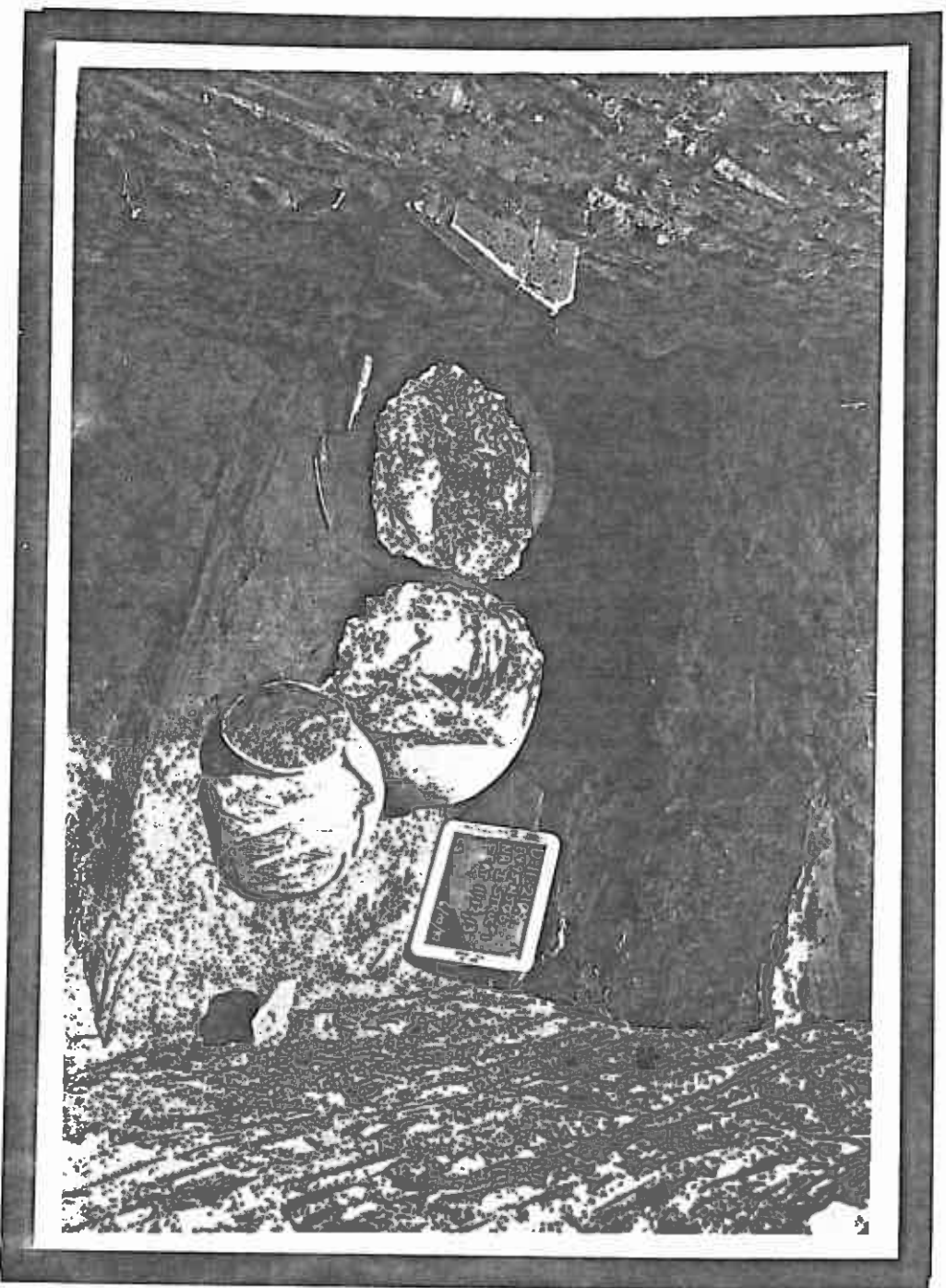
PHOTOGRAPHS

BLACK MESA ARCHAEOLOGICAL PROJECT



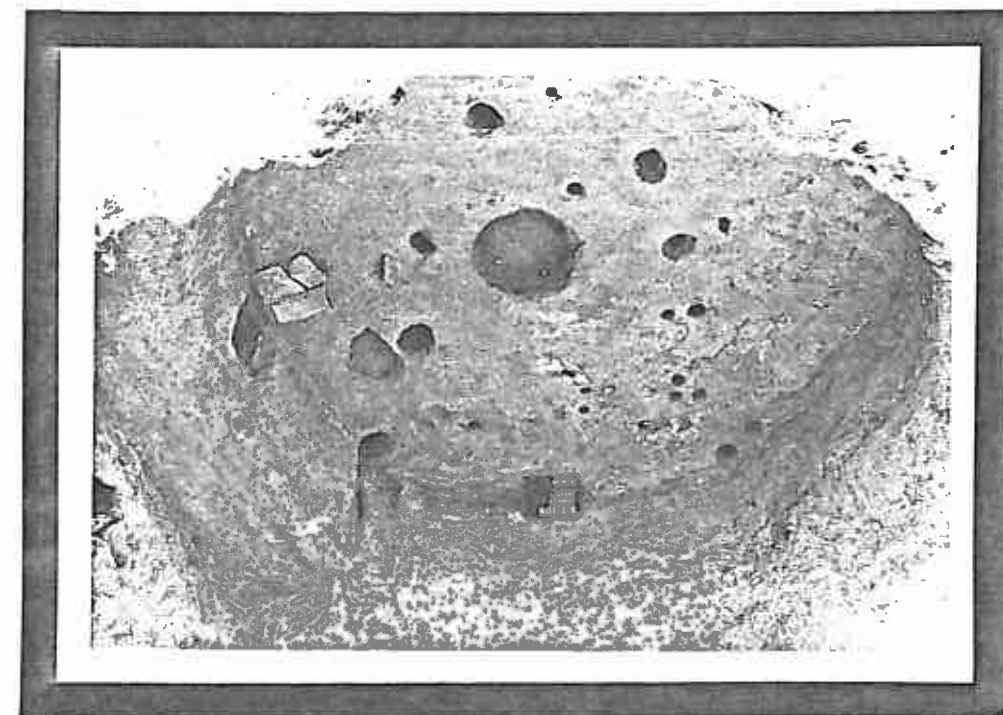
Site D:11:3133

General Site View of a Completed Excavation



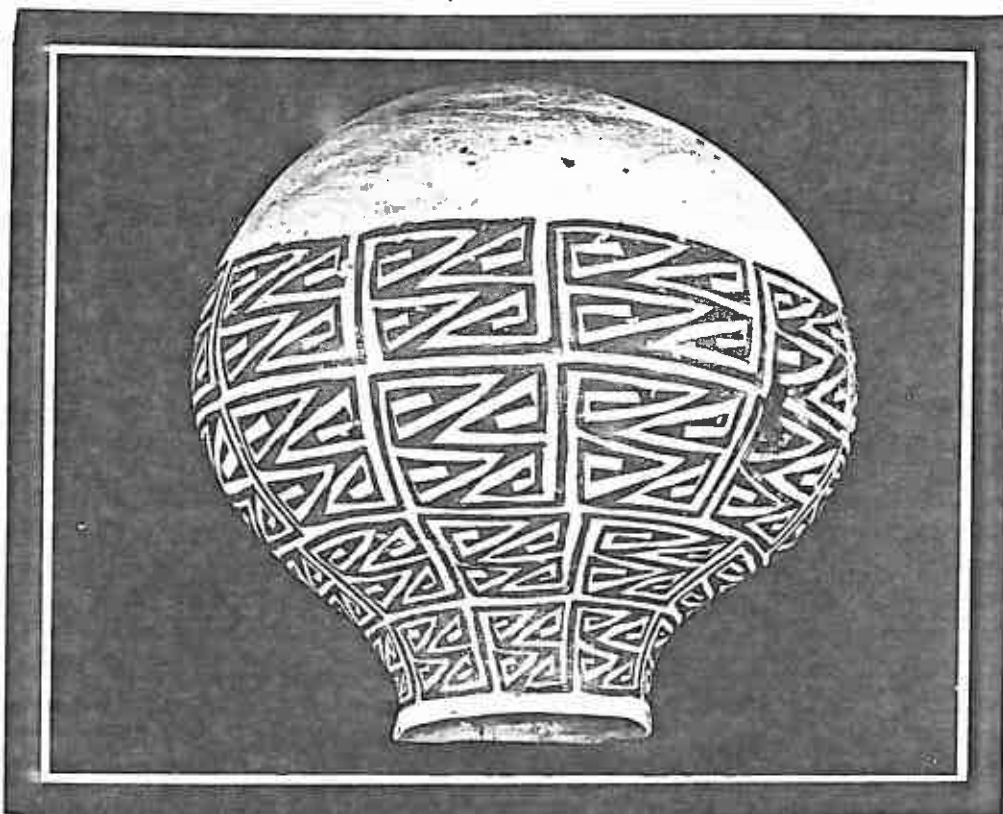
Site D:11:2108

Large earthen Kiya. Photo was taken early in excavation. Three ceramic vessels are uncovered. The one in front is a Dogoszhi Black-on-White. Next to it an unpainted white ware and a Tuseyan corrugated vessel are covered with aluminum to protect the contents of the vessels. Over 40 complete and partial ceramic vessels were recovered from the floor and bench of this Kiya.



Site D:7:109

A large, circular earthen-walled kiva with a prepared clay floor surface. A partial bench can be seen on the right side of the photo.

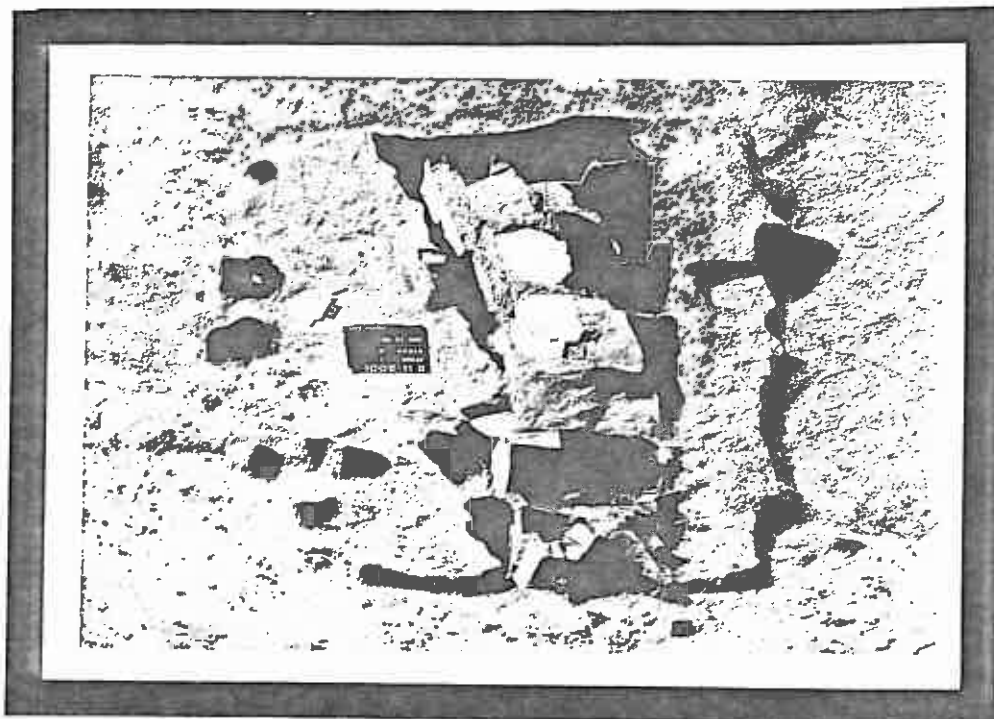


Site D:7:136

Large Sosi Black-on-white Storage Vessel

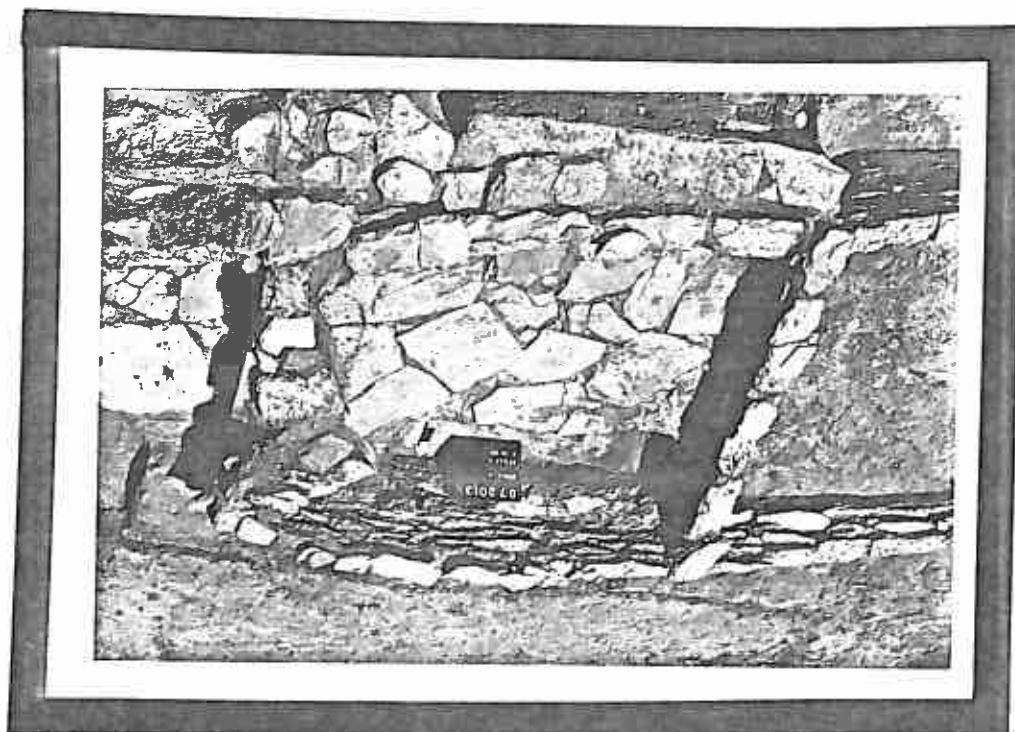
A Rectangular Jacol Containing Six Wealing Bins formed by Upright Slabs.
A Large Number of Shards, Chipped Stone, Hammerstones and Bone were found in this Structure.

Site D:11:2001



A Masonry Room on the East Wing of the Roomblock. Floor is Sandstone Slabs.

Site D:7:2013



One of Three Contiguous, Slab-lined Semi-Subterranean Rooms Composing the Roomblock on the Site. Since No Interior Features Were Found, the Structure Was Probably Used for Storage.

Site D:11:2023

