

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

AN ARCHAEOLOGICAL SURVEY OF PAIUTE MESA, ARIZONA

A THESIS

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

MASTER OF ARTS

BY

MARY ANNE STEIN

Norman, Oklahoma

1966

UNIVERSITY OF OKLAHOMA
LIBRARY

378.76

01e0

SL34a

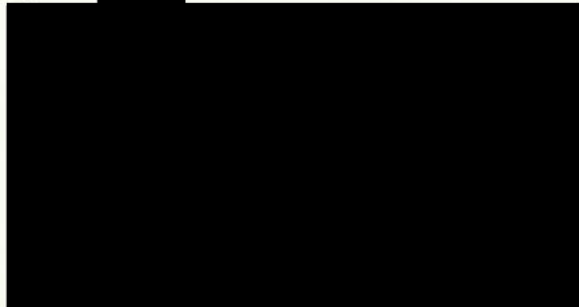
cop.1

AN ARCHAEOLOGICAL SURVEY OF PAIUTE MESA, ARIZONA

A THESIS

APPROVED FOR THE DEPARTMENT OF ANTHROPOLOGY

BY



ACKNOWLEDGMENT

A number of people have willingly given assistance and encouragement during the planning, fieldwork, analysis and writing represented in this thesis. Without the interest and help of these individuals, the survey work could not have been attempted or carried through to completion. It is with pleasure and gratitude, therefore, that I thank the following persons for their contributions.

Members of the staff of the Museum of Northern Arizona, Flagstaff, Arizona have given assistance in all phases of the project from its inception to conclusion. Dr. Edward B. Danson gave permission for the work to be done under the Museum's permits and supervision, and he graciously provided living, working, and storage facilities during the summers of 1964 and 1965. Dr. Alan P. Olson outfitted us with needed field equipment and willingly gave advice and other assistance during the fieldwork and analysis of materials. Dr. Walter B. McDougall kindly gave his time to the identification of wild and domestic plant specimens. Library research was greatly facilitated by the assistance of Miss Katherine Bartlett. Mr. William J. Breed assisted in the identification of lithic materials. Mr. George Gummerman and Mr. Roger Kelly helped with the initial moving of equipment into the field. Pottery restoration was done by Mrs. Harry O. King, Jr. Mr. Paul V. Long, Jr. gave advice on photographic problems and did all the photography of the

artifact plates and the final printing of all photographs included in this report. I sincerely appreciate the large amount of time and effort he devoted to this work.

Mr. William C. Miller of Pasadena, California assisted in the procuring of aerial photographs of the survey area, and provided a stereoscopic viewer and instructions for its use. Dr. Kennan Shank of the University of Oklahoma kindly gave us the loan of a fine living tent for the summer, which made our life in the field most pleasant.

Once out of the field, Miss Susan T. Adams, Miss Pamela Lindsay, and Miss Caroline Lindsay assisted with the washing, stamping, and boxing of sherd and stone material, and their contribution is gratefully acknowledged.

The following persons deserve special thanks for their assistance in all phases of the project. Mr. Alexander J. Lindsay, Jr. has kindly given ideas, time, encouragement, and many helpful suggestions throughout the planning, conduction, and writing phases of the survey, and without his encouragement and helpfulness this survey work by two women would not have been attempted. For his assistance in ways too numerous to mention, I am especially grateful. Miss Mary Ann Lively, of McAlester, Oklahoma, donated a summer of her time and considerable personal expense so that the planned survey work could become a reality. Miss Lively, although not a student of anthropology, assisted in all phases of the preparation and fieldwork. She shared equally with the author in the recording of sites and in note taking, contributing interesting observations and ideas during the work, and she assisted further by doing all of the black and white field photography. Her comments

and suggestions during the writing phase of the project have been most valuable. Miss Lively's cheerful companionship and stamina under often adverse conditions and her quick grasp of survey techniques and the archaeology of the area are to be envied, and I thank her for all the memories of a wonderful summer. Dr. Robert E. Bell, Department of Anthropology, University of Oklahoma, gave his approval to the research project, and he has kindly given his time and interest to aid the writer in the task of preparing the final manuscript. His assistance during all phases of the writing of this thesis is sincerely appreciated.

Without the initial and continued interest and encouragement of my parents, Mr. and Mrs. C. A. Stein, the survey would have been impossible. They provided the major equipment and financial assistance for the survey, including a 4-wheel drive vehicle, and they have provided living space during the writing of this report. For their love and patient understanding throughout this project, I am very grateful.

CHAPTER I. INTRODUCTION	1
CHAPTER II. ENVIRONMENT	14
Physiography	14
Surficial Deposits	18
Hydrography	20
Flora and Fauna	23
Climate	28
CHAPTER III. THE SURVEY	31
Site Locations and Distribution	31
Open Sites	32
Shelter Sites	34
Cliff Sites	36
Combination Sites	38
Resources	38
Cultural Elements	43
Structures	43
Pecked Footholds	48
Refuse Deposits	48
Agricultural Structures	49
Petrographs	49
Lithic Material	54
Chipped Stone	56
Ground Stone	69
Other Lithic Material	79
Pottery	81
Description	82
Restored Vessels and Clay Artifacts	98
Worked Sherds	99
Perishable Material	102
Cultural Components	103

To my parents,
Mr. and Mrs. C. A. Stein

Anasazi Sites	104
Pueblo IV Sites	124
Sites of Unknown Horizon	125
Navajo Occupation	125
IV. SUMMARY AND CONCLUSIONS	131
BIBLIOGRAPHY	140
APPENDIX I. Environmental Characteristics of Sites Surveyed	143
APPENDIX II. Stone Artifacts from Patute Mesa, Arizona	Page
LIST OF TABLES.	ix
LIST OF ILLUSTRATIONS	x
Chapter	
I. INTRODUCTION.	1
II. ENVIRONMENT	14
Physiography	14
Surficial Deposits	18
Hydrography	20
Flora and Fauna	23
Climate.	28
III. THE SURVEY	31
Site Locations and Distribution	31
Open Sites	32
Shelter Sites	34
Cliff Sites.	36
Combination Sites.	38
Resources	38
Cultural Elements	43
Structures	43
Pecked Footholds	48
Refuse Deposits	48
Agricultural Structures.	49
Petrographs.	49
Lithic Material	54
Chipped Stone	56
Ground Stone.	69
Other Lithic Material.	79
Pottery	81
Description	82
Restored Vessels and Clay Artifacts	98
Worked Sherds	99
Perishable Material	102
Cultural Components.	103

Anasazi Sites	104
Pueblo IV Sites	124
Sites of Unknown Horizon	125
Navajo Occupation	125
IV. SUMMARY AND CONCLUSIONS	131
BIBLIOGRAPHY	140
APPENDIX I. Environmental and Cultural Characteristics of Sites Surveyed	143
Table	Page
APPENDIX II. Stone Artifacts from Paiute Mesa, Arizona	147
1. Comparison of masonry size and extent with type of site	
APPENDIX III. Occurrence of Pottery Wares and Types by Site	150
2. Projectile point and knife type occurrence on Paiute Mesa, Arizona	59
3. Lithic artifacts recovered on Paiute Mesa, Arizona	64
4. Pottery from Paiute Mesa, Arizona	83
5. Various combinations of classifiable Tusayan White Ware types found at sites on Paiute Mesa, Arizona	107
6. Ceramic Groups for Paiute Mesa, Arizona	109
7. Classification of sites into Ceramic Groups A through E	111
8. Percent of sites in each Ceramic Group which have sherds of various Teag! Orange Ware and Tusayan Grey Ware types	113
9. The number of sites and percentage of each Ceramic Group found in the various site size and extent categories	115
10. The percentage and number of sites in each location type category which belong to various Ceramic Groups	116
11. Percentage of sites in each Ceramic Group which are located north and south of the Narrows	118
12. Occurrence of types of Tusayan White Ware, Teag! Orange Ware, and Tusayan Grey Ware at sites located north and south of the Narrows	119
13. Comparison of the occurrence of Tusayan White Ware on Paiute Mesa, Arizona with three nearby areas	123

LIST OF TABLES

Table	Page
1. Comparison of masonry size and extent with type of site location on Paiute Mesa, Arizona	45
2. Projectile point and knife type occurrence on Paiute Mesa, Arizona	59
3. Lithic artifacts recovered on Paiute Mesa, Arizona	64
4. Pottery from Paiute Mesa, Arizona	83
5. Various combinations of classifiable Tusayan White Ware types found at sites on Paiute Mesa, Arizona	107
6. Ceramic Groups for Paiute Mesa, Arizona	109
7. Classification of sites into Ceramic Groups A through E	111
8. Percent of sites in each Ceramic Group which have sherds of various Tsegi Orange Ware and Tusayan Grey Ware types.	113
9. The number of sites and percentage of each Ceramic Group found in the various site size and extent categories	115
10. The percentage and number of sites in each location type category which belong to various Ceramic Groups	116
11. Percentage of sites in each Ceramic Group which are located north and south of the Narrows	118
12. Occurrence of types of Tusayan White Ware, Tsegi Orange Ware, and Tusayan Grey Ware at sites located north and south of the Narrows	119
13. Comparison of the occurrence of Tusayan White Ware on Paiute Mesa, Arizona with three nearby areas	123

Figure	Page
19. One hand manos	73
20. Hauls and hammerstones	75
21. Miscellaneous small artifacts	77
22. Tusayan White Ware sherds	87
LIST OF ILLUSTRATIONS	
23. Unidentified black-on-white sherds	89

Figure	Page
24. Paqui Orange Ware sherds	91
25. Tusayan Gray Ware and Anasazi Yellow Ware sherds	95
1. Base map of Paiute Mesa, Arizona	10
2. View north into Sage Valley from the southern limit of the survey area	17
3. Surface topography of Paiute Mesa, looking west towards Navajo Mountain	17
4. Masonry at a Pueblo III open site, NA 8839	35
5. A large open site built at the base of a baldrock ridge, NA 8814	35
6. A small ledge site in Sage Valley, NA 8892	37
7. An inaccessible small alcove masonry site, NA 8819	37
8. Part of NA 8825, a large alcove site in Sage Valley	39
9. Circular masonry storage rooms in a large alcove site, NA 8906	39
10. Site Utilizing a combination of building locations, NA 8896	41
11. Navajo and prehistoric petroglyphs at NA 8916	41
12. Petroglyphs at NA 8822	51
13. Petroglyphs at NA 8905	51
14. Projectile points and drills	57
15. Knives	61
16. Choppers	66
17. Scrapers	68
18. Two hand manos and metates	71

Figure	Page
19. One hand manos	73
20. Mauls and hammerstones	75
21. Miscellaneous small artifacts	77
22. Tusayan White Ware sherds	87
23. Unidentified black-on-white sherds	89
24. Tsegi Orange Ware sherds	91
25. Tusayan Grey Ware and Awatovi Yellow Ware sherds	95
26. Worked sherds	101

This report is concerned with the results of an archaeological survey conducted on Paiute Mesa, Arizona, by the author and Miss Mary Ann Lively during the period between June 18 and August 8, 1964. The survey work was undertaken to fulfill part of the requirements for a degree of Master of Arts at the University of Oklahoma. Surface reconnaissance in this portion of the Navajo Indian Reservation was conducted with the permission and under the auspices of the Museum of Northern Arizona located in Flagstaff. This institution provided storage space at its Research Center for the surface collections and supplied laboratory and office space for analysis and writing activities during the summers of 1964 and 1965, in addition to loaning us field equipment and providing guidance during all phases of the operation.

Paiute Mesa is located within a larger region of northern Arizona and southern Utah which has received the attention of numerous explorers and archaeologists for more than 65 years. These explorations have revealed that this region, sparsely occupied at present, has been the home of various Indian peoples during portions of the past 2000 years.

Early investigations in this northwestern section of the

AN ARCHAEOLOGICAL SURVEY OF PAIUTE MESA, ARIZONA

CHAPTER I

INTRODUCTION

This report is concerned with the results of an archaeological survey conducted on Paiute Mesa, Arizona, by the author and Miss Mary Ann Lively during the period between June 18 and August 8, 1964. The survey work was undertaken to fulfill part of the requirements for a degree of Master of Arts at the University of Oklahoma. Surface reconnaissance in this portion of the Navajo Indian Reservation was conducted with the permission and under the auspices of the Museum of Northern Arizona located in Flagstaff. This institution provided storage space at its Research Center for the surface collections and supplied laboratory and office space for analysis and writing activities during the summers of 1964 and 1965, in addition to loaning us field equipment and providing guidance during all phases of the operation.

Paiute Mesa is located within a larger region of northern Arizona and southern Utah which has received the attention of numerous explorers and archaeologists for more than 65 years. These explorations have revealed that this region, sparsely occupied at present, has been the home of various Indian peoples during portions of the past 2000 years.

Early investigations in this northwestern section of the

reservation were rather sporadic and were mostly confined to the more spectacular scenic localities and prehistoric Indian ruins. Several of the larger ruins, once homes of the Kayenta Anasazi, became well known during the early 1900's and many of the subsequent individual and group expeditions into the region were searching for other large cliffhouses. Three of the largest and best preserved ruins, Kiet Siel, Betatakin, and Inscription House, were incorporated into Navajo National Monument along with scenic Rainbow Bridge. These areas, along with Monument Valley to the east, aroused public interest, and routes into them have been improved for a number of years for tourist travel, but much of the rest of the region has remained relatively isolated from the general public until quite recently.

Among the contributors to the early archaeological knowledge of the region were a number of persons with diverse backgrounds. Geologists, surveyors, residents of the area, and adventurers all contributed their share to the record, as did a number of professional archaeologists. Adams (1960) has summarized the work of an archaeological nature conducted prior to 1959 in the Glen Canyon Basin. This area includes those portions of the Colorado and San Juan rivers to be inundated by the waters of Lake Powell formed by the Glen Canyon Dam, as well as the highland areas immediately adjacent to the two rivers on the north and south. This includes much of Paiute Mesa, Utah, as well as the land lying to the east, west and north of the mesa, north of the state line. Several of the groups listed in Adams' 52 expeditions into the Glen Canyon area worked in the region to the south as well. Among those making lasting contributions to our early knowledge of much of the region south and west

of Paiute Mesa were: The Rainbow Bridge-Monument Valley expeditions of 1933-1938 which worked in the Tsegi-Marsh Pass area primarily (Hargrave, 1935; Hall, 1933; Beals, Brainerd and Smith, 1945); Byron Cummings, who worked in many sections of the Kayenta Anasazi area over a number of years (Hargrave, 1935; Turner, 1962); Noel Morss, who surveyed the Kaibito and Rainbow Plateaus for the Peabody Museum (Morss, 1931); Kidder and Guernsey who worked in the Tsegi region (Kidder and Guernsey, 1919; Guernsey and Kidder, 1921; Guernsey, 1931).

Within the last 10 years, a great deal of archaeological work has been done in northern Arizona and southern Utah in connection with the Upper Colorado River Basin Salvage Program. This program provided for the investigation of those areas of the Colorado and San Juan River basins which would be flooded by Lake Powell upon completion of the new Glen Canyon Dam at Page, Arizona. The highland regions adjacent to these rivers were explored as well as the river basins themselves by the two institutions carrying out the intensive studies, the University of Utah and the Museum of Northern Arizona. In connection with this work, that portion of Paiute Mesa lying in Utah was investigated in 1960 and 1962 by the Glen Canyon Project of the Museum of Northern Arizona. During the two seasons, some 200 sites were recorded by survey personnel and eight sites were excavated on Paiute Mesa, Utah (Lindsay, Ambler, Hobler, Stein, in preparation). In traveling to and from the northern end of the mesa, members of the Glen Canyon Project noticed several sites on the Arizona portion of the mesa. These sites, most of which lie near the main road, were not recorded or given site numbers at that time since they were located outside the Glen Canyon Basin as defined for the salvage

archaeology program. Among these sites visited before 1964 were NA 8825 (NA 2639), NA 8826, NA 8827, NA 8837, and NA 8877. Other evidence of investigation of sites on the Arizona portion of the mesa is scanty. A number of parties are known to have explored Paiute and Nokai canyons to the west and east of the mesa, and groups are known to have crossed the mesa north of the state line by way of the Wetherill Trail (Adams, 1960:12-13), but it is not known whether these parties encountered any sites south of the state line. Only two other investigations of sites on the Arizona portion of the mesa are thought to have occurred prior to this survey. The Rainbow Bridge-Monument Valley expedition of 1933 followed an Indian trail from Skeleton Mesa onto and across Paiute Mesa enroute to Navajo Mountain, and the group stopped at "Hawks Nest Spring" in "Sand Valley" (Hargrave, 1935:23; Beals, Brainerd, and Smith, 1945:5). At this time, a site in a tributary of Nokai Canyon was investigated (NA 2637) and one alcove pueblo on Paiute Mesa was recorded, NA 2639 in Sage Valley. This large alcove site may have been deemed the only site worth recording by the passing expedition, since it is by far the best preserved of any of the sites we encountered on the survey, and it seems likely that no real investigation of the mesa was attempted by the expedition, at least during 1933. We renumbered the above site NA 8825, as shown above, but the site is usually identified in this report by using both numbers. The other known investigation of the mesa was by Adams (Taylor, 1958:5) in 1951 in connection with plans for a pueblo ecology study. Adams noted the presence of a number of sites on Paiute Mesa and the surrounding mesas, most of which were open sites, but he did not assign site numbers to any of the sites on

Paiute Mesa and it is not known, therefore, what sites he visited. The survey of Paiute Mesa, Arizona was undertaken primarily to augment the study of the Utah portion of the mesa made by the Glen Canyon Project in 1960 and 1962, and to record detailed information on the prehistoric occupation for a little known section of the Kayenta-Anasazi region. Although the presence of Kayenta sites on the mesa was known, prior to these two surveys no intensive work on the mesa had been done. It is hoped that the results of the two surveys, totaling some 325 sites, will give a more complete picture of the prehistoric occupation of Paiute Mesa with regard to settlement patterns, changes which took place through time, and the relationships the people had with the occupants of the surrounding regions. Although work in the Kayenta region over the years, especially the recent intensive salvage work, has resulted in a great deal of archaeological data regarding the prehistoric occupation, there are still gaps in our knowledge of the Kayenta people and questions to be answered. Large sections of the region have never been surveyed, and the funds and time allotted to the recent salvage programs were only sufficient to partially reduce the number of uninvestigated areas. Increased survey coverage of the region is desirable so that the available resources for excavation can be focused on those sites and localities most likely to produce new information.

Likewise, a need for knowledge of as much of the Kayenta culture area as possible, at least by survey, becomes increasingly apparent as new areas are developed by the building of roads, powerlines, and tourist facilities. It is necessary to know what the prehistoric picture

is so as to protect sites from vandalism and at the same time, develop areas of archaeological interest for presentation to the public. A survey of Monument Valley was recently undertaken (Neely and Olson, 1965) to provide such archaeological information for the Navajo Tribe to use in planning for facilities in their new Navajo Tribal Park. Although Paiute Mesa is relatively isolated at the present time, the rapid development of the Lake Powell Recreation Area and various projects and improvements planned by the Navajo Tribe will insure the opening of this mesa to the public in the not too distant future. At the time this survey was conducted, a road was under construction across the north end of Paiute Mesa which will connect the mesa with Navajo Mountain, and which may ultimately extend as far as Monument Valley on the east. Such new roads will allow many people into the area who previously could not negotiate the primitive trail system, and will also destroy any sites in the road rights of way. Evidence of vandalism was observed at a few sites during the survey, and easier access to the mesa will undoubtedly cause this practice to increase. Additional sites are being damaged by erosion and trampling by livestock. This destruction of sites cannot be altogether prevented, and this makes an archaeological record valuable, especially if the record can be obtained while most of the sites are in a relatively undamaged condition, as is the present situation on Paiute Mesa. road on the mesa are numerous wagon trails leading to Navajo hogans, wood cuts. Before this survey took place, at least one site with middle to late Pueblo I ceramic material was known to be present on the Arizona portion of the mesa. Sites of this period, having Kana-a Black-on-white pottery, seemed to be entirely lacking among the 200 sites recorded on

Paiute Mesa, Utah. It was hoped that further investigation of the Arizona half of the mesa would produce additional sites with early pottery to shed light on the extent of the early to middle Pueblo I manifestation and perhaps suggest reasons for its absence on the northern half of the mesa. The information for the whole mesa produced by the two surveys would also result in a larger body of data which could then be compared to the survey information gathered recently in the adjacent areas such as Monument Valley, Navajo Mountain, Cummings Mesa, and Navajo Canyon, thereby giving a more complete overall picture of the Kayenta region.

Travel to Paiute Mesa from the Inscription House-Navajo Mountain road and from one section of the mesa to another is best accomplished at the present time with a four wheel drive vehicle, or at least with a truck having high clearance. The road is not passable to passenger cars for all practical purposes, although occasionally one has made the trip without serious damage. The main road is unimproved dirt and it passes over baldrock outcrops, through arroyos, across stretches of deep sand, and up and down steep inclines in its passage from one end of the mesa to the other. Travel speed must be reduced to a minimum over much of the road, and rarely can exceed 30 m.p.h. Along some stretches of the road travel is hazardous at best. Branching from the main road on the mesa are numerous wagon trails leading to Navajo hogans, wood cutting areas, or springs. These trails are often overgrown or washed out, and after rains many sections of them may become covered with water overlying deep mud. Travel off of these trails, even over flat, unbroken ground, is usually impossible due to the dense sage growth and

the unusually large size of these bushes. The wagon trail network does not reach many areas of the mesa, but we were able to drive within a few miles of most of the sites and covered the remaining distance on foot. Foot travel is not too difficult over much of the mesa, although a good deal of the terrain is cut by canyons and arroyos and broken by cliffs and broad rocky outcrops. It is possible to walk to Navajo Mountain in a day, using the Wetherill Trail north of the state line, and the prehistoric inhabitants could probably have reached most of the surrounding mesas and canyons without difficulty.

A base camp was set up near the northern end of the survey area, and daily trips were made from this camp to the portions of the mesa to be investigated. Artifact collections from the sites were stored at this camp between supply trips to Flagstaff, at which time they were taken to the Museum for storage.

During the survey, site characteristics were recorded on the 5 by 8 inch site cards used by the Museum of Northern Arizona (Adams, Lindsay and Turner, 1961:1). On these cards was recorded information such as site location, size, environment, artifactual collections made, drainage, and a sketch map of the site. In addition to the site cards, notes were made at each site. The sites were given serial numbers in the field from 1 to 125, and were later assigned Museum of Northern Arizona numbers from NA 8801 to NA 8925 (Fig. 1). Black and white photographs were taken at every site, and color slides at most of them. There is not a completed United States Geological Survey fifteen minute topographic sheet of the southern portion of Paiute Mesa as yet, so each site was plotted on a set of aerial photographs of the area, and located at the northern limit of the survey area which is bisected by the

when possible on the Shato Springs 1 NE topographic sheet which covers part of the mesa. The site locations were marked temporarily with red engineering flagging tape labeled with the site number, the date, and the initials of the surveying personnel. Collections of sherds and lithic material were made at all sites where possible, and prepared forms were used to record data on those stone artifacts left in the field. Petroglyphs were chalked in when necessary for photographic purposes. At several locations in the survey area, representative plants were collected. At the laboratory in Flagstaff, the sherds and stone artifacts were cleaned, stamped with the site number, and boxed by site to await analysis. All of the sherd and stone collections, site cards, other notes, records and representative photographs from this survey are in storage at the Museum of Northern Arizona in Flagstaff.

Place names of topographic features used in this report are, for the most part, those assigned by the most recent editions of the United States Geological Survey topographic maps, with the exception of the spelling of "Piute" or "Paiute". The ethnographic spelling, "Paiute", has been retained in this report to conform with Museum of Northern Arizona usage. Several prominent landmarks on the mesa have no official name, however, and during the course of the survey it became necessary to refer to these topographic features by some term when locating sites. A minimal number of terms were used, but since they appear in the survey notes, site cards, and other records, as well as in this report (Fig. 1), the definitions of the terms follow: Boot Canyon is the large tributary canyon of Paiute Canyon located at the northern limit of the survey area which is bisected by the

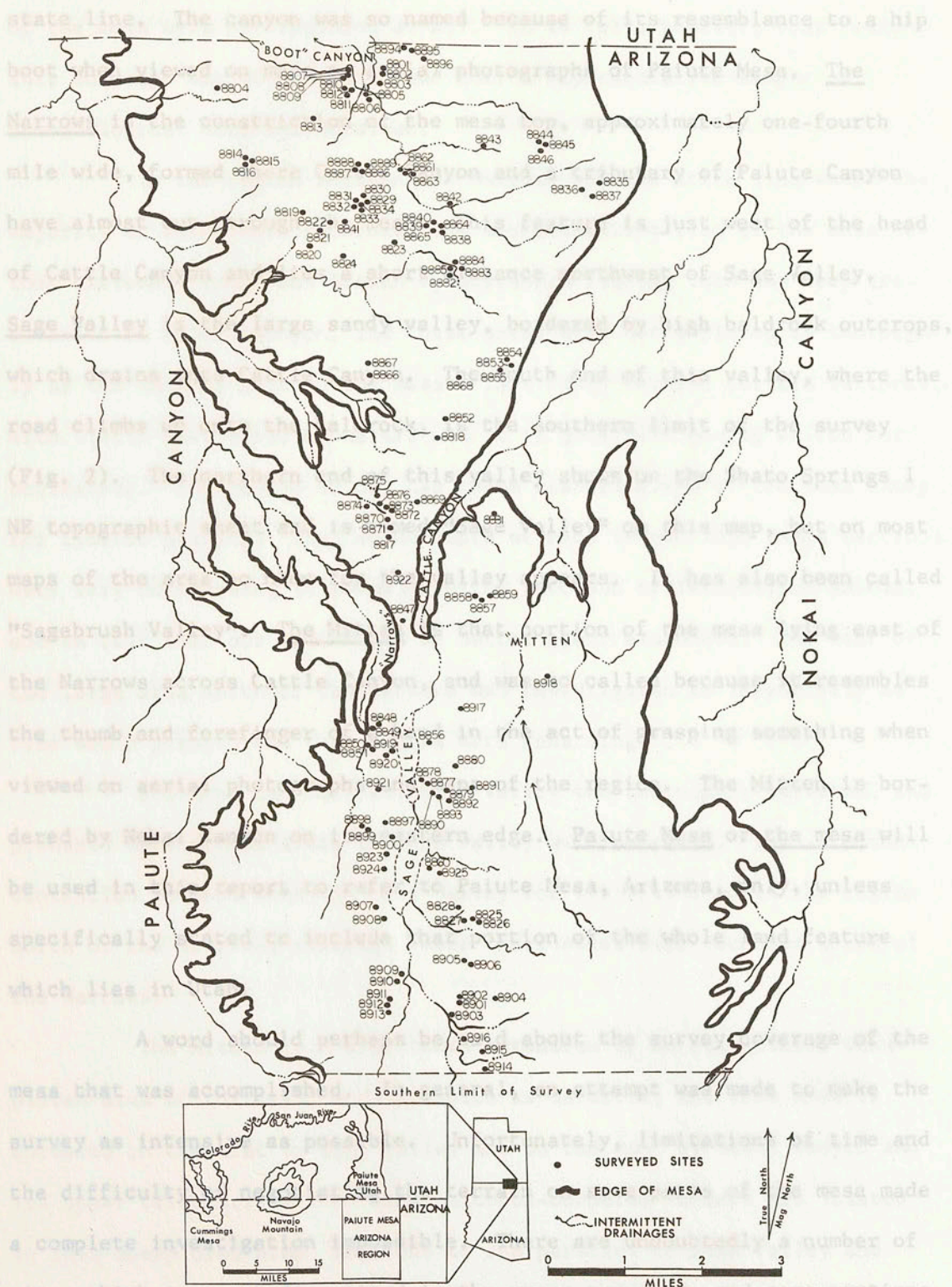


Figure 1. Map of Paiute Mesa, Arizona showing site distribution.

state line. The canyon was so named because of its resemblance to a hip boot when viewed on maps or aerial photographs of Paiute Mesa. The Narrows is the constriction of the mesa top, approximately one-fourth mile wide, formed where Cattle Canyon and a tributary of Paiute Canyon have almost cut through the mesa. This feature is just west of the head of Cattle Canyon and lies a short distance northwest of Sage Valley. Sage Valley is the large sandy valley, bordered by high baldrock outcrops, which drains into Cattle Canyon. The south end of this valley, where the road climbs up onto the baldrock, is the southern limit of the survey (Fig. 2). The northern end of this valley shows on the Shato Springs 1 NE topographic sheet and is named "Sage Valley" on this map, but on most maps of the area no name for the valley appears. It has also been called "Sagebrush Valley". The Mitten is that portion of the mesa lying east of the Narrows across Cattle Canyon, and was so called because it resembles the thumb and forefinger of a hand in the act of grasping something when viewed on aerial photographs and maps of the region. The Mitten is bordered by Nokai Canyon on its eastern edge. Paiute Mesa or the mesa will be used in this report to refer to Paiute Mesa, Arizona, only, unless specifically stated to include that portion of the whole land feature which lies in Utah.

A word should perhaps be said about the survey coverage of the mesa that was accomplished. In general, an attempt was made to make the survey as intensive as possible. Unfortunately, limitations of time and the difficulty of negotiating the terrain on some parts of the mesa made a complete investigation impossible. There are undoubtedly a number of sites which were not discovered in the areas surveyed, and some portions

of the mesa were not explored at all. It is felt, however, that reasonable coverage was accomplished and that a representative sample of archaeological data was obtained.

In the region between the Narrows and the state line where the majority of sites were recorded, the western extremities of the mesa become extremely rough and broken by drainages leading into the deep tributaries of Paiute Canyon, and these areas were not explored as thoroughly as the central part of the mesa. This rough western terrain is rocky, with little soil cover or water, and it is generally poorly suited for habitation. The Navajo do not use these western areas of the mesa except for limited grazing. The few attempts we made to get into these sections were very unrewarding in terms of sites recorded or information gained, and we felt that our time would be better spent elsewhere. The rest of the large area north of the Narrows was investigated as intensively as time would permit, and the results were rewarding.

South of the Narrows, Sage Valley was thoroughly surveyed, and probably most of the sites in this valley were recorded. The site concentration is more heavy in this valley for its size than in the region north of the Narrows, although fewer total sites were recorded south of the Narrows.

The Mitten is the northern extension of an essentially unexplored area of the mesa, much of which is baldrock, and this area is bordered on the west by Sage Valley and on the east by Nokai Canyon and its upper tributaries. Two long baldrock-bordered valleys are located in this unexplored area, adjacent to and parallel to Sage Valley and opening on their northern ends onto the Mitten. These two valleys are

presently unoccupied, according to Navajo informants, and no roads lead into them except the remains of a construction road leading to a reservoir partway into the eastern valley. We were told that many Anasazi sites are located in these two valleys which are very similar in topography to Sage Valley. We were unable to survey these two valleys, unfortunately, but on the completion of our survey work we were taken by a Navajo to visit a large Pueblo II alcove site (NA 8926) near the head of the eastern valley. We saw many promising looking site locations in this valley and in the central valley from a distance. Apparently neither of these valleys has ever been investigated, but a large number of big alcoves and baldrock shelters seem to be present, and these may contain evidence of a substantial prehistoric population in the valleys.

by Paiute West of Sage Valley, the terrain is high, covered by sparsely vegetated baldrock expanses, uncrossed by roads, and extremely rough country all the way to Paiute Canyon. Travel in this area would be extremely difficult, and no attempt was made to survey there, although some sites may be present along the major drainages. South of the Narrows, therefore, the survey was restricted to the west side of the Mitten and all of Sage Valley and its tributaries.

San Juan River makes the large meander known as "the Great Bend", some 30 river miles above the confluence of the San Juan and Colorado Rivers. Well delimited boundaries are present, therefore, on the north, east and west, but the southern limit of the mesa is poorly defined. On the Department of the Interior map labeled "Navajo Country", revised in 1936, Paiute Mesa seems to have its southern limit at the constriction formed by the Narrows, the area south of this point being vaguely termed "Zilox Mesa". The United

States Geological Survey topographic sheets for Marble Canyon, Arizona, (scale 1:250,000) and Shonto Springs 1 NE (scale 1:24,000) mapped in 1956 and 1952 respectively, extend the southern limit of the mesa further, including Sage Valley and terminating south of the valley in an area called "Zilnez Mesa". A third source, CHAPTER II Conservation Service base map

of Navajo District, Land Management Unit 2, indicates no "Zilnez" or ENVIRONMENT "Zilner" Mesa but instead, a promontory south of Sage Valley called "Tall Mountain". This land mass, Physiography recent terms, shows on all the maps as a

Paiute Mesa, an elongate erosional remnant of Triassic and Jurassic sediments, extends northward from the high land mass of the Shonto Plateau toward the San Juan River. The mesa is the highland feature just to the east of the Rainbow Plateau and is separated from it by Paiute Canyon. The mesa is oriented perpendicular to the Arizona-Utah state line and is approximately bisected by that line, approximately 18 miles of the mesa extending north of the state line into Utah, and at least 13 miles extending to the south into Arizona.

The mesa is bordered along its entire length by Nokai and Cattle Canyons on the east and by Paiute Canyon and its tributaries on the west. At the northern end of the mesa, the San Juan River makes the large meander known as "the Great Bend", some 30 river miles above the confluence of the San Juan and Colorado Rivers. Well delimited boundaries are present, therefore, on the north, east and west, but the southern limit of the mesa is poorly defined. On the Department of the Interior map labeled "Navajo Country", revised in 1956, Paiute Mesa seems to have its southern limit at the constriction formed by the Narrows, the area south of this point being vaguely termed "Zilner Mesa". The United

States Geological Survey topographic sheets for Marble Canyon, Arizona, (scale 1:250,000) and Shato Springs 1 NE (scale 1:24,000) mapped in 1956 and 1952 respectively, extend the southern limit of the mesa further, including Sage Valley and terminating south of the valley in an area called "Zilnez Mesa". A third source, the Soil Conservation Service base map of Navajo District, Land Management Unit 2, indicates no "Zilnez" or "Zilner" Mesa but instead, a promontory south of Sage Valley called "Tall Mountain". This land mass, known by different terms, shows on all the maps as a high divide between the drainages trending north into Paiute or Nokai Canyons, and those flowing south into Begashibito Wash. For the purposes of this report, Paiute Mesa is considered to extend south through Sage Valley, terminating at the high region just to the south and southeast of this valley, and to include the land east and west of Sage Valley to Nokai and Paiute Canyons. The northern limit of this survey is the Arizona-Utah state line.

The northern half of the mesa lying in Utah was explored in 1960 and 1962 by the Museum of Northern Arizona's Glen Canyon Project as a part of the Upper Colorado River Basin Salvage Program. Results of this program of survey and excavations, including a discussion of the environment and physiography of the northern half of the mesa, have been reported (Lindsay, Ambler, Hobler, Stein, in preparation). This discussion will therefore deal with the southern half of the mesa, or that portion lying in Arizona, the mesa in its entirety being considered only when necessary for fuller understanding.

Paiute Mesa is located in the eastern half of Land Management District 2 of the Navajo Indian Reservation, and that portion of the

mesa covered in this report is located between $110^{\circ}30'$ and $110^{\circ}45'$ West Longitude and $36^{\circ}45'$ and $37^{\circ}00'$ North Latitude. At the state line, the mesa has an elevation between 6000 and 6700 feet, rising to a maximum of 7300 feet in the vicinity of Sage Valley at the southern limit of the survey.

The surface of the mesa is capped by the Kayenta formation, a sandstone which forms low ridges and broad flat expanses over much of the mesa top. This caprock layer is dissected by many shallow canyons scattered over the surface of the mesa. In numerous locations on the mesa the Kayenta formation is overlain by remnant outcrops of the Navajo formation, a buff to pink colored, friable, eolian sandstone which forms vertical cliffs, baldrock domes, and ridges (Cooley, 1959:53).

These scattered outcrops lie mostly along the eastern side of the mesa north of the Narrows, becoming quite extensive to the south where the baldrock exposure is broken only by several large valleys. Underlying these two Jurassic formations of the Glen Canyon group are three Triassic formations: the Wingate formation which forms vertical impassable cliffs several hundred feet high just below the mesa rim; the Chinle formation of talus-covered, unvegetated slopes composed of varicolored siltstones, conglomerates, and sandstones; and the Moenkopi formation, a red sandstone that is visible in the form of low ledges and slopes near the canyon bottoms. Where downcutting has progressed furthest in portions of the canyon bottoms, the Hoskinnini and DeChelly sandstone members of the Cutler formation of Permian age are exposed. These banded, waterlain formations are varied in color, texture and topography, giving the mesa and adjoining canyons a rainbow effect.

The view from Paiute Mesa of the surrounding mesas and canyons



Figure 2. View north into Sage Valley from the southern limit of the survey area.



Figure 3. Surface topography of Paiute Mesa, looking west towards Navajo Mountain.

is spectacular. Beyond Paiute Canyon to the west lies the Rainbow Plateau, capped by Navajo Mountain with a summit elevation of 10,388 feet (Fig. 3). Part of the Kaipairowitz Plateau is visible to the northwest across the Colorado River, and the Henry Mountains of Utah are visible to the north beyond the San Juan River. No Man's Mesa and Nokai Mesa lie to the northeast and east beyond Nokai Canyon, and Skeleton Mesa can be seen to the east, as well as some of the monoliths of Monument Valley.

Surficial Deposits

Overlying the bedrock formations of Navajo and Kayenta sandstone on the mesa top are several types of surficial deposit. These are windblown sand, alluvial silts and sands, soil, and talus.

Deposits of windblown sand occur over much of the surface of the mesa in the form of small dunes or pockets of sand usually stabilized by sage, cacti, and small plant growth. A few areas of moving sand were noted near the western edge of the mesa just south of the state line. An extensive area of moving sand is located at the head of Sage Valley where several small tributary canyons enter the valley. Elsewhere there are shallow pockets of sand which have collected in swales and depressions. The windblown sand deposits are of two types: a reddish, slightly compacted sand on which prehistoric sites are often located; and a pinkish buff sand which composes the active sand areas and which seems to be of later derivation, perhaps eroded from Navajo sandstone. The sandy areas of the mesa which are stabilized by plant growth are able to catch and retain moisture for some time and the larger sandy

areas were undoubtedly utilized for farming by the prehistoric inhabitants. Obtaining enough water is a problem today in the surveyed area

of southern Alluvial silt and sand deposits are present in the bottoms of the larger valleys and drainages, and in some areas these have accumulated to a considerable depth. In Sage Valley, the alluvium is at least 15 feet deep, where it has been cut by recent arroyos. Possibly older terraces are present in this valley, representing periods of aggradation and degradation, but this aspect of the valley was not studied. The area is in a period of degradation at present, with very deep, wide arroyos being eroded at a rapid rate. Several sites are being destroyed by this erosion. The alluvium profiles exposed in these arroyo cuts show little stratification of a marked degree although some banding is present. ~~creeks have been built near walls of arroyos and~~

~~small springs~~ Deposits of soil are limited for the most part to the wooded areas of the mesa. The soil is shallow, and structural horizons are minimal or lacking. The composition of the soil includes much sand, with varying amounts of organic matter in the upper portions. The poorly structured soil layers usually overlies deposits of sandier composition or bedrock. Talus deposits and rockslides are not common on the mesa, and they are always the result of slumpage from an adjacent cliff or baldrock exposure. Such slumpage is usually not extensive and the individual rocks are rarely large. A few of the larger blocks were incorporated into architectural structures by the prehistoric Indians, or incised with petroglyphs, but these usages of the talus deposits are rare, unlike the situation further to the north, along the San Juan River (Adams and Adams, 1959:37). ~~Water sources, as well as at lesser~~

Hydrography

Obtaining enough water is a problem today in the surveyed area of southern Paiute Mesa, as it undoubtedly was in prehistoric times.

There are no perennial water courses on the mesa top, and permanent water is available only at a few springs and seeps scattered along the basal contacts of Navajo sandstone outcrops.

Several of these springs have been boxed in by the Navajo Tribe to form storage tanks, and at these spring boxes water can be drawn for human consumption. Stock watering troughs are also available at these springs. We located two boxed springs and one windmill well where the water source is protected from livestock contamination, and utilized one of these for our water requirements during our stay on the mesa. A few more stock watering troughs have been built near walled up seeps and small springs, these water sources having just enough flow to keep the stock tanks full when not subjected to heavy use. At some locations where small seeps are present, collecting basins for the water have been dug and often a corral is built around these water holes in alcoves or at the base of the cliff. Even at the boxed springs with storage reservoirs it is necessary to conserve water by turning it off after each use, because the reserve water in the spring box is rapidly depleted and several hours are required for the spring to fill the tank again. On several occasions during the summer when the water was not turned off after use, the inhabitants in the vicinity had to travel 8 or 9 miles to the next water source while waiting for a water reserve to build up in the spring box again.

At all of the improved water sources, as well as at lesser

springs and seeps, there is evidence of prehistoric utilization of the areas in the form of habitation sites at or near the seeps, petroglyphs, or broken pottery nearby. Many of the prehistoric sites on the east side of Sage Valley are located near minor but apparently permanent seeps. There are springs and seeps in Paiute, Cattle and Nokai canyons also, and some of the Navajo take their sheep to these watering spots during the summer. These sources are used during the winter as well, when many of the families move down into the canyons to live with their flocks. Other modern attempts to collect water are present in the form of an earth dam in Sage Valley which backs up a small pond after the summer rains, and a new stone and mortar reservoir footed on bedrock in a large bedrock drainage area on the eastern side of the mesa a few miles south of the state line. This reservoir, recently completed by the Navajo Tribe, held no water during the period of the survey.

Agriculture on the mesa today, and in prehistoric times as well, depends on seasonal precipitation in the form of rain or snow, and fields are planted to utilize flood water or moisture retained in sandy soil. Much precipitation is lost by runoff, especially that which falls on baldrock exposures or on rocky expanses with little or no mantle of soil. Much of this moisture comes in the form of heavy localized summer thunder showers. Where the moisture falls on sandy or alluvial soil, it is retained somewhat longer, but the rate of evaporation from the soil is high. Rapid arroyo cutting and moving sand dune activity indicate a high aridity for the area. This erosional activity appears to be on the increase since 1962, especially in Sage Valley where much moving sand is covering the vegetation, and arroyos eight to ten feet

deep were observed to be cutting upstream as much as 30 or 40 feet after a single cloudburst. The main road through the valley has to be rerouted at frequent intervals to by-pass the deep sand and arroyos at the upper end of the valley. A few Navajo fields utilizing floodwater are planted in the broad deep alluvium of lower Sage Valley, and several of these were washed away by heavy rains during the summer. We noticed no other fields under cultivation in the surveyed area in 1964. With increased precipitation, many smaller dune and sandy alluvial areas would be capable of supporting domestic plants, and judging from the site distribution, many of them were utilized by the prehistoric dwellers on the mesa.

moisture. In addition to springs and seeps, there are some plunge pools and potholes located at the base of baldrock cliff drainages and in drainages passing over broad, level rocky expanses. These natural basins occur in the valley drainages also, where the alluvium has been removed down to scoured bedrock. The larger of such basins may hold several hundred gallons of water for several days after a rain. Rocky exposures on the tops and edges of small buttes and along the edge of the mesa itself have been exposed to weathering by wind and water and often contain "weather pits" of varying depth and diameter. After heavy rains, these pits formed by solution and abrasion become filled with water. The larger pits can hold enough water for several days to provide a valuable additional source of water for inhabitants of the area. These natural basins of various types occur near several sites, among them NA 8914 and NA 8915, located near plunge pools, and NA 8839 and NA 8853, which are located at the base of a cliff containing many weather pits.

Most of the moisture falling on the mesa south of the Narrows

drains into Sage Valley or onto the Mitten and hence into Cattle and Nokai canyons. Between the Narrows and the northern limit of the survey at the state line, the drainage is generally from southeast to northwest, flowing from the eastern rim of the mesa at approximately 6800' elevation across to the western edge of the mesa and into the deep tributary canyons of Paiute Canyon with rim elevations in the range of 6200' to 6700 feet.

The location of many prehistoric sites a considerable distance from any possible water sources we could discern indicates either that more seeps and springs were available, perhaps with more seasonal moisture, or that the people living at some locations were not averse to walking several miles to obtain water. For human consumption and domestic animal usage only, the mesa today could support a number more people than it does, if the water sources presently available were developed. With a few more good water sources in the form of springs and seeps, or enough additional moisture to keep water in natural bedrock basins, the mesa could have adequately supported a large prehistoric population, and evidence from the survey indicates that it did.

Flora and Fauna

The vegetation of Paiute Mesa, Arizona, is basically characteristic of the Upper Sonoran Life Zone, and includes many of the plants typical of that zone. The variations in elevation, exposure, soil, and availability of moisture on the mesa top itself, provided by the many of the large alluvial valleys and the baldrock cliffs which border the cliffs, baldrock remnants, and drainage systems, allow some Lower Sonoran and Transition life zone plants to survive in some locations on the mesa.

Scattered through the piñon-juniper forest growth are numerous

as well. prickly pear (Opuntia compressa var. macrorhiza), narrow leaved yucca. When an overall bird's eye view of the mesa is taken, most of the mesa top appears to be forested with thick stands of pinon pine (Pinus edulis), and juniper (Juniperus monosperma), interspersed with unforested areas of sagebrush (Artemisia tridentata), joint-fir or Mormon tea (Ephedra viridis), and cacti and grasses, against which the sparsely vegetated baldrock remnants of the mesa top and the deep canyon tributaries of Paiute Canyon on the west edge of the mesa stand out in stark relief. The forest cover on the Arizona half of the mesa is much more dense and extensive than on the Utah portion to the north, due to the higher elevations and smaller alluvium filled valley areas of the southern portion of the mesa. Beginning at the Arizona-Utah state line and proceeding south through the surveyed area, the pinon-juniper forest dominates the mesa surface along both edges, becoming less dense near the center of the mesa where many small drainages coalesce to form shallow alluvial valleys and open sandy expanses covered with sage and small brush growth. This pattern of forested land, replaced by large and small sage flats wherever enough alluvium or dune sand has accumulated, continues to the south on the mesa as far as the head of Cattle Canyon. Here, where large areas of eroded Navajo sandstone baldrock are exposed, the forest cover becomes more sparse and is restricted to scrub tree growth on the baldrock remnants and a somewhat denser band of growth between the edges of the large alluvial valleys and the baldrock cliffs which border the valleys. Scattered through the pinon-juniper forest growth are numerous

clumps of prickly pear (Opuntia compressa var. macrorhiza), narrow leaved yucca (Yucca angustissima), other varieties of cacti, and small bushes, plants, and grasses. The trees of the forest are stunted and gnarled where they grow on the baldrock or in the rocky soil on top of the cliffs and buttes that dot the mesa top, but in more sandy soil or in protected, well watered locations, they often grow 30 to 50 feet high. The sagebrush growth near the southern limit of the surveyed area in Sage Valley is unusually dense, and individual plants may attain a height of 6 or 7 feet with corresponding breadth. As one proceeds north toward the state line, the stands of sagebrush become noticeably less dense and the size of the individual bushes can be seen to decrease, until only scattered, small plants are present in the area of the state line, and north of it on the Utah side of the mesa.

At well watered locations, including many alcoves or cliff locations with active seeps or springs, a variety of plants exist which are restricted to these favored locations. Mosses, ferns, Gambel Oak (Quercus gambelli), Box elder or ash-leaved maple (Acer negundo), and various flowering plants were noted. At several moist, sheltered northern exposures along the cliffs in Sage Valley, small stands of aspen (Populus tremuloides) are growing. The presence of these trees, growing alongside yucca and cacti, is unusual but not unheard of for the area. A similar situation exists at Betatakin in Navajo National Monument where aspen and other upper Transition Life Zone plants are growing in a sheltered tributary of the Tsegi canyon system. No ponderosa pine or other conifers were found on the mesa, although the elevation in several places is more than sufficient for their growth, and they are present on

Navajo Mountain a few miles to the west. Evidence of pine growth is reported north of the survey area in the vicinity of NA 7713 (Lindsay, Ambler, Hobler, Stein, in preparation), and it is possible that a number of conifers grew on the mesa in prehistoric times, given more moist conditions.

At a few places on the west side of Sage Valley, stands of young pinon trees were noted which seem to be extending the forest border further down into the valley. For the most part, however, the forest borders seem to have been stable for a long period of time. The location of many prehistoric sites just within the present forest border adjacent to arable sandy areas may indicate that the forested areas of the mesa occupied the same or very similar locations in prehistoric times as well.

The following plants were collected from the surveyed area during the summer of 1964:

Oenothera caespitosa, evening-primrose
Tradescantia occidentalis, spiderwort
Taraxacum officinale, common dandelion
Acer negundo, box elder or ash-leaved maple
Gilia longiflora, long flowered gilia
Lesquerella intermedia, bladderpod
Eriogonum simpsoni, wild buckwheat
Ephedra viridis, joint fir or Mormon tea
Gutierrezia sarothrae, snakeweed
Gilia aggregata, skyrocket
Pinus edulis, pinon pine
Juniperus monosperma, one-seed juniper
Artemisia tridentata, big sagebrush
Distichlis stricta, salt grass
Astragalus lentiginosus, milkwort or loco weed
Oryzopsis hymenoides, Indian rice grass
Shepherdia rotundifolia, buffalo-berry
Penstemon virgatus, Beardtongue
Cleome serrulata, Rocky Mountain beeplant
Populus tremuloides, trembling aspen
Verbesina encelioides, crownbeard

Amaranthus graecizans, amaranth or pigweed
Artemisia ludoviciana, sagebrush or wormwood
Arctostaphylos pungens, manzanita
Castilleja linariaefolia, paintbrush
Franseria acanthicarpa, bursage
Arabis perennans, rock cress
Descurainia obtusa, tansy mustard
Chenopodium fremontii, goosefoot
Berberis repens, creeping-mahonia or hollygrape
Clematis ligusticifolia, clematis
Ribes cereum, squaw currant
Penstemon barbatus, scarlet beardtongue
Thalictrum fendleri, meadowrue
Rhus trilobata, skunk bush or sumac
Penstemon utahensis, Utah beardtongue
Amelanchier utahensis, serviceberry
Koeleria cristata, Junegrass
Artemisia bigelovii, sagebrush
Eriogonum cernuum, wild buckwheat
Cercocarpus intricatus, mountain mahogany

The fauna observed during the survey were mostly small reptiles, mammals, and a few amphibians, the most frequently encountered being varieties of lizards. Horned toads, jack rabbits, cottontails, wood rats, field mice, ground squirrels and a few bats were also seen. Many birds were observed including hummingbirds, pinon jays and doves. No snakes were seen, although an occasional shed skin was noted. After the heavy rains in July, numerous previously dry plunge pools and small ponds remained full of water for several weeks, and were soon teeming with animal life in the form of tadpoles, small frogs, and fairy shrimp. The maturation rate of the tadpoles was very rapid, development into fully formed frogs taking place within a week's time.

Large animals are virtually lacking in the survey area, probably due to the lack of food and shelter caused by disturbance and overgrazing of Navajo livestock. Probably deer, mountain sheep, coyotes, and large members of the cat family existed on the mesa in prehistoric

times, and perhaps a few of these survive today, but none were seen during the survey. A large animal believed to be a badger, and a fox-like animal were the only large animals seen. Insect and arachnid life abounds on the mesa, the most numerous and troublesome variety to the survey personnel being gnats. Flies, mosquitoes, ants, spiders, scorpions, honey bees, yellow jackets, moths, butterflies, wood borers, and one "child-of-the-earth" (sand cricket) were also encountered.

Climate

No meteorological studies have been made on Paiute Mesa, so detailed climatic data for this restricted region are unavailable. Some general comments may be made, however, since the climate is similar in many respects to that of the surrounding highland areas of the Colorado Plateau.

Prevailing winds are from the southwest, with light to moderately strong, dry winds common throughout much of the year. Very strong gusty winds prevail during the spring and early summer, becoming moderate in July and August, and becoming strong again in the fall. These warmer desert climate of the surrounding canyon bottoms and lower plateaus, and the higher elevations and cool, moist climate found on the upper slopes and summit of Navajo Mountain to the west.

The Colorado Plateau in general receives moisture in the form of rain and snow during the winter months of December through March, and additional moisture during the late summer, these two seasons accounting

The closest weather station is at Navajo Mountain Trading Post for perhaps 70% of the annual total of moisture (Harshbarger, Repenning, 12 miles west of Paiute Mesa. This station reports an average annual and Callahan, 1953:112). This pattern seems to hold true for Paiute temperature of 50°F, with a frost free growing period of approximately

Mesa, with April, May, and June being dry, and most of the summer rainfall coming in July and August. This summer rainfall is in the form of heavy localized thunder showers, sometimes accompanied by hail, which are generally of short duration. Several inches of rain may fall in an area in a short period of time causing heavy runoff and gully erosion. These summer storms are associated with moist air moving north from the Gulf of Mexico (Adams, Lindsay, and Turner, 1961:7). During these months of summer storms, the clouds begin to build up in the morning to the south and southwest, becoming storm centers of thunderheads by mid afternoon. After the rain which is often accompanied by spectacular electrical storms, the clouds disperse and the sky usually becomes clear by late evening. The mesa probably receives 10 to 15 inches of moisture during an average year, with proportionately more of this falling on the higher, southerly portions of the mesa.

Prevailing winds are from the southwest, with light to moderately strong, dry winds common throughout much of the year. Very strong gusty winds prevail during the spring and early summer, becoming moderate in July and August, and becoming strong again in the fall. These strong winds buffet the high exposed remnants on the mesa with considerable violence, making it actually dangerous to stand near the edge of a cliff during a wind storm. Loose surface sand is displaced and carried by the surface wind storms, this shifting of sand often covering and uncovering portions of prehistoric sites.

The closest weather station is at Navajo Mountain Trading Post 12 miles west of Paiute Mesa. This station reports an average annual temperature of 50°F. with a frost free growing period of approximately

200 days (Ambler, Lindsay, and Stein, 1964:6). Daytime temperatures may exceed 100°F. some days during the summer, but due to the low humidity, high evaporation rate, and nearly constant breezes, the temperature may be 15 or 20 degrees cooler in the shade. During the summer, nights become quite chilly after the sun sets, but the night air warms rapidly with the sunrise on clear days. During our stay on the mesa, we found

CHAPTER III

the climate to be very pleasant, with a majority of clear sunny days

Site Locations and Distribution

combined with daytime temperatures and low humidity that permitted us

A total of 125 prehistoric sites were recorded on Paiute Mesa, to engage in hard physical activity with little discomfort.

Arizona, during the survey. Navajo remains were noted but were not recorded as sites. It can be seen on the map of the surveyed area (Fig. 1) that the 75 sites in the area north of the Narrows are located in drainage systems trending toward the west or northwest. These large and small drainages empty into the deep tributary canyons of Paiute Canyon which ultimately opens into the San Juan River to the north. Of the 75 sites in this section of the mesa, 45 are located in and around the broad central valley along drainages leading into Boot Canyon, the tributary of Paiute Canyon which lies on the state line at the northern limit of the survey.

South of the Narrows and on the area of the Mitten, there are 11 sites which are located in drainage areas flowing east or west directly into Cattle Canyon. Another 39 sites are located in the large Sage Valley drainage which flows north into Cattle Canyon. This canyon, which separates the Mitten area of the mesa from the Narrows, empties into Nokai Canyon to the northeast, and Nokai Canyon empties into the San Juan River.

The 125 sites recorded by the survey may be divided on the basis of location and environment into several categories comparable to the types of locations described for the Glen Canyon region by Adams, Lindsay, and Turner (1961:11). This classification proved useful in

CHAPTER III

later Glen Canyon Project work in the highland areas south of the Colorado and San Juan Rivers, including the survey done on Paiute Mesa, Utah in

THE SURVEY

1960 and 1962 (Lindsay, Ambler, Hobler, and Stein, in preparation). The

Site Locations and Distribution

location categories as defined for the Glen Canyon region are as follows:

A total of 125 prehistoric sites were recorded on Paiute Mesa, Arizona, during the survey. Navajo remains were noted but were not recorded as sites. It can be seen on the map of the surveyed area (Fig. 1) that the 75 sites in the area north of the Narrows are located in drainages empty into the deep tributary canyons of Paiute Canyon which ultimately opens into the San Juan River to the north. Of the 75 sites in this section of the mesa, 45 are located in and around the broad central valley along drainages leading into Boot Canyon, the tributary of Paiute Canyon which lies on the state line at the northern limit of the survey. A few sites recorded on this survey had talus elements, but always in combination with other location types. Sites of this nature, which have several location types present, have been called "Combination sites" (Ambler, Lindsay, and Stein, 1964:9) for purposes of tabulation and discussion. The location type of each site is shown in Appendix I.

South of the Narrows and on the area of the Mitten, there are 11 sites which are located in drainage areas flowing east or west directly into Cattle Canyon. Another 39 sites are located in the large Sage Valley drainage which flows north into Cattle Canyon. This canyon, which separates the Mitten area of the mesa from the Narrows, empties into Nokai Canyon to the northeast, and Nokai Canyon empties into the San Juan River. Occasionally located in unforested sage areas. Often these sites

The 125 sites recorded by the survey may be divided on the basis of location and environment into several categories comparable to the types of locations described for the Glen Canyon region by Adams, Lindsay, and Turner (1961:11). This classification proved useful in later Glen Canyon Project work in the highland areas south of the Colorado and San Juan Rivers, including that done on Paiute Mesa, Utah in 1960 and 1962 (Lindsay, Ambler, Hobler, and Stein, in preparation). The location categories as defined for the Glen Canyon region are as follows: Open sites, located on sandy ridges or stabilized dunes, on rock and alluvial terraces, or on buttes and remnants; Shelter locations in ledges, small alcoves or rockshelters; Talus sites, located in slumpage from cliffs; Cliff sites, which include those in large alcoves or caves, and prehistoric pecked step trails. These categories are in general applicable to the sites located by this survey of Paiute Mesa with the exception of caves, prehistoric trails, and the paucity of talus locations. A few sites recorded on this survey had talus elements, but always in combination with other location types. Sites of this nature, which have several location types present, have been called "Combination sites" (Ambler, Lindsay, and Stein, 1964:9) for purposes of tabulation and discussion. The location type of each site is shown in Appendix I.

Open Sites

By far the majority of the recorded sites are in open, unsheltered locations. Of these 102 sites, 88 are situated on sandy slopes, ridges, or stabilized dunes, usually within the forest border, but occasionally located in unforested sage areas. Often these sites

are located on a low rise or hillock overlooking an open valley, or they command a view for some distance over the surrounding terrain. An additional 11 sites are situated on top of high buttes or baldrock remnants, and these sites are characterized by a view for several miles in all directions. Sites so situated, such as NA 8839, NA 8816, NA 8820, and NA 8869, would have been easy to defend since routes of access to the sites are limited. Three sites are located on sparsely vegetated alluvial terrace deposits adjacent to the present arroyos in Sage Valley, and these are similar to other open sites in the vicinity. It is worthy of mention that 22 open and four combination sites are located on or against Navajo sandstone baldrock outcrops (Fig. 5). Over half of these are sites situated on sandy slopes which abut to the base of the baldrock cliffs. These remnants of cliffs and domes often provide some shelter from the wind, and are usually excellent lookout points with a wide view of the surrounding terrain. In addition, the sandstone may have provided water in the form of seeps, most of which are presently extinct. In some instances, the sheer baldrock provided a natural rear wall for a room block, and a site so situated would be protected from at least one side. It was evident during the survey that the baldrock outcrops were favored habitation locations for the prehistoric inhabitants due to their height above the surrounding terrain and the abundance of relatively sheltered locations provided by such outcrops. Prehistoric sites were found adjacent to, or sheltered by, such sandstone formations wherever they were present on the mesa.

of these locations seems to be the amount of dry, relatively level floor space available, and the exposure of the alcove to the elements. Several

Shelter Sites

Ten sites located in sheltered spots were recorded by the survey: four in ledge locations, four in small alcoves, and two in rock-shelters. NA 8905 and NA 8911, both petroglyph sites, are situated against sheer sandstone cliff faces which are slightly undercut, providing a sheltered location at the base of the cliff. Outcrops of Kayenta sandstone form low ledges and jagged overhangs, and these were utilized by the prehistoric inhabitants at NA 8818, NA 8843, NA 8859, and NA 8892 (Fig. 6). Two or three masonry rooms are present at NA 8818 and NA 8892, and NA 8859 has several rooms built against a low ridge overhang. These ledge sites are located along small deep rocky drainages where the Kayenta formation has been exposed and eroded away, or along the edges of the higher terrain features of the mesa where outcrops have been exposed by the large scale erosion of the mesa. Relatively few suitable ledge locations are present in this formation, however, as most exposures are too shallow for shelter purposes.

The unusually large and numerous caves and alcoves typical of the Tsegi Canyon region a few miles to the southeast are not present on Paiute Mesa. There are, however, a number of small alcoves and a few larger ones with floor space adequate for 30 or 40 rooms, and a number of these shelters were occupied by the prehistoric inhabitants of the mesa. Small alcoves are present in the Navajo sandstone at two locations in Sage Valley at NA 8826 and NA 8901, on the Mitten at NA 8858, and north of the Narrows at NA 8819. The factor governing occupation of these locations seems to be the amount of dry, relatively level floor space available, and the exposure of the alcove to the elements. Several



Figure 4. Masonry at a Pueblo III open site, NA 8839.

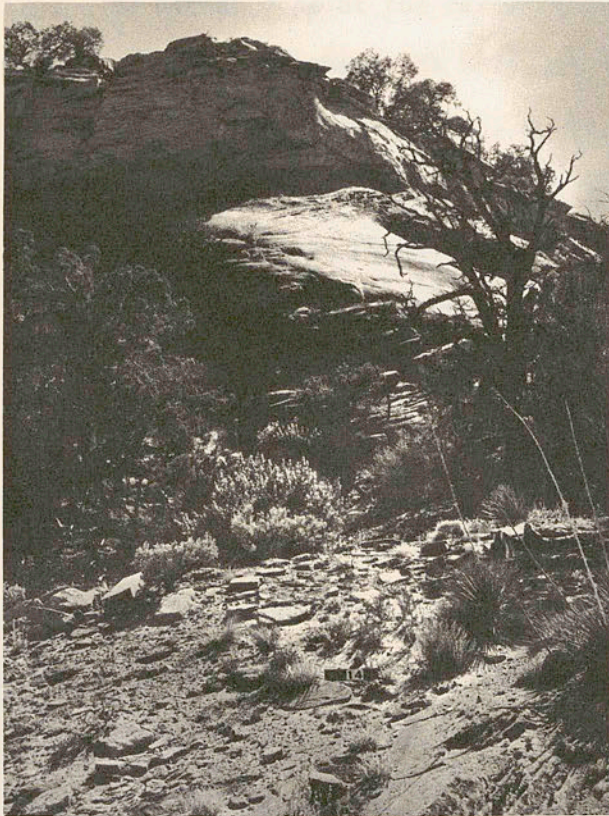


Figure 5. A large open site built at the base of a baldrock ridge, NA 8814.

alcoves with very steep or narrow floors were apparently not occupied. Otherwise suitable small alcoves having northern exposures were likewise not utilized. Masonry remains are present at all of the small alcove sites except NA 8901. At NA 8819, the alcove is high in a larger shallow alcove, and the cliff below has spalled off, leaving the small, masonry filled alcove inaccessible at the present time (Fig. 7). Room count estimates at the small alcoves with masonry range from four to ten rooms, with some walls standing 15 or 20 courses high.

Cliff Sites

Cliff sites are represented by five large alcoves in the Navajo sandstone. Three are in Sage Valley, one is located north of the Narrows and one is on the Mitten area of the mesa. Masonry several courses high is present in three of these (NA 8825, NA 8866, NA 8906) with from four to 30 or more rooms evident (Figs. 8, 9). The best preserved masonry is in the largest alcove site, NA 8825 (NA 2639), which had two stories of rooms in places and possible subterranean storage features as well. Doorways are still present in many rooms at this site, as well as roofing material and other perishable remains. This large alcove has a sheltered floor space of at least 100 by 20 meters, divided into two main habitation sections. The other large alcoves are of considerably smaller dimensions. NA 8881 and NA 8904 may have had masonry or other structures at one time, but they are characterized by scattered trash and petroglyphs at present. A few large alcoves were investigated which have been fenced in and used as livestock corrals by the Navajo, thus destroying any evidence of prehistoric culture to be gleaned from

Figure 7. An inaccessible small alcove masonry site, NA 8819.



Figure 6. A small ledge site in Sage Valley, NA 8892.

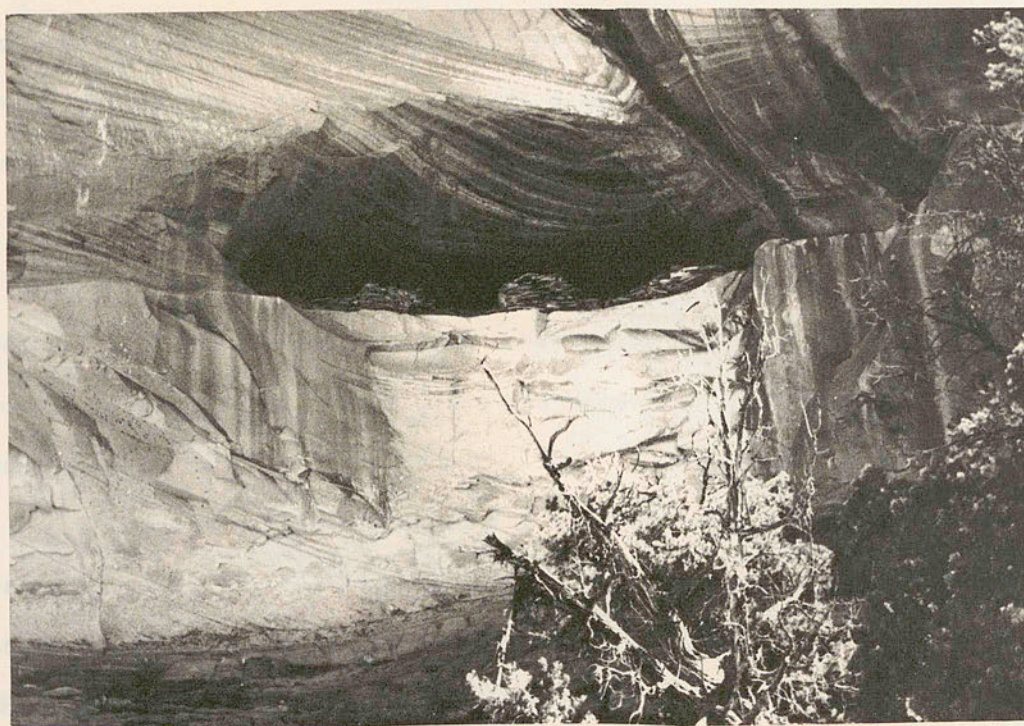


Figure 7. An inaccessible small alcove masonry site, NA 8819.

the surface.

Combination Sites

Eight sites have plans incorporating a combination of locations. These combine rockshelters with talus slumpage and baldrock elements, or large and small alcoves are combined with associated open or ledge elements. An example of this type of site is NA 8896 which is a large alcove with several rooms built on the floor of the alcove, two additional rooms built into ledges in the rear of the alcove, and probable rooms or pithouses located on the broad sandy slope stretching in front of the alcove (Fig. 10).

Resources

The surveyed portion of Paiute Mesa is predominantly forested, and in some areas quite heavily so. All but 18 of the 125 sites investigated are located within the forest boundary, and those 18 sites situated in clearings are within a short distance of the forest cover. The mesa may have been even more heavily forested in prehistoric times, thereby providing an adequate wood supply for cooking, pottery firing, and building purposes. The height and girth of many of the present trees is great enough that the prehistoric inhabitants probably would have had no trouble finding large enough poles and beams for roof supports and other purposes.

Kayenta and Navajo sandstone are available over much of the mesa surface and in the near vicinity of a large majority of the sites. Both types of stone were utilized in the stone masonry and ground stone tools observed during the survey. One site, NA 8889, seems to have been



Figure 8. Part of NA 8825, a large alcove site in Sage Valley.



Figure 9. Circular masonry storage rooms in a large alcove site, NA 8906.

a prehistoric stone quarry. This site is located on a ledge outcrop of Kayenta sandstone, and the stone is naturally fractured into blocks of usable size. At several spots along the outcrop, sections of the stone have apparently been pried loose, and stone of similar type is incorporated into the masonry structures at two nearby sites, NA 8886 and NA 8887. Although no stone tools were found at this supposed quarry, it is evident that the outcrop could have been easily worked, perhaps with no tool other than a stick to provide leverage in prying loose the fractured blocks of stone. Similar quarries are present on Paiute Mesa, Utah, at several sites, among them the large Pueblo III village NA 7713 (Lindsay, Ambler, Hobler, Stein, in preparation). An abundance of stone would have been available without quarrying in the form of small size slabs and rubble formed by cliff rock falls and the water solution and spalling of alcove roofs. Navajo sandstone was frequently used in construction on the mesa. Silicious stone for tool making probably came from the San Juan River gravel terraces, the inhabitants either traveling themselves to the river, or trading for the stone with those who lived on the northern end of the mesa nearer the river.

Clay sources on the mesa appear to be quite limited, and were noted only in the vicinity of NA 8836. Here, thin pockets of both white and purple clayey material are present in the Kayenta formation. The Chinle formation, exposed near the bottoms of the deeper canyons on either side of the mesa, furnishes suitable clay material for pottery making, and this formation may have been the major source of clay for the prehistoric inhabitants.

A sample of the variety of plants present in the mesa environment

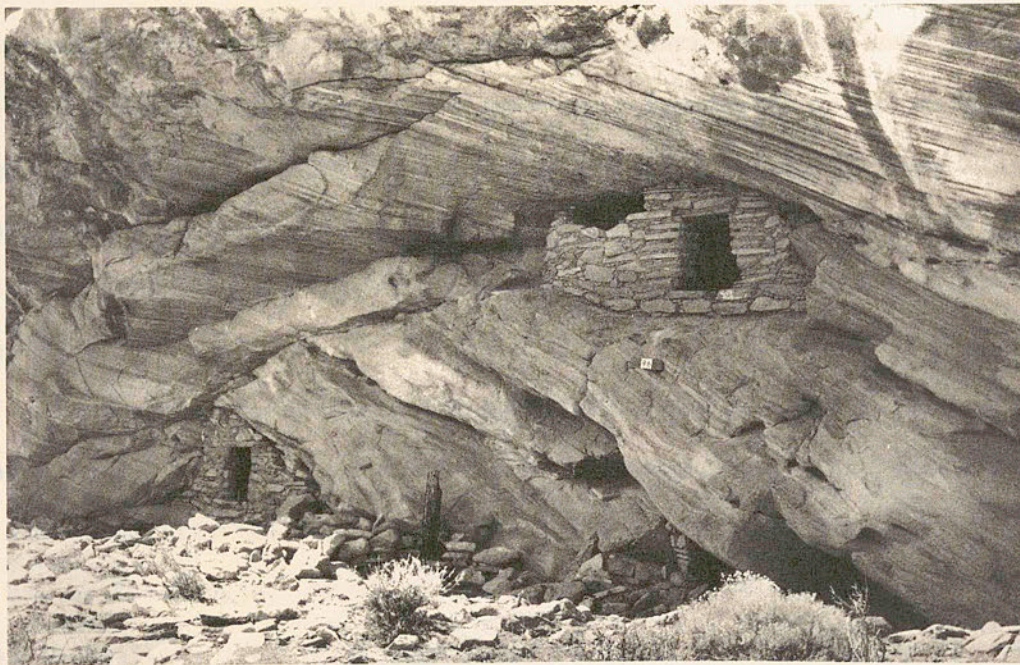


Figure 10. Site utilizing a combination of building locations, NA 8896. Ledge rooms are built into the rear of the alcove, masonry rooms cover the alcove floor, and other structures are present on the slope in front of the alcove.



Figure 11. Navajo petroglyphs and prehistoric petroglyphs (handprint, two anthropomorph-like figures) at NA 8916.

has already been given. A number of these plants have been used by the Hopi in historic times for food, implements, ornamentation, pottery making, and medicinal and ceremonial purposes (Whiting: 1939). Undoubtedly many of the plants listed above were sought in similar fashion and used by the residents of Paiute Mesa, perhaps in much the same way as the Hopi use them.

Nearly all of the sites recorded on the survey are located near arable land. All of the sites in Sage Valley would have had easy access to the broad alluvial deposits of this valley, portions of which are still in use by the Navajo. North of the Narrows, most of the sites are adjacent to smaller, open sandy sage areas suitable for farming, or the sites are located within a mile or two of such locations. Given a little more moisture, most of the sandy sage parks on the mesa could be utilized for farming.

Permanent water in utilizable quantities today is present in the near vicinity at nine sites, and another 30 sites, most of which are located in Sage Valley, are within one mile of these present day water sources. An additional six sites are located near small seeps, or near potholes and plunge pools which hold considerable quantities of water after heavy rains. Large drainages, adjacent to 11 sites and within one mile of 55 others, could possibly have provided a permanent or seasonal water supply for some of the population. The remaining 14 sites had no water source evident in the immediate vicinity, and they are a mile or more from springs, potholes, plunge pools, or major drainages. Although it is likely that there were more active seeps and a higher water table in prehistoric times, many sites were still located a considerable

distance from a dependable water source. It is interesting that most of the well watered locations on the mesa were abandoned during the later, or Pueblo III occupation of the mesa, especially those in Sage Valley. This would seem to indicate that other factors were influencing the choice of habitation location more strongly than the availability of nearby water.

Cultural Elements

Cultural remains recorded at the 125 prehistoric sites encountered during the survey include masonry structures and rubble, lithic and ceramic artifacts and refuse, petroglyphs, perishable materials, and one foothold trail. Every site is composed of one or more of these elements (Appendix I).

Structures

Masonry structures in the form of rooms, storage features, hearths, mealing bins, probable pithouses and kivas were observed during the survey. Masonry room outlines and rubble were present at at least 56 of the surveyed sites. At 37 of these, fairly precise estimates of the size of the ruin could be given, and the other 19 sites had sufficient rubble present to allow a guess as to the number of rooms present. An additional 31 sites have some masonry rubble present, but it was not possible to estimate the number of rooms with accuracy. At 38 sites, evidence for masonry structures was not conclusive from survey investigation, and at a number of these sites it is probable that pithouses are present instead. Temporary shelters or ramadas may have been constructed instead of permanent masonry dwellings at some sites, leaving no

trace on the surface.

The size of the sites with masonry rooms present ranges from small, one or two room structures to large pueblos of 50 or more rooms. When the recorded sizes of the masonry sites were examined, it was found that they could be roughly divided into four groups consisting of one room, two to four rooms, five to ten rooms and more than 11 rooms. A comparison of masonry size with the type of site location is shown in Table 1, with probable pithouse sites included in the group of sites with no masonry. Most sites consist of several contiguous rooms arranged in linear fashion. Some of the small clusters of rooms may have adjoining courtyards. Several of the pueblos appear to have "L" or "U" shaped outlines and others may consist of two or three parallel linear room blocks. A few of the larger pueblos have "D" shaped or square outlines, perhaps enclosing a plaza area with one or more kivas. Structures of more than one story in height could only be identified at NA 8825 (NA 2639), but some of the other large villages may have had multiple storied dwellings as well.

Masonry observed during the survey was generally crude, utilizing poorly dressed stones of varying thicknesses. In sheltered locations, the masonry is best preserved, and often the walls are covered with a coat of thick, sandy mud plaster on interior and exterior wall surfaces. Small stones, sticks and corncobs were used to chink the walls. At several sites alignments of upright slabs were noted, and these may be remnants of walls made by setting large slabs upright in mortar. Walls were rarely more than a few courses high at open sites, but some sites in sheltered locations had masonry standing to probable roof

TABLE 1

COMPARISON OF MASONRY SIZE AND EXTENT
WITH TYPE OF SITE LOCATION
ON PAIUTE MESA, ARIZONA

	Probably no masonry	Rubble-Size Unknown	1 Room	2-4 Rooms	5-10 Rooms	10 or more Rooms	Totals:
<u>Open</u>							
Dune Ridge	32	21	9	9	6	11	88
Butte Remnant	2	5	1		1	2	11
Terrace	1	1		1			3
<u>Shelter</u>							
Ledge	1			2	1		4
Small Alcove		1		1	2		4
Rockshelter	2						2
<u>Cliff</u>							
Large Alcove		2		1	1	1	5
<u>Combination</u>		1	1	4	1	1	8
Totals:	38	31	11	18	12	15	125

levels. None of the sites had roofing material still in place, although roofing poles are present in the rubble of a recently collapsed room at NA 8828, and several subfloor pole alignments were noted at NA 8825 and (NA 2639). the southwest. Two sites each are oriented to the north, northeast. Kivas are known to be present at NA 8839 (Fig. 4), and they probably are present also at NA 8877 and NA 8886, both of which seem to be "D" or square shaped pueblos similar to NA 7498 on Cummings Mesa (Ambler, Lindsay, and Stein, 1964:53-83) and to NA 7719 on Paiute Mesa, Utah (Hobler, 1964). A portion of a circular wall, perhaps belonging to a kiva, is in the alcove at NA 8896 (Fig. 10). It is likely that all kivas are present at numerous other sites as well, especially at the larger sites having evidence of long occupation, and it is possible that at some of these sites the kivas are only partially subterranean. are circular in o Pithouses were thought to be present at several large sites which have considerable cultural refuse but little or no masonry rubble such as NA 8827, NA 8829, NA 8846, and NA 8916. At NA 8913, where an arroyo is cutting into the site, half of a slab lined structure is exposed that appears to be a pithouse. Pithouses are undoubtedly present at a large number of other sites and they may occur with masonry structures at some, as was the case at the two excavated sites mentioned above, NA 7498 and NA 7719. 11 period. A "coffin" shaped site is present at NA Due to the poor preservation of most of the sites, the directional orientation could not always be determined. When possible, the site orientation was determined by the presence of doorways or by the exposure of shelter and cliff sites. The location of a site at the base of a baldrock remnant indicates that the doors probably opened away from

the baldrock. In some cases, extensive refuse deposits on one side of the ruin indicate a probable site orientation in that direction. Fourteen sites have an eastern orientation, 12 face south, 12 southeast, and 11 face to the southwest. Two sites each are oriented to the north, northeast, and northwest, and three face the west. It seems that the prevalent pattern was to construct habitations to face generally to the south or east whenever possible.

Storage structures were difficult to identify except at the better preserved ruins. At NA 8825 (NA 2639), several rooms have door jambs recessed to receive a door slab cut to fit the opening. The tall, circular masonry structures at NA 8906 are probably storage rooms or granaries (Fig. 9), and similar structures may be present at NA 8896 and NA 8858. Slab lined cists were noted at ten sites. These cists are circular in outline and are lined with large upright blocks of stone, the tops of which protrude above the ground surface. The diameter of these features is usually from 1 to 1.5 meters, a few being slightly larger. The function of these circular cists is not definitely known, but most were probably storage structures. At some sites they are present with other masonry structures and pottery, and at others they are the only structure present, often occurring at sites with only lithic refuse, possibly of the Basketmaker II period. A "coffin" shaped cist is present at NA 8862, similar in size and shape to those at NA 7627 and NA 7708, sites excavated on the north end of Paiute Mesa by the Glen Canyon Project in 1962 (Lindsay, Ambler, Hobler, Stein, in preparation). The cist at NA 8862 was tested and was found to contain nothing but scattered chips of stone and charcoal. No other structures are visible at this

site, and it has no pottery, but dense charcoal stained soil and some lithic debris are present.

Agricultural Structures

Slab lined rectangular hearths were noted at 11 sites and undoubtedly they are present at many more. Hearths were found at both lithic and ceramic sites and sometimes they were the only structure present at a site.

Although prehistoric agricultural structures in the form of dams, terraces, ditches and windbreaks are known for the Navajo Mountain region in the northwest (Lindsay, 1961:174-187; Lindsay, Ambler, Stein, Hobler, in preparation), no such structures were identified on

Paiute Mesa, Arizona. A Pecked Footholds to be a possible prehistoric

stone dam Only one example of a pecked step trail was found during the survey, this feature occurring at NA 8814, a large, late Pueblo III site. This site is built against the base of a baldrock dome (Fig. 5), and on one face of the dome six pecked steps lead up to a relatively flat area on the baldrock where present rubble indicates that there may have been at least one room built on the side of the dome. The pecked steps are shallow and weathered, and this sort of gradual obliteration may have destroyed other pecked step trails on the mesa.

of the terrain on the mesa, such features were not needed, but some

Refuse Deposits

knowledge of such features was undoubtedly present if one assumes that

At the majority of the surveyed sites extensive refuse deposits are not present, perhaps due in some instances to erosion of the Canyon.

site area. Debris was recorded as refuse only when concentrated or abundant and giving evidence of some depth. Large numbers of sherds, lithic debris, charcoal stained soil, or quantities of fire cracked rock were considered to be refuse as opposed to a few scattered sherds or stone chips around a site. So defined, refuse was present at more than 40 of the recorded sites. In some instances the refuse was scattered all over the site, but more often it was concentrated to one side or another,

usually downslope from the main habitation area. Valley. Even where

bedrock outcrops occur, however, the stone was not always utilized.

Agricultural Structures

Although prehistoric agricultural structures in the form of dams, terraces, ditches and windbreaks are known for the Navajo Mountain region in the northwest (Lindsay, 1961:174-187; Lindsay, Ambler, Stein, Hobler, in preparation), no such structures were identified on Paiute Mesa, Arizona. A structure believed to be a possible prehistoric stone dam is located at NA 7755 just north of the state line in Utah, however, but this is the only agricultural structure reported for northern Paiute Mesa (Lindsay, Ambler, Hobler, Stein, in preparation). It is possible that further investigation might turn up similar dams or other agricultural structures south of the state line, although in the Sage Valley area, extensive deposits of moving sand combined with the erosion of deep arroyos may have essentially removed any evidence of prehistoric water or wind control features. Perhaps due to the nature of the terrain on the mesa, such features were not needed, but some knowledge of such features was undoubtedly present if one supposes that there was contact between the populations living on either side of Paiute Canyon.

Navajo or Anglo Style I petroglyphs. Two sites, NA 3904 and NA 3913, may have Style 3 (pre A.D. 1050) Petrographs

Petrographs, the generic term used for pictographs and petroglyphs (Turner, 1963), are not numerous in the survey area, in part due to the lack of suitable locations in many parts of the region. The Navajo sandstone is the only formation on the mesa top suitable for petrographic expression, and outcrops of this formation are relatively few in

number except to the south, and surrounding Sage Valley. Even where baldrock outcrops occur, however, the stone was not always utilized. There are many good, sheltered cliff faces and blocks of broken stone located near sites which would have provided good petrograph backgrounds, but these were apparently never used. It is possible that some of these unsheltered expanses of flat rock were used for pictographs which have not survived the elements of wind and water through the years, but it seems clear that petrographic art was never extensively practiced on the mesa, being represented at only 18 of the 125 surveyed sites.

There are relatively few remnants of Navajo sandstone suitable for petrographs in the region north of the Narrows, and petroglyphs were found at only five of the 75 sites in this large portion of the surveyed area. These sites, NA 8820, NA 8822, NA 8837, NA 8846 and NA 8896 have pottery dating from A.D. 1050 to 1300, and the petroglyphs are mostly Style 4 with a few Style 3 designs, following Turner's (1963) petrograph style divisions (Fig. 12). The 13 remaining petroglyph sites are located south of the Narrows, 12 in Sage Valley and one to the east on the Mitten of the mesa. Three of these have only modern Navajo or Anglo Style 1 petroglyphs. Two sites, NA 8911 and NA 8913, may have Style 5 (pre A.D. 1050) petroglyphs along with Style 4, but the panels are small and contain few designs. The other eight sites with petroglyphs have pottery associations falling roughly between A.D. 1050 and 1250, and petroglyph designs of Style 4. NA 8825 (NA 2639), NA 8891 and NA 8905 have additional designs which seem to belong to Style 3 (A.D. 1200-1300), mostly represented by mountainsheep with drooping snouts and

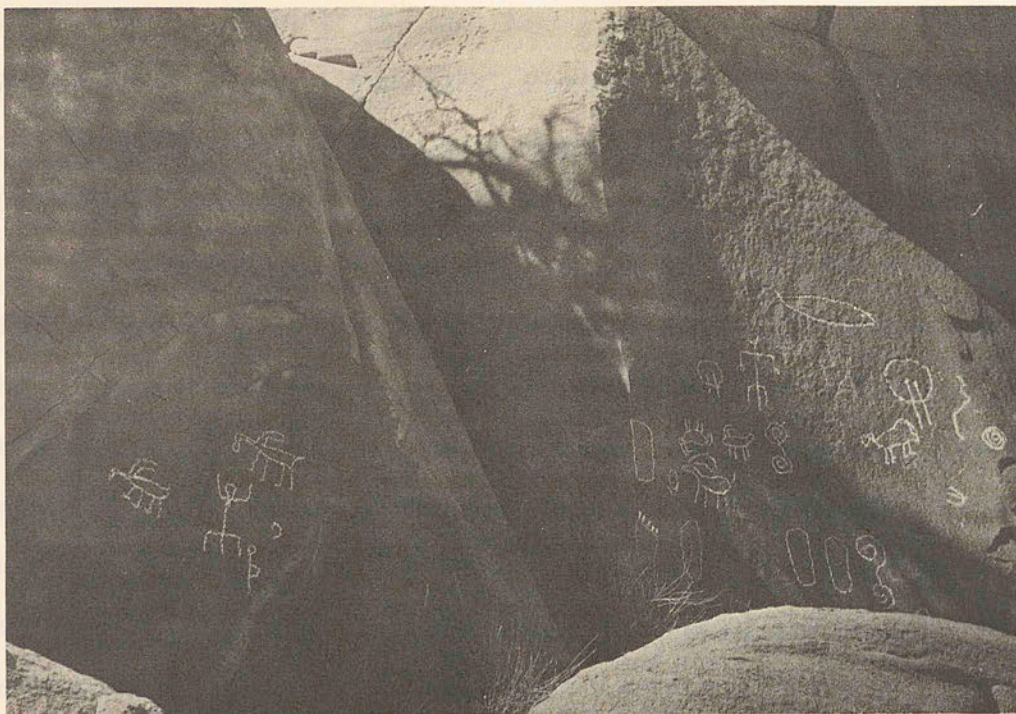


Figure 12. Petroglyphs of Styles 3 and 4 at NA 8822.



Figure 13. Petroglyphs of Style 3 and possibly Style 4 at NA 8905.

horns originating out of the neck region of the animal (Fig. 13). At NA 8891, a large alcove site with permanent water, Style 2 (Post A.D. 1300 or Hopi) petroglyphs may be present in addition to the more numerous examples of Style 4 and Style 3 designs.

Navajo or Anglo (Style 1) petroglyphs were found at six locations on the mesa, five of which have site numbers. At NA 8897, NA 8902, and NA 8906, there were Anasazi culture elements present with the modern petroglyphs, but no prehistoric petroglyphs. An inscription, "Ernest Holmes 10/17/39", is incised in the alcove at NA 8902 in addition to several incised horses present on the rocks in front of the alcove. The word "Denver" is scratched above a Navajo corral adjacent to the prehistoric remains at NA 8897. At NA 8906, a masonry alcove site, a mounted horseman and two riderless horses are lightly pecked into the edge of a plunge pool just below the alcove. The message "Don't go near this rock. Stay away" is lightly scratched near the older Style 4 petroglyphs at NA 8911. The most elaborate Navajo petroglyphs are found with the Style 4 petroglyphs at NA 8916 which are inscribed along the long, vertical cliff face overlooking the large Pueblo II site (Fig. 11). These Navajo glyphs include representations of steer heads, rabbits, horses, trucks, people, and baseball players. At an unnumbered location near NA 8913, there is the inscription "Navajo Mountain September 22, 1961", in addition to horses, cattle brands, wagons and people scratched into the stone. All of the Navajo petroglyph panels are located along the edges of Sage Valley. Some of the drawings are very artistically done in the tradition of modern Navajo painting. Others are crudely executed, probably done by young children while out herding sheep.

Pictographs, or painted designs, were found at two alcove sites in Sage Valley. At NA 8825 (NA 2639), there are at least 20 white and two red handprints, apparently applied by persons standing on the roofs of the now collapsed second story tier of rooms in the alcove. Both left and right hands were used, the majority being left hands. The prints were made by dipping the hand into paint and slapping the hand against the wall of the alcove. One print is done in negative, with the hand apparently held against the wall while white paint was applied around the fingers to form an outline. Also present in the alcove are a large white circle with a red ring inside it and a white geometric blanket pattern. Style 3 and 4 petroglyphs are also present in this alcove in small numbers, and it is probable that the pictographs are of the same style.

The finest pictographs are located at NA 8826, just around the corner from NA 8825 discussed above. In this small alcove are the remains of at least four small rooms, marked by adobe still adhering to the low ceiling of the alcove. On the rear wall of the alcove are approximately nine anthropomorphs and two white mountain sheep. The human figures average one meter in height and bear a strong resemblance to the pictographs at NA 7620 and the petroglyphs of section 13 of the panel at NA 2681 (Turner, 1963: Figs. 23, 73). The figures are done in white, yellow, black, brown, and red paint, some of which is now so faint as to be almost invisible. The figures which bear a strong resemblance to Hopi Kachinas have triangular bodies. Most are wearing head-dresses or masks with ears or horns, and some are carrying shield-like objects. Several anthropomorphs executed in charcoal have been

superimposed on the earlier painted figures. One of these figures is carrying an object resembling a small tree. A few of the painted figures have been crudely outlined with charcoal also. This charcoal work may be Navajo Style 1, and the painted figures are probably Style 4. The painted figures are well done and quite detailed, with eyes and other decorative features on the masks and necklaces and decoration on the triangular bodies. No diagnostic sherds were recovered from this site, the alcove being used presently for the storage of pipe and cement used in the construction of the sheep watering trough below the site.

Lithic Material

Artifactual stone material and chipping residue from tool manufacture occurred at nearly all of the sites recorded on the survey, and collections of lithic material were made at 92 of the 125 sites (Appendix II). The collections consist of small artifacts for the most part. With few exceptions, larger stone items were recorded on stone catalogue cards and left in the field due to transportation limitations.

The majority of the stone artifacts collected were produced by various chipping techniques and include both bifacial and unifacial chipped tools such as projectile points, knives, choppers, drills and scrapers. Ground stone tools, though less numerous than chipped stone artifacts, were relatively abundant and include manos, metates and ornaments (Tables 2,3).

Several varieties of sandstone outcrop on the mesa, and would have provided raw material for the manufacture of manos and metates. Cryptocrystalline silicious pebbles can be found in some of the conglomeritic

sandstones which outcrop in the canyons, but most of the pebbles are of small size and are relatively scarce. The abundance of silicious stone tools and chipping residue found at the sites indicates that the majority of the silicious stone must have been imported onto the mesa. The gravel beds along the San Juan River some 20 miles to the north are a probable source of such stone. Much of the tool stone seems to have been brought onto the mesa in raw form, and then made into tools, as evidenced by the amount of chipping debris at most sites.

The taxonomic scheme used in the analysis of the stone material follows that proposed initially for Lower Glen Canyon material by Adams, Lindsay, and Turner (1961:14-22) and subsequently modified by later work in the Glen Canyon and San Juan river and highland areas. The lithic material recovered on this survey bears strong resemblance in form and raw material to the stone material reported for Cummings Mesa (Ambler, Lindsay, and Stein, 1964), the Navajo Mountain area to the west, and the northern half of Paiute Mesa (Lindsay and others, in preparation).

In most cases, the amount of stone material recovered is not sufficient to allow certain tool types to be assigned to temporal periods of occupation on the mesa with accuracy. Generally speaking, the same artifact types seem to persist for a long period of time in the surveyed area, sites with earlier pottery associations having very similar or identical stone tool complexes to those of sites occupied later in time.

Small triangular points are made of chert, Jasper, chalcedony, agate and quartzite.

Chipped Stone

Projectile points.--A total of 88 whole and fragmentary projectile points or small knives were found, and these form the largest class of bifacially chipped implements in the stone collections from the mesa. Point classifications are based on the stem or basal characteristics of the points. Thirty-six specimens were too fragmentary for analysis. The remaining 52 points fall into three major classes, with subdivisions of each (Table 2).

Small triangular points with or without notches comprise one major point type. Sixteen of the 18 points in this group have no notches and are from 16 to 38 mm. long, 12 to 19 mm. wide and 3 to 6 mm. thick. Twelve of the small triangular unnotched points have slightly concave bases, the remainder being equally divided between straight and slightly convex bases (Fig. 14 a-d). One of the straight based specimens has been ground along both edges from base to tip, and the faces show slight grinding. Chipping is bifacial on all but one of the small triangular points, the exception being a thin chert flake with a natural triangular shape which is chipped unifacially to thin the edges. Although size varies considerably among the unnotched triangular points, they are generally smaller than members of the stemmed and oval groups. The small triangular points tend to be carefully thinned, and have fine, uniform chipping. Two small triangular points have small side and basal notches, the side notches being $2/3$ to $3/4$ the distance from the tip. (Fig. 14 e). Neither point is complete, but approximate lengths are 15 and 17 mm. Small triangular points are made of chert, jasper, chalcedony, agate and quartzite.

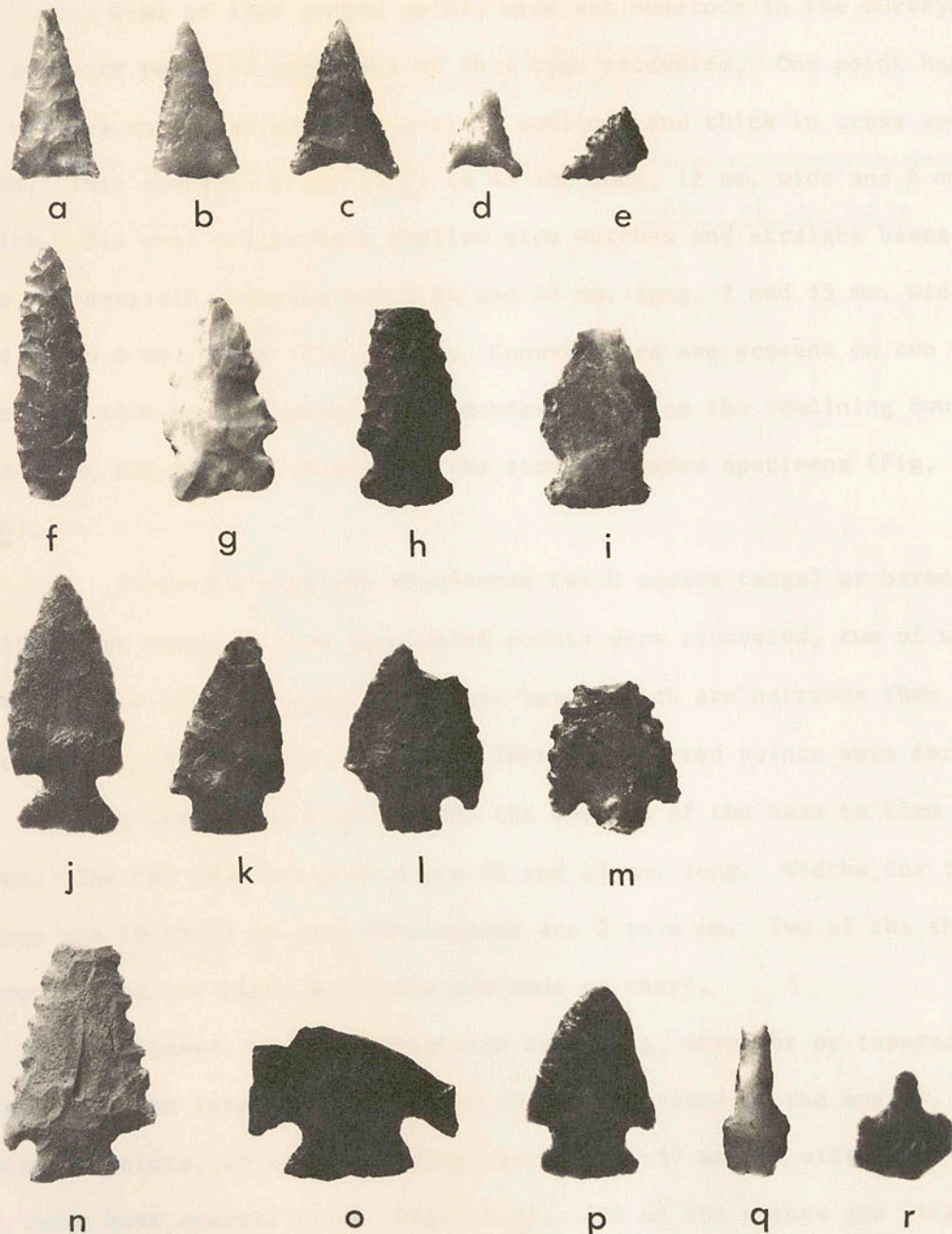


Figure 14. Projectile points and drills. a-d, small triangular; e, small triangular, side and base notched; f, oval, no notches; g-i, oval, side notched; j,k, shouldered, expanding and straight bases; l-p, stemmed, barbed points, straight, tapered and expanding bases; q,r, drills. Length of j, 42 mm.

Oval or leaf shaped points were not numerous in the surveyed area, there being 11 specimens of this type recovered. One point has no notches and is an elongate oval in outline, and thick in cross section. This specimen (Fig. 14 f) is 43 mm. long, 12 mm. wide and 6 mm. thick. Six oval points have shallow side notches and straight bases, the two complete examples being 24 and 46 mm. long, 7 and 15 mm. wide, and 3 and 6 mm. thick (Fig. 14 i). Convex bases are present on two of the oval side notched points, and concave bases on the remaining two, and these are similar in size to the straight based specimens (Fig. 14 g,h).

Stemmed points are shouldered (with square tangs) or barbed (with sharp tangs). Five shouldered points were recovered, two of which are complete (Fig. 14 j,k). All have bases which are narrower than the shouldered portion above the stem. These shouldered points were formed by removing large deep notches from the corners of the base to form the stem. The two complete points are 34 and 43 mm. long. Widths for the group are 10 to 19 mm. and thicknesses are 3 to 6 mm. Two of the shouldered points are agate and three are made of chert.

Stemmed, barbed points with expanding, straight or tapered stems form the largest sub class of points recovered on the survey. Of these 18 points, 15 have expanding bases 10 to 19 mm. in width. Three of these have serrate edges (Fig. 14 n). All of the points are finely chipped and have barbs of varying lengths and flat or slightly convex bases. Only one is complete and two others are nearly so, giving a length range of 33 to 40 mm. Widths on all specimens range from 18 to 35 mm, and thicknesses from 4 to 6 mm. The two largest fragmentary

TABLE 2

PROJECTILE POINT AND KNIFE TYPE OCCURRENCE
ON PAIUTE MESA, ARIZONA

Point and Knife Types	Number of Specimens	
Small Triangular Points	18	
Not notched	16	
Straight base		2
Convex base		2
Concave base		12
Side and base notched	2	
Oval and Leaf-shaped Points	11	
Not notched	1	
Side notched	10	
Straight base		6
Convex base		2
Concave base		2
Stemmed Points	23	
Shouldered	5	
Barbed	18	
Straight stem		2
Tapered stem		1
Expanding stem		15
Unclassifiable Fragments	36	
Square Base Knives	12	
Straight base and sides	7	
Slightly rounded base and sides	5	
Round Base Knives	8	
Crude Knives	7	
Unclassifiable Fragments	8	
TOTAL	123	

Eight knives, four of which are complete (Fig. 15 d,g) have rounded bases, giving them an oval or leaf shaped outline. The chipping on the knives of this group is more crude and they tend to be thicker

specimens in the expanding base class may have been hafted for use as knives rather than as projectiles, due to their unusual size (Fig. 14 o). They are included with the points because of their stems. Their width, however, indicates possible lengths which would correspond more to the sizes of the large, unnotched knives discussed below.

One stemmed barbed point has a tapered base and serrate edges (Fig. 14 m). The remaining two barbed points have straight edged, square stems (Fig. 14 l). Stemmed points are made of chert, agate, jasper, and impure chert.

Thirty-four fragments of points or small knives were collected at 24 sites. These fragments are all either tips or mid sections of points with no bases present to allow classification.

Knives.-Relatively few large knives were found in the surveyed area, and most of the 27 classifiable specimens are fragmentary.

A square based knife type, with no notches, is represented by 12 fragmentary knives (Fig. 15 a-c). These knives are made of jasper, agate, and chert. Pressure flaking and secondary chipping has resulted in sharp, straight cutting edges on the tools. Seven of these finely made knives have very straight bases with right angle corners and straight edges. The other specimens in the square based group have slightly rounded bases and convex edges, still having pronounced basal corners, but being of less fine workmanship (Fig. 15 f,g). Square based knives are 23 to 38 mm. wide and 4 to 7 mm. thick.

Eight knives, four of which are complete (Fig. 15 d,e) have rounded bases, giving them an oval or leaf shaped outline. The chipping on the knives of this group is more crude and they tend to be thicker

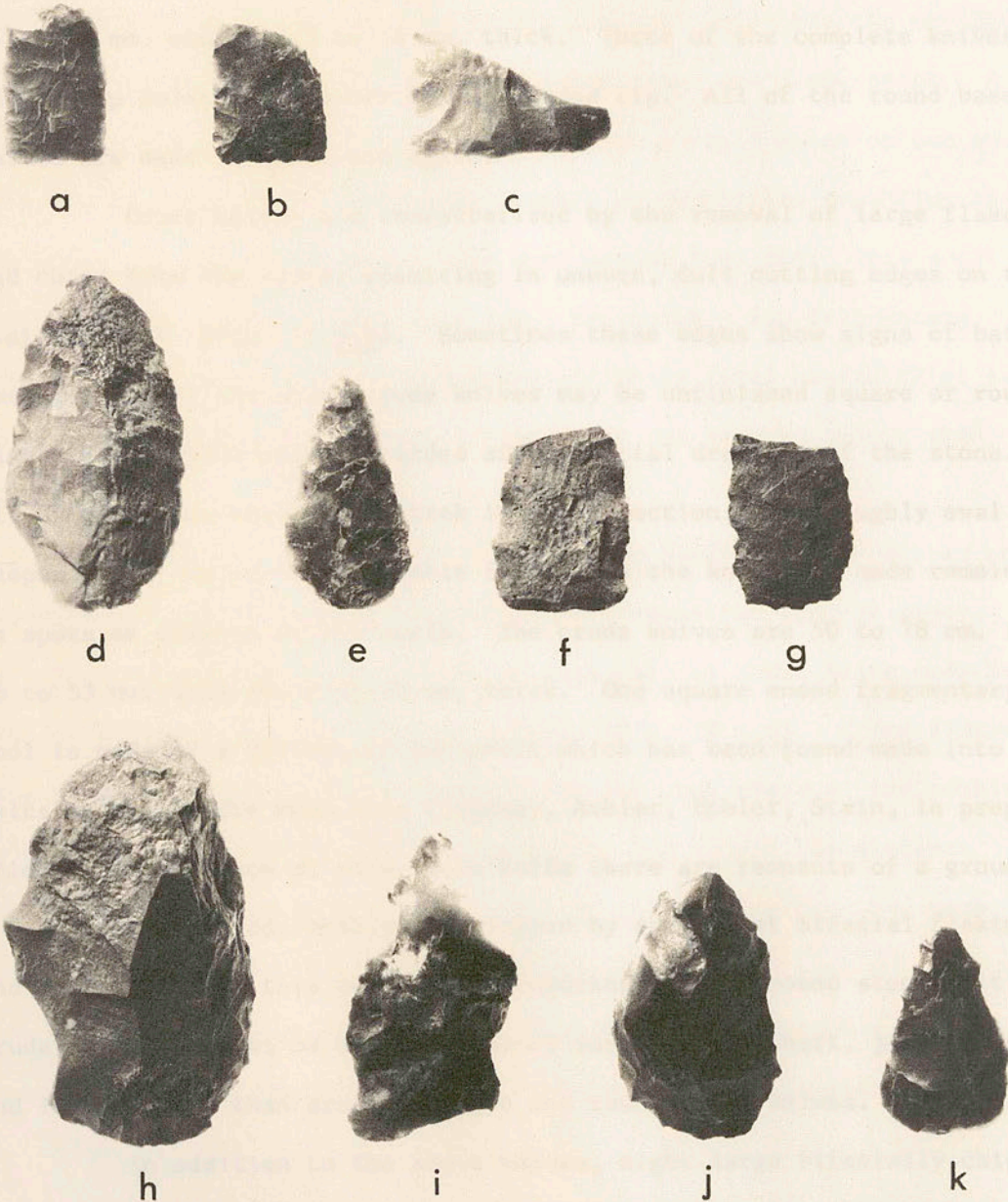


Figure 15. Knives. a-c, straight base and sides; d,e, oval or leaf shaped; f,g, slightly rounded base and sides; h-k, crude knives. Length of h, 77 mm.

than the square based knives. The edges of the round based knives are not retouched, and are less sharp, showing signs of percussive use on several of the tools. Complete round based knives are 40 to 64 mm. long, 21 to 34 mm. wide and 5 to 14 mm. thick. Three of the complete knives have sharp points, the other has a rounded tip. All of the round based knives are made of chert and agate.

(Fig. 14) Crude knives are characterized by the removal of large flakes and chips from the stone, resulting in uneven, dull cutting edges on the finished tool. (Fig. 15 h-k). Sometimes these edges show signs of battering. Two of the seven crude knives may be unfinished square or round based knives which were discarded after partial dressing of the stone. All of the crude knives are thick in cross section, with roughly oval shapes. The cortex of the cobble from which the knife was made remains in spots on several of the tools. The crude knives are 50 to 78 mm. long, 26 to 53 mm. wide and 8 to 23 mm. thick. One square ended fragmentary tool is made of a variety of tan chert which has been found made into celts in the Paiute Mesa area (Lindsay, Ambler, Hobler, Stein, in preparation). On one face of this crude knife there are remnants of a ground and polished surface, mostly obliterated by subsequent bifacial flaking and battering, and this tool may be reworked from a ground stone celt. Crude knives tend to be made of coarser varieties of chert, jasper, agate and impure chert than are the square and round based knives.

In addition to the above knives, eight large bifacially chipped blade fragments were collected. The size of these tip and mid section fragments indicates that they were knives, but they had no basal portions present for classification.

Drills.-One complete and five fragmentary drills are in the collection. The complete drill is bifacially chipped from white agate, with a long narrow blade and an expanding base. The edges have been secondarily chipped and there is little sign of use on the tip or edges. The drill is 45 mm. long, 13 mm. wide at the base, and 5 mm. thick. A small grey chert flake has been modified into a drill point on one end (Fig. 14 r), the rest of the flake forming an unmodified expanding base. The edges and tip of the drill show some polish from use. This small drill is 18 mm. long, 17 mm. wide and 5 mm. thick. Two fragmentary drills have expanding or flanged bases and thick drill shafts (Fig. 14 g). The remaining fragments are drill tips, with the blunted points worn smooth by use.

Choppers.-Both nodular choppers and ovoids were recovered on the survey. The thirty-eight choppers were recovered from 24 sites. Only four choppers are of the nodular type, all of these being made from flat or spherical quartzite river cobbles (Fig. 16 c,e). A few flakes have been removed bifacially from the ends or long edges of the cobble to form an uneven cutting edge running from 1/2 to 2/3 the distance around the perimeter of the stone. Two of the cobbles have had some grinding use on their flat faces, and all four are battered on the cutting edges and also on the unmodified perimeter of the cobble. Sizes range from 6.6 cm. to 11.3 cm. long, 5.1 to 8.1 cm. wide and 1.8 to 3.6 cm. thick.

Ovoid choppers are characterized by a bifacial cutting edge which extends entirely around the circumference of the tool. Usually the cortex of the original cobble has been removed by the flaking process.

TABLE 3
LITHIC ARTIFACTS RECOVERED ON PAIUTE MESA, ARIZONA

Artifact Type	Number of Specimens
Drills	6
Choppers	38
Nodular	4
Ovoid	34
Large	11
Small	23
Scrapers	30
Working edge all around	2
Limited working edge	28
Ground edge	1
Nodular	6
Rough flake	21
Metates	25
Trough	1
Slab	4
Basin	5
Grinding Slab	13
Bifacial	2
Manos	27
One Hand	20
Two Hand	6
Blank (?)	1
Mauls	4
Hammerstones	36
Cobble	10
Nodular	26
Beads	5
Pendants	5
Polishing Stones	6
Modified Minerals	6
Unmodified Minerals	11
Utilized Flakes	17
TOTAL	213

The cutting edge is often uneven and dulled by percussive use, although some specimens have quite sharp edges. The ovoids collected on the survey may be divided on the basis of size into categories of large ovoid and small ovoid. Eleven large ovoids were identified, ranging from 7.3 to 11.8 cm. in maximum diameter, and from 2.5 to 7.4 cm. in thickness (Fig. 16 a). Several of the large ovoids are thicker on one edge, providing a good handgrip on the tool. These large ovoids are made of poor quality chipping stone, mostly cherty limestone and impure varieties of chert, or other silicious stone. Some of the small ovoids are similar in size to the crude knives and may have served similar purposes. These two tool types have a certain amount of overlap, and are distinguished here by size, the small ovoids averaging slightly larger than the crude knives, and the presence or absence of a tip, this feature lacking on the ovoids. The small ovoids are crudely percussion flaked into roughly round or oval outlines, and are battered along most or all of their cutting edge (Fig. 16 b,d). These twenty-three tools are 31 to 67 mm. in maximum diameter and 10 to 50 mm. thick.

Scrapers.-Thirty scrapers of various types were collected on the survey from almost as many sites. Two of the scrapers are characterized by a working edge all around the perimeter of the tool. These two scrapers could have served as a type of planing tool. Both of these ovoid scrapers have been chipped at a very high angle along the edge, giving them a high backed, hemispherical appearance (Fig. 17 d,e). The under surfaces have been chipped in a few spots to flatten them, but the chipping on the working edge is unifacial. One of these hemispherical planes has been polished along the edge from intensive use. Part of the

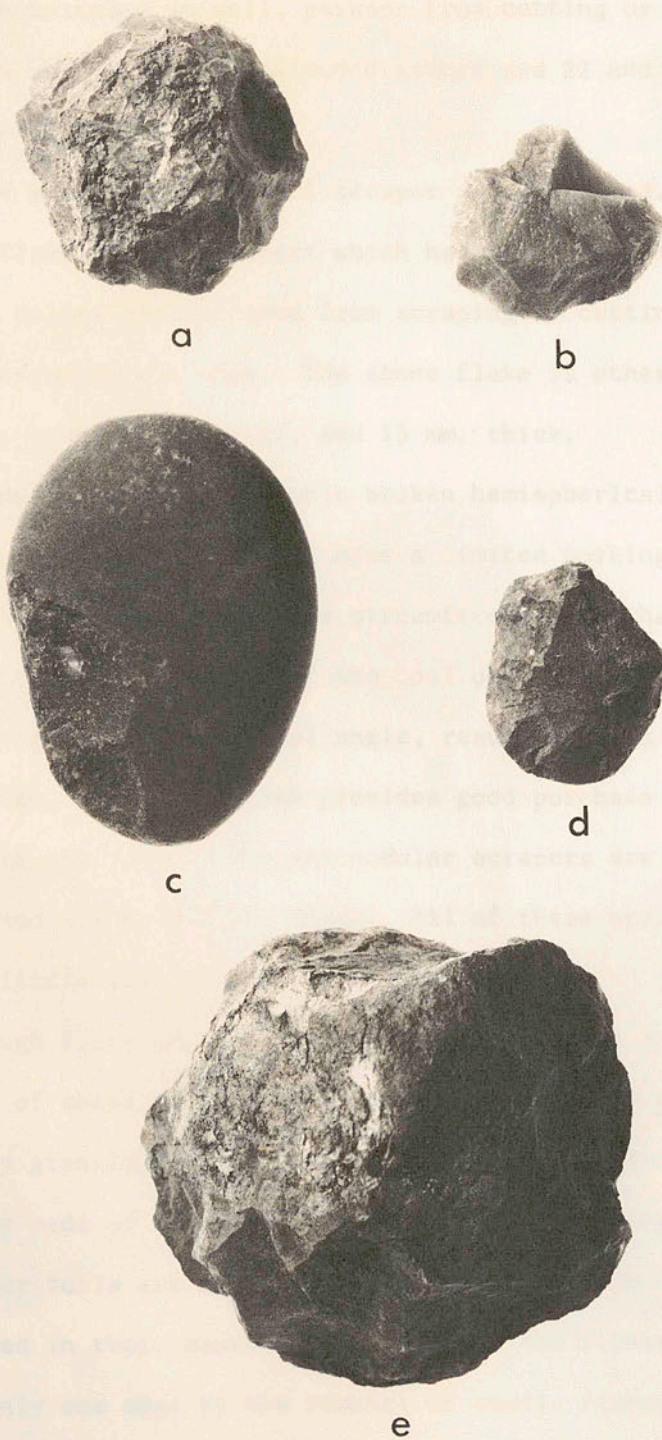


Figure 16. Choppers. a, large ovoid; b, d, small ovoids; c, e, large nodular choppers. Length of e, 10.4 cm.

edge has been battered as well, perhaps from cutting or chopping. The planes are 44 and 76 mm. in maximum diameter and 22 and 26 mm. thick. Both are made of chert.

One ground edge type of scraper was recovered. This tool was made from a flake of impure chert which had one naturally sharp edge. This edge is dulled and polished from scraping or cutting use, tiny striations crisscrossing the edge. The stone flake is otherwise unmodified and is 47 mm. long, 38 mm. wide, and 13 mm. thick.

Nodular scrapers resemble broken hemispherical planes and may be just that (Fig. 17 g,h). They have a limited working edge extending $1/3$ to $1/2$ the distance around the circumference, and have flat or concave under surfaces. The edge of the tool opposite the cutting edge is broken at a high, almost vertical angle, resulting in a thick, otherwise unmodified edge. This high back provides good purchase in pushing the implement back and forth. The six nodular scrapers are 6.0 to 10.9 cm. in diameter and 2.5 to 6.7 cm. thick. All of these scrapers have sharp edges, with little sign of use or retouching.

Rough flake scrapers are more numerous than any other scraper type with 21 of these tools in the collection (Fig. 17 a-c,f). These scrapers vary greatly in size and in fineness of manufacture. The smaller specimens are made of all varieties of cryptocrystalline silicious stone, and the larger tools are made of cherty limestone with coarser, larger flakes removed in their manufacture. Most of the flakes have been modified along only one edge by the removal of small flakes unifacially. Careful retouching is present on several of the smaller flakes, resulting in a "thumb nail" shape. Worked edges on the flake scrapers extend from

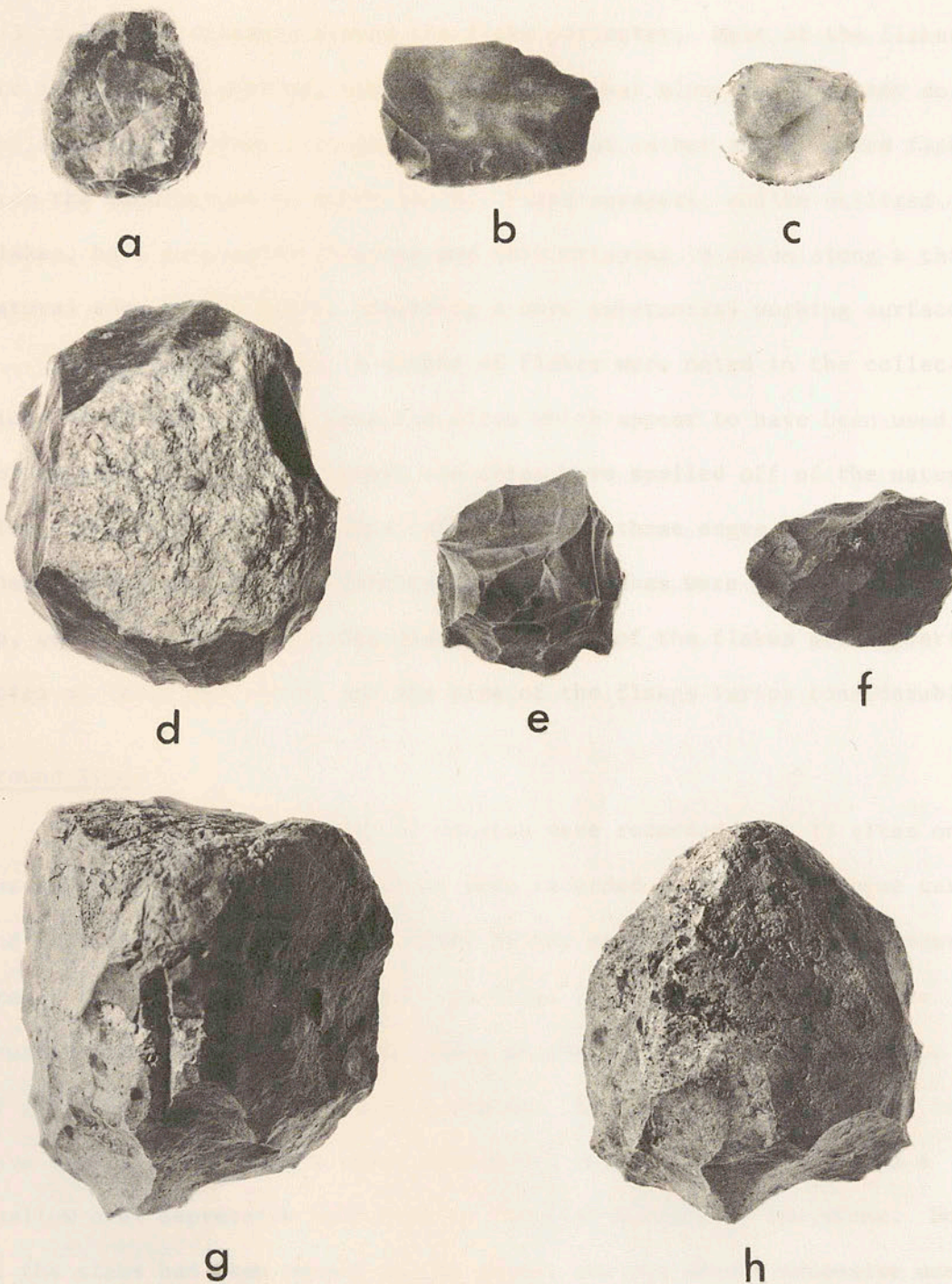


Figure 17. Scrapers. a-c, f, flake scrapers; d, large ovoid; e, small ovoid; g, h, large nodular scrapers. Length of g, 96 mm.

1/3 to 3/4 the distance around the flake perimeter. Most of the flakes are irregular in outline, usually being somewhat elongate, and they do not seem to have come from prepared cores, but rather are reworked flakes from the manufacture of other tools. Flake scrapers, unlike utilized flakes, have purposeful chipping and this chipping is often along a thick natural edge of the flake, providing a more substantial working surface.

Utilized flakes.-A number of flakes were noted in the collections of chipping debris from the sites which appear to have been used for cutting or scraping. Small use chips have spalled off of the naturally sharp edges of the flakes, often dulling these edges so that further cutting use would be difficult. These flakes were probably picked up, used a few times and then discarded. All of the flakes are of varieties of chert and agate, and the size of the flakes varies considerably.

Ground Stone

Metates.-A total of 25 metates were recorded from 13 sites on the survey. All but five of these were recorded on stone catalogue cards and left in the field. The majority of the metates, thirteen in number, are of the simple grinding slab type (Fig. 18 e). Grinding slabs are usually irregularly shaped thin slabs of sandstone which show evidence of grinding on one or both flat surfaces. The grinding action seems to have been rotary, using a small handstone, this action resulting in a shallow oval depression somewhere on the flat surface of the stone. None of the slabs had been shaped on the edges, and few showed extensive use. The grinding slabs are 20 to 35 cm. long, 18 to 27 cm. wide and 3 to 9 cm. thick. Most are of red, fine grained sandstone. They have been

pecked with a stone to sharpen them, these tiny pits being concentrated in or near the ground area of the stone. Ten of the grinding slabs came from one lithic site, NA 8803, and the others are from sites which had features such as slab lined cists and little or no pottery. This association may indicate that the grinding slabs belong to an early or pre-pottery cultural horizon on the mesa, but the evidence for this is inconclusive.

Four slab metates were reported, all of which are well shaped rectangular blocks of sandstone, with flat or slightly concave grinding surfaces extending to the edges of the stone. Two are made of Dakota sandstone, and two are made of fine grained red sandstone. One metate has a short incision in the grinding surface which may have been used as an awl sharpening groove. The three complete slab metates are 22 to 43 cm. long, 15 to 27 cm. wide, and 4 to 6 cm. thick.

Basin metates are represented by four complete and one fragmentary specimen (Fig. 18 d). All are well shaped, thick slabs of sandstone with deep, well worn, basin shaped depressions ground into their upper surfaces, probably a result of rotary grinding with a small mano. The basins are oval in outline and are 4 to 6 cm. deep. On three metates, the basins are off center, leaving a flat platform at one end of the metate, perhaps to rest a mano on when the metate was not in use. The basin metates are 51 to 61 cm. long, 25 to 38 cm. wide, and 7 to 11.5 cm. thick.

In addition to one fragment of a trough metate, a bifacial metate was found which has a deep trough and platform on one face and a basin and platform on the reverse face. Both faces are well worn.

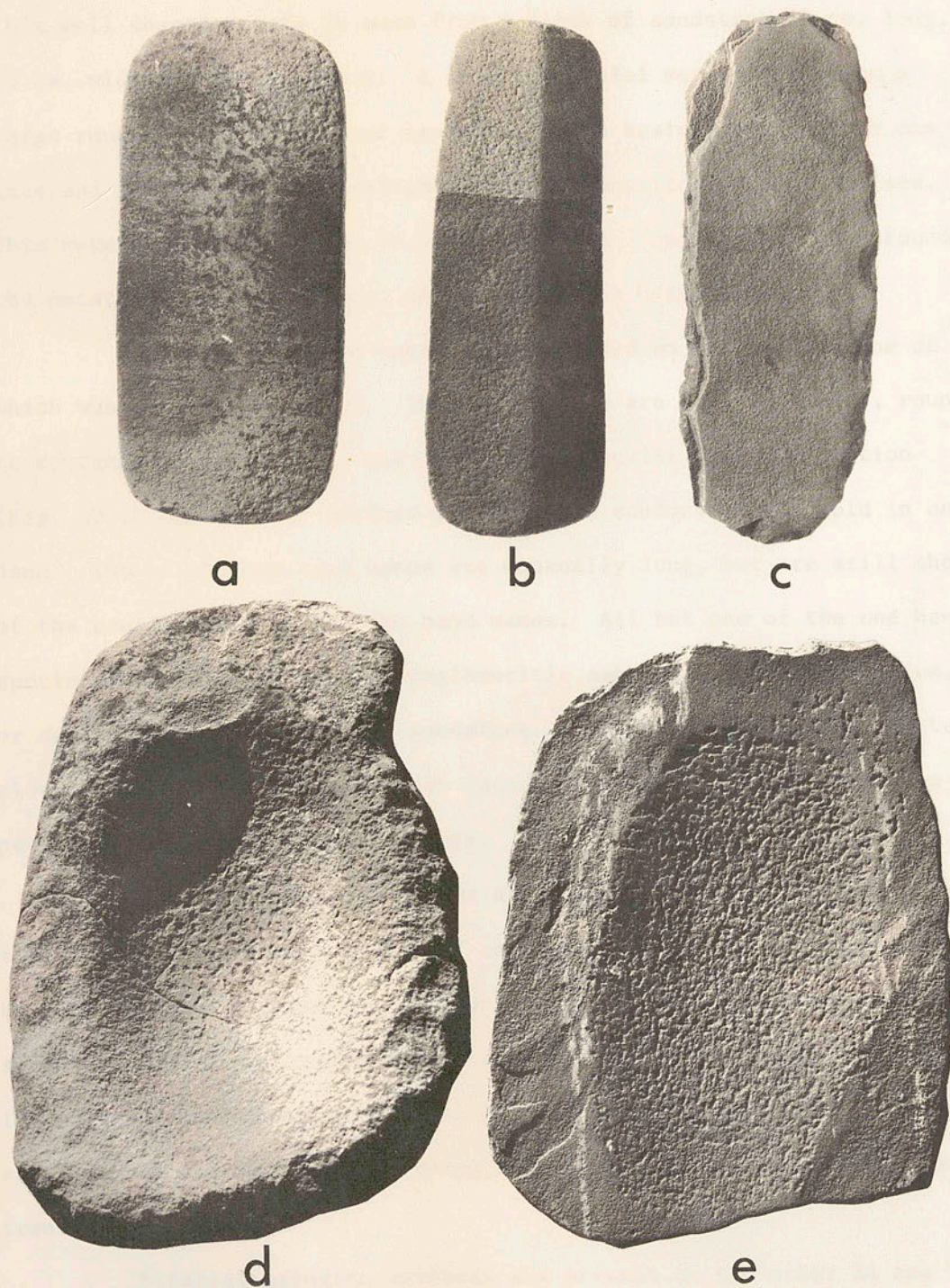


Figure 18. Two hand manos and metates. a, one flat grinding surface; b, one faceted grinding surface; c, mano blank; d, basin metate; e, grinding slab. Length of c, 28.8 cm. Length of d, 61 cm.

This well shaped metate is made from a block of sandstone 63 cm. long, 35 cm. wide and 11 cm. thick. A second bifacial metate made from a large roughly shaped block of sandstone has a basin 3 cm. deep on one face and a heavily pecked, slightly ground opposite grinding surface. This metate is 56 cm. long, 35.5 cm. wide and 7 cm. thick. When found, the metate was in two pieces, one of which was heavily burned.

Manos. - Twenty-six manos were recorded on the survey, one of which was left in the field. Twenty of these are one hand manos, round to rectangular in outline, and oval to rectangular in cross section (Fig. 19). Most are of uniform size and are comfortable to hold in one hand. Two of the one hand manos are unusually long, but are still short of the usual length of the two hand manos. All but one of the one hand specimens are made of coarse conglomeritic sandstone and fine, medium, or coarse grained buff or red sandstone. The exception is a quartzite river cobble, well ground on both faces. Most of the manos have been pecked with a stone to sharpen them.

Six of the one hand manos are unifacial and these cover a wide size range, being from 8.1 to 13.7 cm. long, 6.1 to 9.9 cm. wide and 3.1 to 5.6 cm. thick. Three of these unifacial manos have convex grinding surfaces, indicating reciprocal grinding motion. The others have slightly rounded grinding surfaces, probably the result of rotary use. Rounded surfaces are characterized by being convex in both the longitudinal and transverse planes.

Bifacial grinding surfaces are present on the other 14 one hand manos. Three of these are round in outline and have two flat grinding surfaces. Another has two rounded surfaces to which traces of yellow

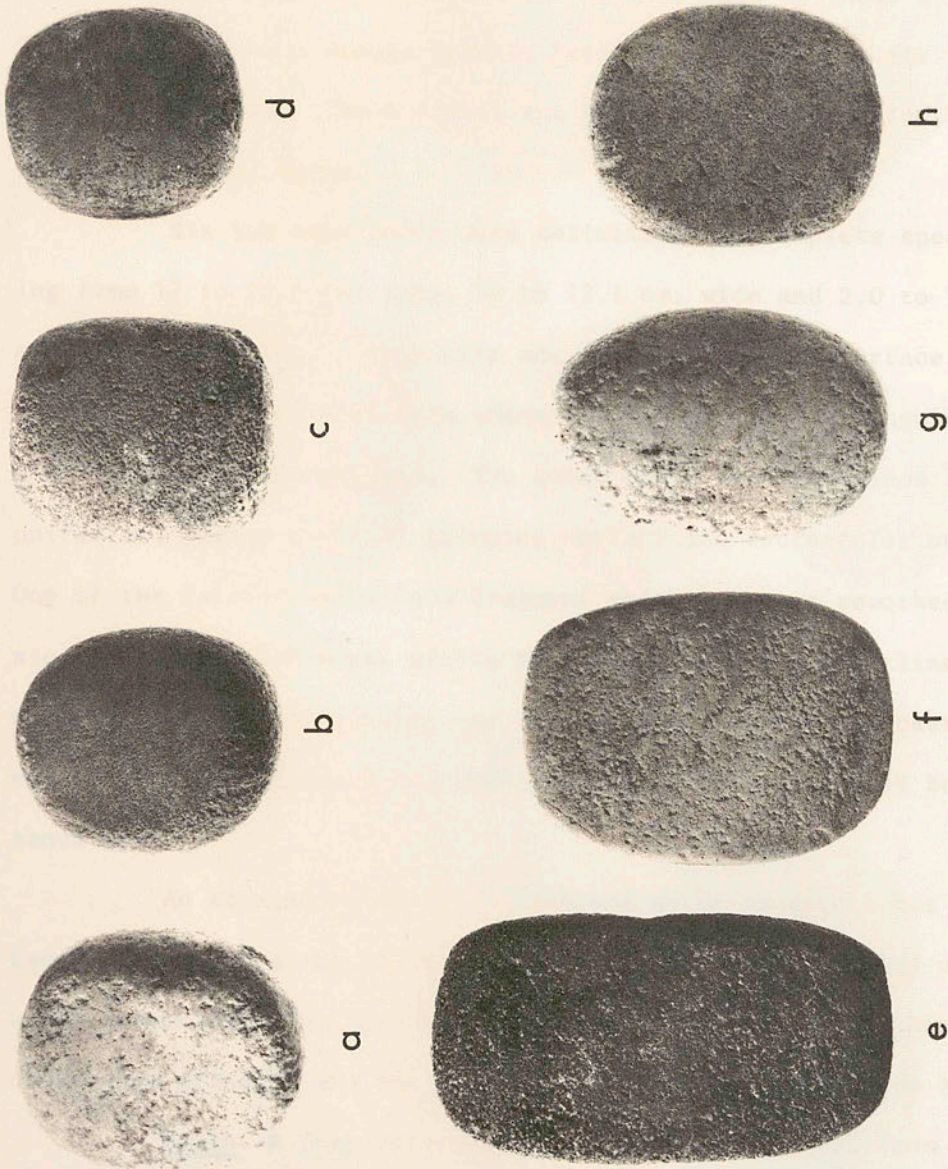


Figure 19. One hand manos. a-c, two convex grinding surfaces; d, one flat grinding surface; e, one convex grinding surface; f, g, two convex grinding surfaces; h, two flat grinding surfaces. Length of e, 16 cm.

ochre adhere. Two convex grinding surfaces characterize six of the bifacial manos, giving them oval cross sections. The remaining four implements have one round and one convex surface. One of these appears to have been used on a trough metate, being quite convex in its longitudinal plane on one face. The bifacial one hand manos fall within the size range of the unifacial manos.

Six two hand manos were collected, the complete specimens ranging from 17 to 27.6 cm. long, 7.6 to 12.1 cm. wide and 2.0 to 3.3 cm. thick (Fig. 18 a,b). Three have one faceted grinding surface, these surfaces being worn thin on both edges giving the manos triangular or "airfoil" shaped cross sections. The other three two hand manos are also unifacial, having one flat grinding surface and rectangular outlines. One of the faceted manos is a fragment which has been reworked by abrasion along one thin edge, giving the mano a crescentic outline. The manos were shaped by pecking and have been subsequently pecked to sharpen them. Two hand manos are made of fine to coarse grained buff and red sandstone.

An elongate slab of finegrained white sandstone has been bifacially chipped along the edges, giving it an elongate oval outline, which resembles a two hand mano (Fig. 18 c). One face of this stone shows some grinding and the stone may represent a rough mano blank.

Mauls.-A fragmentary maul, apparently reworked from a one hand mano, and three complete mauls are in the collection (Fig. 20 g,h). The reworked specimen has a groove passing over the unground surface of the mano but not over the grinding surface. The complete mauls were crudely shaped by pecking from conglomeritic and coarse grained Dakota sandstones.

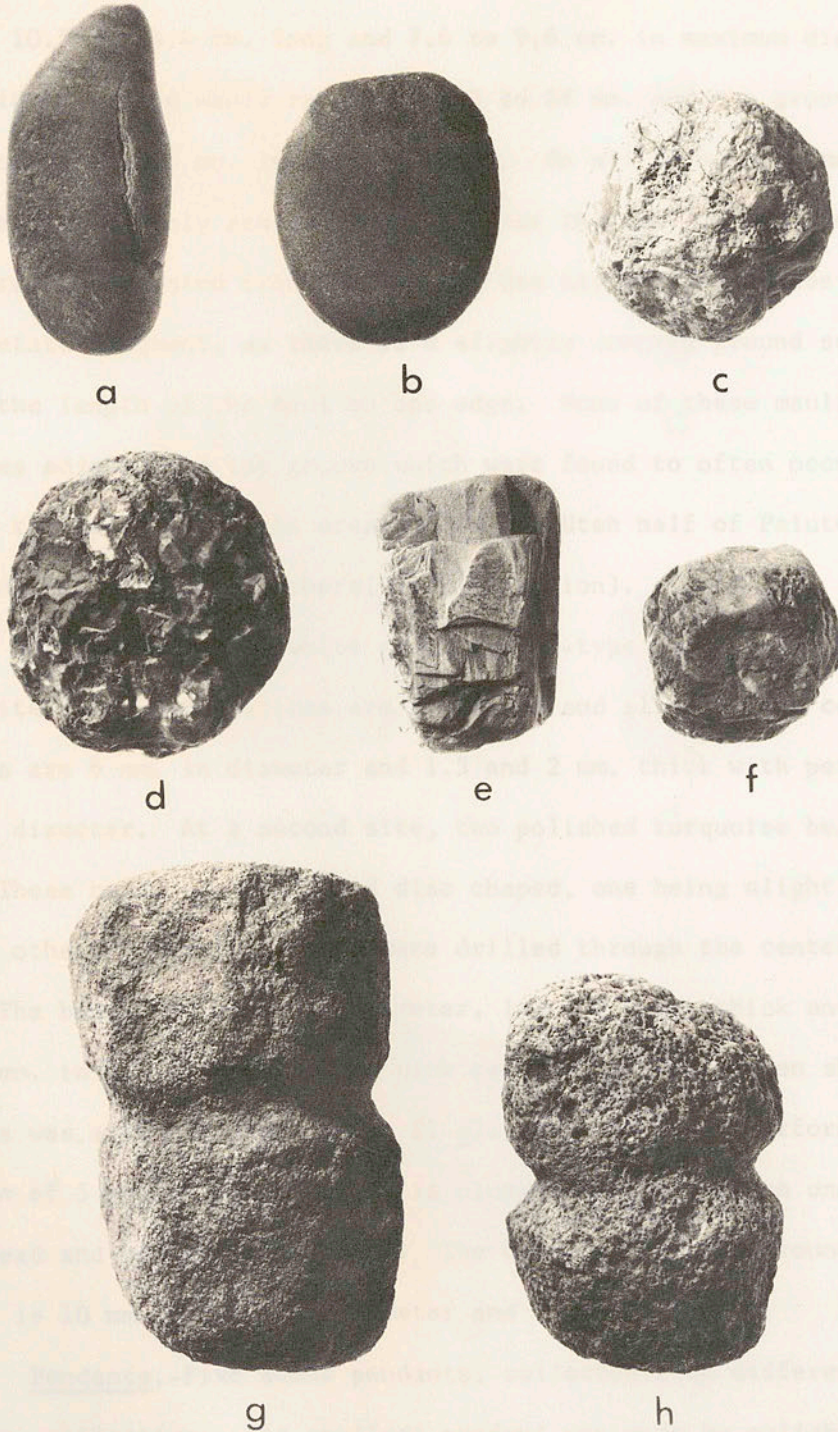


Figure 20. Mauls and hammerstones. a, b, cobble hammerstones; c-f, modified nodular hammerstones; g, h, full grooved mauls. Length of g, 13.7 cm.

They are 10.5 to 14.4 cm. long and 7.6 to 9.6 cm. in maximum diameter. Groove widths on the mauls range from 23 to 28 mm. and the grooves are all approximately 10 mm. in maximum depth. On all three specimens, the groove passes unevenly around the stone near the center, and the ends are tapered and blunted from battering. One may have been made from a broken metate fragment, as there is a slightly concave ground surface running the length of the maul on one edge. None of these mauls have the ridges adjacent to the groove which were found to often occur on mauls in the Navajo Mountain area and on the Utah half of Paiute Mesa to the north (Lindsay and others, in preparation).

Beads.-Two small white calcite disc-type beads were collected at one site. The perforations are biconical and slightly off center. The beads are 6 mm. in diameter and 1.5 and 2 mm. thick with perforations 2 mm. in diameter. At a second site, two polished turquoise beads were found. These beads are small and disc shaped, one being slightly larger than the other. Biconical holes were drilled through the center of the beads. The beads are 6 mm. in diameter, 1.5 and 2 mm. thick and have holes 2 mm. in diameter. A large pink calcite bead of uneven shape and thickness was also collected (Fig. 21 a). The biconical perforation is a maximum of 5 mm. in diameter and is elongate in outline on one face of the bead and round on the other. The bead is not quite round in outline and is 10 mm. in maximum diameter and 5 mm. thick.

Pendants.-Five stone pendants, collected from different sites, are in the collection. The smallest pendant was made by polishing and grinding a thin piece of turquoise into an oval shape and drilling a hole near one end (Fig. 21 d). This object is 13 mm. long, 8 mm. wide, and

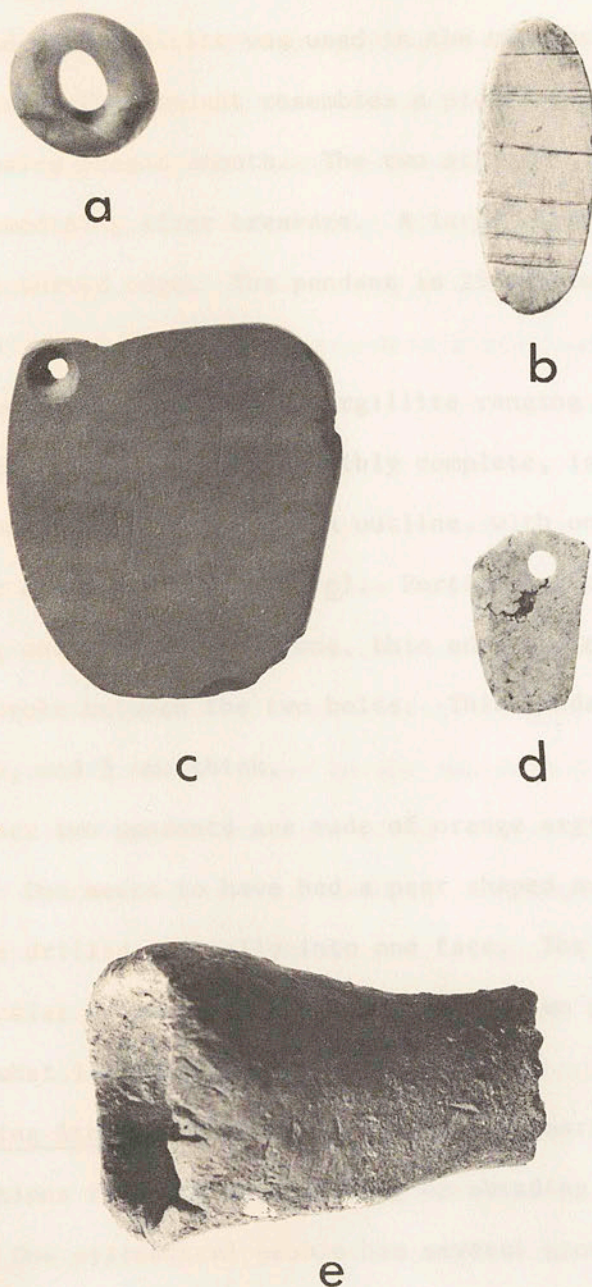


Figure 21. Miscellaneous small artifacts. a, calcite bead; b, incised bone gaming piece; c, red argillite pendant; d, turquoise pendant; e, clay pipe. Length of c, 27 mm. Length of e, 38 mm.

1.5 mm. thick.

Pink and white calcite was used in the manufacture of a second fragmentary pendant. The pendant resembles a piece of pie in outline, the curved edge being ground smooth. The two straight edges were broken and show slight smoothing after breakage. A large biconical hole is near the center of the curved edge. The pendant is 29 mm. long, 24 mm. wide, and 5 mm. thick.

Three pendants were made of argillite ranging in color from dark red to orange. One of these, possibly complete, is made from a thin piece of stone, sub rectangular in outline, with one complete biconical hole near one corner (Fig. 21 c). Portions of two other holes are present along one edge of the stone, this edge having been resmoothed after the stone broke between the two holes. This pendant is 25 mm. long, 22 mm. wide, and 3 mm. thick.

The other two pendants are made of orange argillite and both are fragmentary. One seems to have had a pear shaped outline and there is a shallow hole drilled partially into one face. The other pendant was probably circular in outline, and had at least two perforations near the center, somewhat like a button.

Polishing Stones.-Three small, water worn quartzite pebbles, which show striations from use as polishing or abrading stones are in the collection. One cylindrical pebble has several ground facets, and the two flatter pebbles have heavily striated flat surfaces. These stones may have been used in the manufacture of pottery.

One of these is a rectangular piece of worked calcite which may be an unfinished pendant. The stone

Other Lithic Material

Hammerstones.--Of the 36 hammerstones recovered during the survey, ten are quartzite river cobbles which have been battered around their perimeters. All but two of these are oval flat cobbles with most of the percussive marks on the ends (Fig. 20 a,b). Most of the cobbles are broken, the breakage probably occurring after use, as the broken edges are not battered. Abrading or grinding striations are present on one cobble in addition to battered areas. The cobble hammerstones are 72 to 94 mm. long, 38 to 62 mm. wide and 18 to 47 mm. thick.

Nodular hammerstones are made of petrified wood, limestone, and impure chert. They differ from cobble hammerstones in raw material, and, unlike the cobbles, they have been purposefully shaped by flaking and chipping into crude spherical shapes (Fig. 20 c-f). Many may have been ovoid choppers until their edges became too dulled for cutting use. Most of the 26 nodular hammerstones are of uniform size, the exception being the largest specimen which is flaked in such a way to suggest that it may have been hafted and used like a maul. Sizes for the other tools range from 60 to 87 mm. in maximum diameter, and these fit easily into the hand. The nodular hammerstones are heavily battered on all edges and protuberances, leaving few sharp surfaces, and giving many a smooth, spherical appearance. Hammerstones were probably used in the initial shaping of manos, metates and mauls, and then given subsequent use in the sharpening of the grinding tools.

Minerals.--Several pieces of various mineral types were collected, six of which had been modified. One of these is a rectangular piece of worked calcite which may be an unfinished pendant. The stone

has well worked surfaces and is 18 mm. long, 15 mm. wide and 3 mm. thick. A calcite crystal with smoothed ends and edges was also found. Other modified minerals include a piece of malachite with one abraded surface, a piece of hematite with 5 ground facets, and a piece of agate encased in a jacket of hard limonite some 2 mm. thick. On this specimen, the

limonite has broken away on one side exposing the stone within, and this pigment jacket is striated and faceted from abrasion. All of these minerals are relatively soft, producing colored powder when abraded, and they were probably used in the preparation of paint. Three unmodified orange ware sherds, as these wares have generally proved to be more sensitive temporal indicators than the various gray ware types. Unusual sandstone were also collected. Unusual in form and color, these stones and other mineral crystals were probably collected for their curiosity value by the people.

Stone Chips.-Several hundred stone chips were collected on the survey, and these were found to be present at nearly all of the sites recorded. All of the types of cryptocrystalline silicious stone and cherty limestones utilized in finished tools are represented by the stone chip collection. Evidently much tool manufacture took place on the mesa proper, and the prevalence of chipping residue at nearly all sites indicates that most of the communities did their own tool making, rather than trading for finished tools from specialized manufacture centers on the mesa.

Bedrock Utilization.-At several sites, there are grooves and shallow depressions worn into the bedrock or rock slumpage at the site. The grooves are narrow and usually "V" shaped in cross section, and they may have been used to sharpen awls or other tools. Broad, shallow, well worn depressions may be axe polishing grooves. Some of the larger of

these could have been mealing basins or bedrock metates. NA 8825 (NA 2639) has a number of such depressions, as well as a bedrock mortar. The mortar has well smoothed, vertical sides and is approximately 25 cm. deep with a similar diameter.

Pottery

Ceramic collections were made at 117 of the 125 surveyed sites. At each site, an attempt was made to collect sherds of each ware and type present. Special emphasis was placed on collecting decorated white and orange ware sherds, as these wares have generally proved to be more sensitive temporal indicators than the various grey ware types. Unusual sherds which seemed to deviate in some way from the published descriptions of Kayenta pottery types were also collected. At those sites having a large amount of ceramic refuse, additional large or well preserved sherds were collected to serve as examples of the various types present on the mesa. It was hoped that the resultant rather large surface collections of sherds would allow a more accurate temporal and spatial placement of the ceramic sites when a final analysis was attempted.

In the laboratory the sherds were washed, stamped with their respective site numbers, and boxed together by site. Published type descriptions, especially those of Colton (1952, 1955, 1956), were followed in classifying the sherds from each site into wares and types. Where relevant, information and descriptions based on recent excavations and tree ring studies in the Kayenta area have been utilized.

Nearly all of the pottery could be easily classified as belonging to previously recognized types assignable to the Kayenta Branch of

the Anasazi. A number of sherds, usually undecorated portions of vessels, could not be classified as to type and were therefore listed as unclassified sherds within the wares to which they could be assigned.

A smaller number of sherds, usually decorated, could not be classified using existing type descriptions, although most of these seem to belong to Kayenta wares on the basis of temper and paste, differing mostly in design style. These sherds were listed as unidentified, but many of them probably represent local variants or individual idiosyncracies of potters who were at the same time making other vessels with the traditional Kayenta pottery design styles.

Over 10,900 sherds were collected at the 117 ceramic sites during the survey. Individual site collections range from two to 358 sherds, the average being 92 sherds per site. Only eight sites had fewer than 10 sherds, and another 10 sites had fewer than 20 sherds. Sherds from jars, bowls, plates, dippers, seed jars, and colanders were recognized. The total numbers of sherds in each ware and type are shown in Table 4, and the ceramic complex at each site is indicated in Appendix III., Tables I-IV.

Description

During the ceramic analysis, it was found that most of the pottery corresponds to established Kayenta pottery types, thus presenting few classificatory problems. Those unidentified sherds, which could not be placed in wares or types, are generally isolated examples, and no attempt was made to establish new types or varieties to accommodate them. A number of other sherds correspond in most features to recognized types,

TABLE 4

POTTERY FROM PAIUTE MESA, ARIZONA

<u>Wares and Types</u>	<u>Number of Sherds</u>	<u>Percent of Classifiable Ware</u>	<u>Number of Sites</u>	<u>Percent of Ceramic Sites</u>
<u>Tusayan White Ware</u>				
Kana-a Black-on-white	87	3%	10	9%
Black Mesa Black-on-white	580	19%	56	47%
Sosi Black-on-white	758	25%	75	64%
Dogoszhi Black-on-white	601	21%	73	62%
Sosi-Dogoszhi combination	22	1%	15	13%
Flagstaff Black-on-white	421	14%	50	42%
Tusayan Black-on-white	453	15%	50	42%
Kayenta Black-on-white	66	2%	13	12%
Unclassified	912	--	108	92%
Total	3900	100%		
<u>Tsegi Orange Ware</u>				
Medicine Black-on-red	107	5%	38	32%
Tusayan Black-on-red	712	34%	79	67%
Tus. B/r, Dogoszhi Var.	84	4%	31	27%
Cameron Polychrome	16	1%	6	5%
Citadel Polychrome	109	5%	30	26%
Tusayan Polychrome	867	42%	72	62%
Tsegi Orange	113	6%	32	27%
Tsegi Red-on-orange	7	T	6	5%
Tsegi Black-on-orange	37	1%	17	15%
Tsegi Polychrome	3	T	3	3%
Kiet Siel Polychrome	7	T	5	4%
Kayenta Polychrome	10	T	3	3%
Kiet Siel Black-on-red	16	1%	6	5%
Unclassified	911	--	98	84%
Total	2999	99%		
<u>San Juan Red Ware</u>				
Deadmans Black-on-red	6	75%	4	3%
Middleton Black-on-red	2	25%	2	2%
Total	8	100%		

Sup indicates "Trace" in percent column.

TABLE 4--Continued

Wares and Types	Number of Sherds	Percent of Classifiable Ware	Number of Sites	Percent of Ceramic Sites
<u>Tusayan Grey Ware</u>				
Lino Black-on-grey (?)	3	T	1	T
Kana-a Grey	235	6%	19	16%
Lino Tradition	412	11%	29	25%
Honani Tooled	6	T	4	3%
O'Leary Tooled	3	T	2	2%
Coconino Grey	8	T	2	2%
Tusayan Corrugated	1820	47%	108	92%
Moenkopi Corrugated	1023	25%	99	84%
Kiet Siel Grey	377	10%	57	49%
Unclassified	37	--	19	16%
Total	3924	99%		
<u>Awatovi Yellow Ware</u>				
Jeddito Tooled	4	25%	1	T
Jeddito Plain	12	75%	1	T
Total	16	100%		
<u>Jeddito Yellow Ware</u>				
Jeddito Black-on-yellow	2	100%	1	T
<u>Intrusive Sherds</u>				
McElmo Black-on-white	2	18%	1	T
Mesa Verde Black-on-white	6	55%	4	3%
Gallup Black-on-white (?)	1	9%	1	T
Holbrook Black-on-white (?)	1	9%	1	T
White Mound Black-on-white (?)	1	9%	1	T
Total	11	100%		
<u>Navajo</u>	1	100%	1	T
<u>Unidentified Sherds</u>				
Unidentified Black-on-white	33	49%	9	8%
Unidentified Orange Ware	13	20%	7	6%
Unidentified Grey Ware	21	31%	11	10%
Total	67	100%		
Total Sherds: 10,928				

a"T" indicates "Trace" in percent column.

but some differences are present and these are pointed out below to augment or expand the published descriptions. It is felt that the differences these variant sherds exhibit fall within the range of variation to be expected within a type, since few such sherds were encountered. However, further work in the Kayenta region resulting in the recovery of larger quantities of these variants may indicate a need for the establishment of new types or varieties.

With few exceptions, the surface pottery collected is assignable to three wares: Tusayan White Ware, Tusayan Grey Ware, and Tsegi Orange Ware. A few sherds of San Juan Red Ware and Mesa Verde White Ware were collected, and two sites had Pueblo IV pottery present, representing Jeddito and Awatovi Yellow Wares. The few intrusive sherds and other sherds not included in the above wares are discussed where applicable below.

Tusayan White Ware.-Over one-third of the pottery collected was classified into types of Tusayan White Ware. Some 900 sherds, most from the undecorated portions of vessels, could not be classified as to type, but were retained in Tusayan White Ware. Sherds from seven types within the ware were identified, and these represent a continuity in design style from Kana-a Black-on-white to Kayenta Black-on-white. However, 45% of the classifiable Tusayan White Ware sherds are Sosi or Dogoszhi Black-on-white, and another 20% are Black Mesa Black-on-white. These three types along with considerable numbers of sherds of Flagstaff and Tusayan Black-on-whites comprise 93% of the classifiable Tusayan White Ware.

Kana-a Black-on-white was present at ten of the surveyed sites,

all but one of which are located south of the Narrows. For the most part, the sherds are what might be termed late Kana-a design style, with the slightly wider lines and more careful brushwork characteristic of Black Mesa Black-on-white (Fig. 22 b,c). NA 8879 produced twenty sherds showing a mixture of Kana-a and Black Mesa styles, as well as numerous sherds of typical Kana-a Black-on-white and Black Mesa Black-on-white. Such sherds, showing the transition between the two types, were frequently encountered.

Nearly half of the ceramic sites had Black Mesa Black-on-white present, and the sherds collected range from early Black Mesa style, only slightly removed from Kana-a, to sherds of Black Mesa-Sosi transition in style (Fig. 22 d,e). Black Mesa Black-on-white and Sosi Black-on-white sherds were found to be indistinguishable in some instances, especially when distinctive elements of the types were lacking on a sherd. This situation was complicated by the fact that Black Mesa and Sosi Black-on-white occurred together at 52 sites. Generally, the pendant dots and variety of elements of Black Mesa Black-on-white serves to distinguish it from the bolder treatment and heavy barbed lines of Sosi (Fig. 22 h), but it seems evident, especially on small sherds, that there is considerable overlap between the types.

Dogoszhi Black-on-white is perhaps the most easily distinguished type in Tusayan White Ware because of its characteristic panels of narrow lined hatching, similar to those of Tusayan Black-on-red (Fig. 22 i,j). Twenty-two sherds in the collection have elements of both Sosi and Dogoszhi Black-on-whites (Fig. 22 g) and such occasional combinations are to be expected since these two types are contemporaneous in time.

white; k,l, Flagstaff Black-on-white; m,n, Tusayan Black-on-white; o,p, Kayenta Black-on-white. Length of h, 13 cm.

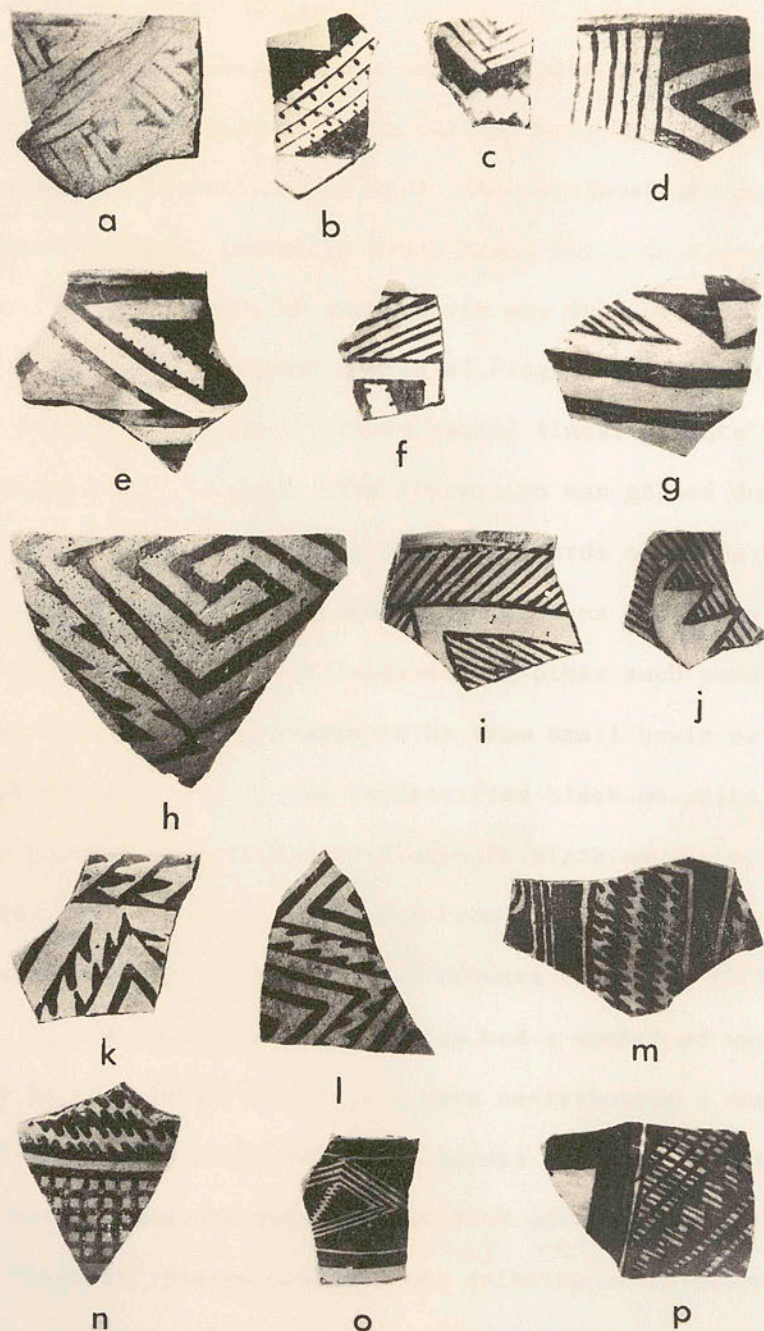


Figure 22. Tusayan White and Grey Ware sherds. a, Lino Black-on-grey (?); b, c, Kana-a Black-on-white; d, e, Black Mesa Black-on-white; f, Black Mesa-Dogoszhi Black-on-white; g, Sosi-Dogoszhi Black-on-white; h, Sosi Black-on-white; i, j, Dogoszhi Black-on-white; k, l, Flagstaff Black-on-white; m, n, Tusayan Black-on-white; o, p, Kayenta Black-on-white. Length of h, 13 cm.

At least one sherd had a combination of Black Mesa and Dogoszhi Black-on-white elements (Fig. 22 f).

Shato Black-on-white was not separated out as a type during the analysis. Sherds that could be called Shato because of their corrugated exteriors (Colton, 1955) were instead classified according to their painted designs, generally Black Mesa, Sosi, or Flagstaff Black-on-whites. The occurrence of such sherds was infrequent.

Fifty sites produced sherds of Flagstaff Black-on-white, characterized by opposed pairs of finely barbed lines, pinnate lines, and cross hatching (Fig. 22 k,l). The impression was gained during the survey that many of the odd, hard to classify sherds might be Flagstaff Black-on-white. Many of these sherds had designs of fine wavy lines, or panels of straight lines often intersecting other such panels at an angle. These unusual sherds seemed to be from small bowls or jars, for the most part. A number of the unidentified black-on-white sherds are thought to perhaps be variants of Flagstaff Black-on-white. Many of these sherds (Fig. 23 a,c,e,g,i), are from sites where Flagstaff Black-on-white was recovered in substantial amounts (NA 8876, NA 8868, NA 8900, NA 8921). It was noted that these sites had a number of unusual sherds and it may be that local individuals were contributing a number of such "odd ball" vessels to their village, whereas neighboring settlements had little or no such unusual pottery. If such unusual designs do in fact belong to Flagstaff Black-on-white, the existing descriptions need to be expanded to include such variants.

No attempt was made to separate Betatakin Black-on-white or Wupatki Black-on-white from Tusayan Black-on-white during the analysis.

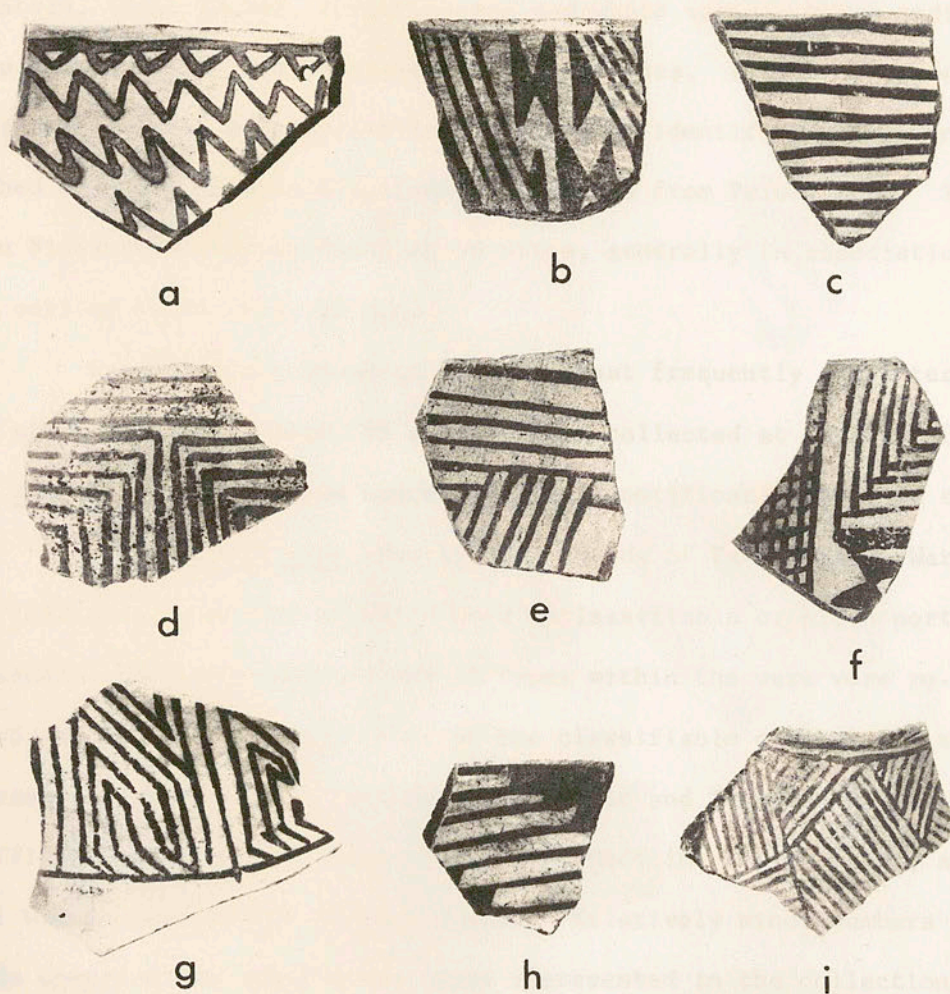


Figure 23. Unidentified black-on-white sherds. a, g, NA 8876; b, NA 8820; c, NA 8868; d, NA 8840; e, h, NA 8900; f, NA 8809; i, NA 8921. Length of a, 88 mm.

Recent work in the western Kayenta region has shown that Betatakin Black-on-white can be identified only on small sherds (Ambler, Lindsay, and Stein, 1964: 70,71), larger sherds and whole vessels being indistinguishable or containing elements of both types. Likewise, it was found that Wupatki Black-on-white could not be identified or distinguished from the Tusayan Black-on-white sherds from Paiute Mesa. Tusayan Black-on-white was found at 50 sites, generally in association with earlier types (Fig. 22 m,n).

Kayenta Black-on-white was the least frequently encountered type of Tusayan White Ware, 66 sherds being collected at 13 sites (Fig. 22 o,p). No problems arose concerning the identification of this type.

Tsegi Orange Ware.--Nearly 3000 sherds of Tsegi Orange Ware were collected, some 900 of which were unclassifiable or plain portions of vessels. Although sherds from 12 types within the ware were recorded, by far the majority (79%) of the classifiable orange ware sherds represent only two types, Tusayan Black-on-red and Tusayan Polychrome. Significant numbers of Citadel Polychrome, Medicine Black-on-red, and Tsegi Orange sherds were collected also. Relatively minor numbers of sherds comprise the other seven types represented in the collections.

Of the 796 sherds classified as Tusayan Black-on-red, 84 could be classified as Dogoszhi Polychrome, since these lack a full covering of red slip on the vessel exterior. This criteria for distinguishing between the two types (Colton, 1956), is only operable when dealing with large sherds, and many small sherds could not be distinguished. In dealing with this material therefore, it was decided to consider those "Dogoszhi Polychrome" sherds to be a variety of Tusayan Black-on-red,

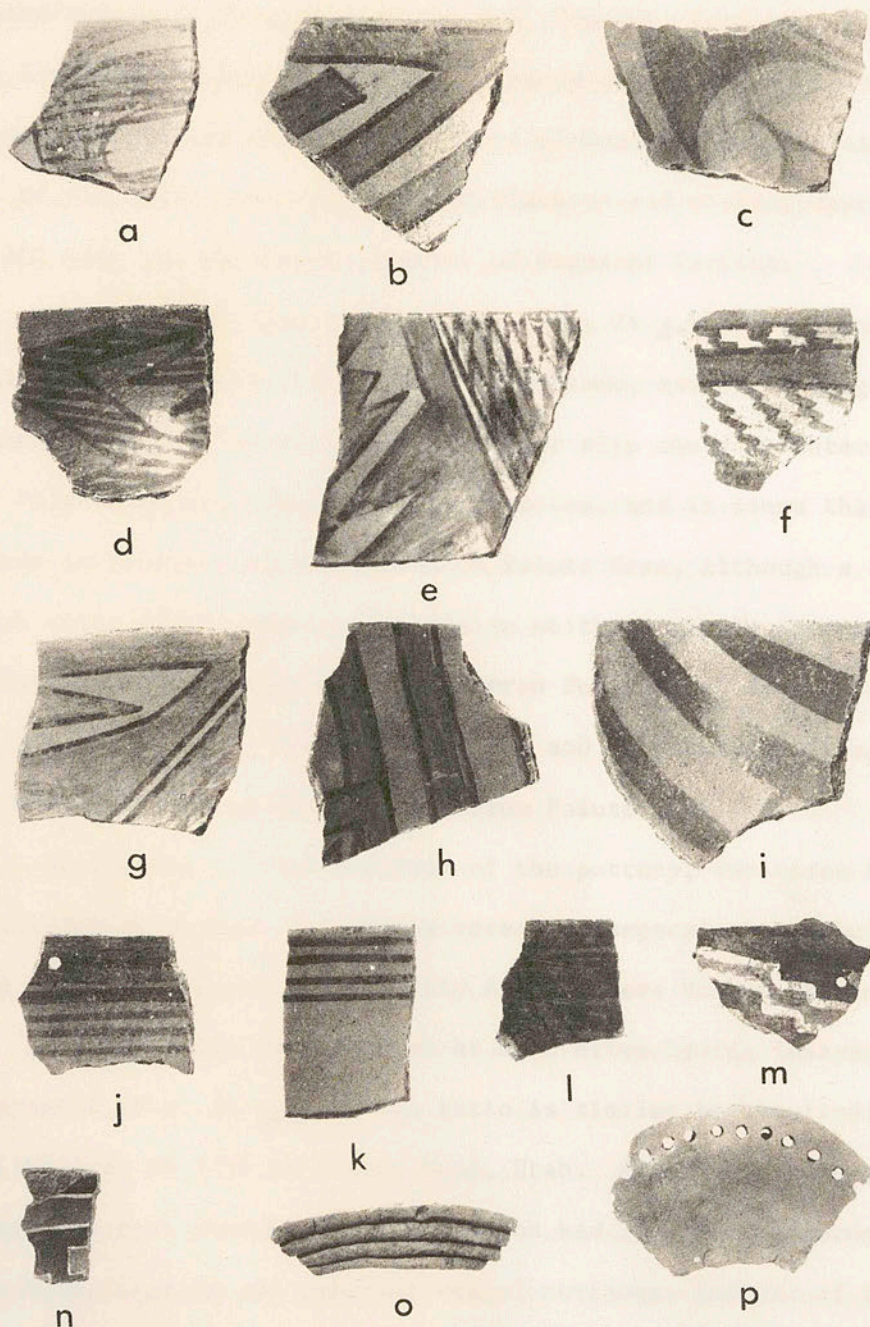


Figure 24. Tsegi Orange Ware sherds. a, Cameron Polychrome; b, Citadel Polychrome; c, Medicine Black-on-red; d, Tusayan Black-on-red; e-h, Tusayan Polychrome; i, Tsegi Red-on-orange; j, Tsegi Polychrome; k, Tsegi Black-on-orange; l, Kiet Siel Black-on-red; m, Kiet Siel Polychrome; n, Kayenta Polychrome; o, Tsegi Orange, coiled exterior; p, Tsegi Orange plate. Length of i, 10.5 cm.

designated herein as Tusayan Black-on-red, Dogoszhi Variety following Ambler, Lindsay, and Stein (1964:71). Sherds of Tusayan Black-on-red were found at 79 sites (Fig. 24 d); those of Dogoszhi Variety at 31 sites. Of the total number of Tusayan Black-on-red sherds, approximately 10% have the unslipped exterior of Dogoszhi Variety.

Cameron and Citadel Polychrome (Fig. 24 a,b) were found to be difficult to distinguish from Tusayan Polychrome, except on large sherds where the presence or absence of an exterior slip could be determined. Cameron Polychrome was found at only six sites, and it seems that it was never made in substantial quantities on Paiute Mesa, although a large number of sites have ceramic complexes in which it should be present. In contrast, a contemporary type of Cameron Polychrome, Medicine Black-on-red (Fig. 24 c), was found at 38 sites and forms a significant portion of the Tsegi Orange Ware complex from Paiute Mesa.

During the initial analysis of the pottery, varieties A and B (Colton, 1956) of Tusayan Polychrome were kept separate for tabulation purposes and it was found that Variety A outnumbers Variety B almost two to one. Both varieties were present at most sites having Tusayan Polychrome present (Fig. 24 e-h). This ratio is similar to the findings of Hobler (1964) at NA 7719 on Paiute Mesa, Utah. At several sites, Tusayan Polychrome bowl sherds were found which had Tusayan Polychrome designs on both interior and exterior vessel surfaces, instead of the usual plain red band or bands on the exterior. At NA 8868, four sherds were collected which have Tusayan Black-on-red designs on one surface and Tusayan Polychrome designs on the other. These variants have been included under Tusayan Polychrome in the ceramic tabulations.

and reser Tsegi Orange, the unslipped, undecorated form of Tsegi Orange Ware, was recognized only when found as rim sherds or as large body sherds of a vessel. Smaller, undecorated body sherds may have been from Tsegi Orange vessels, but they also may be sherds from undecorated portions of otherwise decorated bowls or jars. So defined, Tsegi Orange sherds were found at 32 sites. At nine of these sites, the black-on-white pottery associations were Flagstaff Black-on-white or earlier black-on-white types indicating that Tsegi Orange was probably made in at least small amounts prior to Colton's initial date of A.D. 1250 (1956), and perhaps also before the tentative date of A.D. 1225 (Ambler, Lindsay, and Stein, 1964:76). It seems possible that Tsegi Orange could have been made, perhaps accidentally, from the time of the beginning of Tsegi Orange Ware manufacture, since the type is apparently only the undecorated form of the otherwise painted orange ware types. At four sites the Tsegi Orange sherds were associated with Black Mesa or Sosi Black-on-white. Eight bowl sherds classified as Tsegi Orange are unusual in that they have red slipped exteriors. These sherds, from four different sites, are all from small bowls. The interiors of the sherds are not weathered, and no traces of pigment remain to indicate that the bowls were once decorated. Another two sherds of Tsegi Orange have coiled exteriors. These narrow coils are very round in cross section and appear to have been carefully rounded for decorative purposes, rather than being the unobliterated coils of the manufacturing process (Fig. 24 o). A few Tsegi Orange sherds were noted which have a series of apparently decorative holes punched through the clay below the rim of the sherd. These sherds seem to have come from very shallow bowls or plates (Fig. 24,p),

and resemble one of the Tsegi Orange sherds illustrated by Colton (1956).

The minor amounts of Tsegi Red-on-orange, Tsegi Black-on-orange, Tsegi Polychrome, Kiet Siel Polychrome, Kayenta Polychrome, and Kiet Siel Black-on-red collected do not differ in any essential way from published descriptions (Fig. 24 i-n). The general paucity of these middle and late Pueblo III Tsegi Orange Ware types substantiates the relative lack of late Pueblo III black-on-white pottery as represented by Kayenta Black-on-white.

San Juan Red Ware.-The six sherds of Deadmans Black-on-red from four sites were only tentatively identified due to their small and weathered condition. The time range of A.D. 750 to 1050 given by Colton (1956) for Deadmans Black-on-red places it well within the time periods of Kana-a and Black Mesa Black-on-whites. Since so little Deadmans Black-on-red was identified at sites with such a black-on-white complex, it seems likely that very little was made or traded into the Paiute Mesa region. It is possible, however, that some of the sherds identified as Medicine Black-on-red may in fact be Deadmans Black-on-red. Two sherds were tentatively assigned to Middleton Black-on-red, but these may be variants of Tusayan Black-on-red instead.

Tusayan Grey Ware.-Sherds of various Tusayan Grey Ware types were collected at all but one of the 117 ceramic sites, and this ware constitutes the largest collection. For the most part, the types of Tusayan Grey Ware encountered during the survey are easily distinguished and they presented few classificatory problems. Almost half (47%) of the Tusayan Grey Ware sherds recovered are Tusayan Corrugated, and an additional 25% of the collection is Moenkopi Corrugated. Substantial

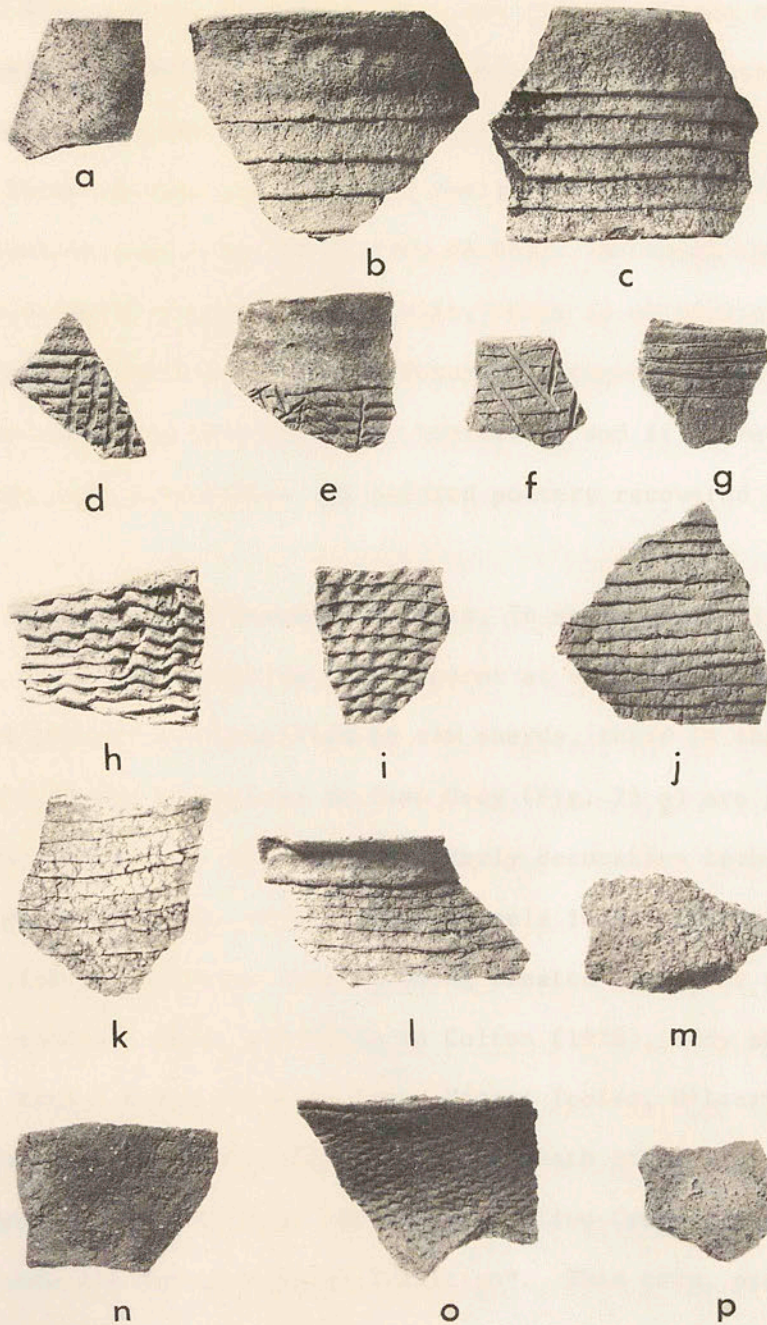


Figure 25. Tusayan Grey Ware and Awatovi Yellow Ware sherds. a, Lino Grey(?); b, c, Kana-a Grey; d-f, Honani Tooled; g, Coconino Grey; h, i, Tusayan Corrugated; j-l, Moenkopi Corrugated; m, n, Kiet Siel Grey; o, Jeddito Tooled; p, Jeddito Plain. Length of b, 10.7 cm.

numbers of Kana-a Grey, Kiet Siel Grey, and Lino Tradition sherds were also recovered, as well as minor amounts of Lino Grey, Honani Tooled, O'Leary Tooled, and Coconino Grey.

Three sherds, probably from the same vessel, were classified as Lino Black-on-grey (Fig. 22 a) from NA 8857. Although there is Black Mesa Black-on-white present at this site, there is no earlier black-on-white and no grey ware earlier than Tusayan Corrugated. The identification of the sherds is therefore very tentative, and if correct, this would be the only Basketmaker III painted pottery recovered on the survey.

In the initial ceramic analysis, 76 sherds were classified as Lino Grey. Since these sherds were present at sites also having Kana-a Grey sherds present as identified by rim sherds, there is the possibility that the sherds classified as Lino Grey (Fig. 25 a) are actually body sherds from Kana-a Grey vessels. Early decorative techniques were only applied to the necks of grey ware vessels in the Kayenta area, the surface finish of the vessel bodies being treated just like the earlier Lino Grey vessels. Thus, according to Colton (1956), body sherds of Lino Grey, Kana-a Grey, Coconino Grey, Honani Tooled, O'Leary Tooled, and Medicine Grey are indistinguishable from each other. It was therefore decided to place all body sherds with a Lino Grey type of surface treatment into the category "Lino Tradition". This term, previously suggested by workers in the Kayenta region (Ambler, Lindsay, and Stein, 1964:73), has generally been used to describe fine tempered, scraped surface grey ware pottery of the Pueblo II-Pueblo III period, such pottery seeming to be a continuation of the Lino method of surface

treatment long after Lino Grey itself had ceased to be manufactured. In this report, the term "Lino Tradition" refers to all sherds with the Lino type of surface treatment, regardless of the other pottery association at the site. Thus, a few Lino Tradition sherds are from late Pueblo III sites, but most are from sites with a Kana-a or Black Mesa Black-on-white ceramic complex, and are probably only body sherds of the late Pueblo I and early Pueblo II grey ware types.

Kana-a Grey rim sherds were easily recognized by their vertical necks and wide, overlapping coils (Fig. 25 b,c), and were found at 19 sites, all of which are located south of the Narrows on the mesa. This type, like Kana-a Black-on-white, was not found to the north on Paiute Mesa, Utah (Lindsay, Ambler, Hobler, Stein, in preparation).

Tusayan Corrugated, Moenkopi Corrugated, and Kiet Siel Grey correspond closely to published descriptions, although considerable variation was noticed at some sites in the width of the coils and amount of indentation on sherds of the two former types (Fig. 25 h-n). The recently described Navajo Mountain Variety of Kiet Siel Grey (Lindsay, and others, in preparation) was not frequently encountered, and those sherds which seemed to fit this variety have been included with Kiet Siel Grey in this report, although they are distinguished on the individual site sherd tabulation forms. Generally, sherds of Kiet Siel Grey and Lino Tradition did not occur at the same site, but where they did, Kiet Siel Grey is distinguished by its rough surface, coarse sand temper, and thicker vessel walls, and often sherds of Kiet Siel Grey had a darker surface color. Honani Tooled (Fig. 25 d-f), O'Leary Tooled, and Coconino Grey (Fig. 25 g) were found in such minute quantities that it

is probable that they are trade wares rather than indigenous to the mesa. Coconino Grey and O'Leary Tooled were each found at two sites; Honani Tooled at four sites.

Pueblo IV Pottery.-Eighteen sherds were classified into types of Awatovi Yellow Ware and Jeddito Yellow Ware. Sherds of Jeddito Plain and Jeddito Tooled were found at NA 8805 (Fig. 25 o,p), and portions of a bowl and a dipper of Jeddito Black-on-yellow were recovered at NA 8851. Both sites had other sherd material present as well.

Intrusives and other Sherd Material.-Identifiable intrusive sherds were noticeably lacking during the survey. Two sherds believed to be McElmo Black-on-white and six sherds of Mesa Verde Black-on-white were the only sherds of Mesa Verde White Ware recovered. One sherd each of Holbrook Black-on-white, Gallup Black-on-white, and White Mound Black-on-white were recorded, but the sherds were small and the identification is not conclusive. Only one Navajo sherd was found, a jar rim sherd with an applique motif.

Restored Vessels and Clay Artifacts

Five partially restorable vessels were collected on the survey. The most complete of these was found eroding out of a wash near NA 8846, but not directly associated with that site's material. It is a large mouthed, globular Kiet Siel Grey jar with a slightly everted rim. The coil marks are mostly obliterated but some finger marks remain on the vessel. The base of the jar is slightly flattened and it is indented with basket impressions. The rim of the basket left a pronounced indentation around the circumference of the jar, indicating a shallow

basket about 33 cm. in diameter. The jar is 36.5 cm. in diameter, 30.5 cm. high, and has a rim measuring 27 cm. in diameter. A partial Tusayan Polychrome dipper was found at NA 8802. The design has an "orange peel" layout, and the edge of the rim to the left of the handle is beveled and worn, probably from use in dipping by a right handed person. The bowl of the dipper is 11.5 cm. in diameter and 6 cm. deep. A small Black Mesa Black-on-white jar with a vertical neck was collected at NA 8900. The jar has a vertical handle made from three fillets of clay, and a decoration consisting of large opposing triangles in a band around the vessel. The jar has a body diameter of 9.2 cm. and a rim diameter of 4.2 cm. Two other very fragmentary vessels were collected at NA 8865. One is a deep hemispherical shaped Tusayan Polychrome bowl with a four fold design of barbed elements on the interior and a single broad red stripe below the rim on the exterior. The bowl is 23.8 cm. in diameter. Part of a Moenkopi Corrugated jar measures 16.5 cm. high, and approximately 16 cm. in body diameter and 8.5 cm. in rim diameter. This vessel is very crudely made with wide, partly obliterated coils, and unusually thick walls. What is believed to be a fragmentary clay pipe was found at NA 8820. The object has a deep bowl modeled in the wider end and a hole was made in the stem of the pipe by modeling the clay around a slender stem or twig which was later removed or oxidized by firing. The pipe is 3.8 cm. long and is made of fired orange clay (Fig. 21 e).

Worked Sherds

The pottery collection includes 58 whole or fragmentary worked

sherds in a variety of shapes and sizes (Fig. 26). These sherds have been formed by grinding the edges of broken sherds into the desired shapes. Eight are perforated discs, roughly circular in outline, with biconical holes at or near the center of the sherd. One of these has an incomplete hole mostly drilled from one face, and the beginnings of a hole started on the opposite face which would have joined the two holes if completed. Another 17 sherds are unperforated discs, the smaller sherds tending to be more carefully ground on the edges than the larger sherds which are generally ground only on uneven projections of the broken edge. Both types of disc range from 23 to 72 mm. in maximum diameter and are 4 to 7 mm. thick. Of these 25 sherds, 17 are various white ware types, seven are orange ware, and one is corrugated. Classifiable sherds are the following: four Tusayan Black-on-white, three Black Mesa Black-on-white, and two each of Sosi, Dogoszhi and Flagstaff Black-on-whites, one Tusayan Black-on-red, and one Tusayan Corrugated.

Two sherds were worked into roughly rectangular shapes and are 4.8 and 5.1 cm. long, 3.5 and 5.7 cm. wide and 4 mm. thick. Other worked sherds include a jar bottom ground on the edges to form a small bowl-like object 6.7 cm. in diameter and five well smoothed sherds in amorphous shapes. These sherds were possibly scoops or small plates. They are larger in size than the other worked sherds, being 9 to 11.9 cm. in length.

The remaining twenty-five sherds have partially worked edges, but the sherds are too fragmentary to determine their original sizes and shapes. Most of the smaller ones seem to have been round but none are perforated. The larger sherds have at least one curved worked edge and

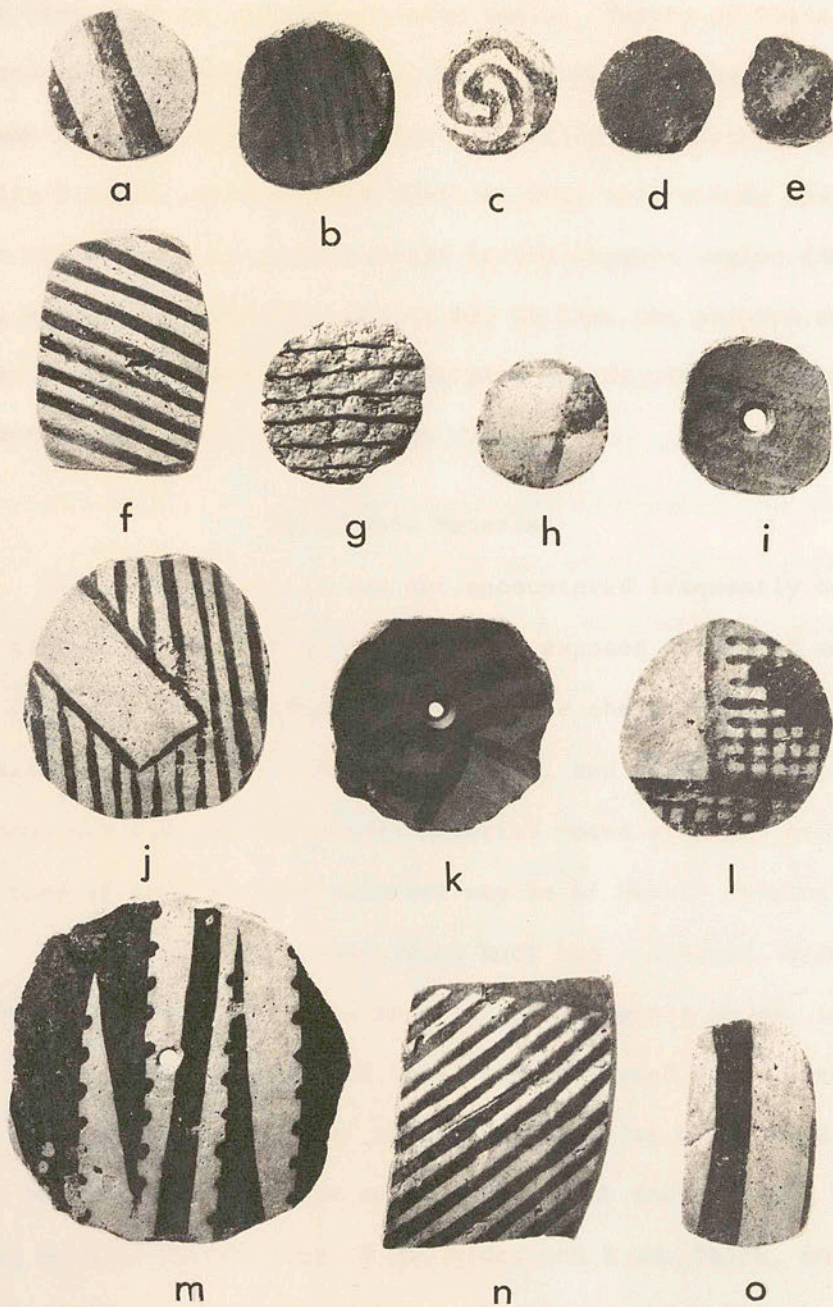


Figure 26. Worked sherds. a-e,g,h,j,l, disc shape; i,k,m, perforated discs; f,n,o, sub-rectangular outline. Maximum diameter of m, 75 mm.

may have been used as pottery scraping tools. Twenty of these fragmentary sherds are Tusayan White Ware, four are Tsegi Orange Ware, and one is Tusayan Corrugated. This apparent selection of decorated sherds, especially black-on-whites, over plain or grey ware sherds has been noted in other collections of worked sherds in the Kayenta region (Ambler, Lindsay, and Stein, 1964:75), and it may be that the painted designs were useful in some way, perhaps in identifying sherds used as gaming pieces, if in fact any of the sherds were so used.

Perishable Material

Perishable material was not encountered frequently on the surface at sites, due in part at least to the exposed nature of most sites and the general lack of refuse in many of the sheltered sites. Corncobs, wood fragments, yucca and other plant parts, and a few animal bones make up the none-artifactual perishable material noted at three prehistoric sites. Some of this surface material may be of Navajo origin.

At NA 8906 an overhand yucca knot was recovered, made from one blade of yucca 5 mm. wide. The knot is approximately 10 mm. in diameter and has frayed ends. A polished bone "gaming piece" was collected at NA 8809 (Fig. 21 b). This oval object has a series of incised lines on its flat surface and the other surface is smooth and convex. This piece of worked bone is 20 mm. long, 8 mm. wide, and 2 mm. thick, and it is similar in size and finish to other such objects which have been found in the Kayenta region.

Fourteen corncobs were collected at NA 8825 (NA 2639). These are almost equally divided between 8, 10, and 12 row types. This site

would undoubtedly produce other perishable material if excavated due to the depth of the refuse and the well protected location and excellent preservation of the site. Corncobs and wood fragments were noted at NA 8826 and NA 8906 also.

Navajo perishable material was collected at two sites. Seven crudely made, fragmentary weaving combs were found at NA 8891. The three complete combs are made from long narrow branches, roughly narrowed on one end to form a handle. One has three teeth and the other two have four, made by cutting notches into one flattened end of the stick. These combs are 30 to 34.2 cm. long, 28 to 32 mm. wide, and 20 to 24 mm. thick.

Anasazi Sites

In the baldrock cliff just above NA 8899, a cache of seeds was discovered.

The Anasazi occupation of the mesa is clearly revealed by ceramic remains and to a lesser degree by the remains of masonry structures. The seeds were packed in coffee cans and glass jars, and are all domestic varieties. Samples of the seeds were identified as red pepper (Capsicum annum), sunflower (Helianthus annuus), watermelon (Citrullus vulgaris), cantaloupe or muskmelon (Cucumis melo), summer squash (Cucurbita pepo var. melo), winter squash (Cucurbita pepo var. moschata), and Hopi corn (Zea Mays). It is possible that these seeds were being saved for planting, and they may indicate some of the variety of plants grown by the Navajo at one time or another on Paiute Mesa.

Cultural Components

On the basis of survey evidence from Paiute Mesa, Arizona, two aboriginal culture horizons can be positively identified. One of these was an Anasazi occupation concentrated in the 11th, 12th and 13th centuries A.D. This occupation probably began in the latter part of the 10th century and seems to have been followed by some Hopi visitation to

the mesa during or after the 14th century A.D. The presence of a pre-ceramic or Basketmaker II horizon could not be definitely demonstrated, but the possibility that some of the lithic sites belong to this period cannot be discarded without further investigation. The second established cultural horizon on the mesa is a Navajo-Paiute occupation, probably confined to the latter part of the 19th century and continuing to the present time. These cultural horizons and evidence revealed by the survey data for the movements of people on the mesa during its occupation are discussed in further detail below.

Anasazi Sites

The Anasazi occupation of the mesa is clearly revealed by ceramic remains and to a lesser degree by the remains of masonry structures at many of the sites. In an effort to more fully understand and describe this prehistoric occupation of the mesa, and to determine what changes, if any, in settlement pattern and size of population on the mesa occurred through time, the ceramic data and site information were further analyzed in several ways. Attempts have been made to derive some pattern out of the mass of ceramic material by organizing it into more comprehensible categories which could then be compared to other site information with meaningful results. Also, survey data from adjacent or nearby regions have been compared to the results from this survey to see what similarities and discrepancies exist between the prehistoric occupation on Paiute Mesa and that of the larger region of which it is a part. The survey data has thus been attacked from a number of angles, each with a different goal in mind. Some of the approaches have proved fruitful; others

less so. ~~By, therefore, some sites have been wrongly classified in the~~

~~tabulation~~ The very nature of surface ceramic collections presents several problems in making any analysis of the ceramic data or in deriving conclusions therefrom. In many instances, the ceramic collection from a site is so small that a large element of risk is introduced in attempting to classify the site into one of a number of categories. One or two sherds can hardly be considered diagnostic of the time of occupation of the site. Also, even though every effort was made during the survey to collect sherds of each type represented at a site, one can never be sure that the resultant collection does, in fact, represent all the pottery types present at the site. Earlier material may be buried, or sherds of some types may be missed during the collecting for one reason or another. The proportion of one pottery type to another as represented in the completed sherd collection may be misleading or completely invalid due to few sherds being exposed on the site or to unconscious selection of some types over others by the collector. During the survey, it was noted that the white ware sherds tended to show up best on the ground, and the more white area present on the sherd the more noticeable it became. Thus, sherds of Sosi and Dogoszhi Black-on-white were easier to spot than sherds of Tusayan or Kayenta Black-on-white which have more black painted surface than unpainted in their designs. In an effort to offset the above factors, as many sherds as possible were collected from each site, and the majority of the site collections are probably fairly representative of the actual ceramic complex of the site as it would be revealed by excavation. Even so, eight sites had fewer than ten sherds in their total collection and another ten sites have fewer than 20 sherds.

Undoubtedly, therefore, some sites have been wrongly classified in the tabulations below for one reason or another. Many of the sites have large sherd collections, however, and it is felt that the overall results of the various analyses of the ceramic material are generally valid, thus giving a reasonably accurate picture of the prehistoric occupation of the mesa.

The various pottery types within Tusayan White Ware are fairly well dated in the Kayenta region and they have proven to be more sensitive time indicators than most of the types within Tsegi Orange Ware and Tusayan Grey Ware. It was decided, therefore, to begin the analysis with special emphasis on the black-on-white pottery. Of the total 125 sites available for analysis, 19 had either no pottery or no black-on-white pottery, and these sites were eliminated from portions of the analysis. Of the remaining 106 sites, 45 have fewer than ten classifiable black-on-white sherds, and this has in some cases made the classification of a site difficult. Wherever possible, all 125 sites have been accounted for in the tabulations, with those sites lacking black-on-white pottery being presented as a separate group.

The first attempt to define ceramic complexes was begun by dividing the 106 black-on-white pottery sites on the basis of the Tusayan White Ware type or types present at the site. In this initial analysis, no regard was given to the number of sherds in each type present, but only to the types represented, even if only by one sherd. Of the numerous possible combinations which could occur, 24 different combinations of black-on-white types were found to be present at sites on the mesa. These range from sites with only one type represented to sites having

six of the seven Tusayan white ware types present. Sosi and Dogoszhi Black-on-white are treated as a single type in the tabulations (Table 5). Five of the 24 combinations, composed of 17 sites, represent only one pottery type, Kana-a Black-on-white being the only type which was not found at any of the sites.

TABLE 5

VARIOUS COMBINATIONS OF CLASSIFIABLE TUSAYAN WHITE WARE TYPES
FOUND AT SITES ON PAIUTE MESA, ARIZONA

Black-on-white Pottery Type Combinations	Number of Sites
Black Mesa	2
Sosi-Dogoszhi	11
Flagstaff	5
Tusayan	3
Kayenta	2
Kana-a, Black Mesa	1
Kana-a, Black Mesa, Sosi-Dogoszhi, Flagstaff	2
Kana-a, Black Mesa, Sosi-Dogoszhi, Flagstaff, Tusayan	1
Kana-a, Black Mesa, Sosi-Dogoszhi	4
Kana-a, Black Mesa, Sosi-Dogoszhi, Tusayan	2
Black Mesa, Sosi-Dogoszhi	16
Black Mesa, Sosi-Dogoszhi, Flagstaff	8
Black Mesa, Sosi-Dogoszhi, Flagstaff, Tusayan	10
Black Mesa, Sosi-Dogoszhi, Flagstaff, Tusayan, Kayenta	2
Black Mesa, Flagstaff, Tusayan	1
Black Mesa, Sosi-Dogoszhi, Tusayan	3
Black Mesa, Sosi-Dogoszhi, Tusayan, Kayenta	4
Sosi-Dogoszhi, Flagstaff	5
Flagstaff, Tusayan	2
Flagstaff, Tusayan, Kayenta	1
Sosi-Dogoszhi, Flagstaff, Tusayan	10
Sosi-Dogoszhi, Flagstaff, Tusayan, Kayenta	3
Sosi-Dogoszhi, Tusayan	7
Tusayan, Kayenta	1
No Black-on-white pottery	19
Total	125

at a site. The results were unrewarding, however, with considerable overlap evident in the orange ware and white ware associations. This is due in part to the small numbers of sites in many of the black-on-white combinations, and to the fact that several of the orange ware types are known to overlap two or more of the black-on-white types through time.

six of the seven Tusayan White Ware types present. Sosi and Dogoszhi Black-on-white are treated as a single type in the tabulations (Table 5). Five of the 24 combinations, composed of 23 sites, represent only one pottery type, Kana-a Black-on-white being the only type which was not found to occur by itself at a site. Of the remaining 19 black-on-white combinations, 14 are combinations of two or more types which occur in an unbroken sequence in what would be regarded as the normal type continuum from Kana-a Black-on-white through Kayenta Black-on-white. Thus, 66 sites, having two or more black-on-white pottery types, show no break in their ceramic content such as might be found if a site were abandoned and reoccupied at a later date. The remaining five black-on-white combinations found on the mesa, composed of 17 sites, represent combinations of two or more types in which there is a break in the ceramic sequence. At all but one of these sites, the missing type in the sequence is Flagstaff Black-on-white. It was felt that these 17 sites might have two components present, representing a reoccupation of earlier sites, and this group was temporarily kept separate from the other sites to see if this was so.

Each site in the 24 black-on-white combination groups was checked at this point with regard to its Tsegi Orange Ware and Tusayan Grey Ware association in hopes that certain orange ware combinations would be found to occur when a given black-on-white complex was present at a site. The results were unrewarding, however, with considerable overlap evident in the orange ware and white ware associations. This is due in part to the small numbers of sites in many of the black-on-white combinations, and to the fact that several of the orange ware types are known to overlap two or more of the black-on-white types through time.

The next attempt at analysis was made with a different approach.

TABLE 6

CERAMIC GROUPS FOR PAIUTE MESA, ARIZONA

Ceramic Group	Approximate Time	Associated Pottery
A	800-1000±50 A.D.	Kana-a B/w, <u>Black Mesa B/w</u> , Deadmans B/r, some Tusayan B/r and Cameron Poly., Kana-a Grey, Tusayan Corr., Coconino Grey, Honani Tooled
B	900 or 1000-1150 A.D.	Black Mesa B/w, <u>Sosi and Dogoszhi B/w</u> , Flagstaff B/w, Deadman's B/r, Medicine B/r, Tusayan B/r, Cameron Poly., Citadel Poly, some Tusayan Poly., some Kana-a Grey, Tusayan corr., Moenkopi corr.
C	1150-1200 A.D.	Sosi and Dogoszhi B/w, <u>Flagstaff B/w</u> , some Medicine B/r, <u>Tusayan B/r</u> , Tusayan Poly., Citadel Poly., Tusayan Corr., Moenkopi Corr., some Kiet Siel Grey
D	1200-1250 A.D.	Flagstaff B/w, <u>Tusayan B/w</u> , Tusayan B/r, some Citadel Poly, Tusayan Poly., Tsegi Orange, Tsegi R/o, Tsegi B/o, Tusayan Corr., Moenkopi Corr., Kiet Siel Grey
E	1250-1300 A.D.	<u>Tusayan B/w</u> , Kayenta B/w, Tusayan B/r, Tusayan Poly., Tsegi Orange, Tsegi R/o, Tsegi B/o, Tsegi Poly., Kiet Siel Poly., Kiet Siel Grey, Kayenta Poly., Kiet Siel B/r, some Tusayan Corr., Moenkopi Corr.

^aThe dominant white ware type in each group is underlined.

used in dealing with the material from Cummings Mesa and Paiute Mesa, Utah (Ambler, Lindsay, and Stein, 1964:19; Lindsay and others, in preparation).

The five ceramic groups are based on the predominant black-on-

The next attempt at analysis was made with a different approach. Each black-on-white type was considered with regard to its relative temporal placement within Tusayan White Ware. Those types found to consistently occur together, as partially indicated by the above 24 black-on-white combinations, were combined into a number of tentative categories. These groups, or ceramic categories, were further examined with regard to recent dendrochronological information, revised pottery dates, and the revised dates proposed for periods of the Pecos Classification in the Kayenta area, especially for the Navajo Mountain region (Adams, 1959: 22-27; Breternitz, 1963; Ambler, Lindsay, and Stein, 1964:99; Lindsay and others, in preparation). Several of the tentative groups were combined and the result was five ceramic groups or complexes with temporal significance. Following recent ceramic date revisions, the pottery types in each ware which could be expected to occur in each ceramic group were determined (Table 6). The five groups were designated by letters A, B, C, D, and E, the earliest ceramic complex for the mesa being Group A, and the latest, Group E. These ceramic groups for Paiute Mesa are similar to Colton's Ceramic Groups 5, 6, 7, 8, and 9 (1946:20), but they differ somewhat from his groups in the types making up each group and in the relative dates assigned to each. Therefore, letter designations were given to the Paiute Mesa ceramic groups instead of using Colton's number system. A somewhat similar approach to the ceramic complex was used in dealing with the material from Cummings Mesa and Paiute Mesa, Utah (Ambler, Lindsay, and Stein, 1964:19; Lindsay and others, in preparation).

The five ceramic groups are based on the predominant black-on-

TABLE 7

CLASSIFICATION OF SITES INTO CERAMIC GROUPS A THROUGH E

Ceramic Group A	Ceramic Group B	Ceramic Group C	Ceramic Group D	Ceramic Group E
NA:	NA:	NA:	NA:	NA:
8827	8801*	8871	8806*	8804*+
8860	8802	8872*	8809	8814
8879	8807	8877	8832*	8816*
8893	8810	8883	8844*	8825*
8901	8812*	8886	8849*	8831*
8903*	8813*	8888*	8850*+	8835*
8912	8821	8892*	8853	8836*
8915*	8822	8897	8855*	8845*+
8	8823	8899	8857	8846
	8824	8902	8858*	8851
	8829	8904	8866	8865
	8830	8907	8867*	8868
	8833	8908	8874*+	8870*
	8834*+	8909	8875*	8881*
	8838	8910*	8876	8882*+
	8840	8913	8878	8889*
	8843*+	8914*	8884	8891
	8847	8916	8894*	8895
	8848	8919	8896	8921
	8852*+	8920*	8900	
	8854*+	8922*	8917	
	8856	8923	8918	
	8859	8924		
	8864*+	8925	22	

48

*Site has fewer than 10 classifiable black-on-white sherds.

+Site classification is based on presence of only 1 black-on-white sherd.

white type or types which are present at a site, regardless of what other black-on-white types are represented by minor amounts. For the most part, the sites were easily classifiable into one group or another, but in some instances no clear majority of one black-on-white type over another was present. This is usually the case at sites with very small amounts of black-on-white pottery present. In borderline instances, the orange ware association was used to help place a site. It should be emphasized that the placing of a site in one group or another does not mean that earlier or later material is not also present at the site. In fact, this was often the case, although generally only a few sherds represent the earlier or later element at the site. Thus, the sites were placed in the ceramic group which seemed to most closely represent the strongest occupation of the site, as revealed by the quantity of sherds of each black-on-white type present (Table 7).

Group A is composed of sites having substantial quantities of Kana-a Black-on-white and Black Mesa Black-on-white present, generally with more Black Mesa than Kana-a. A predominance of Sosi and Dogoszhi Black-on-white accompanied by Black Mesa Black-on-white places a site in Group B, essentially equivalent to Colton's Group 6 (1946:20). Group C is composed of sites having a majority of Flagstaff Black-on-white, often accompanied by a number of Sosi and Dogoszhi Black-on-white sherds. Group D also includes Flagstaff Black-on-white but with more emphasis on Tusayan Black-on-white. The last ceramic complex, Group E, consists of Tusayan Black-on-white and Kayenta Black-on-white, with most of the late orange ware types present also.

After all of the sites had been assigned to one of the five

TABLE 8

PERCENT OF SITES IN EACH CERAMIC GROUP WHICH HAVE SHERDS OF VARIOUS
TSEGI ORANGE WARE AND TUSAYAN GREY WARE TYPES

Ceramic Group	Tsegi Orange Ware													Tusayan Grey Ware									
	Medicine B/r	Tusayan B/r	Tus. B/r, Dog. Var.	Cameron Poly.	Citadel Poly	Tusayan Poly.	Tsegi Orange	Tsegi R/o	Tsegi B/o	Tsegi Poly.	Kiet Siel Poly.	Kayenta Poly.	Kiet Siel B/r	Lino Tradition	Kana-a Grey	Coconino Grey	O'Leary Tooled	Honani Tooled	Tusayan Corr.	Moenkopi Corr.	Kiet Siel Grey		
(8) A	50	75		13	13	25								100	100	13		13	88	25			
(48) B	48	81	29	8	21	52	23	6	2		2	2	4	29	19		2	6	100	92	29		
(22) C	27	68	27		41	68	32		9		4			4			4		86	86	45		
(19) D	5	68	32		37	89	42	5	32	5			5	5	5			89	100	84			
(9) E	33	56	44	11	33	89	67	22	67	11	33	22	22	44				89	89	100			
(19) No B/w	9	9	9			45			18	9			9	9	9			82	64	73			

ceramic groups on the basis of its black-on-white pottery, each site's orange and grey ware association was tabulated. The 17 sites which had been thought to possibly represent two components were examined with regard to their orange ware associations, and no evidence for a break in the orange ware sequence could be determined. At this point, therefore, these sites were assigned to one of the ceramic groups according to the majority of their white ware sherds. Table 8 shows the correspondence of various Tsegi Orange Ware and Tusayan Grey Ware types to the black-on-white Ceramic Groups A-E. Correspondence between the wares from early to late is generally good, although some orange and grey ware types are found earlier or later than they should occur. For instance, Group B, dating from approximately A.D. 1000 to 1150 has minor amounts of the late Pueblo III polychromes present, Kiet Siel Polychrome and Kayenta Polychrome, while the latest group, Group E, includes some Cameron and Citadel Polychromes. Such discrepancies are due to the fact that the sites in each ceramic group may have either earlier or later sherds present, although the majority of the black-on-white sherds places the site in a certain group. Group B, with 48 sites represented, contains the most anomalies; few occur in the other four groups.

In order to see if there was any correlation between type of site location or the size of the site and the temporal periods represented by the ceramic groups, Tables 9 and 10 were prepared. When percentages were figured based on the percent of each ceramic group found in the various site extent categories, a slight patterning is evident. More of the early sites (Groups A and B) are sites with no masonry (pit-houses?) or only scattered rubble which may or may not belong to masonry

TABLE 9

NUMBERS OF SITES AND PERCENT OF EACH CERAMIC GROUP
FOUND IN VARIOUS MASONRY EXTENT CATEGORIES

Site Extent	Ceramic Groups												Total
	No. A	%	No. B	%	No. C	%	No. D	%	No. E	%	No B/w	%	
No Masonry	2	25%	18	37.5%	4	18%	3	16%	1	11%	10	52%	38
Rubble; size unknown	4	50%	12	25%	5	23%	6	31%	1	11%	3	16%	31
One room	0	0	4	8%	2	9%	3	16%	1	11%	1	5%	11
2-4 rooms	1	12.5%	6	12.5%	2	9%	3	16%	2	22%	4	21%	18
5-10 rooms	0	0	5	10%	4	18%	1	5%	1	11%	1	5%	12
11 or more rooms	1	12.5%	3	6%	5	23%	3	16%	3	33%	0	0	15

Totals: 8 100% 48 100% 22 100% 19 99% 9 99% 19 99%

TABLE 10
PERCENT AND NUMBER OF SITES IN EACH LOCATION TYPE CATEGORY
WHICH BELONG TO VARIOUS CERAMIC GROUPS

Ceramic Group	Dune-Ridge			Open			Terrace			Shelter				Cliff			Combination	Total	
	No.	%		No.	%		No.	%		Ledge	No.	%	Small Alcove	No.	%	Large Alcove			No.
A	5	6%		1	9%		1	33%		0	0	25%	1	25%	0	0	0	0	8
B	40	45%		2	18%		1	33%		3	75%	0	0	0	0	1	20%	1	48
C	15	17%		2	18%		1	33%		0	0	25%	1	25%	0	1	20%	2	22
D	11	12%		3	27%		0	0		0	0	0	0	0	0	2	40%	3	19
E	5	6%		3	27%		0	0		0	0	0	0	0	0	0	0	1	9
No B/w	12	14%		0	0		0	0		1	25%	2	50%	2	100%	1	20%	1	19

rooms. Groups C and D are about equally divided between sites with little or no masonry and sites with definite masonry structures of estimable size. The late sites, Group E, show a slight increase in the large pueblo category, but some late sites are small or of moderate size. It is doubtful if the table gives a very reliable picture, however, since the assignment of sites to masonry extent groups was very tentative due to the scanty remains or buried condition of most of the sites. In Table 10, the percentages are based on the number of sites in each location type category which have pottery that places them in the various ceramic groups. The majority of sites in every ceramic group are in open locations, but over half of the open sites have Group B or Group C ceramic complexes. Sites with ceramic complexes of Groups C, D and E (Pueblo III) are not often found in small types of sheltered locations, although some are found in large alcoves. Here again, the variation in the numbers of sites comprising each ceramic group, and the fact that by far the majority of the sites are found in open locations allow for few conclusions. Open sites were utilized throughout the occupation on the mesa in preference to any other type of location. Both large and small sites, with and without masonry, are present throughout the occupation, but slightly more of the early sites are small in size with little or no masonry. The Pueblo III sites (Groups C, D, E) have more masonry pueblos, especially the larger size categories, than do Groups A and B, although the majority of the Pueblo III sites have fewer than five rooms.

When the survey was being conducted, it seemed that most of the earlier sites encountered were in the Sage Valley area south of the Narrows, and most of the late Pueblo III sites were located to the north,

TABLE 12.—Occurrence of types of Tusayan White Ware, Tsegi Orange Ware and Tusayan Grey Ware at sites located north and south of the Narrows on Mesa located to the west of the Narrows, Arizona.

Location on Mesa	Ceramic Groups				Total Sites
	Group A % (no.)	Group B % (no.)	Group C % (no.)	Group D % (no.)	No B/w Pottery % (no.)
North of Narrows	0	56% (27)	64% (14)	74% (14)	63% (12)
South of Narrows	100% (8)	44% (21)	36% (8)	26% (5)	37% (7)
Total:	100% (8)	100% (48)	100% (22)	100% (19)	100% (19)
					125

TABLE 11

PERCENT OF SITES IN EACH CERAMIC GROUP WHICH ARE LOCATED NORTH AND SOUTH OF THE NARROWS

Tusayan White Ware		No. of sites of	Percent of Narrows	No. of sites of	Percent of Narrows
Kana-a B/w	1	10%	90%	10	10
Black Mesa B/w	22	40%	60%	56	56
Sosi and Dogoszhi B/w	58	58%	42%	88	88
Flagstaff B/w	33	66%	33%	50	50
Tusayan B/w	33	70%	30%	50	50
Kayenta B/w	1	85%	15%	13	13
Tusayan Grey Ware		No. of sites of	Percent of Narrows	No. of sites of	Percent of Narrows
Kana-a B/w	0	0%	100%	19	19
Lino T. B/w	2	20%	76%	29	29
Tusayan B/w	64	53%	41%	108	108
Kenkor B/w	8	70%	30%	99	99
Kiet S. B/w	42	74%	26%	57	57
Tsegi Orange Ware		No. of sites of	Percent of Narrows	No. of sites of	Percent of Narrows
Medicine B/w	20	53%	47%	38	38
Tusayan B/w	4	59%	41%	79	79
Tus. B. Var.	24	77%	23%	31	31
Cameroon Poly.	4	66%	33%	6	6
Citadel Poly.	19	63%	37%	30	30
Tusayan Poly.	44	66%	33%	72	72
Tsegi Orange	2	78%	22%	32	32
Tsegi R/o	10	100%	0%	6	6
Tsegi B/o	10	94%	6%	17	17
Tsegi Poly.	3	100%	0%	3	3
Kiet S. Poly.	4	80%	20%	5	5
Kayenta Poly.	1	100%	0%	1	1
Kiet S. B/r	0	100%	0%	6	6

TABLE 12.--Occurrence of types of Tusayan White Ware, Tsegi Orange Ware and Tusayan Grey Ware at sites located north and south of the Narrows on Paiute Mesa, Arizona

	No. of sites North of Narrows	Percent North of Narrows	No. of sites S. of Narrows	Percent S. of Narrows	Total Sites
<u>Tusayan White Ware</u>					
Kana-a B/w	1	10%	9	90%	10
Black Mesa B/w	22	40%	34	60%	56
Sosi and Dogoszhi B/w	51	58%	37	42%	88
Flagstaff B/w	33	66%	17	33%	50
Tusayan B/w	35	70%	15	30%	50
Kayenta B/w	11	85%	2	15%	13
<u>Tusayan Grey Ware</u>					
Kana-a Grey	0	0%	19	100%	19
Lino Tradition	7	24%	22	76%	29
Tusayan Corrugated	64	59%	44	41%	108
Moenkopi Corrugated	69	70%	30	30%	99
Kiet Siel Grey	42	74%	15	26%	57
<u>Tsegi Orange Ware</u>					
Medicine B/r	20	53%	18	47%	38
Tusayan B/r	47	59%	32	41%	79
Tus. B/r, Dog. Var.	24	77%	7	23%	31
Cameron Poly.	4	66%	2	33%	6
Citadel Poly.	19	63%	11	37%	30
Tusayan Poly.	48	66%	24	33%	72
Tsegi Orange	25	78%	7	22%	32
Tsegi R/o	6	100%	0	0%	6
Tsegi B/o	16	94%	1	6%	17
Tsegi Poly.	3	100%	0	0%	3
Kiet Siel Poly.	4	80%	1	20%	5
Kayenta Poly.	3	100%	0	0%	3
Kiet Siel B/r	6	100%	0	0%	6

nearer the state line. When the sites in each Ceramic Group were plotted with regard to their location on the mesa, the results did show a slight increase from early to late going from south to north (Table 11). This is evident even though a third more sites were recorded north of the Narrows (75 sites) than to the south (50 sites). In order to further check this, Table 12 was prepared, showing the numbers and percentages of sites at which each pottery type occurs and the site location on the mesa. Each ware demonstrates the trend, with higher percentages of the earlier types in each ware being found to the south of the Narrows, and more of the later types occurring to the north. There is more Tsegi Orange Ware north of the Narrows throughout the occupation on the mesa, but even this ware shows a continual increase in the north, with the late Pueblo III types not represented, or only barely so, in the Sage Valley area. Thus, the earliest ceramic complex, representing Late Pueblo I, was essentially restricted to the region south of the Narrows. The one exception is NA 8847 which is located on the Narrows itself, almost on the dividing line. It was surprising that the Narrows, which was selected as an arbitrary point of division on the mesa for purposes of tabulation, should turn out to be what seems to represent a real boundary, and that this boundary was apparently operative in prehistoric times for some reason. Very little Kayenta Black-on-white and Kiet Siel Grey are found to the south of the Narrows, in addition to a similar lack of late Tsegi Orange Ware types. The situation in Pueblo II times, as represented by sites having a Group B ceramic complex (Table 11), seems to have been about equally divided between the north and south, there also being more sites of this period than any other. However, a number of the Pueblo

III sites. The reasons for such a shift through time from one part of the mesa to another can only be guessed at. The best locations today from a water and shelter standpoint would seem to be in Sage Valley. As shown in Table 10, however, the early occupants of the valley preferred open locations, only one shelter site being utilized by a late Pueblo I group. Although farm land is abundant in Sage Valley, most of it is useless for flood water farming today due to erosional activity. It may be that this valley is more subject to erosion, even during minor erosional cycles, than are other portions of the mesa, and perhaps during Pueblo III times little of the valley could be farmed. Since it seems evident that the occupation on the mesa continued without a major break, such erosional conditions, if they existed, could not have been wide spread or damaging on all of the mesa, or more of the population would have been affected by the poor farming conditions. A natural increase in population and movements onto the mesa would account for the spread of the people over the entire mesa during Pueblo II times, but it is surprising that no evidence of the late Pueblo I occupation is found north of the Narrows. Perhaps the people had just arrived on the mesa and were already beginning to make the transition into Pueblo II pottery styles before they moved further to the north. The gradual abandonment of the Sage Valley area in favor of the land further to the north during Pueblo III times is likewise difficult to understand. If defense had become important for any reason, there are more buttes and promontories to the north on which defensive villages could be built, and some of these locations seem to have been so utilized. Water sources are fewer and less concentrated north of the Narrows, however, and a number of the Pueblo

III sites are located a considerable distance from a dependable source. Since the mesa top is essentially unapproachable except from the south, pressure might have been brought to bear from that direction, gradually pushing the people north. The people may have come to prefer the more open aspect of the terrain to the north, favoring it over the valleys closed in by high baldrock cliffs. Whatever the reason, the trend to the north apparently continues onto Paiute Mesa, Utah (Table 13), where an even higher proportion of late pottery is present with correspondingly less early material. The Pueblo II manifestation seems to be about the same for both halves of the mesa, and Paiute Mesa, Utah, has a similar large majority of open sites (Lindsay and others, in preparation).

When collections of Tusayan White Ware from other nearby areas are compared to those of Paiute Mesa, another trend appears (Table 13), this being one of a movement from east to west. Higher proportions of Pueblo III pottery, especially Tusayan Black-on-white, than are found on Paiute Mesa are present in the Navajo Mountain region to the west, and this increases still more on Cummings Mesa located west of Navajo Mountain (Ambler, Lindsay and Stein, 1964:17-18; Lindsay and others, in preparation). Evidence for this east to west movement has been noted before for the region, and with further investigation a south to north trend may become evident over more of the area, similar to that on Paiute Mesa. Neely and Olson (1965) have reported Basketmaker III and Pueblo I material at a number of sites in Monument Valley, although the majority of sites fall within the Pueblo II-III period. This presence of more early material to the east of Paiute Mesa is perhaps further evidence of an east to west movement in the occupation of the Kayenta Region.

Pueblo IV Sites

TABLE 13

COMPARISON OF THE OCCURRENCE OF TUSAYAN WHITE WARE
ON PAIUTE MESA, ARIZONA WITH THREE NEARBY AREAS

	Number of Sherds	Percent of Classifiable Tusayan WW
<u>Paiute Mesa, Arizona:</u> (125 sites; 106 with B/w pottery)		
Kana-a B/w	87	3%
Black Mesa B/w	580	19%
Sosi and Dogoszhi B/w	1382	47%
Flagstaff B/w	421	14%
Tusayan B/w	453	15%
Kayenta B/w	66	2%
Totals:	2988	100%
<u>Paiute Mesa, Utah:</u> (200 sites; 135 with B/w pottery)		
Kana-a B/w	0	0%
Black Mesa B/w	70	5%
Sosi and Dogoszhi B/w	677	44%
Flagstaff B/w	157	10%
Tusayan B/w	547	35%
Kayenta B/w	92	6%
Totals:	1545	100%
<u>Northeast Navajo Mt., Utah:</u> (228 sites; 109 with B/w pottery)		
Kana-a B/w	0	0%
Black Mesa B/w	26	3%
Sosi and Dogoszhi B/w	227	26%
Flagstaff B/w	147	17%
Tusayan B/w	433	50%
Kayenta B/w	34	4%
Totals:	867	100%
<u>Cummings Mesa, Utah and Arizona:</u> (180 sites; 133 with B/w pottery)		
Kana-a B/w	0	0%
Black Mesa B/w	11	1%
Sosi and Dogoszhi B/w	242	21%
Flagstaff B/w	269	23%
Tusayan B/w	636	54%
Kayenta B/w	16	1%
Totals:	1171	100%

Pueblo IV Sites

Two of the surveyed sites had small amounts of Pueblo IV pottery associated with them. One of these, NA 8851, is located south of the Narrows near the north end of Sage Valley. The other, NA 8805, is an open site on the rim of Boot Canyon just south of the state line. The 16 Pueblo IV sherds recovered at this site were identified as Awatovi Yellow Ware types, Jeddito Plain and Jeddito Tooled. It is possible that the Jeddito Plain sherds are from one pot, but none of it was restorable. The few other sherds at this site were Tusayan Polychrome, Tusayan Corrugated, Kiet Siel Grey, and unclassifiable Tusayan White Ware. At NA 8851, several sherds of a Jeddito Black-on-yellow bowl and a fragmentary dipper handle of the same type were found in addition to over a hundred sherds of Tusayan White and Grey wares and Tsegi Orange Ware, mostly belonging to the Group D ceramic complex. Jeddito Black-on-yellow dates between A.D. 1325 and 1600, and Awatovi Yellow Ware has an even longer time range of A.D. 1300 to the present (Colton:1956). The paucity of Pueblo IV sherds at these sites and the possibility that perhaps only three or four vessels are represented indicates that a true occupation on the mesa is not represented, but rather a few infrequent visits to the mesa by Hopi from the Jeddito area. The possibility of a limited but real occupation cannot be completely ruled out on survey evidence, however, as there is some evidence of such sporadic occupations of the region by the Hopi like that at NA 7961 on Cummings Mesa (Ambler, Lindsay, and Stein, 1964:87-97). A few sherds of Jeddito Black-on-yellow and Jeddito Tooled were collected at three sites on Paiute Mesa, Utah. These were also found with older Anasazi material (Lindsay and others,

in preparation. seems to have declined between 1962 when the Glen Canyon

Project was in the area and 1964 when this survey took place. We were
Sites of Unknown Horizon

able to locate six occupied hogan clusters during the summer of 1964. Six lithic sites recorded on the survey could not be definitely assigned to any cultural horizon, but there is a strong possibility and there were probably no more than ten families in the whole survey area. There were, however, numerous hogans in good condition, with that at least some of them are preceramic or Basketmaker II sites. A boarded or padlocked doors, which seem to be seasonally occupied. Several number of crude grinding slabs at NA 8803 and metates found at NA 8863 and NA 8898 resemble some metates found at ceramic sites on the mesa. al of these were occupied during the summer of 1962, and the presence of household goods and personal belongings indicated that the owners were Slab lined cists are present at NA 8880 and NA 8890, and scattered up- only temporarily absent. Several families in residence on the mesa were right slabs at most of the other sites suggest the presence of cists or living in temporary brush shelters several miles from their permanent hearths at them also. The sites are generally characterized by stained gan complexes.

soil and fire cracked rock, as well as scattered debris from tool manufacture. Navajo structures encountered during the survey include brush, The few tools recovered from the lithic sites seem to be similar to the tools from ceramic sites but too few were collected for a log, and wire corrals, cribbed earth and log hogans, stone and log sweat- lodges, rock cairns or "shrines", brush, stone or log lambing pens, and detailed comparison. It is possible that these lithic sites are contemporary with some of the ceramic sites on the mesa, in which case they sites during the survey. Domestic animal bones, sheep and horse droppings, and modern trash are also found in the vicinity of Navajo dwellings. The dense accumulations of charcoal stained soil and the extent of some of the sites, as well as the presence of structures at most of dated with prehistoric petroglyphs. Several partly subterranean earth and log dugouts with doors were found, and these seem to have been storage of six sites are quite similar to each other, and they are probably all Age structures. The modern hogans are built of logs and adobe or cement, of the same cultural horizon, whether this is Basketmaker II or a later Pueblo affiliation. with cribbed roofs. Older style, abandoned, forked pole hogans were not ed also. Several families have rectangular buildings with windows, in

Navajo Occupation hogan clusters. These shacks, often tarpaper covered,

seen to be Paiute. The present day Navajo population of Paiute Mesa, Arizona, is not large. In fact, the number of families utilizing the area in the

summer months seems to have declined between 1962 when the Glen Canyon Project was in the area and 1964 when this survey took place. We were able to locate six occupied hogan clusters during the summer of 1964, and there were probably no more than ten families in the whole survey area. There were, however, numerous hogans in good condition, with boarded or padlocked doors, which seem to be seasonally occupied. Several of these were occupied during the summer of 1962, and the presence of household goods and personal belongings indicated that the owners were only temporarily absent. Several families in residence on the mesa were living in temporary brush shelters several miles from their permanent hogan complexes. Several corrals, with sweat lodges near by. Large numbers of old Navajo structures encountered during the survey include brush, log, and wire corrals, cribbed earth and log hogans, stone and log sweat-lodges, rock cairns or "shrines", brush, stone or log lambing pens, and brush ramadas or shelters. Such Navajo remains were not recorded as sites during the survey. Domestic animal bones, sheep and horse droppings, and modern trash are also found in the vicinity of Navajo dwellings. Navajo petroglyphs were found at several locations, usually associated with prehistoric petroglyphs. Several partly subterranean earth and log dugouts with doors were found, and these seem to have been storage structures. The modern hogans are built of logs and adobe or cement, with cribbed roofs. Older style, abandoned, forked pole hogans were noted also. Several families have rectangular buildings with windows, in addition to their hogan clusters. These shacks, often tarpaper covered, seem to be used primarily for storage. At least two hogans have glass windows, and one Navajo is building a five room house, complete with

picture windows. He is building this house with logs he has cut by hand and hauled with a wagon in his spare time. It is also being true. A

Most of the occupied hogan clusters are in open areas away from the forest boundary. This is true also for the padlocked hogans which are temporarily not in use. Older, abandoned hogans and corrals tend to be within the forest boundary, however, and this more closely parallels the prehistoric settlement pattern. Evidences of older Navajo occupation on the mesa are usually smaller clusters of structures, one or two hogans and a corral, presently fallen into ruin. Families living on the mesa today generally have at least two and usually three hogans and several corrals, with sweat lodges near by. Large numbers of old hogans and corrals were noted, probably ten times the number that are presently in use. No harding being done by school age children

Nearly everywhere old Navajo ruins were found, usually in wooded areas near sage covered clearings, prehistoric sites were located in the immediate vicinity. This similarity in settlement pattern for the prehistoric and modern Indian groups has been discussed relevant to the Utah half of the mesa (Lindsay, Ambler, Hobler, Stein, in preparation) and the same reasons advanced for this similarity on the north end of the mesa probably are applicable in this section of the mesa as well. Availability of water, timber, arable land, and wild plants undoubtedly were important factors in selecting a living site for both groups of people, such factors becoming less important for the Navajo in very recent times with increasingly more dependence being placed on commercially prepared foods and supplies. The correspondence in settlement pattern between the ancient and modern peoples held true so often that we

could be almost sure of finding prehistoric remains in areas where Navajo structures were present, the reverse situation also being true. A large region which is devoid of Navajo remains, other than scattered stock trails, we found was not likely to have had much prehistoric utilization either.

In this relatively conservative section of the reservation, sheep raising is still an important part of the livelihood of the Navajo families, although many of the men are seeking wage work. All of the families in residence on the mesa had herds of sheep and goats. A few horses, cattle and mules are kept by some families. One family in Sage Valley was raising a large number of albino rabbits, but for what purpose we could not ascertain. The sheep and goats are taken out to graze every day, most of the herding being done by school age children home for the summer. The animals are often taken many miles each day to water or to graze. Sheep trails crisscross the mesa nearly everywhere, and tie the hogan complexes together. The land is heavily overgrazed in most areas, and this lack of ground cover and trampling by stock is contributing to erosion by wind and water on many sections of the mesa. Attempts have been made to halt arroyo cutting in a few locations by filling the cut with brush and trash. These Navajo soil check dams have been at least partially successful in controlling erosion, and more appreciation and understanding of such measures by the people could save much of the topsoil on the mesa.

In addition to sheep raising, several families had planted small corn plots in Sage Valley, but we were informed that the heavy July rains had washed the fields away. Several fenced fields, located on other

parts of the mesa, were not planted in 1964, although some were under cultivation during the summer of 1962.

The production of crafts such as woven blankets, baskets, and pitch covered water jars is declining at a rapid rate on Paiute Mesa, and this decrease is an indication of how fast the Navajo people are turning to new means of livelihood. In 1962, several families on Paiute Mesa were weaving blankets and making other items, some of which were purchased by Glen Canyon Project personnel. By 1964, only one family had a working weaver, and she was producing very little. The young girls are not learning the crafts, and in addition, many families seem to have left the area, perhaps for wage work. This trend away from craft production has been noted for other sections of the Navajo Reservation, and will probably become more pronounced in the next few years.

Few of the older Navajo speak English, and those who do, speak very little. Most of our communication with the Navajo families was through the interpretation of the children, some of whom speak English fluently. The mesa is still quite isolated, in comparison with other portions of the Navajo Reservation. Transportation for the Navajo is by foot, horseback, or wagon, and occasionally by truck. A trip to the trading post is still an exciting thing for the people on this mesa, and a visit to a town even more so. Few of the residents have been away from the mesa for any length of time except for school children or men who have served in the Armed Forces.

The Navajo families living on Paiute Mesa were very helpful in telling us about sites they knew of in the vicinity, and in giving us directions for locating them. On several occasions an individual would

volunteer his time to guide us to the sites in question. These people proved to be as fine neighbors as one could wish for, respecting our property and privacy during our stay on the mesa, while at the same time being interested in our endeavors to find the "Anasazi" and gladly giving assistance when called upon.

CHAPTER IV

SUMMARY AND CONCLUSIONS

A survey of Paiute Mesa, Arizona, in 1964 recorded 125 sites and yielded evidence for the prehistoric and historic occupation of the mesa. It is hoped that at some future date more work will be done on the mesa, for excavations are needed to substantiate or refute conclusions based on survey data alone. Although the surveyed area is not large, considering the vast region of which the mesa is a part, perhaps the information collected, as represented by this report, will contribute to our growing knowledge and understanding of the prehistoric Kayenta Anasazi of northern Arizona and southern Utah.

Paiute Mesa is an erosional remnant some 30 miles long which lies in Utah and Arizona just to the south of the San Juan River and to the east of Navajo Mountain. The elongate mesa extends north from the Shonto Plateau, and it is bordered on the east and west by vertical cliffs dropping into Nokai and Paiute Canyons. Access to the mesa top is limited, except from the south, although there are a few historic trails which reach the mesa from the canyons on either side and prehistoric trails undoubtedly existed also. Paiute Mesa is approximately bisected by the Utah-Arizona state line, and this survey dealt with only that portion lying in Arizona. Elevations on the mesa top vary from

around 7000 feet at the south to 6000 feet near the state line. The generally flat surface topography of the mesa is locally broken by valleys, baldrock expanses, large deep drainages, and isolated buttes and hillocks.

Ample stone for building purposes is available on the mesa and

CHAPTER IV

wood is plentiful, as most of the mesa top is forested with stands of pi-

non and juniper. Numerous wild plants are abundant

SUMMARY AND CONCLUSIONS

As are many small reptiles and mammals. Arable land is available on

A survey of Paiute Mesa, Arizona, in 1964 recorded 125 sites and yielded evidence for the prehistoric and historic occupation of the mesa. It is hoped that at some future date more work will be done on the mesa, for excavations are needed to substantiate or refute conclusions based on survey data alone. Although the surveyed area is not large, considering the vast region of which the mesa is a part, perhaps the information collected, as represented by this report, will contribute to our growing knowledge and understanding of the prehistoric Kayenta Anasazi of northern Arizona and southern Utah.

Paiute Mesa is an erosional remnant some 30 miles long which lies in Utah and Arizona just to the south of the San Juan River and to the east of Navajo Mountain. The elongate mesa extends north from the Shonto Plateau, and it is bordered on the east and west by vertical cliffs dropping into Nokai and Paiute Canyons. Access to the mesa top is limited, except from the south, although there are a few historic trails which reach the mesa from the canyons on either side and prehistoric trails undoubtedly existed also. Paiute Mesa is approximately bisected by the Utah-Arizona state line, and this survey dealt with only that portion lying in Arizona. Elevations on the mesa top vary from

around 7000 feet at the south to 6000 feet near the state line. The generally flat surface topography of the mesa is locally broken by valleys, baldrock expanses, large deep drainages, and isolated buttes and hillocks.

Ample stone for building purposes is available on the mesa and wood is plentiful, as most of the mesa top is forested with stands of piñon and juniper. Numerous varieties of smaller wild plants are abundant as are many small reptiles and mammals. Arable land is available on nearly all sections of the mesa, both in the large valleys and in the form of scattered sage covered sandy areas. The climate is semi-arid with a growing season of sufficient length for the maturation of a number of domestic plants. Water sources are limited today, although there are enough springs and seeps for domestic purposes. It seems likely that there were more active springs and seeps in prehistoric times, and rainfall trapped in pot holes and plunge pools would have provided an additional source throughout much of the year. Evidence from the survey indicates that a year round occupation was supported by the available water, the supply being sufficient for domestic needs. Agriculture on the mesa today is dependent on flood water and rainfall, as it was in the past, and judging from the present day Navajo fields, getting the right amount of water for crops is often a problem. There are frequently years in which there is not enough rain, or too much at the wrong time. The prehistoric population was faced with a similar problem, no doubt, in their agricultural endeavors.

The present Navajo occupation on the mesa is limited, but it has apparently continued for a number of years, possibly beginning in the latter part of the 19th century A.D. The older Navajo hogans and

ruins are often located on, or adjacent to, prehistoric remains, but the newer dwellings are located nearer the main road and usually away from the forest. A few of the families plant fields, but the major occupation is still sheep raising. Native craft production, such as blanket weaving, seems to be rapidly declining on the mesa.

Most of the 125 recorded prehistoric sites are located within the present forest boundaries as are the older Navajo remains. Prehistoric sites are scattered along the entire length of the surveyed area, being more common near the central portions of the mesa near the major drainages or along the edges of the baldrock bordered valleys. The western extremities of the mesa have poor soil cover and little water and there is little evidence that these portions of the land were much used in prehistoric times. Many sites are adjacent to small, open, sage covered areas, and it is likely that some of these sandy clearings were farmed in addition to the larger valley floors.

By far the majority of the sites occupy open locations, generally on slight elevations such as stabilized dune ridges or baldrock outcrops. Relatively few sheltered locations are available on the mesa, especially in the northern portion, but where ledges and large and small alcoves are present they were generally utilized. Probably only a third or fourth of the sites on the mesa were recorded by the survey, as nearly every good location investigated seems to have been occupied at one time or another.

The ceramic evidence indicates that the prehistoric occupation on the mesa was mostly limited to the 11th, 12th, and 13th centuries A.D., and that the occupation was essentially continuous during that time, with

late Pueblo I, Pueblo II, and Pueblo III sites represented. A few lithic sites were recorded which may represent a small Basketmaker II occupation, but this could not be demonstrated with certainty, and these non-ceramic sites may belong to the later pueblo occupation. If such sites do represent a Basketmaker II occupation, then the mesa was apparently abandoned during Basketmaker III times and not reoccupied until late in the Pueblo I period. The occupation on Paiute Mesa was most extensive during Pueblo II and early Pueblo III, about 1050 to 1200 A.D., thereafter declining until the end of the 12th century. Some Pueblo IV material was recovered at two sites indicating possible visits to the mesa or a limited occupation by Hopi from the Jeddito area during or after the 14th century A.D. Apparently built during Pueblo II, and some of these were occupied. Most of the recorded sites are in a poor state of preservation. At approximately 30% of the sites no evidence of masonry structures could be seen. The size of the refuse areas of many of these sites, and their ceramic complexes, indicate the possibility of pithouses, and in some instances, possible brush shelters. Another 25% of the sites have only scattered rubble present which may indicate masonry, but no room outlines were visible and the size of the site could not be estimated. The remaining 45% of the sites have masonry structures and range in size from one or two rooms to large multiroomed pueblos of nearly 100 rooms. Masonry structures observed during the survey include living rooms, storage structures and kivas. Cists, hearths, and mealing bins were noted at some sites. Several of the larger sites appear to be laid out in a square or "D" shaped plan, and these may enclose a plaza area and one or more kivas. Relatively large sites seem to be present throughout the

occupation period, as indicated in the nonmasonry sites by large accumulations of deep refuse, but such large sites are in the minority. Most sites consist of fewer than ten rooms, probably averaging closer to four or five rooms. Very small sites, probably seasonal one room farm-houses or locations of brush or temporary shelters, are likewise present throughout the occupational sequence on the mesa. This pattern of a few large sites and numerous small sites is similar to the situation in Monument Valley to the east, and in the Navajo Mountain region to the west (Neely & Olson, 1965; Lindsay and others, in preparation). There seems to be little trend toward increase in size through time, although several of the large masonry sites are late Pueblo III sites. The largest number of sites was apparently built during Pueblo II, and some of these were occupied into Pueblo III times.

The masonry is generally of crude construction in the Kayenta style, with wall slabs of unequal thickness predominately used. The stones are only roughly dressed, if at all, and are set in sandy mortar with the interstices chinked with smaller stones and spalls, and in the sheltered sites, occasionally with corncobs. Only a few courses of masonry remain at most sites, but at some the walls are still standing to probable roof height. None had roofing material still in place, however. At least one site was two stories in height, and others may have been. No agricultural structures could be identified, and presumably most of the farming took place without resort to terrace structures, ditches, or windbreaks.

Both petroglyphs and pictographs were recorded at sites on the Paiute Mesa, but they are not numerous. The majority seem to be

associated with the Pueblo II-III occupation, and some are historic Navajo or Anglo works.

The lithic industry on Paiute Mesa includes tools of both ground and chipped stone and the tool types are similar to those found in the surrounding region. Lithic debris at most sites indicates that at least some of the tool manufacture took place on the mesa, but the cryptocrystalline stone used in chipped knives and projectile points would have to be imported, presumably from the gravel terraces of the San Juan River.

By far the majority of the pottery collected can be described as types of Tusayan White Ware, Tusayan Grey Ware and Tsegi Orange Ware, most of it made between A.D. 1000 and 1250. The pottery is very similar in nearly all respects to that found in adjacent regions indicating continuous contact with other Kayenta Anasazi peoples. Very few intrusive or trade sherds were identified in the total collection of over 10,000 sherds, thus giving little evidence for trade or contact with peoples outside the Kayenta region.

The ceramic collections and refuse deposits at some sites are indicative of an occupation over a number of years, while other sites were apparently occupied for a very short time, or perhaps only seasonally. The occupation on the mesa as a whole appears to have been continuous, and sites which were once abandoned were not usually reoccupied. A few sites, however, were found to lack Flagstaff Black-on-white in their otherwise unbroken black-on-white ceramic sequences of two or more types. Whether this indicates an abandonment of these sites during the time Flagstaff Black-on-white was being made, or whether Flagstaff Black-

on-white was for some reason not manufactured at these sites is not²⁵⁰ known. The other pottery at these sites does not seem to indicate a break in the continuum, but it is surprising that 16 of the 17 sites in which are missing a black-on-white type are missing Flagstaff Black-on-white. Except for these sites, the picture is one of stable conditions over a long period of time with gradual changes in the ceramic complex taking place throughout the length of the occupation, probably with considerable overlap in the types of pottery being made at a site at any one time.

To the west and from the north on Paiute Mesa, Utah substantiates this. The mesa was apparently populated from the south, perhaps from the Tsegi region a short distance to the southeast, as evidenced by the ceramic collections and the limited routes of access to the mesa except from the south. Several ceramic complexes were recognized for the mesa, and the earliest of these, essentially late Pueblo I in content, is represented by a small number of sites which are restricted to the southern portion of the surveyed area. On the other hand, the late Pueblo III ceramic material is essentially found only in the northern half of the surveyed region. The Pueblo II sites are scattered all over. It seems that the first occupants of the mesa with a knowledge of pottery arrived near the end of Pueblo I times and settled in small numbers on the southern portion of the mesa, choosing well watered locations. With the development into Pueblo II, the population increased greatly, probably augmented to a large degree by new arrivals moving onto the mesa. The people spread over the length of the mesa in a short time, building many sites, some of which were probably occupied only for a few years. A gradual withdrawal from the mesa apparently began in early

Pueblo III times and continued until late Pueblo III, around A.D. 1250, when most of the population seems to have been concentrated in a few large sites located on the middle and northern portions of the mesa, including the Utah part of the mesa. The comparative paucity of late Pueblo III ceramics as represented by types such as Kayenta Black-on-white, Kiet Siel Polychrome and Kayenta Polychrome indicates that the occupation on the mesa probably did not continue much beyond 1250 or 1275 A.D. and certainly not beyond the end of the century. Survey evidence from regions to the west and from the north on Paiute Mesa, Utah substantiates this general pattern of a limited or non-existent Pueblo I occupation in the region followed by a widespread Pueblo II and early Pueblo III occupation which began to dwindle in numbers of sites, if not in population, during the 13th century A.D., with complete withdrawal from the region by around A.D. 1300.

The subsistence pattern of the Anasazi on Paiute Mesa is difficult to assess from survey data due to the lack of perishable remains at the large majority of sites. Corncobs recovered at a few sites and the numerous manos and metates at many sites indicates that agriculture was the primary means of subsistence for the prehistoric inhabitants on the mesa, as it was for people in the surrounding region. Many sites are located near arable land, and a number of sites seem to be nothing more than small seasonal farmhouses near the fields, perhaps for storage. Hunting was probably also important, judging from the number of projectile points found, but what animals were primarily sought is not known from the survey. Bones of rabbits, deer and mountain sheep are frequently found in sites in the region and have been noted for sites

on Paiute Mesa, Utah (Lindsay and others, in preparation; Hobler, 1964). Some gathering and utilization of a variety of wild plants would have been possible, but what plants were collected, other than yucca, is not known.

BIBLIOGRAPHY

- Adams, William Y.
1960 Ninety Years of Glen Canyon Archeology, 1869-1959. Museum of Northern Arizona Bulletin 33, Glen Canyon Series No. 2. Flagstaff.
- Adams, William Y., and Nellie K. Adams
1959 An Inventory of Prehistoric Sites on the Lower San Juan River, Utah. Museum of Northern Arizona Bulletin 31, Glen Canyon Series No. 1. Flagstaff.
- Adams, William Y., Alexander J. Lindsay, Jr., and Christy G. Turner II.
1961 Survey and Excavations in Lower Glen Canyon, 1952-1958. Museum of Northern Arizona Bulletin 36, Glen Canyon Series No. 3. Flagstaff.
- Ambler, J. Richard, Alexander J. Lindsay, Jr., and Mary Anne Stein
1964 Survey and Excavations on Cummings Mite, Arizona and Utah, 1960-1961. Museum of Northern Arizona Bulletin 39, Glen Canyon Series No. 5. Flagstaff.
- Beals, Ralph L., George W. Brainerd, and Watson Smith
1945 Archaeological Studies in Northeast Arizona. University of California Publications in American Archaeology and Ethnology, Vol. 44, No. 1. Berkeley.
- Bretznitz, David A.
1963 "The Archaeological Interpretation of Tree Ring Specimens for Dating Southwestern Ceramic Styles." MS, Ph.D. dissertation, University of Arizona.
- Colton, Harold S.
1946 The Sinagua, A Summary of the Archaeology of the Region of Flagstaff, Arizona. Museum of Northern Arizona Bulletin 22. Flagstaff.
1952 Pottery Types of the Arizona Strip and Adjacent Areas of Utah and Nevada. Museum of Northern Arizona Ceramic Series No. 1. Flagstaff.
1955 Pottery Types of the Southwest. Museum of Northern Arizona Ceramic Series No. 3a. Flagstaff.

BIBLIOGRAPHY

- Adams, William Y.
1960 Ninety Years of Glen Canyon Archaeology, 1869-1959. Museum of Northern Arizona Bulletin 33, Glen Canyon Series No. 2. Flagstaff.
- Adams, William Y., and Nettie K. Adams
1959 An Inventory of Prehistoric Sites on the Lower San Juan River, Utah. Museum of Northern Arizona Bulletin 31, Glen Canyon Series No. 1. Flagstaff.
- Adams, William Y., Alexander J. Lindsay, Jr., and Christy G. Turner II.
1961 Survey and Excavations in Lower Glen Canyon, 1952-1958. Museum of Northern Arizona Bulletin 36, Glen Canyon Series No. 3. Flagstaff.
- Ambler, J. Richard, Alexander J. Lindsay, Jr., and Mary Anne Stein
1964 Survey and Excavations on Cummings Mesa, Arizona and Utah, 1960-1961. Museum of Northern Arizona Bulletin 39, Glen Canyon Series No. 5. Flagstaff.
- Beals, Ralph L., George W. Brainerd, and Watson Smith
1945 Archaeological Studies in Northeast Arizona. University of California Publications in American Archaeology and Ethnology, Vol. 44, No. 1. Berkeley.
- Breternitz, David A.
1963 "The Archaeological Interpretation of Tree Ring Specimens for Dating Southwestern Ceramic Styles." MS, Ph.D. dissertation, University of Arizona.
- Colton, Harold S.
1946 The Sinagua, A Summary of the Archaeology of the Region of Flagstaff, Arizona. Museum of Northern Arizona Bulletin 22. Flagstaff.
- Lindsay, Alexander J., J. Richard Ambler, Mary Anne Stein, and Phillip M. Hobler
1952 Pottery Types of the Arizona Strip and Adjacent Areas of Utah and Nevada. Museum of Northern Arizona Ceramic Series No. 1. Flagstaff.
- Lindsay, Alexander J., J. Richard Ambler, Mary Anne Stein, and Phillip M. Hobler
1955 Pottery Types of the Southwest. Museum of Northern Arizona Ceramic Series No. 3a. Flagstaff.

- Colton, Harold S.
 1956 Pottery Types of the Southwest. Museum of Northern Arizona Ceramic Series No. 3c. Flagstaff.
- Cooley, Maurice E.
 1959 Physiography of the Glen-San Juan Canyon Area, Part II: Physiography of the San Juan Canyon. Plateau, Vol. 31, No. 3, pp. 49-55. Flagstaff.
- Guernsey, S. J.
 1931 Explorations in Northeastern Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University Vol. 12, No. 1. Cambridge.
- Guernsey, S. J., and Kidder, A. V.
 1921 Basket-Maker Caves of Northeastern Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University Vol. 8, No. 2. Cambridge.
- Hall, Ansel F.
 1934 General Report, Rainbow Bridge-Monument Valley Expedition of 1933. University of California Press, Berkeley.
- Hargrave, Lyndon L.
 1935 Report on Archaeological Reconnaissance in the Rainbow Plateau Area of Northern Arizona and Southern Utah. University of California Press, Berkeley.
- Harshbarger, John W., Charles A. Repenning, and Joseph T. Callahan
 1953 The Navajo Country, Arizona-Utah-New Mexico. IV Subsurface Facilities of Water Management and Patterns of Supply-Type Area Studies, Chapter 7. Interior and Insular Affairs Committee, House of Representatives, U. S. Congress. Washington.
- Hobler, Phillip M.
 1964 "Excavations at Neskahi Village, Paiute Mesa, Utah." MS, Master's Thesis, University of Arizona. Tucson.
- Kidder, A. V., and S. J. Guernsey
 1919 Archaeological Explorations in Northeastern Arizona. Bureau of American Ethnology Bulletin 65. Washington.
- Lindsay, Alexander J., Jr.
 1961 The Beaver Creek Agricultural Community on the San Juan River, Utah. American Antiquity, Vol. 27, No. 2, pp. 174-187. Salt Lake City.
- Lindsay, Alexander J., J. Richard Ambler, Mary Anne Stein, and Phillip M. Hobler
 In Preparation. Survey and Excavations North and East of Navajo Mountain, Utah, 1960-1961. Museum of Northern Arizona Bulletin 42, Glen Canyon Series No. 8. Flagstaff.

Lindsay, Alexander J., J. Richard Ambler, Phillip M. Hobler, and Mary Anne Stein

In Preparation. Survey and Excavations on Paiute Mesa, Utah, 1960 and 1962. Museum of Northern Arizona Bulletin 43, Glen Canyon Series No. 9. Flagstaff.

Morss, Noel

1931 Notes on the Archaeology of the Kaibito and Rainbow Plateaus in Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University Vol. 12, No. 2. Cambridge.

Neely, James, and Alan P. Olson

1965 "A Report to the Navajo Tribe on the Archaeological Potential of Monument Valley Tribal Park." MS at Museum of Northern Arizona, Flagstaff.

Taylor, Walter W.

1958 Two Archaeological Studies in Northern Arizona. Museum of Northern Arizona Bulletin 30. Flagstaff.

Turner, Christy G., II

1962 A Summary of the Archaeological Explorations of Dr. Byron Cummings in the Anasazi Culture Area. Museum of Northern Arizona Technical Series No. 5. Flagstaff.

Turner, Christy G., II

1963 Petrographs of the Glen Canyon Region: The Styles, Chronology, Distribution, and Relationships from Basketmaker to Navajo. Museum of Northern Arizona Bulletin 38, Glen Canyon Series No. 4. Flagstaff.

Whiting, Alfred F.

1939 Ethnobotany of the Hopi. Museum of Northern Arizona Bulletin 15. Flagstaff.

APPENDIX I

Environmental and Cultural Characteristics of Sites Surveyed

NA:	Site Location																	Site Extent						Cultural Elements				Water								
	Drainage	Paiute Canyon	Boot Canyon	Cattle Canyon	Open Sites	Dune-Ridge	Butte-Remnant	Terrace	Shelter/Cliff Sites	Ledge	Small Alcove	Rockshelter	Large Alcove	Combination Sites	On/Against Baldrock	Within Forest Boundary	Within Clearing	No Masonry Visible	Rubble; Size Unknown	1 Room	2-4 Rooms	5-10 Rooms	11 or more Rooms	Possible Pithouses	Cists	Petroglyphs	Pictographs	Pottery	Lithic Artifacts	Refuse Deposits	Water at Site	Water within 1 mile	Water Source Unknown	Drainage within 1 mile		
8801	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x	x	x	-	-	-	x	
8802	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	x	x	-	-	-	x	
8803	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8804	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	
8805	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8806	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8807	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8808	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8809	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x	x	x	-	-	-	x
8810	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8811	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8812	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	x	-	-	-	x	x	-	-	-	x	
8813	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8814	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	-	-	x	x	x	-	-	-	x
8815	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8816	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8817	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	
8818	x	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8819	x	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	x	-	-	-	-	-	
8820	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	x	-	-	x	x	x	-	-	-	-
8821	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	
8822	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	
8823	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	
8824	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	
8825	-	-	-	x	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	x	-	-	-	-	
8826	-	-	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	x	-	-	-	
8827	-	-	-	x	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	
8828	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	
8829	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	
8830	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	
8831	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8832	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8833	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	
8834	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	

Environmental and Cultural Characteristics of Sites Surveyed

NA:	Site Numbers		Site Location										Site Extent										Cultural Elements					Water								
	Drainage		Paiute Canyon	Boot Canyon	Cattle Canyon	Open Sites	Dune-Ridge	Butte-Remnant	Terrace	Shelter/Cliff Sites	Ledge	Small Alcove	Rockshelter	Large Alcove	Combination Sites	On/Against Baldrock	Within Forest Boundary	Within Clearing	No Masonry Visible	Rubble; Size Unknown	1 Room	2-4 Rooms	5-10 Rooms	11 or more Rooms	Possible Pithouses	Cists	Petroglyphs	Pictographs	Pottery	Lithic Artifacts	Refuse Deposits	Water at Site	Water within 1 mile	Water Source Unknown	Drainage within 1 mile	
8835	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	x	-	-	-	-	-	-	-	-	x	x	-	-	-	-	
8836	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	
8837	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	
8838	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	x	-	-	-	x	
8839	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	x	-	-	-	x	
8840	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	x	-	-	-	-	x	-	-	-	x	
8841	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	-	-	-	x	x	-	-	-	x	
8842	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	
8843	-	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8844	-	-	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8845	-	-	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	-	
8846	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	-	-	-	-	x	x	x	-	-	x	
8847	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8848	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	x	x	-	-	-	x	
8849	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8850	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8851	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8852	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8853	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x
8854	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8855	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	
8856	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	x	-	-	x	x	-	-	-	x	
8857	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	x	-	-	-	-	
8858	-	-	-	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	x	-	-	-	-	x	
8859	-	-	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	x	-	-	-	-	
8860	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	-	-	-	-	-	-	x	-	-	
8861	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8862	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x	-	-	-	x	x	-	-	-	x
8863	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	x	
8864	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	
8865	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x	x	-	-	-	x
8866	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	
8867	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	x	-	-	-	-	-	-	x	-	-	
8868	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	
8869	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x	-	-	-	x	
8870	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	x	x	-	-	-	x	

Environmental and Cultural Characteristics of Sites Surveyed

NA:	Site Location																Site Extent										Cultural Elements					Water			
	Drainage	Paiute Canyon	Boot Canyon	Cattle Canyon	Open Sites	Dune-Ridge	Butte-Remnant	Terrace	Shelter/Cliff Sites	Ledge	Small Alcove	Rockshelter	Large Alcove	Combination Sites	On/Against Baldrock	Within Forest Boundary	Within Clearing	No Masonry Visible	Rubble; Size Unknown	1 Room	2-4 Rooms	5-10 Rooms	11 or more Rooms	Possible Pithouses	Cists	Petroglyphs	Pictographs	Pottery	Lithic Artifacts	Refuse Deposits	Water at Site	Water within 1 mile	Water Source Unknown	Drainage within 1 mile	
8871	x				x											x			x									x					x		
8872	x				x											x																		x	
8873	x				x											x												x						x	
8874	x													x	x	x						x						x					x		
8875	x				x											x												x						x	
8876	x				x											x							x	x				x					x		
8877			x		x												x							x			x						x		
8878			x					x									x			x						x						x			
8879			x		x										x	x				x				x				x				x			
8880			x		x											x				x					x		x					x			
8881			x										x			x				x								x						x	
8882		x			x											x				x								x						x	
8883		x			x											x						x						x						x	
8884		x			x											x				x								x						x	
8885		x			x											x												x						x	
8886		x			x											x							x	x				x						x	
8887		x			x											x					x							x						x	
8888		x			x											x				x								x						x	
8889		x			x											x					x					x		x						x	
8890			x		x												x								x								x		
8891			x											x		x						x					x							x	
8892			x							x						x						x						x						x	
8893			x		x												x					x				x								x	
8894		x			x											x						x						x						x	
8895		x			x											x								x				x						x	
8896		x												x	x	x								x	x			x						x	
8897			x		x											x				x						x	x							x	
8898			x		x											x									x								x		
8899			x		x											x									x									x	
8900			x		x												x							x										x	
8901			x								x					x																		x	
8902			x											x		x																		x	
8903			x														x																		x
8904			x										x			x																			x
8905			x									x				x											x	x						x	
8906			x										x			x					x						x	x						x	

NA:	Site Location										Site Extent										Cultural Elements					Water								
	Drainage	Paiute Canyon	Boot Canyon	Cattle Canyon	Open Sites	Dune-Ridge	Butte-Remnant	Terrace	Shelter/Cliff Sites	Ledge	Small Alcove	Rockshelter	Large Alcove	Combination Sites	On/Against Baldrock	Within Forest Boundary	Within Clearing	No Masonry Visible	Rubble; Size Unknown	1 Room	2-4 Rooms	5-10 Rooms	11 or more Rooms	Possible Pithouses	Cists	Petroglyphs	Pictographs	Pottery	Lithic Artifacts	Refuse Deposits	Water at Site	Water within 1 mile	Water Source Unknown	Drainage within 1 mile
8907				x		x										x	x	x						x					x					
8908				x		x										x	x	x						x					x					
8909				x		x										x	x	x						x					x					
8910				x		x										x	x	x						x					x					
8911				x								x					x	x																
8912				x		x										x	x	x											x					
8913				x													x												x					
8914				x		x										x	x	x											x					
8915				x												x	x	x											x					
8916				x		x										x	x	x											x					
8917				x		x										x	x	x											x					
8918				x		x										x	x	x											x					
8919				x		x										x	x	x											x					
8920				x		x										x	x	x											x					
8921				x		x										x	x	x											x					
8922		x				x										x	x	x											x					
8923				x		x										x	x	x											x					
8924				x		x										x	x	x											x					
8925				x		x										x	x	x											x					

Stone Artifacts APPENDIX II Mesa, Arizona

Stone Artifacts from Paiute Mesa, Arizona

Site Numbers	Small Triangular Points	Oval Leaf Shaped Points	Stemmed Points	Unident. Point Fragments	Drills	Square Based Knives	Round Based Knives	Crude Knives	Unident. Knife Fragments	Choppers	Circumference Edge Scrapers	Limited Edge Scrapers	Polishing Stones	Utilized Flakes	Mauls	Metates	One Hand Manos	Two Hand Manos	Mano Blank	Beads	Pendants	Minerals	Hammerstones
NA:																							
8801	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-
8802	-	-	1	1	-	-	-	-	-	3	-	1	-	-	-	-	-	-	-	-	-	-	-
8803	-	-	1	4	-	1	-	-	-	-	-	4	-	-	-	9	1	-	-	-	-	-	-
8805	3	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-
8806	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
8807	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	4	-
8808	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-
8809	1	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
8810	-	1	-	2	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-
8811	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
8812	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
8813	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
8814	-	-	1	-	-	1	-	-	-	-	-	2	-	-	-	-	1	2	-	-	-	-	-
8815	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	1	-	-
8816	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	2	-	-	-	-	-	-	-
8818	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
8820	1	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
8822	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
8826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
8827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
8828	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-
8831	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8832	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-
8834	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
8835	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
8838	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-
8839	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
8841	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
8842	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
8843	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8844	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8845	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-

Stone Artifacts from Paiute Mesa, Arizona

Site Numbers	Small Triangular Points	Oval Leaf Shaped Points	Stemmed Points	Unident. Point Fragments	Drills	Square Based Knives	Round Based Knives	Crude Knives	Unident. Knife Fragments	Choppers	Circumference Edge Scrapers	Limited Edge Scrapers	Polishing Stones	Utilized Flakes	Mauls	Metates	One Hand Manos	Two Hand Manos	Mano Blank	Beads	Pendants	Minerals	Hammerstones
NA:																							
8846	2	1		2		2																	
8847												1											
8848														1									
8849												1											
8850	2	1				1	1			2		1											1
8851	2		1	3	1	2	1					1		1									
8852	1			1								1											
8853														1									
8856												1					3						
8857	1	1	2	2				1	1	1			1		2								1
8859			1	1																			
8861																	1						
8862					1							1											1
8863														1		1							
8864												1		2		2							
8865				1						1									1				
8866																						2	
8870										1											1		1
8871			1																				
8873				1						1		1											
8875							1							1									
8876				1			1										2			1	1		
8879			1							1													
8880			1																				2
8881													1										
8882				1						1				1									
8883										1											1		
8886										1							1						2
8887																							2
8888		1			2	1															1	1	
8889											1												3
8890							1	1		1													
8892										1													
8893										2							1						2

Stone Artifacts from Paiute Mesa, Arizona

Site Numbers	Small Triangular Points	Oval Leaf Shaped Points	Stemmed Points	Unident. Point Fragments	Drills	Square Based Knives	Round Based Knives	Crude Knives	Unident. Knife Fragments	Choppers	Circumference Edge Scrapers	Limited Edge Scrapers	Polishing Stones	Utilized Flakes	Mauls	Metates	One Hand Manos	Two Hand Manos	Mano Blank	Beads	Pendants	Minerals	Hammerstones
NA:																							
8894	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8895	-	-	1	1	-	1	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	3	-
8896	3	-	1	1	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	1
8897	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
8898	-	1	1	1	-	-	1	1	-	2	-	-	-	1	-	1	1	-	-	-	1	-	2
8899	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
8900	1	-	-	1	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-
8901	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
8902	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-
8903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
8904	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-
8906	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
8907	-	1	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
8908	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
8912	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
8913	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
8914	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
8916	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
8917	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	1
8918	-	1	2	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8920	-	1	-	-	-	1	-	-	3	1	1	1	-	1	-	-	1	-	-	-	-	-	-
8921	-	1	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
8922	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
8923	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
8929	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8932	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8933	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8934	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8936	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8937	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8938	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX III

Occurrence of Pottery Wares and Types By Site

TABLE I

TUSAYAN WHITE WARE

Site Numbers	Kana-a B/w	Black Mesa B/w	Sosi B/w	Dogoszhi B/w	Flagstaff B/w	Tusayan B/w	Kayenta B/w	Sosi-Dogoszhi B/w	Uncl. Tus. WW	Unknown B/w
NA:										
8801			4	1					7	
8802		4	26	6	4			3	4	
8804							1			
8805									1	
8806		3			2	3			2	
8807		4	2	3	3	4	2		2	
8808					4				3	
8809			8	6	21	12			11	
8810		1	13	2		2	4		13	
8811			2			3			6	
8812		1	2	1		3			3	
8813			1	2					1	
8814					4	42	15		13	
8815									1	
8816			3			3			5	
8817		1	2	1		2	3		10	
8818									2	
8820			7	2	3	34	23		2	
8821			8	6					11	
8822		6	27	8	22	6			10	
8823		4	32	14	5	6		1	19	
8824			7	14	3				13	
8825	2	2	2			1			6	
8827	37	73	32	25					40	
8828		2		1		3	1			
8829		4	40	11	9	7			25	
8830		13	31	17					23	
8831						3			3	
8832					7				2	
8833		5	7	11	1				16	
8834				1					4	
8835			2			3			1	
8836				2		3			6	
8837									1	
8838	20	4	15	8	3				7	

TABLE I

TUSAYAN WHITE WARE

Site Numbers NA:	Kana-a B/w	Black Mesa B/w	Sosi B/w	Dogoszhi B/w	Flagstaff B/w	Tusayan B/w	Kayenta B/w	Sosi-Dogoszhi B/w	Unclass. Tus. WW	Unknown B/w
8839				2	9	41	6		28	
8840		22	20	27				4	10	1
8842						10	4		4	
8843			1						2	
8844				1	6	3			9	
8845						1			7	
8846		1	15	9	10	50			4	5
8847	1	1	2	4	3	1			5	
8848		6	11	11	4	23		1	23	
8849					2				1	
8850					1				2	
8851			4	7	10	11	2		24	
8852				1					2	
8853		1	11	7	19				9	
8854			1							
8855				1	2				7	
8856		15	18	22					26	
8857		4	11	16	30	11			16	
8858			2	2	3	2			5	
8859		8	8	13					16	
8860	3	29		2					35	
8861									2	
8862									1	
8864			1							
8865			2		1	8			3	1
8866			4		7				1	
8867			3	1	3			1	4	
8868		6	3	14	27	21	2		5	
8869							2		2	
8870				1	4	3			7	
8871		4	27	11				1	8	1
8872			8						3	
8873									3	
8874					1					
8875					2	1			3	
8876		13	27	13	16				4	
8877	2	25	36	24	8			2	9	
8878		2	5		5				5	3
8879	20	83		3					21	
8881					1	1			1	

TABLE I

TUSAYAN WHITE WARE

Site Numbers	Kana-a B/w	Black Mesa B/w	Sosi B/w	Dogoszhi B/w	Flagstaff B/w	Tusayan B/w	Kayenta B/w	Sosi-Dogoszhi B/w	Unclass. Tus. WW	Unknown B/w
8882						1			1	
8883		3	9	8				2	15	2
8884			8	2	2	3			9	
8886		5	23	22	4	4			6	1
8887		1	2			3	1		5	
8888			2	1		1			2	
8889			1			1			2	
8891				1	8	9			3	
8892		2	1	1						1
8893		3							2	
8894				1	1				7	
8895			2	1	3	10			4	
8896			14	7	28	24			17	
8897		5	27	22				1	22	
8899		5	1	5					5	
8900		23	15	24	39				11	15
8901		14							6	1
8902		6	7	3		1			11	3
8903	3	25	9						4	
8904		4	3	5					6	
8906									2	
8907		18	9	16	9				11	
8908		3	6	1		1			5	
8909			11	17				1	11	
8910		3		2					6	
8912	15	20	9	3	3				24	
8913		12	1					1	14	
8914		7	2	1					7	
8915	1	8							2	
8916		18	35	54				1	12	
8917			1	3	17	2			11	
8918		3	13	19	12	16		2	8	
8919		4	3	4					10	
8920			1	1					2	
8921		1	12	13	23	33			12	
8922			5	3		2			10	
8923	3	24	3	7		11			15	
8924		11	25	15	7	3			12	
8925		5	5	5				1	10	

TABLE II

TSEGI ORANGE WARE

[illegible]

TABLE II

TSEGI ORANGE WARE

[illegible]

TABLE II

TSEGI ORANGE WARE

[illegible]

TABLE III

TUSAYAN GREY WARE

Site Numbers	Lino Tradition	Kana-a Grey	Coconino Grey	O'Leary Tooled	Honani Tooled	Tusayan Corrugated	Moenkopi Corr.	Kiet Siel Grey	Unclass. Tus. GW	Lino B/g (?)	Unknown Grey
NA:											
8801						13	4				
8802						17	3				
8804							2	2			
8805						1		9			
8806						6	2				
8807						3	5				
8808							2				
8809						38	60	1			
8810						7	30	29	2		
8811						8	8	10			2
8812						5	4	1			
8813						1	3		1		
8814	1					22	13	12			
8816						2	9	23	5		
8817	8					15	23	28			
8818						3	11	15			
8819						1	1	1			
8820	1					7	19	12			3
8821						30	8	1			
8822						31	30	1			
8823						21	16				
8824						16	9				
8825		3				11	6	15			
8826						2					
8827	31	26	4		1	30					5
8828						40		8			
8829					2	35	23				
8830						14	7				
8831							8	3			
8832						2					
8833						44	5				
8834				2		5	3	1			
8835						7	17	15			
8836						13	23	6			
8837						11	29	11			
8838	1					32	9	1			
8839	9					11	15	7			
8840						29	2				1
8842						19	8	20			
8843						12	3				

TABLE III

TUSAYAN GREY WARE

Site Numbers	Lino Tradition	Kana-a Grey	Coconino Grey	O'Leary Tooled	Honani Tooled	Tusayan Corrugated	Moenkopi Corr.	Kiet Siel Grey	Unclass. Tus. GW	Lino B/g (?)	Unknown Grey
NA:											
8844						7	17	6	1		
8845						2	10	6			
8846						10	10				
8847						11	2	4	2		
8848						21	22	3			
8849						20	11	1			
8850						4					
8851	10	8				14	9	7			
8852	12	2				8	3				
8853						30	47	9			
8854						16	9	3			
8855				1		4	2				
8856	2					38	13				
8857						17	10			3	
8858	2					24	8	1			
8859	11	14				26	5	3	1		
8860	74	36				2					
8861						4	3	3			
8862								1			3
8864						3	2				
8865	18					3	31	5			
8866						25	17		1		
8867	2					19	11				
8868		1				17	15	5	2		
8869	22	16				5	1	18			
8870	4	3				12	13	1			
8871	38	14				32	6		2		
8872	16	8				12	2		1		
8873	1	5				5	1				
8874									1		
8875						13	1	1			
8876						14	11	2			
8877	15					23	15				
8878						15	8				
8879	35	16									1
8881						15	11	1			
8882						3	6	7			
8883						22	17				1
8884						13	8				

TABLE III

TUSAYAN GREY WARE

Site Numbers	Lino Tradition	Kana-a Grey	Coconino Grey	O'Leary Tooled	Honani Tooled	Tusayan Corrugated	Moenkopi Corr.	Kiet Siel Grey	Unclass. Tus. GW	Lino B/g (?)	Unknown Grey
NA:											
8885						12	21	5			
8886						24	6	1			
8887						6	8	10			
8888						4	4				
8889							2				
8891						31	15	7	4		
8892	10	8				14	2				
8893	12	7				3	2				
8894						9	3	1			
8895						20	15	18			
8896						11	14	3			1
8897	1					37	16				2
8899	3					20	3				1
8900	2					29	12				
8901	11	14				12			3		
8902	17	10				31	3		3		
8903	41	18				1					
8904		2				39	4	2			
8906	1	6				2	1	7			
8907	10	5				33	11				
8908						25	1				
8909	2					22			2		
8910		1				44	7				
8912	22	16				58	7				
8913	4	5				39			1		
8914	38	14				9			1		
8915	16	8				1					
8916	1	5				58	2		3		
8917						24	33				
8918						13	8	1			
8919						21	4				
8920	15					2					
8921						28	12	1	1		
8922						13	5				
8923	25	35	4		2	6	1				
8924					1	30	19	1			1
8925						29	5	1			

[illegible]

This volume is the property of the University, but the literary rights of the author are a separate property and must be respected. Passages must not be copied or closely paraphrased without the previous written consent of the author. If the reader obtains any assistance from this volume, he must give proper credit in his own work.

A library which borrows this thesis for use by its patrons is expected to secure the signature of each user.

This thesis by _____ has been used by the following persons, whose signatures attest their acceptance of the above restrictions.

NAME AND ADDRESS

DATE