CONTRIBUTIONS TO THE PREHISTORY OF SOUTHEASTERN UTAH

CULTURAL RESOURCE SERIES
No. 13
BUREAU OF LAND MANAGEMENT  
UTAH STATE OFFICE  
SALT LAKE CITY, UTAH

CULTURAL RESOURCES SERIES PUBLICATIONS  
PUBLISHED MONOGRAPHS

1. Richard A. Thompson. *A Stratified Random Sample of the Cultural Resources in the Canyonlands Section of the Moab District.* (1979) OUT OF PRINT


CONTRIBUTIONS TO THE PREHISTORY OF SOUTHEASTERN UTAH

A SUMMARY OF THE PREHISTORY OF SOUTHEASTERN UTAH
by
Paul R. Nickens

AN ARCHAEOLOGICAL SURVEY OF THE CENTRAL LISBON VALLEY STUDY TRACT IN THE MOAB DISTRICT, SAN JUAN COUNTY UTAH
by
Kevin D. Black
James M. Copeland
and
Steven M. Horvath, Jr.

With a contribution by
William A. Lucius

Assembled
by
Steven G. Baker

1982
Utah State Office
Bureau of Land Management

In cooperation with Centuries Research Inc.
FORWARD

The Bureau of Land Management has the responsibility to insure that public demand activities such as energy development pose no threat to the historic and prehistoric time record or the cultural resource base. The BLM recognizes the need for development of energy reserves as well as its responsibility to protect our country’s cultural heritage. In response to these responsibilities the BLM continues to pursue a program of cultural resource management studies in Utah.

This volume reports the results of a Class I, or existing records and literature overview, and a Class III, or one hundred percent ground inventory, of selected lands in southeastern Utah. These investigations were respectively completed in 1982 and 1981 by Centuries Research Inc. through contract with the BLM and through subcontract with Steven G. Baker, Consulting Archaeologist, of Montrose, Colorado. Steven G. Baker of Centuries Research compiled these two reports which present findings of these projects. I am pleased to present this, the thirteenth volume in Utah’s Cultural Resource Monograph Series titled “Contributions to the Prehistory of Southeastern Utah.”

Roland G. Robison
Utah State Director
ABSTRACT

Volume thirteen of this series includes two separate reports originally prepared for the BLM by Centuries Research Inc. and Steven G. Baker, Consulting Archaeologist.

SOUTH SAN JUAN PREHISTORY NARRATIVE

This report, herein titled “A Summary of the Prehistory of Southeastern Utah” was originally written as Volume II of a four volume report known as the “Cultural Resources Overview for BLM Lands in South San Juan County, Utah” edited by Anthony Klesert of Centuries Research. This volume of the report constitutes a detailed summary and literature review of only the prehistory of South San Juan County. The environmental, previous work and final synthesis sections are not included.

AN ARCHAEOLOGICAL SURVEY OF THE CENTRAL LISBON VALLEY STUDY TRACT IN THE MOAB DISTRICT, SAN JUAN COUNTY, UTAH

This report discusses the results of a Class III cultural resource inventory of 13,572 acres of the BLM managed Lisbon oil and gas field near LaSal, San Juan County, Utah. This project was completed by Steven G. Baker, Consulting Archaeologist with the assistance of Centuries Research Inc. The inventory yielded 547 archaeological sites and 290 isolated finds dating from the Paleo-Indian through Historic periods with most sites being open lithic scatters dating to the lengthy Archaic Period.

Richard E. Fike
Archaeologist & General Series Editor
and
Bruce Louthan
Moab District Archaeologist
INTRODUCTION TO THE VOLUME

The two reports in this volume derive from two substantial BLM sponsored cultural resource management projects completed in southeastern Utah between 1978 and 1982.

The first project is known as the Cultural Resources Overview for BLM Land in South San Juan County, Utah. This was undertaken by Centuries Research in 1978 according to provisions of BLM contract No. YA-512-CT8-189. The purpose of the project was to synthesize existing archaeological data for the BLM to use in its cultural resource management program in South San Juan County. In its original four volumes and several appendices this report summarized the state of our knowledge of the history and prehistory of southeastern Utah. The volume reprinted here was originally written by Paul Nickens but is actually only one volume of the four volume series compiled and edited by Anthony Klesert of Centuries, who was also an author as well as Principal Investigator for this work. The present volume, by Paul Nickens, was the second volume in the series and is a detailed narrative of the prehistory of the region based primarily upon past site specific archaeological studies. The other three volumes of this report are not reprinted here but are available in manuscript form from the BLM's Moab District Office. Volume I by Klesert and Nickens provides introductory background information relative to the natural environment and previous cultural resource studies in the area. Volume III by Kenneth Weber constitutes a detailed discussion of the Indian and EuroAmerican history of southeastern Utah. Volume IV by Anthony Klesert and Steven Horvath constitutes a synthesis of the main points of all the volumes and discusses options and recommendations on future resource management and research needs. The volume also contains a consolidated bibliography for the project area. Among the volumes deriving from the project, the volume by Nickens is quite straightforward and is believed to be particularly important as a baseline statement on the prehistoric resource base. As such it should be of immediate utility for both student and professional archaeologists working in southeastern Utah. In addition, the volume should have wide appeal for the lay reader of southwestern prehistory.

In contrast to the baseline summary of Nickens' paper, the second report printed here deals with a major field research project. This is entitled "An Archaeological Survey of the Central Lisbon Valley Study Tract in the Moab District, San Juan County, Utah" by Kevin Black, Jim Copeland and Steven Horvath. The study addresses, and makes good progress, in the archaeological interpretation of the ubiquitous lithic scatters of the extreme eastern Colorado Plateau north of the Anasazi Core area and its equally widespread ceramic sites. Most archaeological interest has, to date, been focused on the Anasazi or Fremont areas. There had thus been little progress in dealing with purely lithic components of the region. The completion of the 13,000 plus acre inventory of the Lisbon Valley Study area did provide a good and much needed opportunity to look more closely at the archaeology of the region's "common" and profuse lithic sites. The project was completed by Centuries Research Inc. under subcontract to Steven G. Baker, Consulting Archaeologist, of Montrose, Colorado. The BLM's contract No. for this project was YA-553-CT0-1026.
The survey was conducted in 1980 and discovered 547 archaeological sites and 290 isolated finds which are, for the most part, open lithic sites dating to the Archaic Period. Emphasis of the report is placed on interpretation of site function, cultural affiliation, chronological placement, site size, and the relationships of sites to topography, drainages and vegetation zones. While many of these are standard concerns, success in determining site function was quite good through application of a formal statistical methodology developed by the staff of Centuries Research in conjunction with the massive Mount Emmons Project in Colorado. This methodology allowed for the formal assignment of prehistoric sites to one of nine site types which in turn fall into one of two major site classes, namely; multiple activity sites and special activity sites. The end product is important due to the capability to formally type approximately 500 prehistoric sites on the basis of functions as well as the other generally more readily indentifiable attributes. Since completion of the original report, Jim Copeland of Centuries’ staff has continued statistical study of the Lisbon Valley data in order to develop a quantitative method of dating prehistoric archaeological sites without relying on the classical indices of ceramics and projectile points. Copeland’s M.A. thesis from Colorado State University will introduce this methodology in late 1982 and is rooted in the Lisbon Valley data. In essence, Copeland’s efforts allow for formal definition among Archaic, Anasazi, and late prehistoric sites without relying on ceramics or projectile points. This methodology should prove to be of major importance in terms of evaluating resources in basic CRM work as well as in furthering our scholarly understanding of the region’s prehistory.

The Lisbon Valley report has been published here in its entirety with the exception of Tables 4 and 5 which have been deleted due to budget constraints. These tables respectively listed and described all the recorded sites and isolated finds. They were, however simply too voluminous, at 67 pages, to justify publishing in this article. They were also rather dull reading! Some references to these tables will still be found in the text since it has not been altered. One dummy page with the first entries of each table has been inserted. Text pagination has been adjusted throughout.

Centuries is particularly pleased to work with the BLM in making these reports available in published form. In addition to the individual authors and staff of Centuries, BLM personnel Richard Fike and Bruce Louthan have been instrumental in helping us produce what are believed to be two very good reports.

Steven G. Baker, President
Centuries Research Inc.
A SUMMARY OF THE PREHISTORY OF SOUTHEASTERN UTAH

by
Paul R. Nickens

Montrose, Colorado

1982
CULTURAL RESOURCES OVERVIEW
FOR BLM LANDS IN SOUTH SAN JUAN COUNTY, UTAH

EDITED AND COMPILLED
BY
ANTHONY L. KLESEKT

VOLUME II
OF IV VOLUMES

PREHISTORIC CULTURAL NARRATIVE

By
Paul R. Nickens

Montrose, Colorado 81401

BLM Contract No. YA-512-CT8-189
June, 1982
CULTURAL RESOURCES OVERVIEW
FOR BLM LANDS IN SOUTH SAN JUAN COUNTY, UTAH

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  Chapter 1 - Abstract
  Chapter 2 - General Information
  Chapter 3 - Environmental Background
  Chapter 4 - Cultural Resource Investigation and Research Background

VOLUME II - PREHISTORIC CULTURAL NARRATIVE (Paul R. Nickens)
  Chapter 1 - General North American Cultural Development
  Chapter 2 - Prehistoric Cultural History of the Project Area
  Chapter 3 - Prehistoric Lifeways

VOLUME III - HISTORIC CULTURAL NARRATIVE (Kenneth R. Weber)
  Chapter 1 - Early Exploration
  Chapter 2 - Historical Aboriginal Populations
  Chapter 3 - Settlement and Socio-Economic History, 1870-1940
  Chapter 4 - Anglo-Indian Affairs, 1870-1940
  Chapter 5 - Recent Socio-Economic History and Demography
  Chapter 6 - Federal Government Activity and Recent Historical Research in the Project Area

VOLUME IV - SYNTHESIS AND FUTURE DIRECTIONS (Anthony L. Klesert and Steven M. Horvath)
  Chapter 1 - Cultural Resource Synthesis
  Chapter 2 - Future Management Options and Research Directions
  Chapter 3 - Consolidated Bibliography

CULTURAL RESOURCE MANAGEMENT SUMMARY (Independent Volume by Anthony L. Klesert)

Appendix 1 - Form NTIS 35

Appendix 2 - Past Research Project Summary Sheets (bound separately)

Appendix 3 - Narrative of Known Cultural Resource Site Record Compilation and Site Summary Table (bound separately)

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Appendix 5 - Original copy of all maps (site location, sensitivity zones, and project locations)
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PREFACE

This report by Paul Nickens is Volume II of a four volume report entitled "Cultural Resources Overview for BLM Lands in South San Juan County, Utah." The report has been completed in partial satisfaction of Contract No. YA-512-CT8-189 between Centuries Research, Inc. and the Bureau of Land Management. The purpose of the report is to provide a synthesis of existing archaeological data for the BLM to use in its cultural resource management program in South San Juan County, Utah. In essence, the report synthesizes the history and pre-history of Southeastern Utah and provides recommendations for management of the known cultural resources of the area.

In Volume I Klesert and Nickens provide introductory background information relative to the natural environment and previous cultural resource studies in the area. The present Volume, No. II by Paul Nickens, is a detailed narrative of the prehistory of the region based primarily upon past site specific archaeological studies. Volume III by Kenneth Weber is a detailed discussion of the Indian and Euro-American history of the project area. However, in Dr. Weber's report, information derived from analysis of actual cultural resources, such as historic archaeological sites, is minimal since few such data exist. Thus Weber had to rely on more traditional ethno-historical data for his report. In rural southeastern Utah, historic archaeological sites include Euro-American homesteads and ranches, and the remains from the extractive mining industries. Dr. Weber's report provides an elementary framework from which to generate models which can be used to identify and evaluate such historic cultural resources. Historical archaeology should benefit immensely from Dr. Weber's work and become a more conspicuous concern in Southeastern Utah. Volume No. IV by Anthony Klesert and Steven Horvath is a synthesis of the main points of discussion raised by Nickens and Weber together with a discussion of options and recommendations on future resource management and associated research needs. This volume also contains a consolidated bibliography relative to the study area. A final independent volume by Anthony Klesert contains a cultural resource management summary.

Centuries Research is particularly proud to have had the opportunity to assume responsibility for this important project. If, as we believe, we have done our job well, this report should become a major document in the cultural resource literature of Utah and the Southwest culture area. In addition to the efforts of Centuries' project principals Klesert, Nickens, and Weber, the assistance of Bruce Louthan and Richard Fike, archaeologists for the Utah BLM, is gratefully acknowledged. The cooperation of BLM contracting officers John Hunt, Dan Sedlock, and Dick Cazier has also been important in completing this project. Drs. Klesert and Horvath of Centuries are due special recognition for assuming Dr. Nickens' responsibilities in mid-stream and seeing that this report and other project elements were finished in a
timely and professional manner. Many other agencies and individuals provided assistance at some point in the course of the project. Therefore, it is with sincere appreciation that I convey the thanks of Centuries Research to all who have contributed to this project.

Steven G. Baker, President
CENTURIES RESEARCH, INC.
Montrose, Colorado

April 15, 1982
ABSTRACT

Volume II provides a detailed account of the prehistoric and protohistoric aboriginal occupants of the project area, from earliest Paleo-Indian remains to the Shoshonean and Athabaskan traditions. While the region was sparsely occupied as early as 11,500 B.P., the major occupation occurred from about 1 A.D. to 1300 A.D., encompassing the expansion and decline of the local Anasazi tradition. The region represents a geographic and cultural mix between the Kayenta and Northern San Juan branches of the Anasazi, although phase systems developed for the latter are most commonly applied. A general explication of phase systems from adjacent regions is provided. In addition to discussing time-space systematics for all phases of native exploitation, general Anasazi lifeways are also described in depth. These include discussions of material culture, subsistence patterns, political and religious organization, physical anthropological aspects, and a discussion of the Anasazi abandonment. While this volume emphasizes external factors in the Anasazi abandonment of the region, Volume IV of this series offers an alternative explanation which emphasizes internal factors.
INTRODUCTION

The inception, growth, and decline of prehistoric cultural groups in southeastern Utah is reflected in the thousands of archaeological sites which have been formally recorded in the area, as well as in many times more which await recordation. Literally dozens of separate archaeological investigations have been conducted into the vestiges of these early social groupings. For the purposes of our discussion, we can define two primary objectives of this earlier scientific work. First, archaeologists have been greatly concerned with defining and explaining geographic and temporal variations which accompanied the prehistoric occupation of southeastern Utah. This quest is by no means limited to this area and, as we shall see later, the cultural sequence which has been defined for the project area cannot be properly understood without reference to the general New World situation and cultural units and their development in adjoining regions.

A second commonly pursued objective of archaeologists is the elucidation of past lifeways. Simply put, we are interested in employing the archaeological record to identify the modes by which prehistoric cultural units sought to maintain their way of life. These mechanisms include such factors as technology, subsistence, settlement patterns, and social, political, and religious systems. In small group cultures, such as those once found in southeastern Utah, these systems were generally interwoven and geared to a primary goal—the survival of the social unit. The accrued data pertaining to these two objectives form the basis for the following sections. It may be stated at this point, however, that we would be remiss if we did not place these data in their proper context. Past cultural developments in a given geographic area cannot be completely understood without reference to external environmental and cultural situations and the diachronic changes which might occur in either case. Abiotic and biotic environmental conditions in the study area have been outlined in Volume I, including evidences for paleo-environmental change. Some of these external influences, either natural or cultural, are presented in the following discussion.
As noted above, it is difficult to place cultural developments in southeastern Utah in proper perspective without reference to broad, recognizable patterns of cultural development in the prehistoric New World, and, more specifically, in North America. Most archaeologists subscribe to a series of general stages of prehistoric cultural development offered by Willey and Phillips (1958). In this sequence, which extends from the first arrival of Homo sapiens sapiens in the New World to historic contacts, Willey and Phillips defined five stages: Lithic, Archaic, Formative, Classic, and Postclassic. Of these stages, only the first three occur in North America, the last two being restricted geographically to Central and South America. It should be added that the three stages recognized for cultural developments in North America did not occur simultaneously throughout the entire continent. There is, however, evidence for cultural groups belonging to all three stages in the present project area.

In concise format, Willey and Phillips (1958:200-204) define the Lithic, Archaic, and Formative stages in the following manner. The Lithic stage began with the initial peopling of the New World from the Old World, a migration or series of population movements across the Bering Strait which joins present-day Alaska and Siberia. This development, also termed the Paleo-Indian or big game hunting stage, was characterized by chipped-stone and bone tools and weapons, and was associated with the late glacial environments of the Pleistocene and the early postglacial situation. Lithic stage cultural remains are often found with skeletal materials of extinct megafauna. In a recent review of the archaeological record for this stage, MacNeish (1976) has concluded that human occupation of the New World may have begun some 70,000 ± 30,000 B.P. in North America. (Dates listed herein prior to the Christian era are given in Before Present, or radiocarbon years. The present in this case is determined to be 1950 A.D. Dates from the last 2000 years will be given as A.D. dates.) For our purposes, the Paleo-Indian complexes of North America dating to the terminal Pleistocene (ca. 11,000 - 7,000 B.P.) represent the earliest apparent occupation of the region surrounding southeastern Utah; the evidence for these cultural developments in the project area will be discussed below.

The succeeding Archaic stage was characterized by a continuation of hunting and gathering cultures into environmental conditions similar to those of the present. Like the Lithic stage, the Archaic was apparently a continent-wide cultural development but it differed in the subsistence pattern being geared toward a diffuse exploitation of the smaller and more varied post-Pleistocene fauna and many floral species.

The widespread and successful Archaic lifeway persisted until new cultural developments—domesticated plants, pottery, and sedentary village life—spread northward from Mexico and marked the initiation of the Formative stage. Thus the interface between the Archaic and Formative stages represents a profound change in North American cultural
development, a fundamental economic shift from hunting and gathering to agricultural food production. In the American Southwest, the arrival of these traits occurred by 2300 B.P. and, in time, three major regional traditions became recognizable, culturally and geographically. These traditions were the Hohokam, Mogollon, and Anasazi. The Anasazi tradition was responsible for the majority of prehistoric cultural resource sites being recorded in southeastern Utah today. In subsequent paragraphs data relating to the presence and characteristics of the various earlier cultural units in the project area are presented along with observations on the local relationships of the various expressions of the stages to each other and to adjacent areas.

PALEO-INDIAN STAGE

The designation "Paleo-Indian" stage (or Lithic stage of Willey and Phillips) is a cultural term applied to the earliest definable human occupants of the region including the South San Juan project area. The later part of this New World cultural development can be subdivided into three cultural units or complexes: Llano, Folsom, and Plano (cf. Jennings 1974; Schroedl 1977b). It has been common in the past to define each of these complexes on the basis of distinctive projectile points attributed to each, and by the primary animal(s) hunted. Additionally, although overlapping occurs, it is generally possible to place the complexes into a temporal ordering with the Llano complex being the earliest, followed by Folsom, and ending with the Plano cultures.

Thus the first of these complexes, the Llano, was characterized by the manufacture and use of the Clovis point, a unique, fluted, lanceolate point averaging 3 to 6 inches in length (Figure 1c). Although other late Pleistocene fauna have been found in association with Clovis points, the mammoth (Mammuthus sp.) appears to have been the primary prey for these groups. As a result of several radiocarbon determinations throughout the Southwest, it is estimated that the Llano complex of the Paleo-Indian stage dates between 11,500 and 11,000 B.P.

Sites and other items associated with the Folsom complex (ca. 11,000-9,000 B.P.) are more numerous than Llano sites and have a wider distribution throughout North America. The distinctive projectile point of this complex was the Folsom point (Figure 1a), also lanceolate in form and made with delicate, pressure-flaked retouch. The points were thinned by the removal on each face of a long, thin flake. Animal remains found associated with Folsom points are those of large-horned extinct bison, usually Bison antiquus.

The third and terminal Paleo-Indian subdivision was the Plano complex which has been dated to the period 9,000-7,000 B.P. This complex is identified by a number of projectile point types which have considerable variation in form and geographic distribution. Plano points are generally lanceolate-shaped, unfluted, and exhibit fine pressure-flaked flintwork. Typically, Plano complex points and other tools are discovered with early postglacial modern fauna, such as bison or antelope.
Figure 1: Paleo-Indian projectile points of the Clovis and Folsom complexes: a) Folsom point drawn from Denver Museum of Natural History cast; b) Folsom point fragment found on Lime Ridge, San Juan County, Utah, in 1978; c) Clovis point drawn from Denver Museum of Natural History cast; d) Clovis point found in Oak Creek Canyon, San Juan County, Utah (after Lindsay 1976).
Aside from temporal changes in projectile point manufacture and big game preference, there are certain cultural characteristics which typify all of the Paleo-Indian complexes. Groups in each period appear to have oriented their subsistence patterns toward the larger, migratory faunal forms. One aspect of Paleo-Indian subsistence orientation we should not overlook, however, is a probable partial dependence on smaller animal species and many varieties of edible floral species available in the environmental settings occupied by these groups. In the archaeological context, difficulties of preservation and the transitory, nonsedentary lifestyle of the Paleo-Indians undoubtedly mask the overall importance of these food items in the economy.

In a general vein, socio-economic structure of the Paleo-Indians consists of completely nomadic small groups, or bands, which were involved in year-around exploitative activities. Behavioral data relating to these groups are inferential and usually scant in the archaeological record. Wendorf and Hester (1962) have provided a comparative analysis of the known information and have observed that Paleo-Indian sites fall into one of two categories: camp-sites and kill sites. Campsites frequently occur on ridges or dunes, and the remains include hearths; broken, split, and charred food bones; flint knapping debris; and a wide range of stone tools (fluted or unfluted points, hammerstones, several varieties of scrapers, and utilized flakes). Kill sites, on the other hand, are found near the banks of former lakes or streams, or at the base of a cliff where animals were stampeded to their death. Kill site debris are usually restricted to animal skeletal materials and tools, including points of the various complexes, which were utilized in the killing and butchering processes. In the majority of the cases, the kill sites contain multiple killings, but they can range all the way from one animal to two-hundred. Site situations for both types of Paleo-Indian activities appear to be dictated by proximity to primary economic resources, and by a need for observation of game.

There are presently only hints for the existence of each of the Paleo-Indian complexes in southeastern Utah and adjoining areas. However, there is enough evidence accrued to indicate the area was at least sporadically utilized by these groups. Basically, there are two topics which require examination regarding this problem: 1) the presence of late Pleistocene game species preferred by the hunters must be established, and 2) the physical cultural evidence.

It now seems apparent that several species of Pleistocene and post-glacial fauna probably roamed the Colorado Plateau. Madsen et al. (1976) have briefly reviewed the evidence for the presence of late Pleistocene mammoths in Utah. They feel that an appropriate resource base was available to the Paleo-Indian big game hunters, probably centered near lake margins or in marsh or riverine environments. At the time of their review, some 19 separate instances of mammoth remains had been recorded in Utah. Further evidence for the presence of game animals the Paleo-Indians are known to have relied on has come from two rockshelters in Wayne County, Utah, about 75 miles northwest of the South San Juan project area. These adjacent sites, designated Cowboy
Cave and Jim Walters Cave, were partially excavated in 1975 by the University of Utah (Jennings 1975). In the lowest level of the caves was a 30 to 40 cm thick layer of dung which has been identified as predominantly bison along with dung of ground sloth, elephant, horse and possibly elk and camel (Schroedl 1976a). Also found within this layer was a juvenile bison mandible (with abrasion patterns somewhat suggestive of human use), bison guard hairs, and mammoth tusk fragments. Dung from the layer at Cowboy Cave has been radiocarbon dated to 11,810 ± 840 B.P.

Along with the undisputed presence of early megafauna, there are limited but definite reported surface finds of projectile points which have been attributed to each of the three Paleo-Indian complexes (Figure 2). To date, however, no finds have been made of a concrete association between Paleo-Indian points and extinct forms of fauna in the vicinity of southeastern Utah. A Clovis point was found in Oak Creek Canyon, San Juan County, and reported by Lindsay (1976) (Figure ld). A second Clovis point has been noted just south of the Utah-Arizona stateline in Navajo County (Agenbroad 1967), and a more recent Clovis discovery occurred along Bullhorn Wash near Lisbon Valley, in northeastern San Juan County (Black and Copeland 1981). A fragmentary Folsom point (Figure 1b) was recovered in 1977 on Lime Ridge about two miles northwest of the confluence of Comb Wash and the San Juan River (Bruce D. Louthan, 1978 personal communication). On the Dark Canyon Plateau, immediately north of the present project area, Sharrock and Keane (1962) have described a fragmentary Folsom point from Sweet Alice Springs and Folsom points have been reported from the Moab, Utah vicinity (Hunt and Tanner 1960).

Unfluted Plano points also have been reported from the region. Hunt (1953:24) reported on a Angostura-like projectile point from the La Sal Mountains east of Moab, Utah and Hicks (1975:44) has noted four Plano complex points from the vicinity of Hovenweep National Monument. Tentative classifications of the Hovenweep points include a complete Gypsum Cave point (an Archaic point), and fragments of a possible Scottsbluff I or Eden point, a possible Plainview point, and a possible Agate Basin or Angostura point. A little farther east, Hayes (1964:88) recovered a Plano point of the Milnesand type during an archaeological inventory in Mesa Verde National Park.

Thus a combination of faunal and cultural evidence suggests that big game hunters of the Paleo-Indian complex occupied the Colorado Plateau and, more specifically, southeastern Utah. Based on the evidence at hand, it may be inferred that this occupation was somewhat more limited and sporadic than contemporaneous developments in neighboring regions such as the Southwest and the Great Plains east of the Rockies. Whether or not this occupation was continuous and stable over the span of several millenia cannot be stated for certain. Irwin-Williams and Haynes (1970) have presented a model for explaining early population change and movement in relationship to climatic fluctuations. Their reconstruction is based on large-scale environmental and cultural patterning; nonetheless, the model can be scaled-down to a specific area such as southeastern Utah to provide a possible background for defining Paleo-Indian culture change (Figure 3).
Figure 2: Distribution of Paleo-Indian complex finds in southeastern Utah: 1) Clovis-Oak Creek Canyon (Lindsay 1976); 2) Clovis-Bullhorn Wash (Black and Copeland 1981); 3) Folsom-Lime Ridge; 4) Folsom-Sweet Alice Spring (Sharrock and Keane 1962); 5) Folsom-Moab area (Hunt and Tanner 1960); 6) Plano-LaSal Mountains (Hunt 1953); 7) Plano-Hovenweep National Monument (Hicks 1975).
Figure 3: Suggested Paleo-Indian and Early Archaic cultural distribution and spread at several points of time.
Pattern A: Plains-based Paleo-Indian;
Pattern B: Western-based Archaic cultures;
Pattern C: Southern-based Archaic cultures;
Pattern D: Great Basin Archaic cultures
(after Irwin-Williams and Haynes 1970: Figs. 2-4).
According to this model, the mammoth-oriented llano groups represent a relatively short-lived adaptation to a late-Pleistocene environment marked by more effective moisture than the present. This environmental context was capable of supporting important economic species such as the mammoth, bison, sloth, horse, and camel. By 11,000 B.P., a shift towards less effective moisture conditions was occurring with the end result being the drastic decline or extinction of the mammoth and other members of the faunal species hunted by the Clovis groups. Apparently, conditions following this period saw a return to a moister climate, one which was very favorable to large herds of now-extinct forms of bison. This situation coincides with the Folsom complex which, as of 10,500 B.P., ranged eastern Utah and Arizona, and Colorado and New Mexico. By 9,000 B.P., a drier period had forced the Paleo-Indian hunters eastward toward the Great Plains, leaving southeastern Utah abandoned. The Great Basin Archaic groups now occupied all of Utah north of the Colorado River, and the western-based Archaic cultures were spreading toward the Four-Corners area from the extreme southwestern portion of the southwestern United States. Irwin-Williams and Haynes (1970) see another period of increased moisture beginning about 8700 B.P. which, by 8500 B.P., was reflected by a concomitant westward movement of the Plano complex groups to near the present Utah-Colorado line. This population movement correlates well with the reported distribution of Plano points in the Mesa Verde-Hovenweep area and the La Sal Mountains. By this time, the western-based Archaic cultures occupied much of the southern Colorado Plateau, including the South San Juan project area; the Great Basin Archaic groups persisted on the northern Colorado Plateau.

In summary of the Paleo-Indian stage, then, we see an initial occupation of southeastern Utah by the Llano hunters sometime around 11,500 B.P. Changing environmental conditions may have ushered in the Folsom complex shortly thereafter; however, by the end of the Folsom period, the Paleo-Indian big game hunters seem to have withdrawn to the east, again in response to fluctuating environmental situations. By 8500 B.P., the southeastern Colorado Plateau had been occupied by Plano hunters who may have co-existed with Archaic cultures in the region of southeastern Utah. It cannot be stated with certainty when the last Paleo-Indian hunters were found in southeastern Utah. The evidence suggests that the Archaic lifeway, characterized by a wider flexibility in resource-oriented subsistence patterns, was dominant in the Four Corners area by at least 7500 B.P.
ARCHAIC STAGE

The Archaic way of life which followed the decline of the Paleo-Indian big game hunters is viewed by most investigators as a cultural adaptation to the postglacial environmental settings found throughout North America subsequent to the end of the Pleistocene Epoch. In many regions human groups could no longer depend on the large herds of migratory game animals which, except on the Great Plains, had been replaced by smaller, more solitary animals such as deer. To be successful in terms of subsistence economy during this period required a less specialized and more diffuse pattern of exploitation geared toward the use of several species in the ecosystem and the versatility to utilize various resources from season to season.

In the eastern United States this situation called for adaptation to the moist woodlands and in the midlands to grasslands and river systems. In the West and Southwest, however, the Archaic lifestyle necessitated adaptation to highly variable conditions of aridity and often sparse biotic resources. There were, of course, certain parts of the West, one example being the Colorado Plateau, where resources were found in more abundance when compared to regions such as the Great Basin.

Relationship to the Paleo-Indian Stage

The origins of the Archaic stage and its relationship to the preceding Paleo-Indian groups are not completely understood and there is little evidence for direct development from one stage to the other. There are, in fact, good data available to indicate that the two stages co-existed as far back as 10,000 B.P., perhaps earlier in some areas of the West (Jennings 1974). One of the clearest examples of this situation is the Great Basin where Jennings (1957) has posited the existence of a widespread uniform Archaic tradition, known as the Desert Culture, which was found throughout nearly all of the western United States. Based on his work in the Great Basin, Jennings (various) sees the origins of the Desert Culture occurring as far back as 10,000 B.P., well within the projected ages for the Paleo-Indian Folsom and Plano complexes.

A primary theme of Jennings' Desert Culture tradition was a cultural adaptation to environmental conditions which, although marked by minor oscillations, have remained nearly constant over the past 10,000 years in the Great Basin. It should be noted that an alternative model has been offered (cf. Swanson 1966, Butler 1968) which suggests that both the marked aridity of the Great Basin and the corresponding advent of the Desert Culture are more recent developments. In this model, the Desert Culture is seen as an adaptation to a distinct climatic change (toward desiccation) beginning about 7000 B.P. which corresponds with Antevs' (1955) altithermal climatic period. According to Swanson (1966), the Desert Culture developed out of an older big game hunting tradition in response to this period of aridity in the Great Basin.
Whatever the derivation and time depth associated with the Desert Culture, the original definition of this tradition has become synonymous with the western expression of the North American Archaic pattern. It is perhaps best viewed at the synthetic level (Irwin-Williams 1967:444-445; Jennings 1978:29) as a way of life adapted toward general climatic conditions of aridity found in the western United States. As we shall see in succeeding paragraphs, it has become possible to delineate localized and regional expressions within this general concept, including several in southeastern Utah.

Definition of the Desert Culture

The Desert Culture concept, or Western Archaic pattern, includes many characteristics that are common throughout the West as well as to comparable cultures in the eastern United States. Many of the basic traits are even common to world-wide cultural patterns found among prehistoric and ethnographic cultures engaged in a hunting and gathering way of life. Further, elements of this lifeway persisted into the 1800s in some places in the western United States. Thus it will be of benefit here to briefly define this general pattern of Archaic existence in that the concept represents an important part of the culture history in the South San Juan project area and surrounding regions.

As noted previously, Jesse D. Jennings has produced the most comprehensive and definitive contributions to the delineation of the Desert Culture and his various publications form the basis for the following descriptions. Readers interested in extended discussions of this concept should consult Jennings (1956, 1957, 1964, 1978).

Generally speaking, the Desert Culture is seen as oriented toward the exploitation of many animal and plant species, as opposed to the earlier Paleo-Indian concentration only upon big game animals. This hunting and gathering pattern was characterized by many techniques—hunting, trapping, and snaring of birds, insects, deer, antelope, mountain sheep, rabbits, and other animals; and exploitation of available plants: seeds from plants and grasses, lily bulbs, nuts, roots, and berries.

Given the environmental and hence available resources constraints found throughout the region, it is assumed that the food quest must have been nearly continuous throughout the year. Small groups of people, perhaps 25 to 50 kin-related individuals, were probably moving from place to place within a definable territory in response to the growth and maturing of certain plants and/or wild animal populations. Caves and overhangs appear to have been favored for base camps, especially in the winter time. However, although the majority of our data come from caves or overhangs where preservation is best, we should not overlook the fact that much time was probably spent at seasonal specialized activity camps located in the open. From the ethnographic literature, we also see that several groups might be able to congregate in the area of an especially "rich" temporary food resource for a short time period. During such occasions social interaction, including visiting, marriages, and the forming of alliances, would have been possible between groups.
As expected, the technological aspects of the Desert Culture was geared toward a tool kit specialized for tasks associated with the food quest. Nonetheless, the diagnostic artifacts of this stage are extensive and include: basketry (twined basketry generally predominant) and cordage; fur cloth; woven sandals; the atlatl (or spear-throwing device) and dart; a wide variety of small projectile points; chipped-stone knives; flat and basin milllingstones and the one-handed grinding stone; digging stick; wooden clubs; tubular pipes; use of Oliva sp. and Olivella sp. shells from California for beads; firedrill and hearth; and a variety of bone and antler tools.

In brief, then, the Desert Culture concept provided a useful and unifying scheme for expressing the overall pattern of the Archaic groups of the western United States. Soon after the definition was outlined, however, it was apparent that discrete regional trait clusters defining subareas within the larger Desert Culture area could be delineated. These regional or subareal variations adhere to the general definition of the Desert Cultures, but they each possess distinctive culture traits and developmental sequences which serve to distinguish them from other regional variants.

Archaic Development in the Project Area

One of these regional variants of the Desert Culture, which includes the area of southeastern Utah, was identified by Irwin-Williams (1967, 1968) as the "Picosa" or "Elementary Southwestern Culture." The Picosa was defined as a continuum of similar closely related preceramic cultures existing in the southwestern United States, going back to 5000 B.P. but resulting from a cultural synthesis of uniform developments originating as early as 10,000 B.P. Irwin-Williams further posited that the Picosa substrate served as the progenitor for most of the Formative stage cultures in the Southwest. Jennings (1974:154, 1978:29) believes that the Picosa development does represent a "regional variation of the overall Desert Culture" (see Martin and Plog, 1973:79-80, for an alternative point of view).

In her early definition of the Picosa, Irwin-Williams (1967) considered the development to share many elements of economy and cultural traits with contemporary cultures of the Great Basin; however, detailed traits and culture-history were seen as being sufficient to define a spatially recognizable entity for the Southwest. The Picosa was subdivided into three broad spatial dimensions: the Southern, Western, and Northern sectors. The latter sector includes southeastern Utah as well as the rest of the Four Corners region and central Colorado (Figure 4). Employing then admittedly scant data, she posited two major periods of development for the Picosa: 1) an early period from about 5000 to 3000 B.P.; and 2) a late period from 3000-1950 B.P. Aside from artifactual typology differences, an important feature which separates the Picosa from the Great Basin Archaic groups, is an early presence and importance of horticulture (ca. 4000 B.P.). This early presence of domesticated plants in the Archaic diet was undoubtedly limited, but its significance to the Archaic lifestyle was great in that it 1) somewhat restricted annual movement, and 2) created the potential for further sedentism.
Figure 4: Distribution of Archaic cultural patterns in the Southwest and Great Basin, about 4050 B.P. (after Irwin-Williams 1967: Fig. 2).
Several groupings of artifactual materials from southeastern Utah and adjoining areas were believed to fit into the northern sector of this continuum, although, it must be noted, none of these data are very extensive, many consisting solely of limited surface finds. In southeastern Utah, these manifestations include: 1) the Aneth complex (Mohr and Sample 1959); 2) the Montezuma Creek complex (Botelho 1955); and 3) the Moab and LaSal complexes (Hunt and Tanner 1960). Additionally, a similar manifestation, the Uncompahgre complex, was defined from western Colorado, which probably extends into southeastern Utah (Wormington and Lister 1956). As the situation now stands, each of these "complexes" is based on scant and/or ill-defined information such that more precise data is necessary in each case before cultural affiliation(s) can be defined.

Fortunately, investigations and synthetic statements regarding the Archaic stage on the Colorado Plateau have continued to proliferate to the point that better defined regional variants are becoming recognizable. It will, however, require much more data, particularly from excavated contexts, before this period is fully defined. Briefly listed, these recent contributions include: 1) Cynthia Irwin-Williams' (1973) definition of the Oshara Tradition which presents a continuum from Archaic groups into the Formative Anasazi Pueblo groups for the southern Colorado Plateau; 2) a definition of the Archaic period for the northern Colorado Plateau by Schroedl (1976a) which he believes may have included the progenitors of the Fremont agriculturalists in that area; and 3) the limited definition of the Desha Complex in southeastern Utah (Lindsay et al. 1968). Although each of these cultural schemes is in need of additional supportive data, they do represent significant improvements over earlier reconstructions in that each is based on limited excavated information, often found in conjunction with datable materials. Each of these manifestations and its relationship to the Archaic of the South San Juan project area is briefly discussed below.

The Oshara Tradition

The Oshara Tradition concept represents a refinement of the Archaic/Formative continuum in the Northern Sector of the Pecosan Culture resulting from the work of Irwin-Williams in the Arroyo Cuervo region of northwestern New Mexico (Irwin-Williams 1973). As such, it is an important contribution, yet much investigation remains to be done before the sequence can be considered to be valid for the entire northern Southwest. Nonetheless, there are several important aspects of the Oshara formulation which should be approached as testable hypotheses. These include the delineation of a phase system for the Archaic stage on the southern Colorado Plateau and a preliminary discussion of the sequence and mechanisms related to the development of sedentary, horticultural-based aboriginal societies from an Archaic substratum.

In the Arroyo Cuervo region, the earliest inhabitants were the Paleo-Indian big game hunters including the Llano, Folsom, and Plano complexes. Paleobotanical and geological research suggest a climatic change toward decreasing effective moisture which led to the withdrawal of these groups from this area by about 7500 B.P.
In the earliest Archaic phases of the Oshara Tradition (Jay, 7450-6750 B.P. and Bajada, 6750-5250 B.P.), the subsistence pattern was based on extensive mixed foraging and hunting, employing a wide but not total range of locally available flora and fauna. The basic social unit was the small nomadic band who carried out these activities in a relatively unstructured continuing seasonal movement. Importantly, the technology and tool types of the early Archaic differ greatly from the preceding Paleo-Indian stage and Irwin-Williams (1973) sees no generic connection between them. Rather, the tool assemblages of the Jay and Bajada phases appear to be related to the western-based Archaic cultures in California and western Arizona.

Following the Bajada phase, a period of increased effective moisture began, accompanied by a new cultural phase, termed San Jose (5250-3950 B.P.). This phase witnessed changes in food processing and settlement patterns which permitted more intensive and efficient use of natural resources. These changes were coupled with a regional population increase but not much alteration in the basic social or economic structure.

Next, the Armijo phase (3750-2750 B.P.) shows the introduction of limited maize horticulture which made possible a small seasonal surplus, and permitted a seasonal pattern of population aggregation in the fall or fall-winter to develop. This new resource initially contributed more toward increased complexity in social-ceremonial interaction than to the economic pattern.

In the succeeding En Medio phase (2750 B.P.-400 A.D.) and final phases of the Oshara Tradition (Trujillo, 400-600 A.D., Sky Village, 600-700 A.D., Loma Alta, 700-850 A.D.) the full transition to sedentary, agriculturally dependent communities was initiated; these data will be discussed in the Formative Stage section.

The importance of the Archaic phases of the Oshara Tradition in northwestern New Mexico to southeastern Utah lies in the similarities between artifact assemblages between the two areas. Irwin-Williams (1973) places the Moab complex (Hunt and Tanner 1960) into the Jay, Bajada, and San Jose phases, and the Aneth complex (Mohr and Sample 1959) with the Bajada, San Jose, and Armijo phases of the Oshara sequence. More recently, surface finds in the Hovenweep area have been related to the San Jose, Armijo, and early En Medio Archaic phases (Hicks 1975). Here, Winter and his colleagues (1975) have recorded 28 Archaic sites which cluster on ridges around canyon heads and springs where faunal resources have apparently congregated. As a result of a number of small-scale archaeological surveys conducted in the South San Juan project area, Lucius et al. (1978) have recovered a series of projectile points which include examples from each of the Archaic phases of the Oshara Tradition. This series of surface collected points also includes types affiliated with the Western Archaic in age and some Great Basin Archaic points such as San Rafael side-notched, Rose Spring, and Gypsum types (Lucius et al.:73-78). Projectile point types of Archaic age from southeastern Utah are shown in Figure 5.
Figure 5: Archaic projectile points from southeastern Utah.
Top Row: Desha Complex (after Lindsay et al. 1968: Figs. 23 & 25;)
Middle Row: Moab and La Sal Complexes (after Hunt and Tanner 1960: Figs. 4 & 5;)
Bottom Row: Oshara Tradition (after Lucius et al. 1978: Figs. 1 & 2).
Northern Colorado Plateau Archaic

Based on recent excavations by the University of Utah, Schroedl (1976a) has described what he calls a Northern Colorado Plateau Archaic complex comprised of four sequent phases: Black Knoll (8300-6200 B.P.), Castle Valley (6200-4500 B.P.), Green River (4500-3300 B.P.), and Dirty Devil (3300-1500 B.P.). Along with Irwin-Williams (1973), Schroedl does not have evidence for continuity between the Paleo-Indian stage and the early Archaic, although he does not completely discount the possibility (1976a:55). At the other end of the cultural continuum, Schroedl, based on artifact assemblage comparisons, suggests that the roots of the Formative stage Fremont culture may well be found in the terminal Archaic stage on the northern Colorado Plateau. Not surprisingly the Archaic of the northern Plateau shows affinities to the Plains and the eastern and southern Great Basin, causing Schroedl to note "the Archaic in those sections south of the Colorado River (which includes the South San Juan project area) appears to be distinctly different from the Archaic in the northern sections of the Plateau (1976a:4)."

There are, however, some indications that Schroedl's northern Plateau Archaic may have had some cultural linkages to the south. Artifacts from Cowboy Cave, a northern Colorado Plateau Archaic site, show affiliations with the Great Basin, but also show rather close affinities with the Desha Complex (discussed below) which is located south of the Colorado River near Navajo Mountain in extreme southeastern Utah (Jennings 1978:93). Based on the presence and distribution of a unique late Archaic artifact, the split-twig figurine, there appears to be evidence that the Colorado River and its tributaries may have served as a cultural avenue for certain Archaic traits. Schroedl (1977a) has hypothesized, on the basis of radiocarbon dates and projectile point types, that this artifact complex originated in the Upper Grand Canyon in Arizona (ca. 4000 B.P.), and subsequently spread northward along the Colorado River to the northern Plateau where they have been dated to a period 2100-1500 B.P.

The Desha Complex

An Archaic manifestation, labeled the Desha Complex, has been defined on the basis of excavation of two caves, Sand Dune and Dust Devil, located near Navajo Mountain in southeastern Utah (Lindsay et al. 1968). The complex has been securely radiocarbon dated between 7000 and 8000 B.P. The artifact assemblage included sandals, matting, coiled basketry, shallow basin millingstones, one-hand manos, projectile points, and a variety of chipped stone and bone tools. Based on artifact classes and faunal remains, the subsistence pattern was one of primary dependence on wild plant foods, especially grasses, and small game, with large game only occasionally utilized. Cultural affinities appear to be strongest to the Great Basin, but there are possible resemblances to the east, particularly the Uncompahgre Plateau area (Uncompahgre and La Sal complexes). Artifacts similar to those of the Desha Complex have been recorded at sites in the Glen Canyon area (Lipe 1960; Sharrock et al. 1963), and, as previously noted, farther north at
Cowboy Cave. A precise delineation of the Desha Complex and its cultural affinities awaits further investigation; however, the limited data thus far available again point to the Colorado River as an avenue for the spread of certain Archaic traits.

Summary

The resulting picture of Archaic development and utilization of the South San Juan project area and adjoining regions is a complex one. One aspect clearly evident from the literature is a relatively extensive utilization of the entire Colorado Plateau. It would seem that southeastern Utah south of the Colorado River shows strongest affinities to the Southwestern developments (Picosa/Oshara) while areas to the north and west are more closely related to the Great Basin situation. Based on geography, this distribution is not entirely arbitrary as the Colorado River could have been both a physical and cultural boundary during Archaic times. Whether the river served as an "avenue" or as a "barrier," or both, needs to be investigated more fully. The salient point remains, however, that all of these areal developments represent what has been designated as a Desert Culture lifestyle, one involved with an intensive exploitation of natural resources, whatever the local setting. In terms of the transition to the subsequent cultural stage, trends established in the late Archaic generally continue, particularly in the Southwest, including horticulture and incipient sedentism. Other traits, such as the bow and arrow and ceramics, will combine with these to result in a series of Formative stage cultures which entirely supplanted the Archaic populations in southeastern Utah and adjoining areas.
THE FORMATIVE STAGE

General

Willey and Phillips (1958:146) provided a basic definition of the Formative stage based on "the presence of agriculture, or any other subsistence economy of comparable effectiveness, and by the successful integration of such an economy into well-established sedentary village life." As it applies to the prehistoric Southwestern culture area, this stage specifically includes the diffusion of certain domesticated plants, the most important being maize, beans, and squash, from Mexico to an area occupied by various regional manifestations of the Archaic Desert Culture. The processes underlying the transition from hunting and collecting groups into food producing communities are not well understood and, indeed, have only begun to come to light as investigators have expanded our knowledge of late Archaic adaptations. One attempt to treat this transition is the previously discussed Oshara Tradition concept of northwestern New Mexico.

The onset of the Formative stage cannot be viewed as a sudden occurrence in the Southwest, nor can it be considered to represent a totally new way of life. The exploitation of nondomesticated plant and animal resources discussed in the previous section continued after the widespread acceptance of horticulture, especially in areas considered marginal for horticultural products, such as the Colorado Plateau.

Before discussing the evidence for the transition from the Southwestern Archaic to the Formative lifeway, it will be beneficial to review briefly the historical development for the classification of Formative cultures as it pertains to the northern Southwest, including the South San Juan project area. Indeed, many of the data used to develop and refine the chronological and developmental sequences for the Colorado Plateau originated from southeastern Utah. Once the various periods and phases are placed in historical perspective, it will then be possible to more fully delineate the past lifeways of the prehistoric horticultural-based groups who once occupied southeastern Utah and contiguous areas. Included in this later section will be observations on the evolution and distribution of such topics as settlement patterns and architecture, technology and material culture, subsistence systems and diet, social and religious aspects, art, and physical anthropology/health problems. The final portion of that section deals with causal factors related to the final abandonment of the region by Formative groups.

Spatial and Temporal Systematics

The presence of prehistoric horticulturally-based, ceramic-producing sedentary village societies in the Four Corners region of the Southwest was recognized in the late 19th century. In part, this recognition came from observations of ethnographic situations extant in the occupied Pueblo villages, but it largely derived from well preserved remains in the cliff dwelling sites of southwestern Colorado and southeastern Utah. Despite this early identification of what we now
designate generally as Formative groups, it was not until the third
decade of the 20th century that sufficient data were on hand to allow
for definitive but tentative statements on the age, relationships, and
developmental sequences in the prehistoric Four Corners area. Indeed,
there is still much discussion and ongoing refinement of such topics
even today as changing methodologies and theoretical orientations cause
archaeologists to explore new avenues of inquiry, and sometimes
reinvestigate old ones.

Resulting from nearly 100 years of investigations we can define,
with a fair degree of precision, the spatial distribution and temporal
positioning of the Formative groups within the South San Juan project
area as well as those of the neighboring areas with which certain
relationships existed. On the other hand, while the overall
distribution and age of these groups is somewhat well known, the
underlying dynamics of situations are not yet properly understood.
Examples of research areas requiring additional investigation include
synchronic and diachronic explication of internal relationships such as
those between the cultures of an area and the environmental situation or
external contacts between diverse Formative groups. In the first case,
we require not only archaeological data but paleoenvironmental
information as well, and in the second instance, comparable
archaeological data are a must. Another domain which requires much
additional examination is the population movements which occurred in the
Four Corners area not only in the prehistoric periods but in
proto-historic/historic times also. Primary among these movements was
the complete abandonment of the South San Juan study area and all
adjoining regions by Formative groups at a certain point in the past.
Thus, while the following paragraphs appear to give a straightforward
picture of spatial and temporal factors in and near southeastern Utah, a
caveat is offered here that when looking at specific archaeological
problem domains in discrete areas, numerous gaps are to be found; hence
the need for effective management of the cultural resource base and
continued archaeological research.

Spatial Considerations

The Formative stage in the vicinity of the present project area is
synonymous with the development of the Anasazi or Pueblo culture.
Within the Southwestern culture area, the Anasazi occupied southeastern
Utah, southwestern Colorado, and roughly the northern halves of Arizona
and New Mexico. The early definition of the Anasazi was based on the
late 19th and early 20th century investigations of numerous
archaeologists working primarily in the San Juan River drainage, or the
Four Corners area. This work resulted in the famous Pecos
Classification of Anasazi development in 1927 (Kidder 1927) which is
discussed later. It soon became apparent that the Anasazi situation did
not apply to the entire Southwest, and by 1940 two additional
Southwestern Formative cultures had been recognized, the Hohokam of
southern Arizona and the Mogollon of southern New Mexico and
east-central Arizona. Further, another Formative tradition, the
Fremont, was identified occupying nearly all of Utah north of the
Colorado River.
At the same time, sub-areas or cultural variations were soon recognized in each of these larger areas. The Anasazi area included: the Kayenta sub-area of northeastern Arizona and southeastern Utah below the San Juan River; the Chaco sub-area of northwestern New Mexico; the Virgin sub-area of northwestern Arizona and southwestern Utah; and the Northern San Juan, or sometimes Mesa Verde sub-area of southeastern Utah and southwestern Colorado. A similar subdivision has been offered for the Fremont area (Marwitt 1970). The general boundaries of the Anasazi and Fremont areas and Anasazi subdivisions are shown in Figure 6.

The South San Juan project area lies entirely within the Northern San Juan Anasazi Area, although at times in the past, influences and perhaps population movements from other areas have occurred. Following Gillespie (1976), the Northern San Juan Area includes the geographic area north of the San Juan River from the Colorado River on the west to the San Juan Mountains of Colorado on the east (Figure 7). The northern boundary is variable and awaits further delineation; however, Gillespie (1976:13) believes it approximates the limits of the San Juan drainage under elevations of ca. 9,000 feet.

Based on previous investigations, it is possible to further delimit prehistoric cultural districts within the Northern San Juan Anasazi Area. The boundaries of these districts are somewhat poorly known, but they do correspond with recognizable differences in cultural manifestations. From west to east, these districts include the Grand Gulch, Western Mesa Verde, Yellowjacket, Mesa Verde, and La Plata Districts. Farther to the east, three additional districts have been defined: the Durango, Piedra, and Navajo Reservoir Districts. The suggested boundaries of those districts important to the South San Juan project area are illustrated in Figure 7.

One additional cultural/geographical concept needs clarification. In the past some writers have chosen to utilize the term "Mesa Verde Region" as a synonym for the Northern San Juan Area. Gillespie (1976) has observed that the Mesa Verde Region properly only applies to the central portion of the Northern San Juan Area and includes the Western, Yellowjacket, Mesa Verde and La Plata Districts. The Grand Gulch District, for example, is considered marginal to the Mesa Verde Region and, while Mesa Verde influence was at times present, apparently it received primary cultural stimuli from the Kayenta Anasazi to the south. Not surprisingly, the imposing geologic feature known as Comb Ridge forms the boundary between the Mesa Verde Region and the Grand Gulch District. It should be noted, however, that such distinctions are not always easily drawn, especially when viewing the Anasazi cultures on a diachronic scale. During the incipient stages of the Anasazi situation, for example, the early Basketmaker manifestations exhibit general similarity east and west of Comb Ridge and it is possible that regional or district differences came about later in the Anasazi sequence.
Figure 6: Generalized cultural distribution of Formative cultures in the project area and surrounding regions (modified from Jennings 1978: Figure 76).
FIGURE 7

THE NORTHERN SAN JUAN AREA
AND THE MESA VERDE REGION

1. WESTERN DISTRICT
2. YELLOW JACKET DISTRICT
3. MESA VERDE DISTRICT
4. LA PLATA DISTRICT
5. GRAND GULCH DISTRICT

Figure 7: Northern San Juan Anasazi Area (modified from Gillespie 1976:Fig. 1).
Temporal Classifications

The quest for definition of stages of cultural development in the Northern San Juan Anasazi Area was a major preoccupation for archaeologists during the first decades of this century. This concern continues today although the emphasis is more often centered on refinement of local sequences rather than stage development. Before entering discussions of these developments, it will be useful to briefly define certain terms which will appear often throughout succeeding paragraphs. The archaeological unit definitions used herein follow those provided by Willey and Phillips (1958) and include:

Component - A component represents a single identifiable occupation of an archaeological site. In many instances, a specific site can be defined on the basis of a single instance of occupancy or it may contain successive or interrupted multiple components, each somewhat foreign to the other(s).

Phase - This designation refers to "an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time (Willey and Phillips 1958:22)."

Period - In the Anasazi Southwest, chronological sequences often have been defined as a series of definite cultural concepts, or periods, which emphasize a generalized cultural picture over a large geographic area. In this context, archaeological periods often delineate both cultural development and chronological situations in a region. It has been common to equate or substitute the term "stage" for period; however, in this discussion, stage refers to the broad, generalized continent-wide cultural developments (e.g. Lithic, Archaic, and Formative stages).

As is the case with prehistoric archaeological sequences in any part of the world, the successful culmination of the slow, arduous processes of piecing together cultural developments revolves around the adequacy of extant dating techniques. In the northern Southwest, relative techniques quickly came into play as investigations sought to elucidate archaeological evidences in an anthropological perspective. Before the end of the 19th century, it was recognized that remains stratigraphically beneath others represented earlier cultures, although generally only differences between artifacts and other materials were noted as relationships could not be properly understood. During the first two decades of the 20th century, great strides were made in defining stratigraphic situations, principally in the establishment of pottery sequences which could then be utilized to cross-date other sites.
The inherent problem in using stratigraphic positioning and artifact cross-correlation is that year placements are not possible. Fortunately, a chronometric technique was soon perfected for the northern Southwest to provide these data. By the late 1920s, A.E. Douglass (1929) had completed certain dendrochronological or tree-ring sequences for the area in which archaeological wood specimens could be analyzed and dated. Although additional chronometric techniques (e.g. radiocarbon, archaeomagnetism, thermoluminescence, and obsidian hydration) have appeared in the past 30 years, dendrochronology remains today by far the most useful dating technique in the Southwest as literally thousands of archaeological wood specimens are processed and dated annually at the Laboratory of Tree-Ring Research in Tucson, Arizona.

With the above general comments serving as a background, we can now briefly review the history of developmental and chronological sequences for the Northern San Juan Anasazi Area, and more specifically, the South San Juan project area. Again, much of the data on which the early sequences were based, as well as those in vogue today, were generated from the Four Corners region, including southeastern Utah.

As early as the mid-1890s, Richard Wetherill was using data from Cottonwood Wash, Butler Wash, and Grand Gulch in the present study area to argue that there was a different culture, termed the Basket Makers, found underneath the more obvious Cliff Dweller remains (McNitt 1957). Just as important, Wetherill and others were stressing a similarity between the artifacts, architecture, and skeletal remains of the Cliff Dwellers and groups who inhabited the large open sites on mesa tops and valley floors.

Further work in the next few decades throughout the Anasazi area led to increasing agreement among archaeologists that there were in fact other manifestations besides the Basket Maker-Cliff Dweller dichotomy. By 1921, three sequences had been proposed as follows (earliest cultures at the bottom);

<table>
<thead>
<tr>
<th>Kidder and Guernsey (1919)</th>
<th>Morris (1921)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cliff House Culture</td>
<td>Cliff House Culture (divided into early and late black-on-white pottery periods)</td>
</tr>
<tr>
<td>Slab House Culture</td>
<td>Pre-Pueblo Culture</td>
</tr>
<tr>
<td>Basket Maker Culture</td>
<td>Pre-Pueblo Culture</td>
</tr>
<tr>
<td><strong>Guernsey and Kidder (1921)</strong></td>
<td>Basket Maker Culture</td>
</tr>
</tbody>
</table>

| Cliff Dweller Pueblo   |  |
| Pre-Pueblo Culture     |  |
| Post-Basket Maker Culture |  |
| Basket Maker Culture   |  |
The cultural and skeletal traits used to define these cultural periods are not listed here as they will become apparent in subsequent discussions; for a summary listing of the traits for each of these early classifications, the reader is referred to Brew (1946:32-34).

By 1935, two period classifications had been proposed to account for temporal and cultural development of Anasazi culture. The first of these classifications resulted from a meeting of Southwestern archaeologists at Pecos, New Mexico in 1927. This meeting, organized by A.V. Kidder, produced a series of periods accounting for the then-unknown antecedents of the Anasazi through the historic pueblos and was based, in the main, on previous archaeological investigations in the Four Corners region, where many of the participants had worked. As summarized by Kidder (1927), the periods and their general characteristics were as follows (from earliest to most recent):

Basket Maker I or Early Basket Maker. A postulated pre-agricultural period. (This period is today recognized as the Archaic stratum preceding the development of Formative Southwestern cultures.)

Basket Maker II or Basket Maker. The first recognizable agricultural, atlati-using, non-pottery making stage.

Late Basket Maker, Basket Maker III, or Post-Basket Maker. The pit or slab-house building, pottery making stage.

Pueblo I or Proto-Pueblo. First stage with cranial deformation, ceramic vessel neck corrugation was introduced, and villages composed of rectangular living rooms and true masonry were developed.

Pueblo II. The stage marked by widespread geographical extension of life in small villages; corrugation (of pottery), often of elaborate technique, extended over the whole surface of cooking vessels.

Pueblo III, or Great Period. The stage of large communities, high development of the arts, and growth of intensive local specialization.

Pueblo IV, or Proto-Historic. The stage characterized by the contraction of the area formerly occupied; by the disappearance of corrugated pottery; and, in general, by decline from the preceding cultural peak of Pueblo III.

Pueblo V, or Historic Pueblo. The period from 1700 A.D. to the present.

This classificatory scheme, commonly referred to as the "Pecos Classification" remains in general usage today, although often with modifications, particularly in response to local situations.

A contemporary of Kidder's, F.H.H. Roberts, Jr., suggested slight revisions to the Pecos Classification resulting from his extensive fieldwork in the Anasazi area. Since his classification has been employed by many Southwestern archaeologists, it deserves brief mention.
For purposes of our later discussions, however, the Pecos terminology will be utilized. According to Roberts (1935), the following changes in terminology should be made:

**Basket Maker.** To designate the period formerly known as Basket Maker II.

**Modified Basket Maker.** To replace Basket Maker III, Late Basket Maker, or Post-Basket Maker.

**Developmental Pueblo.** This term would supplant Pueblo I and Pueblo II, incorporating them under one heading.

**Great Pueblo.** An alternate title for Pueblo III.

**Regressive Pueblo.** To replace Pueblo IV.

**Historic Pueblo.** Proposed as being preferable to Pueblo V.

Thus, the basic modifications proposed by Roberts to the Pecos Classification were to drop the numerals and to combine the Pueblo I and Pueblo II periods. The latter change resulted from Robert's perception that one or the other of these developments was absent in some areas.

Once dendrochronology had come of age, it was possible, using timbers and wood specimens from archaeological sites, to provide dates for the various periods of whichever sequence was used. In terms of the Pecos Classification, the following dates are commonly used today for the various periods:

- Basketmaker I -- pre-1 A.D.
- Basketmaker II -- 1-500 A.D.
- Basketmaker III -- 450-700 A.D.
- Pueblo I -- 700-900 A.D.
- Pueblo II -- 850-1100 A.D.
- Pueblo III -- 1100-1300 A.D.
- Pueblo IV -- 1300-1700 A.D.
- Pueblo V -- 1700 A.D. to the present

A correlation of the Pecos and Roberts' Classifications, along with suggested dates are presented in Figure 8.

**Phase Sequences**

The development of local and/or regional cultural sequences often must be defined in more precise terms since the period categories discussed above generally provide pigeonholes which are too broad for effective integration of archaeological data from any one cultural subarea or district. In response to this situation, Southwestern
<table>
<thead>
<tr>
<th>Years A.D.</th>
<th>Pecos Periods</th>
<th>Roberts' Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>PUEBLO V</td>
<td>HISTORIC PUEBLO</td>
</tr>
<tr>
<td>1850</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1750</td>
<td></td>
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</tr>
<tr>
<td>1650</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1550</td>
<td>PUEBLO IV</td>
<td>REGRESSIVE PUEBLO</td>
</tr>
<tr>
<td>1450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td>PUEBLO III</td>
<td>GREAT PUEBLO</td>
</tr>
<tr>
<td>1150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1050</td>
<td>PUEBLO II</td>
<td>DEVELOPMENTAL PUEBLO</td>
</tr>
<tr>
<td>950</td>
<td></td>
<td></td>
</tr>
<tr>
<td>850</td>
<td>PUEBLO I</td>
<td></td>
</tr>
<tr>
<td>750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>650</td>
<td>BASKETMAKER III</td>
<td>MODIFIED BASKETMAKER</td>
</tr>
<tr>
<td>550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>BASKETMAKER II</td>
<td></td>
</tr>
<tr>
<td>350</td>
<td></td>
<td></td>
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<tr>
<td>250</td>
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<td></td>
<td></td>
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<tr>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 A.D.</td>
<td>BASKETMAKER I (Archaic)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8: Correlation of the Pecos and Roberts' cultural development classifications for the Anasazi along with suggested dates.
archaeologists, while recognizing the general utility of schemes such as
the Pecos or Roberts' Classifications, have often devised more specific
categories for use in defining chronological and cultural development in
any given area.

The term most frequently applied to these designations is the
"phase," which has been previously defined. The development of phase
sequences in the northern Southwest usually requires intensive and
regional examination of the relevant data. Due to the requirement for a
body of substantial cultural data for a workable phase system, sequent
phase categories have tended to result from rather large-scale and
intensive investigation programs. It is important to recognize that any
phase system so offered may be, and usually is, somewhat restricted in
geographical applicability, being defined in accordance with a set of
local cultural criteria and chronological data.

In this context, phase systems with relevance to the South San Juan
project area, and adjoining regions, are briefly reviewed in the
following paragraphs with relative importance given to those directly
related to the present study area. In many cases, distinctive traits
defining the phases are listed (e.g. ceramic types, architectural
styles, etc.), each of which will be discussed in more detail in
subsequent discussion on the lifeways of the Formative groups in the
Four Corners region.

The first attempt at establishing a system of phases descriptive of
the Mesa Verde region, or more properly the Northern San Juan Anasazi
Area, was made by the Gladwins (1934), who proposed a La Plata Phase for
Basketmaker III and Pueblo I, a Mancos Mesa Phase equivalent to Pueblo
II, and McElmo and Montezuma Phases for early and late Pueblo III.
Based on his work on Alkali Ridge, southeastern Utah, Dr. Brew (1946)
modified this sequence to include an Abajo Focus to refer to the
Basketmaker III - Pueblo I situation, and continued the usage of the
Mancos Focus (Pueblo II) and the McElmo and Montezuma Foci (Pueblo III).
In the Mancos Canyon of southwestern Colorado, Reed (1958) found the
Gladwins' original phase system to be usable, but he added the Piedra
Phase to account for the Pueblo I period in the Mesa Verde area. Based
on this early work and that of others (e.g. O'Bryan 1950), a refined
phase delineation was presented by Hayes (1964) which continues to be
generally accepted for the Mesa Verde Region including the Yellowjacket,
Mesa Verde and La Plata Districts. A caveat is in order, however, since
Hayes' classification is based on a chronologically valid typology and
surface remains from the Mesa Verde proper, and spatial and temporal
variations do occur away from the mesa. The correlation of the Pecos
Periods and this phase system along with suggested dates can be found in
Figure 9. It will be noted that a phase designation is not available
for the Basketmaker II period, a reflection of the lack of early
Basketmaker remains in Mesa Verde National Park. The phases defined by
Hayes are as follows:
<table>
<thead>
<tr>
<th>Years A.D.</th>
<th>Mesa Verde Phase System</th>
<th>Pecos Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300</td>
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<td>Pueblo IV</td>
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<tr>
<td>1200</td>
<td>MESA VERDE PHASE</td>
<td>Pueblo III</td>
</tr>
<tr>
<td>1100</td>
<td>McELMO PHASE</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>MANCOS PHASE</td>
<td>Pueblo II</td>
</tr>
<tr>
<td>700</td>
<td>ACKMEN PHASE</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>PIEDRA PHASE</td>
<td>Pueblo I</td>
</tr>
<tr>
<td>900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>LaPLATA PHASE</td>
<td>Basketmaker III</td>
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<tr>
<td>500</td>
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<tr>
<td>450</td>
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<td>300</td>
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</tbody>
</table>

Figure 9: Correlation of the Pecos Classification and the Mesa Verde phase system (Hayes 1964), along with suggested dates.
La Plata Phase (450/500-700 A.D.): The trait list for this phase includes turkey domestication, cultivation of corn, beans and squash; troughed metates; basally notched projectile points; undeformed skulls; and pottery of Chapin Gray and Chapin or La Plata Black-on-white. The dwellings were shallow pithouses, circular to roughly rectangular, with four roof-support posts, a bench support for sloping wall poles, a fire hearth often intersected by a low partition wall, and a ventilator that is sometimes narrow but more often widened to form an antechamber. Houses are oriented with the ventilator/entrance to the south or southeast, and subterranean cists or above ground storage structures may be associated.

Piedra Phase (700-900 A.D.): The Piedra phase is considered to represent the transition from the year-round residence in the pithouses to habitation of surface rooms. Pithouses continue to be used, however, in association with surface rooms and are sub-rectangular in shape with narrow or true ventilator shafts. The surface structures are commonly crescentic rows of contiguous rooms of jacial and adobe, often slab-based, from one to three rows deep. Ceramics associated with this phase include Piedra Black-on-white, Chapin Gray, and Abajo Red-on-orange.

Ackmen Phase (900-975 A.D.): This phase was characterized by the appearance of the first true kivas, a development from the earlier pithouses, first true masonry, and the introduction of corrugated culinary pottery. The kivas usually lacked the southern recess, a characteristic of later structures. Masonry characteristics included poorly developed coursing of sandstone blocks, infrequent chinking, and frequent use of adobe. Surface habitations typically consisted of a few contiguous rooms in a straight line located north of the kiva and well-defined trash area. Utility pottery types included Mancos Gray and Mancos Corrugated and the decorated white wares were predominantly Cortez Black-on-white while the introduction of Mancos Black-on-white occurred.

Mancos Phase (975-1050 A.D.): Surface structures of this phase were still one-story and usually were a single or double row of up to 12 rooms laid in a straight line. Sometimes a perpendicular wing of rooms was added to one end of the linear roomblock to form an "L" shaped configuration. Masonry techniques improved with uniformly selected building blocks which were sometimes given a rough shaping with a hammerstone used to spill back the edges of the block. Kivas were still located south of the houses, but were drawn closer to the surface rooms, often immediately adjacent. The kiva structures were constructed with masonry pilasters to support the superstructure and were usually lined with masonry from floor to bench level and often all the way to the roof. Another architectural innovation of this period was the introduction of circular surface structures commonly called towers. The precise function of these features remains unknown.

Mancos Corrugated in the culinary ware and Mancos Black-on-white in the decorated continued as the dominant pottery types during this phase. Deadman's Black-on-red was important in some areas of the Mesa Verde Region. Slab metates replaced the earlier troughed variety and side-notched projectile points appeared for the first time.
McElmo Phase (1050-1150 A.D.): During this phase the Pueblo III or so-called "Classic" Pueblo period was initiated in the Mesa Verde Region. Towers were occasionally two-story structures and some multi-story dwelling units were built. Masonry itself became more highly developed with well finished building blocks and compound walls more common. Communities of 30 or more rooms were constructed, though pueblos of 10 to 15 rooms were more common. Kivas during this period were fully lined with masonry and occasionally incorporated within the roomblocks. In some parts of the Mesa Verde Region, construction of sizeable cliff dwelling units was initiated toward the end of this phase.

Ceramics during this time included Mancos Black-on-white, McElmo Black-on-white, and Mancos Corrugated. While Mancos Black-on-white continued as the dominant decorated ware, the introduction of McElmo Black-on-white marked the beginning of the utilization of carbon painted pottery which became dominant during the next phase.

Mesa Verde Phase (1150-1300 A.D.): This time period marked the termination of the Anasazi occupation of the Mesa Verde Region including the project area. Little in the way of architectural innovation took place during this phase. The chief difference in dwellings was that the majority of the sites were in alcoves where limitations imposed by the configuration of the cave wall frequently were more important to village layout than were the inherited notions of the builders. Examples of the result of this space constraint included other than circular shaped kivas and more frequent multi-story rooms. Ceramics from this phase include McElmo Black-on-white, Mesa Verde Black-on-white, and Mesa Verde Corrugated as a replacement of the earlier Mancos type.

Causal factors leading to the abandonment of the Mesa Verde Region by the Anasazi groups are not fully understood, but probably include a combination of reasons. Possible causes include climatic deterioration in the form of extended and recurring droughts, erosion of agricultural lands, increased disease levels, and the arrival of Athabaskan or Shoshonean groups.

Aside from the early work of Brew, the only other phase sequence derived for the South San Juan project area is that of Lipe (1967, 1970) who, employing data from the Glen Canyon project, defined a series of phases for the Red Rock Plateau province lying between the Colorado and San Juan Rivers. Chronologically, Lipe's sequence reflects the fact that the Glen Canyon area was not occupied between about 300 A.D. and perhaps 1000 A.D., and was abandoned by 1260-1275 A.D. (Jennings 1978). Other work in nearby areas (Lucius et al. 1978) may, however, account for much of this hiatus. Cultural influences from both the Kayenta and Mesa Verde Anasazi areas are also evident in this phase system as well as sporadic Pueblo IV intrusions into the Grand Gulch District following its total abandonment by Pueblo III groups. This phase system includes the following categories and attributes:
White Dog Phase (200-300 A.D.): The White Dog Phase is equivalent to the Basketmaker II period and is found in northeastern Arizona and in southeastern Utah east (e.g. Grand Gulch) and west (e.g. Cave Du Pont) of the Colorado River. It is marked by the absence of pottery, slab cists in caves, temporary brush shelters and shallow pithouses in the open, and the presence of corn and squash, but not beans. The skulls were undeformed and the dead were placed flexed and bundled in slab or hardpan cists in caves, often covered with baskets and twined bags. Wild food collecting played an important part in the subsistence pattern, as evidenced in site types (e.g. habitation, storage, and food-collecting camps) and site distribution.

Klethla Phase (1100-1150 A.D.): This phase followed about 800 years of abandonment of the Red Rock Plateau and again shows close similarities with the northeastern Arizona situation. Cultural attributes assigned to this phase include: Tusayan and Moenkopi corrugated utility pottery; Sosi Black-on-white and Tusayan Black-on-red as the primary decorated pottery types; small masonry pueblos with kivas; corn, beans, and squash; deformed skulls; and inhumation of the dead in flexed positions. At the end of this phase, the Red Rock Plateau population declined sharply, or perhaps the area was entirely abandoned. This decline coincides with the onset of a severe drought which extended for nearly 40 years (Lipe 1970:113-114).

Horsefly Hollow Phase (1210-1260 A.D.): The Horsefly Hollow Phase represents a reoccupation of the Red Rock Plateau during Pueblo III times with migrants from both the Kayenta area to the south and the Mesa Verde area to the east. In this context, the Red Rock Plateau evidently was a contact zone between the Tsegi Phase of the Kayenta and the Mesa Verde Phase from the east. This blend is seen best in the mixture of ceramic types where the following types are predominant:

<table>
<thead>
<tr>
<th>Kayenta</th>
<th>Mesa Verde</th>
</tr>
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<tbody>
<tr>
<td>Utility:</td>
<td>Utility:</td>
</tr>
<tr>
<td>Kiet Siel Gray</td>
<td>Mesa Verde Corrugated</td>
</tr>
<tr>
<td>Moenkopi Corrugated</td>
<td></td>
</tr>
<tr>
<td>Tusayan Corrugated</td>
<td></td>
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<tr>
<td>Decorated:</td>
<td>Decorated:</td>
</tr>
<tr>
<td>Tusayan Black-on-white</td>
<td>McElmo Black-on-white</td>
</tr>
<tr>
<td>Tusayan Polychrome</td>
<td>Mesa Verde Black-on-white</td>
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<td>Dogoszhi Polychrome</td>
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<td>Kayenta Black-on-white</td>
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<tr>
<td>Kayenta Polychrome</td>
<td></td>
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<tr>
<td>Kiet Siel Polychrome</td>
<td></td>
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</tbody>
</table>

Sites of the Horsefly Hollow Phase are commonly located in shelters in the cliffs, or sometimes near the canyon rims. At the close of this phase in the middle thirteenth century, the Glen Canyon region, and the rest of the Four Corners area was abandoned by the Anasazi.
Jeddito/Sikyatki Phases (ca. 1300-1600 A.D.): Following the abandonment of the entire region, the Red Rock Plateau was visited by small parties of Hopi from northeastern Arizona. The reasons behind these intrusions are not understood although Lipe (1967:321) hypothesizes hunting forays, visitation of shrines, or trading ventures with the Paiute as possibilities. Jeddito-Sikyatki components in the area are small, suggesting brief occupancy. Definitive attributes include some rock art motifs and the presence of highly distinctive Awatovi Yellow Ware (Jeddito Corrugated and Jeddito Plain) and Jeddito Yellow Ware (Jeddito Black-on-yellow and Sikyatki Polychrome).

Phase Systems in Adjoining Areas

It will be beneficial for possible comparative purposes to list phase systems which have been derived for geographic provinces neighboring the South San Juan project area. Excepting the Kayenta Anasazi, relationships between the Anasazi of the South San Juan area and the adjacent areas do not appear to have been great; however, it can be stated that more work is necessary in several cases to accurately outline the interrelationships between several areas. The neighboring phase systems are listed below, without elaboration but with references for those readers desiring additional information.

   No phases recognized based on extant data.

2. Virgin Anasazi (west of the Colorado in southeastern Nevada, south-central and southwestern Utah and northwestern Arizona).
   - Moapa Phase 2250 B.P.-500 A.D.
   - Muddy River Phase 500-700 A.D.
   - Lost City Phase 700-1100 A.D.
   - Mesa House Phase 1100-1150 A.D.

   Phases (cf. Colton 1939; Lindsay 1969).
   - White Dog Phase Pre-500 A.D.
   - Lino Phase 500-700 A.D.
   - Marsh Pass Phase 700-900 A.D.
   - Black Mesa Phase 900-1100 A.D.
   - Klethla Phase 1100-1200 A.D.
   - Tsegi Phase 1200-1300 A.D.
Summary of Formative Development

To briefly recapitulate, the period between 500 and 1300 A.D. witnessed the major prehistoric occupation of the region including the South San Juan project area, that of the horticultural-based, sedentary Anasazi. In that the overwhelming majority of the cultural resources and the preponderance of past archaeological investigations are associated with this era, the spatial and temporal systematics are much better understood than those of the preceding Paleo-Indian and Archaic stages. The South San Juan area falls entirely within the Northern San Juan Anasazi Area and abundant evidence of each of the Basketmaker and Pueblo periods is found somewhere in the study area, although certainly the distribution is not geographically or chronologically even. It can be seen that the more precise phase developments are somewhat more geographically restricted, pointing out a need for additional intensive investigations aimed at better understanding the relationships within the study area and those of surrounding regions.
POST-FORMATIVE ABORIGINAL DEVELOPMENTS

Aside from the limited Pueblo IV (Hopi) remains found in southeastern Utah, there are two additional aboriginal cultural traditions requiring examination: the Shoshoni (Ute and Paiute) and the Athabaskan (Navajo) situations. These developments, albeit poorly understood in the prehistoric and/or proto-historic sense, bridge the cultural gap between the prehistoric and historic aboriginal sequence in the South San Juan project area. Each of these groups was present in San Juan County, Utah, at the time of Euro-American settlement in the late nineteenth century, and the majority continue to inhabit delimited areas in southeastern Utah. The origins and chronological developments, so far as they are known, of the Shoshonean and Athabaskan groups are briefly reviewed below; more complete descriptions for the Utes, Paiutes, and Navajos can be found in Part II of the Cultural Resources Narrative by Dr. Weber.

Shoshonean Tradition (ca. 1300 A.D. - Present)

It is unfortunate that archaeological data on the early Shoshonean groups, including the Ute and Paiute in southern and southeastern Utah are all but nonexistent. We must rely upon ethnographic and linguistic evidence for establishing the origin and time of the Shoshonean movement into the region. The most popular hypothesis identifies the Shoshoni, who speak a language of the Numic group of the larger northern Uto-Aztec language family, as part of a general cultural development originating in southern California about 2,000 years ago (cf. Fowler 1972; Jennings 1978:235). From this "homeland," the Numic-speaking groups eventually spread into the Great Basin. By using glottochronology (or lexico-statistics), a dating method derived from comparisons of language dialects, the extent of dialect divergence indicates that the Shoshoni were in the Great Basin by about 1200 A.D. and in the Four Corners area by 1300 A.D. or slightly later (Jennings 1978).

Thus, based on linguistic data, there may have been a slight overlap between the Anasazi and Shoshoni occupation of the Four Corners. Indeed, as we shall see later, the arrival of the Numic-speaking groups has been offered to explain the abandonment of the area by the Anasazi. Archaeological confirmation, however, is lacking with respect to the date of the Shoshoni arrival. There is no artifactual evidence of overlap or confrontation between the groups. The only chronometrically-derived archaeological date for Shoshoni occupation in the Four Corners area is the dendrochronological determination by Dean (1969) that one of the structures in the well-known Basketmaker II Talus Village near Durango, Colorado, is actually Ute in origin and dates to just after 1600 A.D. and perhaps as late as 1774 A.D. The earliest historic reference to the Ute in the Four Corners area was in 1626 A.D. (Schroeder 1965:54).
The Paiute, or more properly, Southern Paiute, are often described as having historically occupied the small triangle area lying between the Colorado and San Juan Rivers, although they were found primarily north and west of the Colorado River (Euler 1966:Fig. 1). In contrast to a lack of archaeological data on the Ute, there is a little information available for the Southern Paiute stemming from ancillary studies of the Glen Canyon Project (Euler 1964, Sweeney and Euler 1963). In a short summary of the status of Southern Paiute archaeology, Euler (1964) has postulated that the Southern Paiute entered the southern Great Basin and northern Southwest about 1150 A.D. Paiute cultural materials have been dated to the Virgin Anasazi Lost City phase (ca. 700-1100 A.D.) in southern Nevada (Shutler 1961:69-70), and are found in the succeeding Mesa House phase in that area as well. To summarize the Paiute case, while there is evidence of Paiute occupation back as far as 1150 A.D. in the southern Great Basin, there are no data at hand to indicate a Paiute occupation of portions of the South San Juan project area in prehistoric times. However, there are numerous accounts and references to Paiutes in San Juan County in historic times.

**Athabaskan Tradition (ca. 1700 A.D. in southeastern Utah)**

The arrival of the Athabaskan-speaking Navajos and their linguistic relatives, the Apaches, in the Southwest appears to date about 1500 A.D. based on the available archaeological and linguistic data. A general northward expansion of Navajos into southeastern Utah appears to have occurred sometime after 1700 A.D., although there is one tree-ring date of 1620 for one Navajo structure in San Juan County; however, other dates from the same structure date in the 1700s (Stokes and Smiley 1963:13). Navajo utilization of the South San Juan project area has been continuous since at least the early 18th century (Brugge 1966; Correll 1971). To our knowledge, the presence of Apache groups in southeastern Utah has not been documented and probably never occurred.

Although a number of Navajo sites have been recorded in San Juan County by Navajo land claims archaeologists, the Glen Canyon Project, and more recently, by Hurst (1976; and personal communication, 1979), data retrieval thus far has been limited to site recordation and dating (Stokes and Smiley 1963). Navajo archaeological studies have been extensively conducted in northwestern New Mexico and northeastern Arizona resulting in period and phase designations. The applicability of these studies to southeastern Utah has not been determined; nonetheless, a brief examination of these data will provide a general background for the Navajo situation.

Hester (1962) has reviewed the archaeological and historical data for the Navajo in northwestern New Mexico and northeastern Arizona resulting in a cultural sequence extending from about 1500 A.D. to the present. His classification is as follows:
Eastern (New Mexico) Navajo

Pre-Southwestern Navajo (pre-1500 A.D.)—a hypothetical period, poorly defined due to a lack of archaeological data.

Dinetah Phase (1500-1696 A.D.)—Defined by the presence of corn, bean, and squash horticulture; Dinetah Utility pottery; the forked stick hogan; and initial Spanish contact.

Gobernador Phase (1696-1770 A.D.)—Characterized by stone masonry hogans, weaving; European trade goods; horse and sheep; and Gobernador Polychrome and Pueblo trade pottery.

Cabezon Phase (1770-1800 A.D.)—Noted by the stone-walled hogan in addition to forked stick and cribbed log hogans; Navajo Polychrome pottery; and extensive Pueblo and Spanish contact.

Reservation Period (1800 A.D. to present)—cribbed log hogan, sheep corrals, glass bottles, and tin cans.

Western (Arizona) Navajo

DeChelly Phase (1770-1800 A.D.)—Equivalent to the Cabezon Phase of the Eastern Navajo and characterized by the forked stick and cribbed log hogan styles; Navajo Polychrome, Navajo Utility (?), and Pinyon Utility (?) pottery; and little Pueblo and Spanish contact.

Reservation Period (1800 A.D. to present)

More recently, James (1976) has presented a more detailed sequence for the Western Navajo in the Canyon de Chelly area of northeastern Arizona. Although as yet undocumented, James' sequence may have more applicability to the southeastern Utah situation based on (1) proximity and (2) because it focuses in more detail on the later time periods. According to this sequence, Navajo phases and attendant attributes include:

Del Muerto Phase (ca. 1750-1800 A.D.)—corbelled-log hogans; forked-pole hogans; the appearance of stone hogans; Pinyon Utility, Navajo painted pottery, some Gobernador Polychrome, and, commonly, Puebloan pottery; fortresses, refuge sites, and possibly small pueblo-like structures; the introduction of agricultural and tree crops, and animals; Pueblo contact; and the initial Navajo settlement of the area.

DeChelly Phase (1800-1863 A.D.)—corbelled-log, forked-pole, and stone hogans; defensive and refuge sites; warfare; Navajo and Pinyon Utility pottery; Navajo Painted pottery; the disappearance of Pueblo painted pottery; and a decrease of pottery found in ash dumps at sites.
Fort Sumner Hiatus (1863-1867 A.D.)—Area nearly devoid of Navajo groups.

Tsaile Phase (ca. 1867-1900 A.D.)—Varieties of cribbed-log hogans appeared; forked-pole hogan common; wagons appeared; extremely limited Anglo goods; Navajo and Pinyon Utility and Navajo Painted pottery; and hogans built in less conspicuous places than before.

Wheatfields Phase (ca. 1900-1946 A.D.)—All varieties of hogans; limited amount of Anglo goods; wagons common; and an extremely limited number of native tools.

Chinle Phase (ca. 1946-1965 A.D.)—All varieties of hogans; some framed houses; many innovations (Anglo) beginning; automobiles becoming common; plastic and foil wrappers appearing; zip codes on labels appearing; and an abundance of glass.

Window Rock Phase (1965 A.D. to present)—Framed houses and modular homes; all varieties of hogans; plastic and foil packaging; and zip coded and dated labels; aluminum and glass containers.
GENERAL

In this section we undertake a brief examination of the various cultural patterns which characterized the prehistoric occupation and utilization of southeastern Utah. In many instances, archaeological data bearing on certain facets of the prehistoric aboriginal cultural manifestations are voluminous and are consequently only outlined here. Readers are referred to the many archaeological reports listed in the bibliography for additional information and details. For the purposes of our discussion, prehistoric lifeways are subdivided into the following categories: (1) settlement pattern and architecture; (2) material culture and technology; (3) subsistence systems; (4) social and religious structure; and (5) physical anthropology and health problems.

While these subjects provide distinct discussion items, it should be remembered that each forms an integrated part of what was an interwoven whole, the cultural system. Nor should we forget that the cultural system, with its various components, interfaced and adapted to another dynamic system, the natural environment comprised of abiotic and biotic constituents. In reality, we cannot properly or completely understand past cultural systems in the study area without reference to the environment since these were small group cultures which existed in close relationship to external environmental variables. It would, however, be overly deterministic to view past cultures as being totally at the mercy of the environment since, as we shall see, cultural adaptation and ingenuity were a common response to changing stimuli from the natural world. Certain conditions (e.g. climatic fluctuations, resource exhaustion, or, perhaps, outside cultural pressures) brought about new adaptations and/or even more drastic response (i.e., population movement.)

SETTLEMENT PATTERN AND ARCHITECTURE

As might be expected, little information is available in the project area concerning settlement patterns during the Paleo-Indian and Archaic stages. This situation can be attributed to both a lack of data and to the absence of long-term or permanent encampments, a reflection of the general way of life during those times. Another reason apparent in the literature is that it seems unlikely that southeastern Utah ever witnessed large numbers of Paleo-Indian big game hunting groups or Archaic hunter-collectors. In the extreme eastern portion of the area, on Cajon Mesa in the vicinity of Hoverweep National Monument, Winter (1975:282) has observed that Paleo-Indian projectile points, usually found in association with extensive scatters of lithic debris, tend to occur on ridges above springs and canyon mesa edges. Such locations may have been hunting camps overlooking favorable hunting zones. Given the mode of economic pursuit of the groups, sites providing overlooks would seem to have been preferred as campsites. Similar patterns were noted in the Rio Grande Valley of New Mexico where Judge (1973) has provided
the most complete analysis of Paleo-Indian settlement patterns yet undertaken in the Southwest. We can further hypothesize that these camps were temporary in nature, but we have no further evidence for the remainder of the annual movement which characterized these small groups.

During the lengthy Archaic stage, foraging groups in the Hovenweep area once again favored ridges, especially around canyonheads where springs occur. Winter and his associates found through modern faunal analyses that these locales constitute one of the most productive zones on Cajon Mesa (Winter 1975:283). It is also evident that summer camps in the mountainous areas are represented, at least in the La Sal Mountains (Hunt and Tanner 1960). The finding of grinding implements at Archaic campsites evinces exploitation of wild plant resources along with faunal species. Sheltered localities may have served as winter encampments with examples including Sand Dune and Dust Devil Caves south of the San Juan River (Lindsay et al. 1968); Cowboy Cave north of the present project area (Jennings 1975); and several sites in the Uncompahgre Plateau to the northeast (Wormington and Lister 1956).

At some point during the Archaic/Basketmaker II transition, the first observable habitation and storage structures came into being. The best example of the early permanent dwelling structures comes from Talus Village near Durango, Colorado, where Morris and Burgh (1954) discovered the remains of circular houses apparently constructed of cribbed logs laid in mortar. These structures were built over shallow saucer-shaped depressions and did not contain interior fireplaces. The existence of shallow "pithouses" at Basketmaker II open sites in the project area has been noted (e.g. Winter 1975, Hobler and Hobler 1978). Caves seem to have been principally burial and storage places rather than permanent dwelling sites, although they were probably used sporadically as habitations. One cave which exhibits extensive habitation, but without dwelling structures, is the aforementioned Sand Dune Cave where a rich selection of Baskemaker II artifacts was recovered in a stratum immediately above materials belonging to the Archaic Desha Complex (Lindsay et al. 1968).

Typically, however, Basketmaker II evidence in caves is in the form of slab-lined cists or pits excavated into the cave floor, in no particular arrangement. Burial of the dead seems to have been the principal activity in such caves with burials being placed in a flexed position in the cists. The bodies were frequently wrapped in cloth or fur robes and covered with baskets. It was these sites that drew much attention from relic seekers and museum collectors in southeastern Utah during the 1890s. Some of these caves, however, containing numerous cists and jar-shaped cists appear to have served another function—food storage. In the Red Rock Plateau area, Lipe (1967:143-145) has suggested that at least two cave sites served as storage repositories for foodstuffs resulting from wide-ranging hunting and foraging trips, as well as harvest of domesticated plants. Lipe (1967) has also recorded open food-collecting camps of a temporary nature which can be assigned to the Basketmaker II period. Temporary encampments of this sort probably were utilized by wild plant collecting and/or hunting parties since projectile points, flaking debris, and grinding tools are
Basketmaker II campsites in the open are rather infrequent occurrences in comparison to later Anasazi sites but do occur throughout the South San Juan project area (cf. Winter 1975; Pike and Lindsay 1978; for other examples).

William Lipe and his colleagues, as part of the long-term Cedar Mesa Project, have provided the most stimulating hypotheses regarding Basketmaker II settlement patterns in southeastern Utah. In their latest statement, Matson and Lipe (1978) have reviewed their earlier hypotheses which include (Lipe and Matson 1971):

1. Basketmaker II groups were farming in the canyons in the summer and hunting and gathering on the mesa tops much of the rest of the year.

2. Basketmaker II base camps will therefore tend to be located in the canyon rim areas of the mesa to provide access to both canyon bottom and mesa top environments.

3. Because of the primarily hunting-gathering nature of the mesa top occupation, Basketmaker II sites of all types tend to be associated with the pinyon-juniper woodland areas, but not necessarily with areas of deep, cultivable soils.

4. In the canyons, Basketmaker II sites would be concentrated in natural shelters.

Based on accumulated data, Matson and Lipe (1978) have found general confirmation of the first three hypotheses but they have rejected the fourth having found little occupation of the cave sites. They do, however, suggest that a more generalized model may actually be more applicable, one that includes farming of the soil resources of both canyon bottoms and mesa tops along with hunting and gathering.

In the succeeding Basketmaker III period and continuing into Pueblo I times, the principal dwelling place was the pithouse, a unit with a sunken floor and a superstructure supported by posts. In a comparative study of Basketmaker III-Pueblo I pithouse types and distribution, Bullard (1962) includes the following traits as those most common to the western portions of the Northern San Juan Anasazi Area. Basketmaker III pithouses tend to be circular in shape, averaging about 17 square meters in size, and excavated on the average from .75 m to 1.29 m below the ground surface. The general orientation was to the south or southeast where a supplemental room, the ante-chamber, served a probable entrance function from the outside. Commonly, a four post configuration distributed in a square or rectangular pattern in the house supported the roof. Often the southern portion of the main room was partitioned off by a low wall or very low floor ridge sometimes joining the fireplace rim. In addition to the fireplace, other floor features often include a deflector immediately south of the fireplace to ward off entering air, an ash pit, subfloor storage pits, above floor bins, and a small circular hole north of the fireplace known as the sipapu, or
sacred hole, which in modern Pueblo ritual represents the spot where the ancestors emerged from the underworld. For reference, Figure 10 shows the floor plan of an excavated pithouse from Alkali Ridge and a pithouse reconstruction is shown in Figure 11.

Basketmaker III villages usually consist of a number of pithouse structures along with several separate circular slab-lined storage cists. During Pueblo I times, the pithouse and slab-lined cists continue, but contiguous, often crescentic, rows of above-ground habitation and storage rooms were added to the village layout.

In southeastern Utah, the famous Site 13 on Alkali Ridge (Brew 1946:152-202) includes a village of 15 or more pithouses along with a complex of several hundred above-ground storage and living rooms. Surface room wall construction at Site 13 included a variety of methods, the most common being heavily plastered upright stone slabs, above which were alternating courses of small, slender stones and adobe mud. Another type of early wall construction is "jacal" or pole-in-mud in which upright posts were set into the ground with adobe mud plastered around and between them.

The general settlement pattern for Basketmaker III and Pueblo I sites is not completely understood in southeastern Utah. In the Cedar Mesa area, the earlier period is poorly represented and the Pueblo I period seems to be lacking altogether (Matson and Lipe 1978). Basketmaker III sites there tend to be concentrated in the higher, deep soil areas of the mesas where extensive rainfall farming is believed to have taken place. Other portions of the present study area exhibit considerably denser populations during these periods, all to the east or northeast of Cedar Mesa, and especially on the mesa tops and benches of the larger, well-watered drainages with abundant alluvium (e.g. Comb, Butler, and South Cottonwood Washes, Alkali Ridge, and Montezuma Canyon) (Miller 1976; Patterson 1975; Schroeder 1965; Brew 1946).

Reflected at sites such as Brew's (1946) Alkali Ridge location is a trend during Pueblo I times toward both subterranean (pithouses) and surface domiciliary rooms. Perhaps the single most significant architectural change which ushered in the Pueblo II period was the complete loss of the habitation function for the subsurface rooms which assumed a male-oriented religious usage. The former pithouses become "kivas," a term from modern Pueblo languages whose speakers still utilize such structures in their villages today in the Southwest. In the Northern San Juan Anasazi Area the "typical" kiva (Figure 12) retained some of the earlier characteristics—ventilator system, deflector, fire hearth, and sipapu—and other characteristics were added including: (1) the entire interior was lined with masonry from floor to roof; (2) a bench was formalized which encircled the interior; (3) upon this bench were four to six (most common) pilasters, or masonry pillars which supported the superstructure; and (4) a "southern recess," a deep recess at the bench level on the south end of the kiva, the function of which is unknown. The kiva was most frequently roofed with a cribwork of logs laid between the pilasters. Entrance to the underground room was made through an entryway/smoke-hole located near the center of the roof.
Figure 10: Floor plan and cross-section of Pit House D, a Basketmaker III - Pueblo I structure excavated by J.O. Brew at Site 13, Alkali Ridge, San Juan County, Utah (after Brew 1946:Fig. 32). Floor features of this pithouse can be compared to the reconstructed pithouse shown in Figure 11.
Figure 11: Postulated method of roof construction of first pithouse (after Lancaster and Watson 1954).

A. Main support posts
B. Main stringers.
C. Secondary stringers.
D. Slender poles or withes.
E. Sloping side poles.
F. Poles, brush, or reeds.
G. Bark and trash fill.
H. Earth covering.
I. Tunnel to antechamber.
J. Deflector.
K. Wingwall.
L. Firepit.
M. Sipapu.
N. Plastered walls.
O. Bench.
P. Smokehole and hatchway.
Figure 12: Reconstruction of a typical Mesa Verde style kiva of the Pueblo II - III era. Note similarity of the floor features to those of the earlier pithouses (Figures 10 and 11) and the Butler Wash kivas illustrated in Figures 14 and 15.
Village layout became more formalized during the Pueblo II span in the form of what is referred to as the "unit house" (Prudden 1905). This type of structure consisted of a single or double row of rooms (habitation and storage) comprising a rectangular block, sometimes with a short perpendicular extension of rooms at one or both ends. A kiva was located a short distance in front of the rooms, invariably to the southeast or south. A trash or midden area was located southward from the kiva. In architectural technique, Pueblo II masons were relying more on the use of coursed stone walls with adobe mortar than the jacal and slab construction of the preceding period. Late in the Pueblo II period building blocks were given rough shaping by spalling back the edges.

A Pueblo II village recently excavated in Butler Wash (Nickens 1977b) demonstrates these characteristics. This site, Wood Rat Knoll (42SA4989), consisted of an L-shaped block of rooms (Figure 13) and the remains of two dissimilar kivas. The first, Kiva 1, apparently had been destroyed by fire and replaced, nearer to the rooms, by Kiva 2. Kiva 1 had masonry construction only to the level of the bench (Figure 14) with the upper walls being composed of native soil. The cribbed roof of Kiva 1 had been supported by four vertical logs set into the bench, and further supported by a series of smaller posts. The unlined ventilator shaft, fire hearth, and sipapu were present, but a standing deflector was absent being replaced in position by an ash pit (which could be the remains of a wooden deflector). Kiva 2, in contrast, was entirely faced with sandstone masonry; however, the earlier architectural style of horizontal blocks resting on vertical slabs was employed (Figure 15). A set of six masonry pilasters supported the roof and the ventilator tunnel was masonry-lined. As in Kiva 1, an ash pit was in the anticipated deflector location, and a firepit and sipapu were present. These kivas, and a review of Brew's (1946) data, point out a salient fact: there is no situation in which "typical" northern Anasazi kivas as defined above can be realistically expected. To be sure, certain features (but with different expressions) can be anticipated; however, there is sufficient regional and temporal variation to warrant additional study of this structural type.

The Wood Rat Knoll Pueblo unit actually overlays a Basketmaker III pithouse village which included the three surface slab-constructed storage bins and pit structure shown in Figure 13. We are interested only in the Pueblo II settlement at this time, however, which consisted of the roomblock and, probably, only one kiva at any one time. An artist's reconstruction of the village is shown in Figure 16. In this reconstruction, Kiva 2 is shown as a roofed, functioning religious chamber. The ventilator opening can be seen just below the roof—compare with Figure 13. Kiva 1 is shown in a destroyed state. Apparently the structure had burned and, as indicated by artifactual materials, had been used as a trash receptacle by the later occupants of the pueblo.
Figure 13: Map of the Pueblo II Wood Rat Knoll site showing an L-shaped series of habitation and storage rooms and two kivas (after Nickens 1977b).
Figure 14: Floor plan and cross-section of Kiva 1 at the Wood Rat Knoll site. Vertical posts set in the bench supported the roof rather than masonry pilasters. Also note the absence of masonry facing on the upper walls (after Nickens 1977b).
Figure 15: Kiva 2 at the Wood Rat Knoll site. This structure more closely conforms to the Mesa Verde kiva, but lacks a southern recess and deflector (after Nickens 1977b).
The settlement pattern of the Pueblo II period often has been described as one marked by population dispersal and growth throughout the northern Anasazi area. Winter (1976a:286), for example, has documented a threefold increase in the number of Pueblo II sites over Pueblo I sites in the Hovenweep area, and he feels this situation reflects population increase. Pueblo II unit pueblos tend to be located on mesa ridges or deep soil divide areas where mesa top dry farming was possible (Brew 1946; Matson and Lipe 1978; Winter 1976a). It should be noted that special use/limited activity sites dating to the Pueblo II period are also common; these sites usually consist of ceramic sherd and lithic debris scatters without observable architectural features. Two additional structural features, towers and water control devices, apparently had their genesis during this period; towers are discussed below and water control features are covered in the next section.

The Pueblo III architectural methods generally elaborate on those present during the Pueblo II period with one exception: sites are consistently larger, reflecting a concentration of populations. In addition to very large multi-story apartment-type pueblos, villages were built in caves in the sandstone walls of the canyons characterizing the Four Corners region. Kivas in the open villages and cliff dwellings tended to be multiple, often being incorporated within the roomblocks. Throughout much of the South San Juan study area, the large population aggregations so publicized in the Mesa Verde, Chaco, and Kayenta areas do not occur. Exceptions include large apartment-sized pueblos in Montezuma Canyon (Matheny 1962), Bug Point (Leh 1942), and Edge of the Cedars Ruin near Blanding. Unfortunately, none of these pueblos have been extensively excavated and/or reported in the literature. Pueblo III cliff dwellings occur throughout the canyons of San Juan County, often overlying Basketmaker II or III remains (Keller et al. 1974; LaMar Lindsay, personal communication concerning Westwater Ruin, 1979); but, by and large, these sites are small when compared to similar manifestations in the Mesa Verde or Kayenta areas. The largest cliff dwelling in southeastern Utah lies south of the San Juan River where Poncho House (Neely and Olsen 1977) is estimated to have consisted of 200 rooms.

A distinctive feature of Pueblo III times is the presence of towers, notably in the Hovenweep area (Figures 17, 18, and 19), although these structures first appeared during the Pueblo II period. Pueblo III towers were often two and three stories high, and were constructed of brick-like sandstone blocks shaped by pecking (a Pueblo III stone mason's technique). Tower construction in the Hovenweep area has been dated through the use of tree-rings to between 1163 to 1277 A.D. but the majority were built after 1230 A.D. (Winter 1976a:287-289). Tower function(s) remain enigmatic. However, Winter and his colleagues (1977:211), based on a series of test excavations and observations, have raised the possibility that "a variety of different economic, social, and ceremonial activities probably occurred, including possible storage, ceremonial, food processing, tool making, calendric and other activities." Another recent analysis of these structures has supported the idea of multiple functions, and documented the possibility of making regular solar observations for the purpose of determining a calendar.
Figure 17: Tower structure located in Hovenweep National Monument, San Juan County, Utah. This photo was taken about 1905 prior to excavation and stabilization programs (courtesy Walker Art Studio, Montrose, Colorado).
Figure 18: Tower structures located in Hovenweep National Monument, San Juan County, Utah. These photos were taken about 1905 prior to excavation and stabilization programs (courtesy Walker Art Studio, Montrose, Colorado).
Figure 19: Tower structures located in Hovenweep National Monument. San Juan County, Utah. This photo was taken about 1905 prior to excavation and stabilization programs (courtesy Walker Art Studio, Montrose, Colorado).
(Williamson et al. 1977; Williamson 1978). Further, Williamson et al. (1977) have observed that the proximity of many towers to kivas and a direct linkage of many towers and kivas by tunnels indicate a strong connection between sunwatching practices and ceremonialism.

On the other hand, we should not let the more spectacular Pueblo III villages and towers mask the importance of the many smaller hamlets and limited use sites which occur especially in southeastern Utah (cf. Fike and Lindsay 1976; Matson and Lipe 1978; Jennings 1966; and others). In this context, Matson and Lipe (1978) have reported that Pueblo III sites on Cedar Mesa tend to occur on the mesa tops, as in earlier periods, but there is a general tendency for Pueblo III sites to occur in the canyons as well. The reasons for this shift in settlement pattern are not clear, but may include a need for defensible locations (in caves), and increased reliance on alluvial soils for floodwater farming as a subsistence practice. They do not believe (Matson and Lipe 1978:9-10), however, that the canyons ever became the principal locus of occupation but rather that mesa top rainfall farming probably continued as the primary mode of subsistence.

While the above statements appear to provide an orderly description of developments in southeastern Utah, there is still much to be learned. There is indeed great variation in architectural styles, both regionally and temporally, and despite some limited work (e.g. Lipe and Matson various; Matheny 1971; Green 1974; DeBloois and Green 1978; Louthan 1977; Fike and Lindsay 1976; Winter various; to name a few) there is still much to learn concerning changing settlement patterns and the underlying causes. Notable statements have been offered regarding changes in architectural modes for the area including Brew's (1946:203-226) descriptions of kiva and house development and Gillespie's (1976) and Patterson's (1975) examinations of the Pueblo I - Pueblo II pithouse to kiva transition. However, Jennings' (1966:62) statements for the Glen Canyon area generally hold true: "there exists no uniform or step-by-step progression from brush shelter to pithouse to clan unit house," and "somehow the great towns occupy attention while the homesteaders receive scant study." Without doubt many advances have been made since Jennings' assessment; however, the archaeological record, known and unknown, holds much promise for additional analyses of this most common type of Anasazi settlement in southeastern Utah and the explication of relationships of architecture and settlement to other aspects of aboriginal lifeways.
MATERIAL CULTURE AND TECHNOLOGY

With a few exceptions, the technological efforts and resultant material culture of the prehistoric inhabitants of southeastern Utah were oriented toward those items necessary for the daily functioning of the lifestyle and protection from the elements. Within this general context, a few basic materials—bone and antler, clay, stone, wood and plant fiber, and rarely, shell—at the disposal of these groups were shaped or formed into usable, utilitarian artifacts. Each of these materials was subjected to a variety of techniques, employed to produce whatever effect, shape and size was desired by the craftsperson. In general, these methods include chipping, flaking, pecking, abrasion or polishing and drilling or reaming. Moreover, some natural materials were woven, molded or sewn into a variety of containers and articles of clothing.

The technological aspects of the prehistoric southwest have received considerable attention in the past and still form major sections of archaeological survey and excavation reports today. The discussion which follows is intentionally general, designed to give the reader an overview of the situation. Several illustrations are included to provide a visual representation of relevant material culture. The figured artifacts were redrawn from a variety of sources, all concerned with southeastern Utah. For additional information of a general vein, the following works can be consulted: 1) prehistoric Southwestern crafts (Barnett 1973; Tanner 1976); 2) ceramics (Breternitz 1966; Breternitz et al. 1974; Forsyth 1972; Oppelt 1976); 3) stone artifacts (Woodbury 1954); 4) basketry (Morris and Burgh 1941); cotton weaving (Kent 1957). More specific data can be found in the numerous bibliographic references at the end of this volume which report previous investigations in the project area. Brew (1946) gives a detailed description of the minor arts of Alkali Ridge and, although out of the project area, Morris' (1939) review of technology and material artifacts in the La Plata district of the Mesa Verde Region remains profitable reading for persons interested in the Northern San Juan Anasazi Area.

For the purposes of our discussion, the following general functional categories of material culture will be examined. The first category includes domestic tools made from a variety of materials which were generally associated with subsistence activities (e.g. hunting, agriculture, food processing), or were used in the manufacture of other items. In reality, a large number of tools in this category must be considered multi-functional although archaeologists often assign a supposed primary function to any given tool or composite artifact. A second category includes containers, principally those made from clay or plant materials (baskets and squash vessels). As we shall see, containers, especially basketry and pottery, have distinctive temporal and geographical characteristics; thus, these items, or in most cases their fragments, are important to archaeologists for dating and identifying cultural relationships. Third, we will examine the evidence for clothing and adornment, including weaving of such items as cloth and sandals.
Finally, examination will be made of certain items which have been assigned a real or suggested ritual function within prehistoric societal patterns. For the most part, reliable information and artifactual materials for these categories are entirely lacking in the project area for the Paleo-Indian and Archaic stages; hence the following paragraphs relate mainly to the various periods of Anasazi development.

Domestic Artifacts

A multitude of utilitarian items comprise this category of material culture with all of the available raw materials being widely used. One important grouping of artifacts was hunting tools and weapons. During the Basketmaker II period, the spear and atlatl (spear-thrower) (Figure 20) was the common implement. During the Basketmaker III era, the spear-thrower was gradually replaced by the bow and arrow throughout the Northern San Juan Anasazi Area. Arrow points, when not of pointed hardwood, included finely-chipped stone points, corner-notched and tanged in Basketmaker III-Pueblo I times but giving way to side-notched forms during the succeeding Pueblo II-III periods (Figure 21). Throughout the Anasazi sequence various nets, snares, and traps were also in common use.

Two basic methods of working stone for the production of utility objects were practiced in the project area: (1) pecked and ground, and (2) flaked and chipped. Materials most commonly used in the first technique include coarse to fine quality sandstone, basalt, diorite, andesite, and others. The second technique required a very different type of stone, one with a cryptocrystalline structure in which the chipping could be controlled to arrive at the desired end product. Common among the materials used in this technique were fine-grained quartzite, chert, chalcedony, jasper, and obsidian if available.

Foremost among the pecked and ground tools were the millingstone/metate and handstone/mano which were probably present throughout the several millenia of aboriginal occupation of southeastern Utah and used for milling of wild plants seeds and agricultural products. The early metates were of the trough type, open at one or both ends with parallel side flanges. Later, slab metates became more common; mortars and pestles occurred widely as well (Figure 22). Fine and medium-grained stones were used in the manufacture of groundstone axes and agricultural hoes (Figure 23).

Chipped-stone manufacture resulted in a wide range of artifacts. In addition to projectile points, the most common tools of this technique were scrapers, knives, gravers, drills, chippers, and hoes. Figure 24 shows a set of chipped-stone knives, hafted with wooden handles, recently excavated from Westwater Ruin near Blanding, Utah.

Bone and antler served for a great variety of items and functions. Bones from medium and large-sized birds and mammals were fashioned into awls, reamers, scrapers, needles, tubes, and gaming objects (Figure 25).
Figure 20: Basketmaker II atlatl and dart foreshafts from Sand Dune Cave, San Juan County, Utah. A closeup of the finger grip construction is shown in b. The length of the atlatl is 59 cm. (after Lindsay et al. 1968:Figs. 40-42).
Figure 21: Arrow points from Alkali Ridge, San Juan County, Utah. The top row shows tanged Basketmaker III - Pueblo I style, while side-notched Pueblo II - III specimens are illustrated in the bottom row (after Brew 1946: Fig. 172).
Figure 22: Ground stone implements: a) one-hand mano from Wood Rat Knoll; b) slab metate; c) trough metate from the Navajo Mountain area (after Lindsay et al. 1968).
Figure 23: Stone implements: a) grooved maul; b) hammerstone; c) hoe; d) notched axe; e) pick; f) tchamahia. A-e from Wood Rat Knoll (after Nickens 1977b) and f from Glen Canyon (after Lipe et al. 1960).
Figure 24: Hafted, chipped stone blade knives from Westwater Ruin, San Juan County, Utah. (Redrawn from a photo supplied by the Antiquities Section, Utah Division of State History.)
Figure 25: Implements fashioned from bird and mammal bone, Alkali Ridge, San Juan County, Utah. A variety of awls, needles, scrapers, a bone tube, and possible gaming pieces are shown (after Brew 1946: Figs. 176-186).
Wood derived from nearly every available shrub and tree in the ecosystem was used in a myriad of ways for utilitarian artifacts, construction components, and for fuel to heat the early pithouses and later domestic rooms and kivas. Among the more common and useful wooden items were agricultural digging sticks, throwing sticks, cradleboards (Figure 26), arrow shafts, and bows.

Containers

Containers in which to collect and store subsistence items form an integral component of the material culture of any early culture regardless of the economic mode. Varieties of portable containers include forms of basketry (Figure 27), flexible twined bags, skin bags, ceramic vessels (Figures 31, 32, and 33), and hollowed out squash fruits (Figure 29). As noted above, temporal changes in materials, form, and technique of manufacture, have been of extreme importance in assessing temporal placement of archaeological remains throughout the Southwest, and often cultural affiliations as well. Thus it will be beneficial to examine the types and technological background of containers, especially ceramics, in more detail.

Basketry apparently has a long history reaching back to the early Archaic stage and perhaps was used by the Paleo-Indian groups as well. Jennings (1957) notes that several techniques and forms of baskets were present in the Desert Culture by about 9000 B.P., but decoration other than structural variation was lacking. The utilization of basketry during Archaic times in southeastern Utah has been documented for the Desha complex (Lindsay et al. 1968).

The earliest Anasazi are aptly named Basketmakers because their baskets were of extremely high quality and preceded the advent of ceramic containers. Basketmaker II baskets ranged in size from a few inches to several feet in diameter, were often decorated with geometric designs in black, and, in some instances, were resin-treated or so tightly woven that they were waterproof. Most Basketmaker II baskets were manufactured by coiling, a technique which uses a foundation of twigs or split twigs wrapped with the sewing splints which bind each successive coil to the previous one. One of the more common shapes was a shallow tray used to store or cook roods (Figure 27a).

Large conical carrying baskets, 30 inches or more in diameter, were utilized for gathering and carrying plant roods. These flexible baskets were carried on the back by means of a tumpline that was attached to the basket and then passed across the forehead. Most Basketmaker II tumplines were undecorated; however, beginning in the following period, tumplines were often finely decorated with tapestry weave and/or woven or painted designs (Figure 28).
Figure 26: Pueblo III cradle from Iceberg Canyon, Glen Canyon National Recreation Area, San Juan County, Utah (after Reiley and Birkby 1975:Fig. 2).
Figure 27: Anasazi basketry:

a) Basketmaker coiled specimen from Grand Gulch (after Pepper 1902);

b) Pueblo twilled yucca-ring basket from the Glen Canyon area (after Lipe 1960:Fig. 58).
Figure 28: Basketmaker III tumpline woven from yucca fibers and with a design painted on the surface. This specimen was excavated from Battle Canyon, San Juan County, Utah, in 1889 (after Martin and Plog 1973:Plate 46).
Figure 29: Gourd storage vessel from the Glen Canyon area. The specimen is 49 cm. tall (after Sharrock et al. 1961:Fig. 93).
Basketmaker III basketry was very similar to that of the Basketmaker II period in many respects, but one of the most observable changes was the addition of twilled basket manufacture. These containers were made by interweaving yucca leaves in an over 2, under 2, or over 3, under 3, pattern into a flat mat and then attaching this to a circular wooden ring, creating a shallow form (Figure 27b). Both the coiled and twilled basketry technique continued to be used through Pueblo III times in the Northern San Juan Area, and the techniques have survived to historic times among the Southwest Pueblos. The twilled basket, however, apparently became more common during the later prehistoric Pueblo periods.

Another early container deserving mention is the flexible woven bag of plant fiber string. These bags, usually 6 to 8 inches in diameter with geometric designs woven in or sometimes painted on the exterior surface, were common during Basketmaker II times. These bags continued through the Basketmaker III period, but they were then more likely to be undecorated.

It is not surprising that once the transition to a sedentary Formative way of life had been completed, ceramic vessels, more useful than baskets in household activities like cooking and storing, replaced basket forms as the most important type of container. The earliest forms of pottery appear in the archaeological context about 575 A.D. (Basketmaker III) in the Northern San Juan Anasazi Area (Breternitz et al. 1974). It is generally accepted, however, that ceramics were present in the more southerly groups, the Mogollon and Hohokam, several centuries earlier, a result of diffusion from the Mesoamerican sphere.

Technologically speaking, methods of making pottery throughout the Southwest varied only slightly. Neither the potter's wheel nor true kiln was known. Native clay was collected and ground into a fine consistency. Nonplastic materials such as sand, crushed rock, or crushed pottery pieces (sherds) were added to the clay as temper to prevent formed vessels from cracking or breaking as the vessels dried. Together, the clay, tempering material, and water could be kneaded into a doughlike mass to construct vessels. The method of construction employed in the Anasazi area was that of adding concentric coils of clay on top of each other, pinching and scraping the coils together as the vessel walls were formed. In this method, known as the coil-and-scrape technique, a small worked sherd, a smooth pebble, or dried squash rind was commonly utilized to smooth and scrape the coils (Figure 30).

In some cases, utilitarian or undecorated pots, coils or parts of coils were left visible on the exterior of the vessel. This surface finish is called corrugation. If the vessel was to be decorated, however, the coils were scraped smooth and often repeatedly rubbed with a water-worn pebble to smooth and polish the surface. In later Anasazi pottery manufacture, a slip or wash of watered-down clay was applied, smoothed and polished also, to remain as the finished surface or serve as a base for decoration of the vessel. Decorations, often quite elaborate in layout and design, were then painted onto the vessel surface using black, red, or white pigments of mineral or vegetal origin. Once the vessel had been formed and decorative motifs applied,
Figure 30: Miscellaneous artifacts from the Wood Rat Knoll site (after Nickens 1977b): 2) ceramic sherd scraper; b) pebble polishing stones used in the manufacture of pottery; c) ceramic sherd disks of unknown function.
the pot was fired by exposing it to a burning or smoldering fire. Two methods of firing were utilized, in either an oxidizing or reducing atmosphere, with the difference being that oxygen gets to the vessel as it is being fired in the first method, while the pot is covered—almost cutting off the oxygen supply—in the latter process.

Although the vessels were certainly susceptible to breakage, once it is fired, pottery is practically indestructible and is readily preserved in the archaeological context. As a result, it is widespread and abundant in prehistoric sites. Thus, because it is easy to collect, handle, and analyze, and because pottery manufacture and decoration reflect spatial and temporary changes, its value to the study of Formative groups in the project area and surrounding regions cannot be understated. Indeed, prior to the advent of modern dating techniques, typologies of ceramic spatial and temporal variability were utilized to define cultural units and establish relative chronologies. As pottery types (now numbering about 900 names [Oppelt 1976] although much overlapping occurs) could be sufficiently tree-ring dated (e.g. Breternitz 1966), it was possible to date sites without chronometric dates, primarily based on surface evidence only, within fairly precise parameters. The practice of designating temporal placement, and often cultural affiliation, for such sites continues to be a widely used practice today.

In the South San Juan project area, three traditions of ceramic manufacture are represented: gray, white, and red pottery are all present. It should be noted at the outset, however, that ceramic types common to two Anasazi culture areas, the Mesa Verde and Kayenta, are found in the project area, and a considerable number of questions still remain regarding the temporal and cultural relationships of groups making pottery types associated with each area (cf. Lipe 1967; Matson and Lipe 1977).

It is possible, on the other hand, to identify certain trends in the two ceramic traditions. Generally speaking, Mesa Verde types appear to be predominant throughout the project area, although certain types are more restricted to the area east of Comb Ridge. Kayenta types are more likely to be found west of Comb Ridge and in the southwestern portion of the study area. Further, periods of popularity of certain types can be defined in the Kayenta-influenced area, for certain Mesa Verde and Kayenta types can be clearly identified at times in the record, and continuity of pottery types from each tradition can be documented at some sites. Thus, as Lipe (1970) hypothesizes, either extensive trading of pottery was conducted, or, perhaps, a situation involving marriage and residential patterning among Kayenta and Mesa Verde men and women may have existed.

Nonetheless, these two culture areas spawned similar ceramic traditions in the three color categories, with distinct but related temporal dimensions. In this sense, the two areas evince similar evolutionary and functional patterning in ceramic styles. Each of these traditions is briefly described below and corresponding pottery types are listed in Table 1. For additional information of the pottery types and their distributions in the project area, readers are referred to
Colton (1955, 1956), Breternitz et al. (1974), Lipe (1967:357-374), Matson and Lipe (1977) for specific data, and to Oppelt (1976) for a general listing and annotated bibliography of Southwestern pottery. Forsyth (1972) has also written a rather distinctive classification for Anasazi ceramics from Montezuma Canyon which should be consulted by interested persons. Representative pottery types and vessel forms are illustrated in Figures 31 through 33.

Gray utility pottery types last from Basketmaker III through Pueblo III times. Early forms were constructed by the coil-and-scrape technique with obliterated coils and were unslipped. Basketmaker III types include Mesa Verde Chapin Gray (Figure 31) which has crushed rock temper and Kayenta Lino Gray (Figure 31), distinguished by the use of sand temper. In the Pueblo I period, unobliterated coils were left on the necks of the vessels (Figure 31). The last two Pueblo periods saw the widespread use of corrugated types (Figure 31) which served cooking and storage functions.

The white pottery tradition also lasted from Basketmaker III through Pueblo III. It was constructed by coiling and fired without access to oxygen. The finish was characteristically rough and unslipped in both Mesa Verde and Kayenta early types, but tended to be slipped and polished in the later periods. The early bowls frequently bear design motifs and layouts reminiscent of the earlier basket designs (Figure 32). Vessel forms varied widely according to function including bowls (Figure 32), ladles, and pitchers (Figure 32, 33a, c, d) for food and water storage.

In late Basketmaker III, around 700 A.D., the manufacture of red surfaced pottery began and continued until about 1000 A.D., perhaps longer in some areas of southeastern Utah. This pottery was fired in an oxidizing atmosphere and was painted with mineral paints containing iron ores or manganese which results in a black appearing decoration. All of these types were constructed by coiling and finished by scraping. Red ware vessel forms were like those of the white tradition (Figure 32b) with similar functions.

Clothing and Adornment

Evidence for clothing is generally lacking except from dry deposits in sheltered caves. From these sites, however, comes evidence that a variety of textile and cord products was fashioned into clothing which served to protect the people from the elements. Foremost among utilitarian garments were robes or blankets which, during Basketmaker times, were made by wrapping strips of rabbit skin around heavy strings made from yucca fiber, and then weaving the furry strings together with rows of twining to form a blanket. It is not uncommon in cave sites to find burials, adults and children alike, with the bodies wrapped in such items. During the Pueblo stages, fur cord blankets continued to be made, but even more popular were feather blankets, made in about the same manner but with split turkey feathers wound around the cordage instead of fur strips.
<table>
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<th>PERIOD</th>
<th>GRAY TRADITION</th>
<th>WHITE TRADITION</th>
<th>RED TRADITION</th>
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<td>(generalized)</td>
<td>MESA VERDE</td>
<td>KAYENTA</td>
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<td>Mesa Verde Gray Ware</td>
<td>Tusayan Gray Ware</td>
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<td>Kiet Siel Gray Moenkopi</td>
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<td>Corrugated</td>
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<td>Kana-a Gray</td>
<td>Deadman's Black-on-red</td>
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<td>Abajo Red-on-orange</td>
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Table 1: Mesa Verde and Kayenta Pottery Types Found in Southeastern Utah (earliest at bottom in each case).
Figure 31: Gray ware utilitarian ceramic vessels from San Juan County, Utah:
a) Lino Gray (after Brew 1946:Fig. 100);
b) Chapin Gray (after Nickens 1977b:Fig. 31);
c) Moccasin Gray (after Nickens 1977b:Fig 31);
d) Mancos Corrugated (after Sharrock et al. 1961:Fig. 79).
Figure 32: Decorated ceramic vessels from San Juan County, Utah:

a) Chapin Black-on-white bowl (after Nickens 1977b:Fig. 31);
b) Bluff Black-on-red pitcher (after Nickens 1977b:Fig. 31);
c) Mancos Black-on-white pitcher (after Brew 1946:Fig. 111);
d) Mancos Black-on-white olla (after Brew 1946:Fig. 112);
e) McElmo Black-on-white bowl (after Sharrock et al. 1963:Fig. 68);
f) Mesa Verde Black-on-white mug (after Brew 1946:Fig. 153).
Figure 33: Decorated ceramic vessels from San Juan County, Utah:
a) Mesa Verde Black-on-white olla (after Sharrock and Keane 1962:Fig. 5);
b) Sosi Black-on-white pitcher (after Sharrock et al. 1961:Fig. 80);
c) Dogoszhi Black-on-white jar (after Sharrock et al. 1961:Fig. 80);
d) Tusayan Black-on-white jar (after Lipe et al. 1960: Fig. 41).
Also by the end of the Basketmaker era, loom weaving and cotton textiles had been introduced into the northern Southwest. Studies have documented the presence of raw cotton in southeastern Utah and there is evidence that finished cotton cloth products were being produced as well. From several caves, primarily in the Glen Canyon, parts of looms, weaving batten, spindles (Figure 34a) and beaters for preparing cotton fibers (Figure 34b) have been recovered along with fragments of cotton weaving. Extremely fine cotton ponchos and blankets have been excavated from sites throughout the Four Corners region.

Aprons of yucca cordage and other materials were apparently common apparel throughout the Basketmaker and Pueblo periods. A yucca-string apron of Basketmaker III age excavated in 1889 from southeastern Utah is illustrated in Figure 35. Leggings, fashioned from coiled netting with cotton or fur/feather cordage, also have been recovered.

A principal clothing item was sandals and a wide variety was manufactured by the Anasazi. Beginning in the Basketmaker II period, sandals of two different styles were made. One type, known as wickerwork, was made out of partially washed yucca leaves woven back and forth across them (Figure 36a). Another type of Basketmaker II sandal, one that became more common in Basketmaker III times, was the cord type. The cord sandal undoubtedly took longer to manufacture, being made from woven string prepared from yucca and other fibrous plants. By the late Basketmaker era, elaborate patterns were produced on these sandals with raised designs, woven colored designs (Figure 37a), or painted motifs found. After Basketmaker III, broad and narrow-leaf yucca twill-plaited sandals became the common type (Figure 37b), although decorated cord sandals continued in use. Apparently people of all ages wore sandals as children's sizes have been recovered along with the more plentiful adult sandals.

Personal appearance was also of concern. Hair brushes, usually made from grass stems or pine needles (Figure 38) have been found in dry cave sites in the project area, and jewelry—particularly necklaces, pendants, bracelets and rings—is somewhat common in artifactual collections. A typical assemblage of ornaments was recovered at the Wood Rat Knoll site in Butler Wash (Nickens 1977b) (Figure 39). Included are Olivella shell beads, shaped turquoise, drilled circular stone beads, and pendants made from both stone and shaped ceramic sherds. Also found at this site were two fragments of stone finger rings. From other sites in the Four Corners area, we know that jewelry was fashioned from bone as well and that such things as walnuts and dried juniper berries were also used in necklace-making.

Religious Artifacts

A final class of artifactual materials includes those items which are thought to have served a function in the religious sphere of Anasazi society. All too often, concrete data supporting such functions are lacking and such assignments are made only by reference to the ethnographic picture for historic Pueblos, or in some cases, based on the archaeologist's point of view that only a nonutilitarian function
Figure 34: Weaving implements from San Juan County, Utah. A wooden spindle and whorl is shown on the left (after Adams and Adams 1959:Fig. 10), and a carding tool for preparing cotton is shown at the right (after Lipe 1960:Fig. 50).
Figure 35: Basketmaker III apron made from yucca strings. This specimen was recovered in 1889 from Battle Canyon, San Juan County, Utah (after Martin and Plog 1973: Plate 45).
Figure 36: Basketmaker style sandals:
a) four-warp wickerwork; and
b) woven
(both after Lipe 1960:Fig. 62).
Figure 37: Sandals from San Juan County, Utah:

a) Basketmaker III woven cord type, with design in red and black (after Martin and Plog 1973: Plate 21);

b) Pueblo twilled plaited yucca sandal (after Lipe 1960:Fig. 63).
Figure 38: Hairbrush from the Glen Canyon area. The specimen is made of leaf spines, tied together with fiber cord, and is 26 cm. long (after Lipe 1960:Fig. 63).
Figure 39: Jewelry and ornaments from the Wood Rat Knoll site including:
a) stone pendants; b) ceramic pendants; c) Olivella sp. shell bead; d) worked turquoise; and e) drilled stone beads (after Nickens 1977a:Fig. 48).
can be given to certain artifacts. This latter category includes such things as so-called "medicine bundles" consisting of bags containing assorted small objects, and wooden artifacts from Basketmaker caves in northeastern Arizona such as carved sunflowers, cones, and birds.

Certain pottery forms in the Mesa Verde area, especially animal and bird effigy vessels, may have had a religious function. One jar form, commonly known as the "kiva jar," was elaborately decorated, with a lip around the top and fitted lid, and may have been used to hold special ceremonial items although once again, supporting data are absent. Tinklers, made from rabbit tibiae, are widespread and seem to be found associated with kivas where drafts entering the ventilator system or roof entryways would have provided a noise from such suspended items.

Smoking paraphernalia, both pipes and cigarettes, are common and, based upon ethnographic analogy, are thought to have been used for ceremonial purposes rather than pleasure smoking. In later historic times, similar pipes were called "cloud blowers," and were often used in ceremonies to create images of clouds designed to bring rain. Musical instruments, including flutes, rasps, and whistles, were common and could have been used for ceremonial purposes.

Another item of unknown significance was the copper bell. These artifacts were not manufactured in the Southwest, but rather were traded to the area from Mesoamerica. Three copper bells have been recorded from southeastern Utah, all found at the large Edge of the Cedars Ruin near Blanding (Green 1970; Terry Walker 1978, personal communication).

Finally, another set of cultural phenomena which may well relate, at least in part, to religious circumstances is the widespread rock art found throughout the project area. Such occurrences are recorded in association with campsites and/or masonry ruins and in isolated spots. Turner (1963), in his treatment of rock art of the Glen Canyon region, notes that much of the rock art in this area may have religious connotations. Examples of this type of art motifs include anthropomorphic figures (Figure 40), sympathetic magic scenes showing animals portrayed as being hunted (Figure 41), or with hunting implement shahs attached to the bodies (Figure 42). Figure 42 shows a depiction of what appears to be a kachina figure from Pueblo IV times; other kachina figures and Hopi clan symbols have been recorded in the Glen Canyon area by Turner (1963) who used native Hopi informants to evaluate the meanings of the rock drawings.
Figure 40: Zoomorphic and anthropomorphic petroglyphs from Moqui Canyon, San Juan County, Utah (after Sharrock et al. 1963:249).
Figure 41: Anthropomorphic petroglyphs from the Glen Canyon area (after Lipe 1960:Fig. 13).
Figure 42: Pueblo IV petroglyphs from Moqui Canyon, San Juan County, Utah. Shown are probable Hopi kachina figures and hunting scenes; Hopi pottery was found in association with this panel (after Sharrock et al. 1963:246).
SUBSISTENCE PATTERNS

During the past two decades, archaeologists and their colleagues in botany and zoology have produced considerable data regarding prehistoric subsistence resources and their utilization. In southeastern Utah, as in the remainder of the Southwest, this attention has focused on the varieties of plants cultivated and the agricultural techniques used in growing them, the types of wild plants collected, and the faunal populations exploited for foodstuffs.

The evidence for prehistoric diet comes from several distinct materials and specialized analyses. Plant and animal remains are to be found in differing quantities in nearly every archaeological site, and can be speciated by biological specialists. These items are especially plentiful in the more sheltered alcove sites where dry preserved deposits are located. Archaeological sediments and features are routinely sampled and analyzed for pollen grains indicative of economic plant utilization as well as being past climatic markers. Pollen investigation of human coprolites (fecal specimens) has proven especially fruitful in determining past dietary practices. Climatologists and soil scientists are often called upon to determine the climatic parameters of certain cultivated plants or the productivity of soil deposits once famed by the Anasazi. Another widespread technique is ethnographic analogy. In this case, utilization of certain plants, methods of collection, and preparation, are assumed to have been similarly practiced in prehistoric times as they were in the late 19th and early 20th centuries among the Pueblo and Athabaskan groups in the Southwest.

Several studies have been conducted within each of these topics in the project area, some of the more important of which are listed in Table 2. Our discussion of subsistence patterns in southeastern Utah will focus on four topics: (1) pre-Formative patterns; (2) the kinds of plants that were cultivated during the Formative stage; (3) the agricultural techniques employed; and (4) the exploitation of nondomesticated flora and fauna.

It is possible to dispense with one topic at the onset, that being the presence and importance of domesticated animals. While the dog was clearly kept as far back as Paleo-Indian times, their function(s) is unclear as they might have been kept as pets, used in hunting, or used as food. There is ample evidence that the turkey was used for food and kept at sites (turkey pens and eggshells are found for example); however, it has never been fully determined whether the birds were actually domesticated or wild.

Pre-Formative Subsistence

Our knowledge for actual subsistence patterns of the Paleo-Indian groups who apparently sporadically occupied southeast Utah is nonexistent. Based on evidence from other regions, we expect these groups to have participated in a general big-game hunting way of life;
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<td>1. Palynology</td>
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<td>Scott and Stiger (1978)</td>
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<td>2. Coprolites (pollen and macrospecimens)</td>
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<td>4. Nondomesticated flora and fauna</td>
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<td>Louthan (1977)</td>
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Table 2: Topical Breakdown and Related Sources for Prehistoric Subsistence Patterns and Practices in the South San Juan Project Area and Vicinity.
however, smaller animals and plant species also would have been important. The primary prey of Paleo-Indians, the late Pleistocene megafauna, do appear to have been present in the area, based on the evidence from the lower levels of Cowboy Cave where indications of bison, mammoth, and possibly the giant ground sloth were noted (Jennings 1975) and the existence of petroglyphs near Moab which bear a striking resemblance to mammoth.

The Western Archaic subsistence pattern can be generally classified as a hunting and collecting situation with the hunting of modern big game animals (e.g., deer, elk, bighorn sheep, and antelope) and smaller mammals and rodents. In many localities, nearly every available and edible plant was exploited including seeds, bulbs, nuts, roots, and berries. To date, no Archaic sites have been intensely investigated within the project area, but two sites belonging to the previously mentioned Desha complex (Lindsay et al. 1968), located near Navajo Mountain in southeastern Utah south of the San Juan River give us at least a partial picture of Archaic subsistence ways. At these sites, Sand Dune and Dust Devil Caves, the presence of many nullingstones and relatively large amounts of grass pollen may indicate an importance of grass seeds in the diet (Hevly 1968). Faunal remains included those of cottontail and bighorn sheep (most common), ground squirrel, pocket gopher, and jackrabbit occurring with some frequency. Based on their work, Lindsay et al. (1968:120) conclude that the Desha subsistence pattern "was one of primary dependence on wild plant foods and small game with large game being only occasionally utilized." Although substantive data are not available, similar patterns of mixed foraging and hunting have been posited for the Oshara tradition (Irwin-Williams 1973) and Archaic groups in the Hovenweep area (Winter 1976).

Plant Domesticates of the Formative Stage

Corn, beans, and squash were the primary plants cultivated in prehistoric southeastern Utah. It is possible, but unproven, that cotton also may have been grown (Cutler 1966:21). Several parts of cotton plants (bolls, seeds, and fibers) have been found in sites in the Glen Canyon area, however, making the possibility at least a realistic one awaiting further data.

Corn: Corn, or maize, first appeared in the southwest about 5550 to 4250 B.P. but its first appearance in southeastern Utah has been radiocarbon dated at 375±80 A.D. and 255±90 A.D. (Winter 1973), having diffused from the area of New Mexico and/or Arizona (Winter 1976b). Most of the corn found in the Glen Canyon area has been classified as flint corn, although dent and flour corn are also present, and pod corn may have been grown in the area (Cutler 1966). Cutler (1966) also found the majority of the corn cobs from Glen Canyon to have either 10 or 12 rows of kernels, a distribution also found at recent excavations in Butler Wash (Northcutt 1978).
Different genetic varieties of corn can be defined on the basis of a number of attributes of the kernels and cobs. Two races, Chapalote and Reventador, had small cobs and a flinty kernel. These corns had from eight to sixteen rows of kernels, with 10 or 12 rows the most common number. These races appear earliest in the Southwest and neither was found in Glen Canyon (Cutler 1966). Another race, known as Pima-Papago variety, includes both flint and flour corn and includes the following variants: 1) Onaveno (flint); 2) Mais Blando; and 3) Harinoso de Ocho (eight-rowed corn), a flint corn. Most of the corn from southeastern Utah falls within the Pima-Papago complex (Cutler 1966; Northcutt 1978; Heaves 1977).

Beans: At least three kinds of beans were grown in southeastern Utah. The common or kidney bean (Phaseolus vulgaris) has been identified at Butler Wash (Northcutt 1978) and Alkali Ridge (Jones 1946). Jones (1946) has also reported the lima bean (P. lunatus) and the tepary bean (P. acutifolius) from the Alkali Ridge sites. Each of these bean varieties were originally domesticated in Mexico and spread to the Southwest sometime between 2950 and 2450 B.P. The time of entry into southeastern Utah is not certain but they were present by the Pueblo I period at Alkali Ridge.

Squash: The term squash refers to a plant group which includes squash, pumpkin and gourds. All of these plants belong to the genus Cucurbita, except the common gourd which is of the genus Lagenaria. In prehistoric times, and continuing into the modern Pueblo villages, the seeds, flesh, and leaves of the plants were used for food and the dried fruits were employed as containers.

Cutler (1966) has reported the prehistoric presence of three species of cucurbits and one gourd from archaeological contexts in the Glen Canyon area. One of the cucurbits, C. foetidissima (the wild gourd or coyote melon) has been found at a few sites; C. pepo (common pumpkin) and C. mixta (cushaw) are the primary squashes recovered. The bottle gourd (Lagenaria siceraria) was also encountered, but infrequently in the Glen Canyon.

C. pepo is the oldest cultivated squash in the southwest, having appeared from Mexico about 3950 B.P. in the area of New Mexico. It is not known exactly when squashes began to be cultivated in southeastern Utah; however, Martin and Plog (1973) have observed that C. pepo was in use throughout the Anasazi area by about 250 A.D. and seems to have become abundant about 900 to 1000 A.D. In the Glen Canyon sites, all species of cultivated squashes date to the Pueblo II - III time frame. Another form of squash known to have been cultivated in the Southwest, C. moschata (field pumpkin) did not occur in the Glen Canyon plant materials.

Cotton: The cultivation of cotton in southeastern Utah is uncertain, although the evidence seems to indicate that it was grown in some areas. Pollen of the cotton plant has been recovered from archaeological sites in the Hovenweep area (Winter 1977) and Cutler (1966) notes the presence of several plant parts, including bolls, seeds, and fibers from several sites in the Glen Canyon.
Agricultural Practices in Southeastern Utah

Hack (1942) defines four primary types of fields from his extensive work on aboriginal agricultural techniques in northeastern Arizona, three of which appear to have had widespread usage in prehistoric southeastern Utah. These field types also include a number of variations and subtypes within each category, many of which also have been documented in the present project area. Each of the principal types of fields and the evidence for their existence is briefly reviewed below.

1. Floodwater Farming: Floodwater farming involves planting crops in fields watered by surface runoff. Fields watered in this manner generally occur in one of four locations: on alluvial fans at arroyo mouths, along the course of shallow arroyos or rivers, in the lower terraces of arroyos, and in the bottom of arroyos. In the Four Corners area, the success or failure of these fields depends on the rainfall pattern in a given watershed which determines the streamflow or flooding in the watercourses.

In the project area, there is abundant evidence for the presence of prehistoric floodwater farming. Farming of the deep, sandy alluvial soils found along river courses and in canyons has been widely suggested, based primarily on associated settlement patterns (e.g., Lipe and Matson 1975; Matson and Lipe 1978; Fike and Lindsay 1976). On the other hand, several instances of actual farm sites (terraces, check dams across arroyos) have been recorded, and in some cases, a farming function has been documented through pollen analysis of field sediments (Brooks 1974; Winter 1977). Such examples, commonly termed water and soil control sites, are known from the Hovenweep area (Winter 1977), Upper Horse Flats on the western periphery of Elk Ridge (Brooks 1974); immediately south of the San Juan River (Lindsay 1961); and in Glen Canyon (Sharrock et al. 1961). In the Hovenweep area, Winter (1977:188-209) found four kinds of floodwater fields including: (1) alluvial farms, including check dam structures; (2) main wash floodplains, which appear to have been extensively utilized; (3) arroyo bottom fields; and (4) slope wash sites consisting of linear terraces which ran along talus slopes.

2. Fields Watered by Rainfall: Fields watered by rainfall, or dry farming, would be expected to occur on the mesa tops where deep soil profiles are found. Unfortunately, this method of agriculture is usually characterized by a lack of structural associations and fields are, therefore, difficult to identify. Mesa top farming has been postulated for the Cedar Mesa area (Matson and Lipe 1978) and the White Mesa area (Fike and Lindsay 1976), again based upon observed settlement patterns. Utilizing an innovative approach to dry farm field identification, Winter (1977) examined a series of pollen transects around Anasazi mesa top pueblos in the Hovenweep area and found abundant corn pollen along with that of beans and squash. Winter concluded that dry farming was probably fairly common around these sites, but it was probably restricted to areas immediately adjacent to the villages.
3. Fields Watered by Irrigation: In this form of farming, water is taken from rivers, springs, or slope wash, and transported by container, ditch, or canal to fields. Prehistoric ditches were not discovered at Hovenweep, but have been noted farther west (Lindsay 1961; Sharrock et al. 1961). Thus, this practice appears to have been of lesser importance in southeastern Utah than floodwater or dry farming.

4. Fields Watered by Subsurface Seepage: Hack (1942) noted this type of field to occur at mesa edges in the Hopi area of northeastern Arizona where water aquifers fed both colluvial soils and sand dunes. This mode of farming has not been documented for prehistoric contexts in the project area. However, Winter (1977:201) has recorded the use of seeps which were modified to feed what he has labeled springside gardens. The presence of the farming at one seep near Hackberry House was revealed through palynological studies.

In summary of the agricultural practices, then, a wide variety of techniques were employed prehistorically. In light of Winter's pollen evidence it is beneficial to briefly present his conclusions for the Hovenweep area, which are probably valid for other parts of the South San Juan area as well:

Maize, beans and squash were probably the most common crops at Hovenweep. Based on the pollen samples it appears that extensive fields grew in dry farm locations around the villages on the mesa tops and in floodwater locations in the canyons and mesa top arroyos. Maize and squash were probably grown in almost every arable location, except for the broad mesa tops and canyon bottoms away from the villages, while beans seem to have been restricted to the fields around the mesa top villages. All three crops were sometimes grown in the same field, but at times corn grew alone, and at other times corn grew with beans or squash. Cotton was also probably grown as indicated by pollen.... The exact locations of the cottonfields are not known, but they may have been around the springs, since modern Hopi cottonfields were restricted to the moist springside terraces around the mesa and in irrigated fields... (Winter 1977:230).

Temporal Variation in Farming Techniques

Some diachronic patterns in farming techniques are present for the Anasazi occupation of southeastern Utah. Floodplain farming appears to have been predominant during the Basketmaker II era where possible methods could have included planting in moist soil near springs and seeps, farming on alluvial floodplains having high water tables and receiving occasional floods from adjacent watersheds (Matson and Lipe 1978).

Dry farming was apparently not practiced until Basketmaker III times when settlement patterns reflect a general movement to higher resource zones where more effective moisture was available for dry farming. This general trend extended into the succeeding Pueblo I period in some areas where that occupation occurred (Fike and Lindsay 1976; Louthan 1977).
Beginning in the Pueblo II period, increased reliance on agriculture and concomitant higher productivity is reflected in the advent of water control systems such as check dams, terracing, and irrigation structures. Brooks (1974) has dated check dams in Upper Horse Flats to approximately 1000 to 1300 A.D. Throughout the region during Pueblo II-III times, a primary subsistence mode appears to have been floodwater farming of river and canyon bottoms, especially with the use of water control measures in some areas. However, settlement patterns and pollen evidence indicate that dry farming of the mesa tops continued to be important.

Wild Flora and Fauna Utilization

The exploitation of nondomesticated plants and animals for food by the Anasazi populations seems to have been extensive throughout time. It is possible, however, that as agricultural techniques were perfected and productivity increased during the later periods, the reliance on wild resources diminished. Nonetheless, tabulations of micro and macro plant and animal remains from archaeological sites indicate widespread and intensive usage of wild edible plants and large and small animals. Two lengthy lists have resulted from the Glen Canyon Project (Woodbury 1965; Clark 1966); the reader is referred to these tabulations for genus and species lists. Additionally, many archaeological reports dealing with excavation results contain data of these resources. Clark (1966), for example, lists over 920 species of plants from the Glen Canyon region and shows that over 390 of these species are known from ethnographic accounts to have been used by historic Pueblo groups. Nearly 110 of these plants also were recovered from archaeological contexts in the Glen Canyon area.

Of special interest is the fact that several wild plants of economic importance may have been semi-cultivated or encouraged around the villages and in the fields. Jennings (1966) believes that amaranth, beeweed, and prickly pear cactus were probably tended in favored locations by the prehistoric inhabitants of the Glen Canyon area. Likewise, Winter (1977) has found through pollen analysis of fields in the Hovenweep area that a number of wild or weedy economic plants were probably manipulated and allowed to grow in fields.

One field of analysis which deserves special mention is the study of macrospecimens and pollen from human coprolites, or fecal specimens. Typically these remains occur only in dry sheltered contexts but when found contain a wealth of data regarding dietary components and patterns. Several such studies are available for southeastern Utah, all concerned with fecal materials from Glen Canyon sites (Martin and Sharrock 1964; Callen and Martin 1969; Fry 1976; Scott and Stiger 1978; Stiger 1978). As expected, these studies generally show abundant evidence of cultigens (corn, beans, and squash). Important wild plants include prickly pear cactus, beeweed, bulrush, amaranth, and grasses.
SOCIO-POLITICAL AND RELIGIOUS SYSTEMS

Defining social, political, and religious organizations which characterized prehistoric populations is often an elusive research question in archaeology. Stated simply, the data needed to reconstruct such situations are not as evident in the archaeological context as those related to settlement pattern, subsistence strategies, and material culture. We are fortunate to have a long cultural continuum in the Southwest extending from the prehistoric Anasazi to the present-day Pueblos from which inferences, or more properly analogies, can be drawn regarding the configuration of extinct social organizations. In the past few years, several attempts have been made to project historic patterns into the past using the many ethnographic accounts available for the Southwest and other general treatments of historic Pueblo social organization (e.g. Parsons 1939; Eggan 1950; Dozier 1970). Pertinent examples of this type of analysis include various papers in Longacre's (1970) collection and Dozier's (1965) examination of Southwestern social units and archaeology. To date, such analyses have not been rigorously applied to archaeological contexts from southeastern Utah; nonetheless, a brief review of the overall situation will provide a basis for understanding similar manifestations in the South San Juan project area. In this sense, the following discussion serves to call attention to the types of social and religious organization which probably were associated with the various stages of cultural development in prehistoric southeastern Utah.

Prior to examining these data, it is of benefit to define the terms "social and religious organization" and the roles they play in the maintenance of a given cultural grouping. Social organization is concerned with the arrangements and relationships of human beings one to another. Within this situation, a specific structure can be delineated regarding the component groups of a society and the configuration of their arrangement (e.g. residential groups, social position and statuses, etc.). Religious or ideological systems serve primarily to provide understanding of the social and natural environments and to structure individual and intra-group relationships. In this vein, Dozier (1970:133) has observed that historic Pueblo society and religion revolves around five basic concerns: (1) weather, (2) illness, (3) warfare, (4) control of flora and fauna, and (5) village harmony. We can expect, based on observable archaeological data, that the prehistoric Four Corners Anasazi shared the same concerns and structured their social and religious patterns around similar ideas. A final observation is that social and religious organization are not static entities and changed, often markedly, throughout the stages of cultural development in the project area as other facets of the lifeway and natural environment underwent alteration.

Service (1971) has outlined a useful classification of levels of socio-cultural integration which can be applied to the prehistoric developmental situation in southeastern Utah. In this scheme three stages are identified in the evolution of primitive social organizations: (1) band level of integration, (2) tribal level of integration, and (3) chiefdom level of integration. The band level characterizes the network of relationships found in hunting and
gathering or pre-agricultural societies (i.e. the Paleo-Indian and Archaic groups). Generally speaking, a band is a local group made up of several families who camp, forage, and migrate seasonally together. The band is a politically autonomous entity, composed of nuclear families, who hunt and gather within a definable territory. Typically, population density is low in this case and overall band size ranges from 10 to 50 persons. Inter-band relationships may be solidified through marriage patterns. It is theorized that most pre-European contact band societies were of the "patrilocal" type which is organized around a nucleus of males and in which the marriage pattern has the bride moving from her own band to that of the groom (Service 1971). The patrilocal band is the simplest form of social structure but for a very good reason. Jennings (1957:278) has observed that the prehistoric Great Basin Desert Culture way of life involving "a constant food quest could militate against the development of a rich esthetic or socially complex life."

Once the agricultural-based way of life became dominant in the northern Southwest, the band level of integration would have been too simple to handle the more complex group activities and social relationships of the larger, sedentary communities. At this point, we see the advent of Service's tribe level of integration, a stage or organization which probably characterized nearly the entire span of Anasazi occupation of the project area. At this level, there is an increase in the social complexity as economically self-sufficient residential groups or families became more important. Integration of these groupings ranged from households (various types of families), to lineal groups (lineages or clans).

The lineage and clan are very important to modern-day Pueblo societies and thus deserve brief elaboration. A lineage is a consanguineal (blood-related) residential group whose members can trace their common relationship genealogically. Belief in descent from a real or mythical common ancestor (e.g. a bird or animal), localized residence, and lineage ceremonies may contribute to lineage solidarity. If a lineage becomes too large, it may divide up into several smaller groupings called clans, whose members hold to the myth of a common ancestor, marry outside the group, and share common rituals. Steward (1955:161-170) has posited a developmental sequence from lineages to clans in prehistoric Southwestern social organization in which Basketmaker III pithouse villages began as lineage groupings, and eventually evolved into clan segments in larger villages in late Pueblo times (Pueblo II-III).

At the same time, as Anasazi communities evolved from Basketmaker to Pueblo times, spatial distinctions developed in the villages separating the domestic households from the ritual structures. McFeat (1974) has observed that this separation produced distinct intra-community spatial contexts which were separate yet interdependent, thus lending to centralized unity of the village. Hence, the religious kiva structure became a central focus for the village—it was centrally located and domestic rooms were oriented toward it—and it served an integrative function as social patterns became more complex at the tribal level of organization (Plog 1974).
In reality, there is a close interrelationship between kinship groupings and religious structure in Pueblo social organization. Crosscutting even these forms of structure were supra-lineal groups (e.g. moieties or dual divisions of the villages) and village associations, such as curing, hunting, and clowning associations (Dozier 1965).

It has been posited (e.g. Martin and Plog 1973) that some communities in the prehistoric Southwest, including the northern Anasazi area, may have reached a level of social integration known as the chiefdom. In this form of integration a society is even more complex and organized, being particularly distinguished from tribes by the presence of centers which coordinate economic, social, and religious activities (Service 1971). Importantly, incipient specialization in production and redistribution of produce from the controlling center is necessary to this level of integration. Possible evidence for chiefdoms in the northern Southwest include the degree of authority and integration necessary for constructing and maintaining large-scale water control systems (Vivian 1974), the possibility that great kivas may have served, among other things, a redistribution function (Plog 1974:122-127), and the presence of high status burials at certain sites (Reed 1977). Overall, the evidence for the chiefdom level of social integration has not been fully documented for the Southwest, and few results related to this problem are presently available for southeastern Utah. It may be that a few sites in the project area, Edge of the Cedars Ruin for example, may be associated with such a development in late Pueblo times but probably more in the sense of being a satellite or outlier for larger, more centralized situations such as those in Chaco Canyon in northwestern New Mexico.

In summary, the first two stages—the Paleo-Indian and Archaic eras —were characterized by the rather simple band level of society, a social organization geared toward a non-sedentary, hunting and gathering economy. Beginning with the advent of the Formative stage, new subsistence and settlement patterns brought about concomitant increasing levels of socio-political and religious integration, namely the tribal and, possibly, the chiefdom levels. There remains, however, much research to be done before this increasing complexity and its ramifications can be fully understood.
In order to describe in complete detail the lifeways of past social groupings for a given area it is necessary to include the biological aspects of the human populations in question. Such an undertaking includes physical characteristics of the population and pathologic or other health conditions affecting the individual members. Unfortunately, large, well-described skeletal populations are not available for southeastern Utah despite the fact that several hundred burials and mummies were exhumed by relic collectors in the 1890s. Much of this material is curated at several widely separated museums, often without accompanying specific site information (see Turner 1960a for an extensive but incomplete listing of skeletal remains from southeastern Utah and their present location). On the other hand, skeletal materials from the Basketmaker II caves in the project area, have been used in part as data for comparative studies of Southwestern physical anthropology (e.g. Hrdlicka 1931; Woodbury n.d.; Seltzer 1944). Table 3 provides a list of references which deal with recovered and analyzed human skeletal materials from southeastern Utah. From the table it can be observed that just over 150 human burials from southeastern Utah have been described in detail; however, a significant number of these are poorly preserved materials or infants, situations which negate many meaningful observations.

By combining information from the studies listed in Table 3 it is possible to generate some general physical characteristics for prehistoric Anasazi populations of southeastern Utah. The infant mortality rate was very high as shown by a large percentage of fetal or infant burials. Of skeletons which could be adequately aged, there are indications that very few adults lived past the age of 50 years. Reconstructed stature figures show adult males ranging from 5'1" to nearly 5'8", with females usually just below 5' in height. A dental trait known as shovel-shaped upper incisors was observed in a majority of the dentitions. This trait is common among American Indian populations, past and present.

During the early part of this century, it was noted that a dichotomy existed between the head forms of the early Basketmaker populations who had long-heads (or undeformed) and the later Pueblo groups who possessed broad or round-shaped crania. A prevalent theory at that time saw a "Pueblo invasion" in which the Pueblo peoples replaced the Basketmaker culture. During the 1930s, comparative studies of Southwestern skeletal populations, including the extensive collections of Basketmaker II crania from Utah which were found in several eastern museums, dispelled the idea that two distinct populations had occupied the Southwest in the past (cf. Woodbury n.d.; Seltzer 1944). Rather, it was shown that there was indeed genetic continuity between early Basketmakers and the historic Puebloans, and that the advent of wooden cradleboards during the Pueblo I era was responsible for the flattening of the lambdoidal and/or occipital areas of the skull during infancy. For our purposes, it is interesting to note that skeletal material from the present project area was important to the development of this idea. Basketmaker and Pueblo crania from the various Glen Canyon excavations and Alkali Ridge conform to this.
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Table 3: List of references for human skeletal materials and related studies for southeastern Utah.
distribution. The general genetic continuum found from the Basketmaker periods to the recent Pueblo periods has been defined by Seltzer (1944:23) as the "Southwest Plateau" physical type.

Pathologic conditions were relatively prevalent in prehistoric southeastern Utah populations, as might be expected. Among the more common maladies were osteoarthritis of the spine, broken bones, osteoporosis (an anemic condition evident on the skull), and a wide variety of dental problems. Brues (1946) has also observed evidence of violent deaths in the Alkali Ridge skeletal series where two males had been killed by blows to the head; one also had been scalped and a projectile point fragment was imbedded in the spine of this individual. Brues also noted indications of malnutrition and probable vitamin deficiency in the Alkali Ridge skeletons. To these health problems, we can add the observations of Woodbury (1965) who states that these populations were probably plagued by other difficulties such as obnoxious pollens, parasites of many types, and several forms of endemic diseases.

ABANDONMENT

Based on archaeological data (Lipe 1970) and tree-ring dates (Bannister et al. 1969; Hobler and Hobler 1978), the Anasazi populations abandoned southeastern Utah around 1250 A.D. moving in a general southeasterly direction to present-day northeastern Arizona or New Mexico. The problem of widespread abandonment of the northern San Juan Anasazi area has received considerable attention in the archaeological literature. The most common causal factors cited either have been related to the arrival of Athabaskan or Shoshonean groups, or to climatic changes in the form of drought, erosion, or shifts in the seasonal rainfall pattern. These hypotheses have been challenged on a number of grounds (see Jett 1964; and Martin and Plog 1973:318-333, for example), such that none adequately or completely provides reasons for these drastic demographic changes in all cases. Other ideas which have received even less support include lower temperatures resulting in shortened growing seasons, widespread diseases and epidemics, overhunting of wild animals, soil depletion, and derorestation.

In all likelihood, more than one of these causal factors combine to contribute to the abandonment of separate localities. It is known, for example, that various areas of the northern San Juan Anasazi were not abandoned simultaneously, a situation probably related to local environmental conditions and social aspects. In this context, detailed analyses are required in order to arrive at causal explanations. An example of this type of situation from southwestern Colorado recently resulted from an intensive study of two Pueblo III communities (Nickens 1977a). In that locality, it was suggested that although drought conditions were probably the indirect cause, declines in the corn and bean crops, animal protein, and drinking water may have been the direct causes of the abandonment, along with the failure of the local farmers to develop an intensive water control network. One apparent result of the pre-abandonment problems was an increase in child mortality rates.
Such a model cannot be expected to apply to similar situations throughout the entire northern Anasazi area; however, the point to be made is that abandonment of the region was probably due to a complex combination of variables and not any single causal factor.
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AN ARCHAEOLOGICAL SURVEY
OF THE CENTRAL LISBON VALLEY
STUDY TRACT IN THE MOAB DISTRICT
SAN JUAN COUNTY, UTAH

by
Kevin D. Black
James M. Copeland
and
Steven M. Horvath, Jr.
Centuries Research Inc.
Montrose, Colorado

1981

With a contribution by
William A. Lucias.
AN ARCHAEOLOGICAL SURVEY OF THE CENTRAL
LISBON VALLEY STUDY TRACT IN THE MOAB DISTRICT,
SAN JUAN COUNTY, UTAH

Prepared for the Bureau of Land Management
under the terms of contract no.
YA-553-CTO-1026

By
KEVIN D. BLACK
JAMES M. COPELAND
and
STEVEN M. HORVATH, JR.

With a contribution by
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June 1981
PREFACE

This report discusses the findings of a Level III Cultural Resource Inventory of 13,572 acres of land near La Sal, San Juan County, Utah which is administered by the Bureau of Land Management. The inventory project was designated as the "Class III Cultural Resource Inventory of the Lisbon Oil and Gas Field in Utah" by the Bureau of Land Management. The contract for completion of the work was awarded to Steven G. Baker, Consulting Archaeologist, of Montrose, Colorado in the spring of 1980. This contract was YA-553-CTO-1026. Centuries Research, Inc., of Montrose, Colorado completed most of the project under subcontract. Fieldwork was directed by Kevin D. Black and James M. Copeland of Centuries with Baker serving as Principal Investigator. Kevin D. Black assumed the primary responsibilities for completion of the project report. Steven Horvath of Centuries collaborated with Black and Copeland in production of the report under the general direction of Baker. The efforts of these individuals are sincerely appreciated as is the work of the various field, lab, and office staff members of Centuries. The field crews led by crew chiefs Bryan Byrd, Jeff Bentley, Russell Ebel, Will Reed and Jonathan Weyer deserve special thanks for completing the tedious and somewhat thankless job of recording one third more sites than originally predicted. It was a long and tedious field season. Finally, much appreciation for their help is extended to Bureau of Land Management District Archaeologist Bruce Louthan of Moab who provided technical direction, and Dick Cazier, Bureau of Land Management Contracting Officer from Denver who helped in contract administration.

Steven G. Baker/Principal Investigator
Montrose, Colorado
February 10, 1981
ABSTRACT

A Class III archaeological inventory of 13,572 acres has been conducted on BLM-administered lands within the Central Lisbon Valley Study Tract in northern San Juan County, Utah. The survey resulted in the discovery of 547 archaeological sites and 290 isolated finds dating to the Paleo-Indian through Historic periods. Most of the sites are open lithic scatters, and a majority of sites with diagnostic artifacts has been shown to date to the lengthy Archaic period. Diagnostic features and artifacts also document the presence of peoples of Clovis, Plano, Archaic, Anasazi, Ute/Paiute, Navajo and Euro-American affiliation. A very limited Fremont presence also is suggested, but not proven, solely on the basis of projectile point styles. The evidence suggests that site densities are somewhat higher in the eastern portion of the Indian Creek-Dry Valley planning unit than indicated by a previous Class II inventory. Areas particularly sensitive to developmental impacts are the East Coyote Wash drainage and the wooded divide between Lisbon and East Coyote Valleys. Further archaeological inventories are recommended for adjacent tracts to avoid undue impacts to important sites and site concentrations.
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CHAPTER I

INTRODUCTION

On behalf of the Utah Bureau of Land Management (BLM), an intensive archaeological survey has been conducted on 13,572 acres of BLM-administered land in San Juan County, Utah (Figures 1 and 2). This land lies within the Dry Valley Planning Unit of the Grand Resource Area in the Moab District of the BLM. This work was conducted under the terms of contract no. YA-553-CTO-1026 between the Moab District of the BLM and Steven G. Baker, Consulting Archaeologist, Montrose, Colorado.

The BLM is required by law to identify, evaluate, and protect prehistoric and historic cultural resources on public lands under its jurisdiction, and to insure that Bureau-initiated or Bureau-authorized actions do not inadvertently harm or destroy non-federal cultural resources. These requirements are mandated by the Antiquities Act of 1906; the Reservoir Salvage Act of 1960, as amended by P.L.93-291; the National Historic Preservation Act of 1966; the National Environmental Policy Act of 1969; Executive Order 11593 of 1971; the Federal Land Policy and Management Act of 1976; and the Archaeological Resources Protection Act of 1979.

The contract under which this work was conducted called for an intensive Class III (100%) level inventory of all BLM-administered lands in Township 30 South, Range 25 East, Sections 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, and 18 (Figure 2). The study tract represents ten percent of the Lisbon Oil and Gas Area, and is considered to be the main focus of energy exploration and development activity in the Lisbon Valley region of Utah.

OBJECTIVES

The objective of this project as specified by the Statement of Work is to "identify, record, and evaluate all the cultural sites which have significant cultural materials so that no cultural inspection is needed on a project-by-project basis. The sites will also be marked to allow BLM non-archaeological personnel to relocate them and accomplish avoidance/mitigation, regardless of snow cover or other adverse conditions" (BLM-Moab 1980:26-27).

In addition to the above-mentioned specific management objective, the following objectives also are to be accomplished: 1) recognition or elaboration of patterns of past human use and occupation; 2) determination of the cultural resource potential of the study area; 3) prediction of zones of greater or lesser activity by past human populations; 4) identification and assessment of the environmental and/or cultural variables, or combinations of variables, that form the most accurate
Figure 1: Map of Colorado Plateau showing location of Lisbon Valley Project Area. Broken line indicates border of Colorado Plateau.
Figure 2: Portion of Indian Creek-Dry Valley Planning Unit map, Bureau of Land Management-Moab District, showing study tract (within interior line) and immediate vicinity. Odd shaped blocks in sections 6 and 15 are privately owned lands. Scale = 1:62,500.
predictors of cultural resource sites; 5) development of projections of the expected density, distribution and diversity of cultural resources; 6) discovery of the range of cultural resource variability within the study area; and 7) development of a comprehensive research design for the study area that will provide for future research and a basis for formulative and evaluatory mitigation plans.

To accomplish these objectives, a BLM Class III Inventory was conducted. This is a complete (100%), intensive field inventory designed to identify and record, from surface and exposed profile indications and informant data, all cultural resource sites within a defined area. It also provides the data base for making an objective estimate of the nature and distribution of cultural resource sites in immediately adjacent areas in combination with available Class II cultural inventory data.

The Principal Investigator for the project was Steven G. Baker, Consulting Archaeologist, Montrose, Colorado. Kevin D. Black and James M. Copeland co-directed and supervised the actual field work and served as crew chiefs. Bryan Byrd, Jeff Bentley, Russell Ebel, Will Reed, and Jonathon Weyer also served as crew chiefs. Crew members for the project included Joe Bartolini, Bruce Boeke, Barbara Brown, Doug Elson, Denise Evans, Margaret Glass, Dana Hubbard, Diane Huffman, Don Irwin, Maria Mason, Patrice Neuman, Frank Rupp, Lisa Senior, David Smythe, Helene Pogachnik, Curt Stanley and Gary Wiggins.

Fieldwork for the project commenced on May 19, 1980 and was concluded on October 11, 1980. Generally, five day work weeks were followed with several instances of ten day and six day work sessions also completed. A total of 104 days was spent in the field.

The project personnel lived and worked out of La Sal, Utah for the duration of the project. All crew members took turns with meal preparation and, thankfully, most were pretty good cooks. The crew experienced no serious injuries except for an occasional sprain. Gnats were extremely bothersome for a while in June and July and rattlesnake encounters were sporadic.

Crews put out two different lightning strikes in pinyon-juniper stands in and near the project area. Overall, access in the project area was excellent and long hikes into work areas were the exception rather than the rule.

METHODS

Field methodology for this project called for a complete and intensive inventory of all cultural resources within the defined study area. This was accomplished by the use of 2-3 crews comprised of 3-4 people each. Each crew had their own vehicle and was assigned an individual section of land to survey. Upon the completion of a section, the crew would
move to another section, usually adjacent to a previously inspected section and one that had located cadastral markers and a section line that had been previously flagged.

As required by the contract and specified in the Statement of Work, "the contractor shall locate or demonstrate a diligent effort on at least one U.S.G.S. corner marker per quarter section surveyed prior to beginning the inventory" (BLM-Moab 1980:29). Overall, cadastral markers were well represented even though few of them were indicated as being "in" on the topographic maps. Most difficulties in cadastral location occurred in areas that had been chained or railed; however, small islands of standing trees in chained areas were at times found to indicate cadastral marker locations. Markers for the east and west section lines of sections 1-6 were not well represented. These sections are slightly more than 2 mi north-south by 1 mi east-west and located markers were usually on township lines or at the corners.

In conjunction with using cadastral markers and topographic features for locational determinations, 7½' aerial orthophoto-quad maps were used. These maps did not have land lines superimposed upon them, but by scaling off the 15' series topographic map land lines using the Universal Transverse Mercator (UTM) grids and then transferring them onto the orthophoto-quad maps, a fairly accurate plotting of land lines was accomplished. When the field work was implemented and corner markers were actually located on the ground, adjustments would be made on the aerial maps and in most cases these involved discrepancies of 50 meters or less. Realizing the occasional discrepancy in plotted corner markers, crews were instructed to survey past the plotted section lines to ensure consistent and complete coverage. In all, 54 section corner and ¼ corner markers were found and all are dated 1916. Upon the location of a section corner or ¼ corner, florescent orange surveyors' flagging tape was placed there and was left as an aid to later surveyors.

Coverage of the sections by the crews was accomplished by search line sweeps across the ground with distances between the surveyors not exceeding 15 m (Figure 3). Conversation with Bruce Louthan, Moab District Archaeologist, on August 7, 1980 resulted in some relief from this contract requirement. The relief was given for open range land where, as of August 7, very few sites had been located. Ground and inter-crew visibility were quite high in these areas, assuring adequate coverage at a spacing of 20-25 m. Spacing in wooded areas remained at 15 m.

Sections were covered by sweeps oriented in the cardinal directions although in some cases rugged terrain was covered by contouring along the slopes. As the sweep would progress, the crew member on the outside edge of the sweep would hang an occasional piece of flagging tape or toilet paper to mark that extent of the sweep. When the end of the section or a topographic feature being used as a boundary was reached,
Figure 3: View looking east at crew during sweep in Section 10 transect. Negative number 123-80-786.
the crew would move over accordingly and begin the return sweep with a new flag line established and the old line retrieved. When working adjacent to an unsurveyed section, flags were left so that when a crew began work in that section, they would have a ready-made boundary to work from and insure coverage along that line.

Upon the location of a site, the crew would begin marking all the artifacts with wire pin flags (Figures 4 & 5). If the sites were small enough, all artifacts were thus marked and recorded. If after a short period of time it was realized that there were too many artifacts to mark, then only prepared tools, modified flakes, diagnostic or unique artifacts and/or features were marked. After the site had been intensively inspected, crew members began assigned duties which included drawing maps and artifacts, conducting on-site sample and analysis of artifacts and taking photographs (Figure 6). Crew chiefs generally completed the site forms and were responsible for locational placement of the site on the maps. Each site was tagged with a pressure sensitive 3" x 5" aluminum tag (Figure 7) which was then wired onto a convenient and, if possible, easily visible feature at the site (e.g. a fence post or tree). These tags also served as the site datum for mapping purposes. Information inscribed on each tag included the project name, temporary site number, general site type, date, recording crew, and consultant's name. The tags on previously recorded sites at times were observed during the project shining brilliantly in the sun up to distances in excess of 100 m. This type of easy visibility will undoubtedly aid in site relocation, especially in the winter, but it also may draw undue attention to the sites with potentially adverse consequences. Only time will tell.

On-site analysis consisted of locating and recording all prepared tools and, when possible, a complete artifact count. However, when artifact numbers precluded a total inventory, which was most often the case, nonrandom sample transects usually two meters wide and of varying lengths were utilized. The crew chiefs selected at their discretion the area for transect sample. In some cases where roads passed through sites, the road was used for a sample transect. In some cases, two or more transects were completed when artifact recovery in the first transect was low and believed not to be reflective of the artifactual content on the site. All artifacts within the transect were recorded as to type and material. When tools were present outside the transects, these were also recorded. All diagnostic lithic artifacts were drawn and photographed. Overall, collections were not made, with the exception of some ceramic sherds and a few diagnostic lithic artifacts. An artifact accession-provenience list has been provided to the BLM (see Appendix 3) and the artifacts will be curated at the Edge of the Cedars Museum in Blanding, Utah. A few sites, particularly large quarries of homogenous materials such as at 42SA9864, were not sampled as outlined above. Instead, the sampling consisted solely of artifact density estimates made at representative areas of these sites.

Site maps were prepared by either one or two crew members and in some instances by the entire crew on large or complex sites. The site tag
Figure 4: View looking northwest at pin flags marking stone tools in rockshelter site 42SA9756. A pictograph can be seen on the rock face above the pin flags. Negative number 123-80-1103.

Figure 5: View of crew in process of recording site 42SA9640. Negative number 123-80-32.
Figure 6: View of crew members mapping site 42SA9396 along East Coyote Wash. Negative number 123-80-903.

Figure 7: View west of metal site tag in juniper tree marking datum for site 42SA9668. Negative number 123-80-216.
was used as the datum, from which paced distances and necessary directional data were plotted on the maps. The topographic and environmental situations also were recorded on the maps. When features such as claim posts, road intersections, corner markers, well pads, etc., were present they were thus noted and included on the maps, or azimuths and distance information was given.
CHAPTER II
ENVIRONMENT

GEOMORPHOLOGY

The project area lies on the Colorado Plateau near the Colorado border in southeast Utah, toward the northeast corner of San Juan County. This portion of Utah is also within a broad regional sub-area of the Colorado Plateau known as the Canyonlands Section and, more specifically, it lies within a tectonic division of the Colorado Plateau variously known as the Paradox Basin, Paradox Salt Basin, Paradox Fold and Fault Belt, and the Pennsylvanian Paradox Evaporite Basin (Buss 1960; Curtis 1960; Thornbury 1965). The Paradox Basin is a rectangular tract of land approximately 241 km (150 mi) northwest-southeast by 112 km (60 mi) southwest-northeast. It is bounded on the north by the Uinta Basin, on the northeast by the Uncompahgre Plateau, on the northwest by the San Rafael Swell, on the southwest by the Abajo and Henry Mountains, and on the southeast by the San Juan Mountains (Figure 1)(Dane 1935). Physiographically the Paradox Basin is characterized by large anticlinal valleys oriented northwest-southeast, e.g. Lisbon Valley and Paradox Valley, and heavily dissected plateaus in generally flat-lying sedimentary rock. The La Sal Mountains, one of a number of Tertiary-age laccolithic domes present on the Colorado Plateau, are found to the immediate north of the project area and elevations there exceed 3,658 m (12,000 ft).

Most rocks in the project area are Mesozoic in age though Cenozoic, Upper Paleozoic and Pre-Cambrian deposits are present in a few locations (Cater 1955). Figure 8 is a generalized cross-section of the project area from the southwest corner of Sec. 18, T30S, R25E to the northeast corner of Sec. 1, T30S, R25E (see Figure 2) showing the influence of the Paradox Evaporite member of the Pennsylvanian-age Hermosa formation on overlying sediments and surface structures. The Paradox Evaporite member consists of gypsum, salt and anhydrite interbedded with brown and black shales (BLM-Moab 1976); the soft and soluble nature of this formation has facilitated its occasionally rapid movement resulting in the uplifted, faulted, collapsed and eroded structural forms seen today (Buss 1960; Cater 1955). The salt in this formation, once considered a possible resource to prehistoric aboriginal groups, has been shown to contain significant amounts of sulphates and carbonates (Baldwin 1976; Copeland 1980a).

The complex geologic events of the past in this area have resulted in a variety of geologic formations being exposed in different parts of the project area. The slopes and valley floor of Big Indian Wash are composed of the Cutler and Rico formations of upper Pennsylvanian-Permian age (BLM-Moab 1976; Baars 1972). The Rico formation is a gray to grayish-blue limestone interbedded with red and purple mudstone, siltstone and sandstone which is often arkosic. The overlying Cutler formation is somewhat similar and consists of brown, red and purple arkosic
Figure 8: Cross-section of project area from (left to right) the southwest corner of Section 18 to the northeast corner of Section 1, showing geological stratigraphy and surface features. Adapted from BLM-Moab (1976:Figure 2, Minerals).
sandstones, siltstones, and mudstones. The Rico limestone is quite fossiliferous, yielding marine invertebrates such as brachiopods whereas the Cutler strata contain small amounts of fossil wood.

Moving to the northeast, the floor of Lisbon Valley and its southwest slopes as far as the crest of the Big Indian-Lisbon divide are composed of the oldest exposed rocks in the project area, the Honaker Trail formation of Pennsylvanian age (BLM-Moab 1976). This formation is the upper portion of the Hermosa group, between the underlying Paradox Evaporite and the overlying Rico formation. The Honaker Trail formation, like the Rico, is a gray to grayish-blue limestone with lesser amounts of dark colored shales. This is also a fossiliferous stratum, somewhat better known than the Rico (Tidwell 1975:Chart 1), containing fossil lycopods, conifers, treelike relatives of Equisetum, and plants with fernlike foliage.

The northeast slopes of Lisbon Valley contain the only exposures of the Morrison formation in the project area. The Morrison is of Upper Jurassic age and consists of a lower Salt Wash member and an upper Brushy Basin member (BLM-Moab 1976). The Salt Wash is a grayish-yellow to pale orange sandstone and siltstone, while the Brushy Basin is composed of variegated bentonitic shales with interbedded sandstones, limestones and conglomerates. The Morrison formation is famous for its abundant dinosaur bones, but it also yields such fossils as petrified wood of several plant genera (Tidwell 1975:Chart 2) and dinosaur tracks.

Most of the northeast portion of the project area, from the crest of the Lisbon-East Coyote divide to near East Coyote Wash, is covered by rocks of the Dakota and Burro Canyon formations. The Burro Canyon formation, of lower Cretaceous age, contains light colored sandstone and conglomerate along with interbeds of purple and green shale and mudstone. Above the Burro Canyon lies the Dakota formation, also of Cretaceous age. It is composed of three main strata, including an upper fine-grained whitish sandstone, a middle unit of carbonaceous shales and coal, and a lower unit of light brown to gray conglomerate and coarse sandstone (Baars 1972; BLM-Moab 1976). The Burro Canyon is not an important fossil-bearing formation, but the Dakota has been reported to yield fossil ferns, wood and bone.

The only other geologic formation exposed in the project area is the Mancos shale, remnants of which can be found along East Coyote Wash at the far northeast corner of the project area. The Mancos shale dates to Upper Cretaceous times and consists of dark gray and black shales with some yellowish sandstone interbeds (BLM-Moab 1976). Marine fossils such as brachiopods and sharks' teeth have been recovered from the Mancos formation. Quaternary deposits overlay the strata described above, but in the project area they are limited to thin veneers of aeolian silts and thicker accumulations of alluvium along larger drainages (see discussion of soils below).

Topographically, the project area is typical of much of the Colorado Plateau though not nearly as rugged and dramatic as other areas of the Canyonlands Section to the west. The area is more like areas in west-
central and southwestern Colorado a few miles to the east. Lisbon Valley is the dominant land form in the study area and extends northwest-southeast through the western half of the project area along the Lisbon Valley fault (Figure 9). Parallel to Lisbon Valley lie Big Indian Valley to the southwest (Figure 10) and East Coyote Wash to the northeast (Figure 11), which together drain virtually the entire project area. Bullhorn Wash (Figure 12) and Lisbon Canyon catch the runoff which avoids the three major drainages. Lisbon Valley and East Coyote Wash drain to the southeast, Bullhorn Wash to the east, Lisbon Canyon to the northeast, and Big Indian Valley to the northwest then southeast and west. All waters except Big Indian Wash eventually end up in the Dolores River via Greasewood Canyon (Coyote Wash in Colorado); Big Indian Wash drains into Hatch Wash and eventually into the Colorado River.

Overall, terrain in the study area is not particularly severe. The valley floors of the three main drainages are wide and exhibit a gentle gradient typical of such large drainages in the Paradox Basin. The extensive southwestern slopes of the East Coyote Wash watershed dip gently to the northeast, although some of the canyons cutting into these slopes are quite rugged. Thus, ground slopes generally do not exceed 10° in the project area but steep gradients are encountered along the northeast slopes of both Big Indian Valley and Lisbon Valley, and along the larger canyons of Bullhorn Wash and the southwest tributaries of East Coyote Wash. Elevations within the study area range from 1,829 m (6,000 ft) where East Coyote Wash flows out of the east side of the study tract, to 2,188 m (7,177 ft) near the northwest corner of the area on the Lisbon Valley-East Coyote divide.

Given the varied geologic and topographic situation in the project area it was not surprising to find extensive prehistoric and historic utilization of the area for its economic minerals and raw material for stone tools. Historic mining activity has focused on the Chinle and Morrison formations for uranium and vanadium; on the Mancos, Chinle, Cutler, Hermosa and Leadville formations for oil and gas; and on the Cutler formation for copper (BLM-Moab 1976). Prehistorically, aboriginal groups in the area mined local outcrops of chert, chalcedony, quartzite, siltstone and mudstone for stone tools from the Dakota, Burro Canyon, Morrison, Cutler and Rico formations (see Figure 8).

**CLIMATE**

The Lisbon Valley area lies between two areas of decidedly different climatic regimes, those being the arid deserts to the south and the temperate to subarctic La Sal Mountains to the north. Elevation is a major factor in the distribution of these climatic zones. The proximity of the La Sal Mountians likely has influenced weather patterns such that the climate of the project area is slightly cooler and wetter than areas of similar elevations and topography further removed from mountainous areas. Thus, climatic figures given below for the town of La Sal are likewise slightly cooler and wetter than those for the project area since the town lies even closer to the La Sal Mountains.
Figure 9: Overview of Lisbon Valley looking south. Negative number 123-80-464.

Figure 10: Overview of Bin Indian Valley looking west. Negative number 123-C80-39.
Figure 11: Overview of East Coyote Wash looking east. Negative number 123-80-398.

Figure 12: Overview of Bullhorn Wash looking east. Negative number 123-80-1112.
In general, the climate of the La Sal area is semi-arid, with the average annual precipitation ranging from 203 mm to 330 mm (8-13 inches). Most of this precipitation falls as summer rains and winter snows, with fully 45 percent of the annual moisture received from July to October. Generally, storm patterns in the area are derived from the southwest. Temperatures are hot in the summer and cool in the winter, with average highs of 29° to 35° C (85°-95° F) in July and -1° to 4° C (30°-40° F) in January. The average length of the growing season at La Sal for the period 1966-1975 was 154 days (BLM-Moab 1976).

FLORA

Five major vegetation zones are present within the study area (Figure 13). The dominant plant community is pinyon-juniper woodland (Pinus edulis - Juniperus utahensis) which covers extensive areas of the crests and slopes of the Big Indian-Lisbon and Lisbon-East Coyote divides (Figure 14). Typically, the understory in these woodlands includes shrubs, forbs and grasses such as sagebrush, serviceberry, mountain mahogany, cliffrose, bitterbrush, yucca, Mormon tea, purple gentian, prickly pear, cholla, Indian ricegrass, snakeweed, aster, mallow, salsify, daisy, sunflower, bluegrass and june-grass (Costello 1954). Past chaining of these woodlands, particularly in the northwest half of the project area, has facilitated the expansion of grasslands for cattle grazing although the forest has begun to regenerate (Figure 15).

Within the pinyon-juniper woodland and extending in a broad belt along the southwest slopes of East Coyote Wash grow sparse stands of ponderosa pine (Pinus ponderosa), aspen (Populus tremuloides) and gambel oak (Quercus gambelii). This zone also exhibits the most extensive areas of barren slickrock within the study area and, given the dryness of the area today, may represent floral remnants from cooler and wetter conditions during the Pleistocene (Figures 14, 16 and 17). Since the pinyon and juniper woodland has largely replaced the ponderosa and aspen stands in this area, the understory is similar, though sparser and with the addition of gambel oak. Where water is available denser stands of ponderosa are present along with wetland flora like cattails and cottonwood trees (Figures 16 and 18).

A third ecozone occupies extensive breaks in the valley bottoms and on Middle Mesa toward the east edge of the study area. This is the sagebrush (Artemisia spp.) zone, generally occupying somewhat alkaline to neutral soils (Figure 19). The understory is almost exclusively herbaceous, as typical plants include snakeweed, Indian ricegrass, wheatgrass, squirreletail, blue-grass, june-grass, cheatgrass, galleta, cholla, prickly pear and yucca (Costello 1954).

Within the East Coyote Wash drainage system is a fourth plant community dominated by greasewood (Sarcobatus vermiculatus). Greasewood occupies drainage bottoms and terraces having heavy soils, high alkali content
Figure 14: Overview of pinyon and juniper covered slopes southwest of East Coyote Wash showing scattered ponderosa pine and slickrock areas. La Sal Mountains in background. Negative number 123-80-866.

Figure 15: View of chained pinyon and juniper area northeast of the Big Indian-Lisbon divide. Negative number 123-80-111.
Figure 16: View looking northeast at ponderosa pine and spring-fed pool (at bottom of photo) in canyon southwest of East Coyote Wash. Salamanders found swimming in the spring waters attest to its permanence. A small aspen grove can be found a few hundred meters up canyon from the spring. Negative number 123-80-1007.
Figure 17: View of scrub oak and (in rear) aspen in Section 4. Negative number 123-C80-111.
Figure 18: View northeast at lone cottonwood tree in Section 15. Negative number 123-C80-11.

Figure 19: View northeast at sagebrush and (in middle distance) greasewood along East Coyote Wash. Negative number 123-80-630.
and a high water table; within the project area it is most common in Section 3 toward the northern boundary (Figure 19). Unlike other zones, the understory in greasewood stands is very sparse and typically includes such herbaceous plants as saltgrass, dropseed, foxtail barley and grama grass along with a few low shrubs like saltbush, shadscale and various species of sagebrush.

Lastly, the fifth vegetation zone within the study tract is a more general categorization called grassland (Figure 20). It is believed that the distribution and, probably, the species composition of this zone has been altered since the advent of cattle and sheep raising in the area during the late nineteenth century. Specifically, the present distribution of grassland range is weighted heavily toward disturbed areas of valley bottoms, ridges and mesa tops such as roadsides, well pads, and chained pinyon-juniper woodlands. On the other hand, the density of Artemesia tridentata and relatively sparse occurrence of grasses within the sagebrush zone is quite possibly a function of grazing intensity, since once grasses and their root systems are supplanted by sagebrush the latter becomes more difficult to displace through time (Costello 1954: ix). Thus, what today is sagebrush range once may have been a more even mixture of sagebrush and grasses, whereas today's grasslands may have been pinyon-juniper woodlands and grasslands of different species composition. The dominant grass species present today in the grassland zone include cheatgrass, Indian ricegrass, wheat-grass, grama and foxtail barley.

**FAUNA**

Given the high eozonal diversity within the project area and the proximity of the La Sal Mountains, it is not surprising that a wide variety of wildlife can be found in the area at any time of the year. The pinyon and juniper woodlands provide prime cover for migratory animals wintering in lower elevations after spending warmer months in the nearby mountains; both hunter-gatherer and Formative level cultures took advantage of this diversity as do modern hunters.

According to Dalton et al. (1978) and Mills (in BLM-Moab 1976), south-eastern Utah in the La Sal Mountains and project area vicinity is and has been in the past inhabited by a total of at least 22 insectivore, 21 carnivore, 38 rodent, 4 artiodactyl, 264 bird, 40 amphibian and reptile, and 31 fish species, a few of which have been introduced into the area and many of which are only seasonal residents. With permanent water being rare in the area, the importance of waterfowl, amphibians and fish in the diet of past inhabitants of the study tract would be slight, but the meat, bones, hides and feathers of other species may have been highly valued. Likely prey for past hunting parties include, but are not limited to, lizards, snakes, grousse, quail, hawks, owls, eagles, squirrels, porcupines, hares, rabbits, foxes, coyotes, bears, deer, elk, antelope and bighorn sheep.
Figure 20: View of grassland in disturbed area of Section 5. Negative number 123-C80-110.
SOILS

The development of soils is dependent on climate, time, parent material, topographic relief and organisms (Birkeland 1974:125). Variability in parent material, topographic relief and vegetation within the study tract has resulted in the genesis of several soil types (Figure 21). Overall, however, project area soils can be described as warm, usually dry, light-surface soils with horizons of calcium carbonate or gypsum accumulation; calciorthsids are the predominant soils within the area (UCRCFS 1971; BLM-Moab 1976). Table 1 lists the soil series for the codes shown in Figure 21, and the natural vegetation cover on each.

WATER RESOURCES

As shown on the 15' Lisbon Valley topographic map and in Figure 2, there are no permanent streams within the study tract. Water resources are limited to a few seeps and springs (Figure 16) during dry periods. After larger rainstorms, water collects in "potholes" on the surface of slickrock areas and can be easily collected. Runoff in the drainages is usually fast-running and short-lived; if no collection system was used it would be quite difficult to utilize much of this water before it disappeared. During the most severe thunderstorm of the season on August 25, 1980 approximately 46 cm (18 inches) of heavy, silt-laden water was observed in Bullhorn Wash at the height of the storm, but the following day water was present only in a few puddles.

A SUMMARY OF THE AREA PREHISTORY AND HISTORY

THE PREHISTORIC CONTEXT

Past work in the vicinity of the project area (Hunt 1953; Wormington and Lister 1956; Hunt and Tanner 1960; Buckles 1971; Green 1974; Berry 1975; Lindsay 1976; Malone 1976; Toll 1977; Baker 1978; Copeland 1978, 1978a, 1979, 1979a and 1980; Nissley 1978; Pierson 1978; Kvamme 1979; Thompson 1979) has documented the influence or presence of several different cultural groups in the prehistoric and historic past. Those documented to date in various degrees are Paleo-Indian, Archaic, Anasazi, Hopi, Navajo, Ute and Euro-American.

The Paleo-Indian period is poorly documented and as indicated by Jennings (1978), it is not at this time heavily represented in Utah. Hunt (1953) and Hunt and Tanner (1960) documented Paleo-Indian projectile points in the La Sal Mountains to the immediate north of the project area and near Moab. Copeland (1978a) reported on a possible Hell Gap point as well as possible James Allen points east of Lisbon Valley in the San Miguel River country of Colorado.

The Desert Archaic tradition, a hunting and gathering mode of life, is well documented (Jennings 1957; Aikens 1970) but in most cases excavations
Figure 21: Soil map of project area compiled from U.S. Soil Conservation Service (Moab office) file data. See Table 1 for explanation of soil type abbreviations.
<table>
<thead>
<tr>
<th>Map Symbol</th>
<th>Soil Series</th>
<th>Dominant Vegetation Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>CaC</td>
<td>Ca Very Fine Sandy Loam</td>
<td>sagebrush, grasses</td>
</tr>
<tr>
<td>CdC</td>
<td>Hagerman Very Fine Sandy Loam</td>
<td>sagebrush, grasses</td>
</tr>
<tr>
<td>DbA</td>
<td>Cahona Very Fine Sandy Loam</td>
<td>sagebrush, grasses</td>
</tr>
<tr>
<td>DbC</td>
<td>Cahona Fine Sandy Loam</td>
<td>scattered pinyon &amp; juniper, sagebrush, grasses</td>
</tr>
<tr>
<td>DdC</td>
<td>Palma Very Fine Sandy Loam</td>
<td>sagebrush, grasses</td>
</tr>
<tr>
<td>HpD</td>
<td>Pinyon-Anasazi-Rock Outcrop Complex</td>
<td>pinyon &amp; juniper</td>
</tr>
<tr>
<td>KbA</td>
<td>San Mateo Very Fine Sandy Loam</td>
<td>sagebrush, grasses</td>
</tr>
<tr>
<td>KbC</td>
<td>San Mateo Fine Sandy Loam</td>
<td>sagebrush, grasses</td>
</tr>
<tr>
<td>LaA</td>
<td>Redbank Fine Sandy Loam</td>
<td>greasewood, saltbush, grasses</td>
</tr>
<tr>
<td>LbA</td>
<td>Redbank Very Fine Sandy Loam, Alkali</td>
<td>greasewood, saltbush, grasses</td>
</tr>
<tr>
<td>RmD</td>
<td>Re-Lithic Ustic Torriorthent Complex</td>
<td>pinyon, juniper, sagebrush, Gambel oak</td>
</tr>
<tr>
<td>RS</td>
<td>Rock Outcrop</td>
<td>90% unvegetated</td>
</tr>
<tr>
<td>RT</td>
<td>Rock Outcrop - Lithic Ustic Torriorthent Complex</td>
<td>70% unvegetated; pinyon &amp; juniper</td>
</tr>
<tr>
<td>TSD</td>
<td>Lithic Ustic Torriorthent - Rock Outcrop Complex</td>
<td>25% unvegetated; pinyon &amp; juniper</td>
</tr>
<tr>
<td>TWG</td>
<td>Ustic Torriorthent - Ustollic Haplargid Complex</td>
<td>pinyon, juniper</td>
</tr>
</tbody>
</table>

Table 1: Soil Series in the project area and natural vegetation cover. See Figure 21.

* Map symbols from Figure 21.
have been limited to cave sites. Numerous open lithic sites are undoubtedly of Archaic origin, but in many instances temporal indicators are not present and Archaic determinations cannot be made. However, lithic scatters representing an "Archaic" hunting and gathering lifestyle are the most common prehistoric archaeological sites found in the area (Hunt 1953; Green 1974; Lindsay 1976; Malone 1976; Toll 1977; Nissley 1978; Pierson 1978; Thompson 1979). At this point, it must be made clear that two uses of the word "Archaic" are possible. As used in one sense Archaic refers to a stage of cultural development—the next step up the cultural ladder is called Formative and refers to a sedentary horticultural/agricultural lifestyle rather than the Archaic nomadic hunting and gathering lifestyle (Willey and Phillips 1958). Archaic can also refer to a temporal period in Colorado Plateau prehistory, postdating the Paleo-Indian period and predating the Late Prehistoric period introduction of the bow and arrow (e.g. see Hauck 1979). Thus, protohistoric/historic Ute bands followed an "Archaic stage" lifestyle based on hunting and gathering, but did not occupy the Lisbon Valley region until well after the end of the "Archaic period", i.e. after ca. AD 1300-1500 (Lindsay 1976:38). Figure 22 depicts the different interpretations of the prehistoric era by archaeologists working in areas near the Lisbon Valley study tract.

Definition of the Uncompahgre complex was originally offered by Wormington and Lister (1956) on the basis of test excavations at various sites on the east side of the Uncompahgre Plateau. The complex was seen as a regional variant of the basic and widespread Desert Culture tradition originally defined by Jennings (1957) for the Great Basin. As a local variant of the larger tradition, it was believed to have developed with certain adaptations due to local environmental constraints and geographical and subsequent cultural isolation from larger culture centers, such as that of the Anasazi (Wormington and Lister 1956). It was believed that the complex persisted with only minor changes for thousands of years. Hunt and Tanner (1960) ascribed most campsites found by Hunt (1953) in the La Sal Mountains above 6,000 feet to the Uncompahgre complex.

William Buckles ultimately elaborated on and attempted further definition of the complex by outlining a sequence of phases from about 10,000 to 100 years BP (Buckles 1971). This chronology is for the variant of the Desert Culture or Desert Archaic lifestyle which involved local adaptation of a hunting and gathering economy that presumably persisted without major changes into the Historic period. It was Buckles' suggestion that the historic Ute peoples could be the ethnographic representatives for this complex. Linguistic evidence, however, does seem to contradict this view and indicates that the Numic-speaking Utes probably came into the area fewer than 700 years ago (Gunnerson 1969; Fowler 1972; Lindsay 1976). The length of the Ute presence in the Uncompahgre complex territory is, thus, still a major research question. Although some of Buckles' postulated phases have been informally questioned, his work has resulted in the only formal cultural chronology proposed for the Uncompahgre region.
Figure 22: Cultural phase sequences developed for areas near the Lisbon Valley Project.
More recently the Uncompahgre complex has been placed into a larger cultural unit, the Desert Archaic Technocomplex, which includes "...all sites in the arid and semi-arid west that reflect an Archaic lifestyle based on seasonally migratory hunting and gathering of modern fauna and flora, and...referred to as the Desert Archaic" (Reed and Scott 1980: 35). Thus, it is not correct to view the lower Dolores River drainage only in terms of the Uncompahgre complex. The evidence supports the view that the generalization in adaptive strategies by Archaic stage nomads was a success for several millennia; Hunt (1953) found numerous and diverse lithic assemblages in the LaSal Mountains region from elevations of 1,219 m to 3,658 m (4,000 - 12,000 ft), indicative of diverse resource utilization. Away from the mountain zone, Thompson (1979) and Copeland (1978a, 1979a, 1980) found relatively high concentrations of lithic sites in pinyon-juniper woodlands, as Copeland (1979a:47) noticed a particularly heavy utilization of resources between 1,890 m and 2,012 m (6,200 - 6,600 ft) in elevation. There is also some evidence (Williams 1976:111 and Copeland 1978a:1) that ecotone areas, particularly the pinyon-juniper and sage-grass association, were favored site locations if present vegetation patterns are reflective of past environments.

Other recent archaeological investigations at two rockshelters on the Colorado Plateau, Sudden Shelter and Cowboy Cave (Jennings et al. 1980 and 1980a) west of the project area, induced Schroedl (1976, 1980) to further refine the Archaic tradition in that area. He has defined four Archaic phases based on projectile point sequences and subsistence patterns as derived from excavations in these two rockshelters and elsewhere on the Plateau. Overall, Archaic hunters and gatherers in that area seem to have relied heavily upon meat in their diet until about 6,300 years ago when floral resources began to compose larger portions of the diet. Thereafter, the percentage of wild plant foods in the diet remained high while bighorn sheep constituted an increasingly important component of the faunal resources hunted. Changes in projectile point styles paralleled changes in the aboriginal diet; the deeply stratified remains in these rockshelters, the abundant and diverse projectile points recovered, and the consistent sequence of radiocarbon dates received from the deposits constitute the most well-documented chronology developed for the northern Colorado Plateau.

Cynthia Irwin-Williams (1973) undertook a similar effort in northwestern New Mexico with her definition of the Oshara tradition, which she sees as a precursor of the pueblan Anasazi development. Five Archaic phases are defined in her sequence, from ca. 8,000 to 1,500 years BP. Climatic fluctuations involving temperature and effective moisture resulted in changes in subsistence patterns through time. These changes were paralleled by developments in projectile point styles which together, as with Schroedl's (1976, 1980) work, served to define individual phases. As opposed to the point styles represented at rockshelters in eastern Utah, the projectiles from the Arroyo Cuervo region show a distinctive and consistent influence from the west (i.e. Great Basin) in that they appear closely related to the Lake Mojave and Pinto point series until ca. 3,000 years BP. At that time the unique developments leading to the
Anasazi culture become increasingly apparent, and overshadow the chipped stone industry in favor of a greater variety of tools and structures to accommodate the gradual addition of domesticated floral resources in the diet.

Three other early cultural complexes have been described in the general area. Lindsay et al. (1968) defined the Desha complex from excavations at Sand Dune and Dust Devil Caves near Navajo Mountain. Radiometric dating brackets early Archaic occupations there between 8,000 and 7,000 years BP. The complex resembles materials found in the lower levels of Cowboy Cave and may be ascribed to the Black Knoll phase in Schroedl's scheme (1976:58). Unfortunately, doubts about stratigraphic control and artifact associations hamper interpretations as to the cultural position of the complex (Berry 1975:76; Schroedl 1976:58). Hunt and Tanner (1960) used surface evidence in defining two other possible cultural complexes near Moab and the La Sal Mountains. An association of Folsom points with Pinto points was said to be diagnostic of the Moab complex, and another association of Gypsum points with two other Pinto variants was termed the La Sal complex. However, many researchers now agree that the supposed point associations were fortuitous, casting doubt on the validity of the complexes (Schroedl 1976; Berry 1975; cf. Pierson 1978:4.1.1 p.20).

Both Irwin-Williams (1973) and Schroedl (1976) correlate changes in Archaic population size and subsistence strategies with changing environmental conditions; Schroedl's work is perhaps most applicable to the Lisbon Valley Project area. Schroedl (1976:24-26) identifies three major discontinuities in regional radiocarbon date distributions, which he feels reflect lowered population levels. These three discontinuities occur at approximately 11,000-9,000 years BP, 6,000-5,000 years BP, and 3,000-2,000 years BP. Madsen and Berry (1975) in a reassessment of Hogup Cave data, postulate a hiatus of approximately 1,000 years in occupation of the northeastern Great Basin, between the end of the Archaic period at ca. 2,500 years BP and the appearance of the Fremont culture at ca. 1,500 years BP. This interpretation very roughly coincides with the latest of Schroedl's (1976) "discontinuities". While Madsen and Berry (1975:398) hedge against extending the hiatus to the Colorado Plateau and place the end of the Archaic period there at ca. 1,600 years BP, Berry (1975:80) also ascribes a date of ca. 3,000 years BP to the end of the Archaic on the Plateau.

Thus, Madsen and Berry (1975) see no Archaic-Fremont continuum in the eastern Great Basin, and Berry (1975) would extend this hypothesis in denying the existence of substantial evidence for an Archaic-Anasazi continuum on the northern Colorado Plateau. Irwin-Williams (1973), on the other hand, saw no occupational hiatus in northwestern New Mexico; rather, she argued for a gradual transition from Archaic to Basketmaker to Pueblo. Indeed, Schroedl (1976) considers Archaic occupation to have intensified after the 3,000-2,000 years BP hiatus, lasting until ca. 1,500 years BP and, thus, establishing the Archaic nomads as the direct precursors of the Fremont.
As indicated in Figure 23, the Lisbon Valley study area lies outside the Kayenta and Northern San Juan (Mesa Verde) Anasazi core areas. It is also somewhat east and south of the San Rafael Fremont culture area. The project area lies within a zone marginal to all of these prehistoric cultures and primarily reflects generalized Archaic prehistoric assemblages. Recent work in extreme western Colorado by Baker (1978) and Copeland (1978a, 1979a, 1980), as well as in the Lisbon Valley area (Copeland 1979; Thompson 1979) indicate that the Archaic cultural tradition is the predominant culture manifestation in the project vicinity. The work of Pierson (1978), Lindsay (1976), and Toll (1977) further confirms that one should not expect extensive occupation of the area by Formative groups.

Both Thompson (1979) and Lindsay (1976) conclude that the area between the Book Cliffs and the Colorado River-Dolores River confluence constitutes a rough boundary between the Fremont and Anasazi cultures; the Fremont did not settle far south of the base of the Book Cliffs, the Anasazi lived south of the Colorado River-Dolores River confluence, and the intervening area was generally unoccupied by these Late Prehistoric agriculturalists. Thus, essentially no Fremont occupation and a limited Anasazi occupation of the study tract is to be expected—probably part of the well-defined Anasazi expansion in Pueblo II-early Pueblo III times (ca. AD 900-1150; see Schroeder 1964, Sharrock 1966, Berry 1975, Lindsay 1976, and Pierson 1978:4.1.1 p.33-41). Most investigations of Anasazi sites have taken place farther south in the Four Corners area, and the volume of literature that research on the Anasazi has generated is massive (e.g. see Hull and Scott 1978; Nickens 1980). Some of the more definitive works on this sedentary agriculturalist society include Kidder (1924), Brew (1946), Hayes (1964), and Rohn (1977).

In terms of local culture history, then, it is most appropriate to view Lisbon Valley area developments from an Archaic-to-Anasazi perspective. Using the standard Pecos Classification terminology (Kidder 1927), Anasazi prehistory is presently broken down as follows (Jennings 1978): Basketmaker II, AD 1-500; Basketmaker III, AD 450-750; Pueblo I, AD 750-900; Pueblo II, AD 850-1100; Pueblo III, AD 1100-1300; Pueblo IV, AD 1300-1700; and Pueblo V, AD 1700-present. The once-postulated Basketmaker I period for sometime now has been recognized as representing the Archaic stage lifestyle in the Four Corners region. In the Anasazi heartland, the transition to a sedentary, agricultural lifestyle is well-established as having begun in the Basketmaker II period; the dates for Basketmaker II sites generally fall in the AD 1-500 time frame (Jennings 1966, 1968, 1978; Pierson 1978; Nickens 1980), which included the latter portion of the late Archaic Dirty Devil phase of Schroedl (1976) for the northern Colorado Plateau. Typically, Basketmaker II sites exhibit such traits as corn; chipped stone drills, knives, and scrapers; no ceramics (but see Eddy 1961); stone pipes; slab-lined storage cists; medium-sized dart points; one-hand manos; and flat metates (Reed 1964; Irwin-Williams 1973; Jennings 1978). Smaller arrow points usually occur in later contexts but are occasionally found in Basketmaker II sites (Reed 1964; Reed and Kainer 1978). Burnt adobe, burnt stone and depressions may mark pit structures (Reed and Kainer 1978; Huse et al. 1978).
Figure 23: Cultural areas of Utah and the Four Corners area. Adapted from Berry (1975), Lucius (1976), Jennings (1978) and Nickens (1980).
In sum, Basketmaker II groups practiced maize horticulture and led a sedentary (at least during part of the year) lifestyle largely centered in the caves, canyons and mesa rims of the Four Corners area. The most diagnostic Basketmaker II traits are distinctive basketry artifacts, corn, and pit structures in the absence of ceramics; these items are only very rarely recovered in archaeological surveys. Other Basketmaker II artifacts and features such as chipped stone drills, knives, scrapers and dart points, one-hand manos, slab metates, and slab-lined features are also found in earlier Archaic contexts. For example, slab-lined firepits were common in the Castle Valley phase, ca. 5,000-4,500 years ago (Schroedl 1976:64). Thus, Basketmaker II sites are very difficult to distinguish from late Archaic sites with survey evidence alone (Huse et al. 1978:71).

In the general vicinity of the project area, excavated and dated sites of late Archaic/Basketmaker II age are quite rare, and no habitation structures of that age have been excavated north of the Anasazi heartland. Excavated sites on the northern Colorado Plateau dating to this period include level 5 in Deluge Shelter (Leach 1967), units IV and V in Cowboy Cave (Jennings et al. 1980a), Tabeguache Cave I (Hurst 1940, 1941, 1942), layer 2 in Clyde's Cavern (Winter and Wylie 1974), stratum 4 at Pint Size Shelter (Lindsay and Lund 1976), and two hearths at 42SA6218 (Weder et al. 1979). Most of these deposits are considered Archaic (Schroedl 1976), although stratum 4 at Pint Size Shelter is early Fremont; some researchers prefer the label Basketmaker II for Tabeguache Cave I (Hurst 1940), Cowboy Cave unit IV (Lindsay 1976:23), and Clyde's Cavern level 2 (Lindsay 1976:23; Berry 1975:79). The earliest corn in the area has been recovered from Cowboy Cave unit IV, Tabeguache Caves I and II (cave II undated; Hurst 1943, 1944, 1945), and Clyde's Cavern layer 2.

Thus, no demonstrated structural Basketmaker II sites have been excavated north of the Anasazi heartland. Assignment of a Basketmaker II cultural affiliation to sites and strata dating between AD 1-500 has been based almost solely on the presence of corn in a pre-ceramic context. Available evidence suggests to some workers, however, that these sites represent Archaic stage groups seasonally planting and harvesting corn but otherwise following a nomadic hunting and gathering lifestyle (cf. Schroeder 1964; Crane 1978). One interpretation is that late Archaic groups north of the Anasazi heartland merely supplemented their diet with corn obtained from true Basketmaker people to the south, and never achieved a maize-dependent sedentary lifestyle as began to occur during Basketmaker II times in the Four Corners area. Pierson (1978: 4.1.1 p.40) considers sites called Basketmaker II in the vicinity of the project area as suspect given the present lack of evidence.

Both the Basketmaker III and Pueblo I periods are poorly represented in the project area (Berry 1975; Lindsay 1976; Kasper 1977; Pierson 1978; Thompson 1979; Weder et al. 1979; Copeland 1980a). The few sites that are present are normally marked only by a scatter of lithics and diagnostic pottery types. Small stemmed and tanged arrow points character-
istic of the AD 500-900 time frame (Hayes and Lancaster 1975) are occasionally found, but are not of certain Anasazi affiliation when found on the surface in the absence of diagnostic ceramics. In fact it is reasonable to conclude that, based upon present evidence, the west side of the lower Dolores drainage was largely outside the northern limit of Anasazi occupation until ca. AD 800-900. About that time the Pueblo II expansion extended their range into and beyond the project area as far north as the present Arches National Park and the area about the confluence of the Colorado and Dolores Rivers. This expansion was relatively short-lived, however, and the Anasazi all but abandoned the northern periphery by AD 1150-1200 (Schroeder 1964; Berry 1975; Lindsay 1976; Crane 1977 and 1978; Toll 1977; Pierson 1978; Thompson 1979; Copeland 1980a).

Compared to our scant knowledge of Anasazi culture in the northern periphery before Pueblo II times, the Pueblo II-early Pueblo III time frame in the project vicinity is fairly well-documented. As opposed to the Uncompahgre Plateau proper, there is definite archaeological evidence for Anasazi occupation of the lower Dolores watershed. Between 1939 and 1947, C.T. Hurst conducted extensive excavations focused on cave and structural sites in the Tabegauche Creek drainage and other vicinities reasonably near the project area. These excavations were oriented to "culturally marginal" sites away from classic centers (Hurst 1957) such as the Anasazi core area. In discussing Hurst's work, Albert Schroeder (1964) suggested that Basketmaker and Anasazi traits and ideas diffused north and west into Colorado, Utah, and Nevada. This resulted in formation of what he termed at least three "northern peripheral blends" of the Northern San Juan Anasazi pattern and generalized Uncompahgre complex. These were specifically the "Pueblooid" of southern Nevada and southwest Utah, the Fremont of Utah and western Colorado, and the development in the Uncompahgre-Gunnison area. In his view, these peripheral cultural patterns seem to have been shaped by the vagaries of "irregular or unregulated diffusion from the south, a variety of geographic barriers, and the spread of different types of maize, plus the dictates of culture on the local recipients" (1964:77).

Although the maize range expanded by way of this diffusion, the Uncompahgre Plateau and lower Dolores River drainage area was a generally marginal environment, and this probably precluded an intense occupation by Basketmaker and early Puebloan populations. There was, however, clearly an alteration of the local Archaic culture pattern in the lower San Miguel and Dolores drainages as evidenced in Hurst's work, with the more sedentary Puebloan pattern perhaps supplanting the local nomadic lifestyle by AD 800-900 (Schroeder 1964; Crane 1977 and 1978; Copeland 1980a). Recent paleo-environmental studies (Euler et al. 1979) suggest that increased effective moisture at this time may have been a major boost to the Pueblo II expansion, temporarily rendering more dependable the cultivation of maize in previously marginal areas.

Several actual Puebloan structural sites are known from the west end of Paradox Valley (Woodbury and Woodbury 1932; Leach and Lippold 1973;
Kasper 1977), and influence from the Anasazi area is suggested by numerous circular to rectangular dry laid masonry structures in the area (Copeland 1980a). As noted by Hunt (1953) and Green (1974) all these sites are found below 1,830 m (6,000 ft) elevation in the La Sal Mountains area, unlike in the Abajo Mountains where structural dwelling sites were found at elevations of 2,134-2,438 m (7,000-8,000 ft; Marwitt 1967:47 and Louthan 1977:12). The Huschers surveyed many of these in the San Miguel River drainage and called them "forts" (Huscher and Huscher 1943:17-24). A couple of these structures showed Anasazi ceramics but some architectural features, site locations on high rimrock, and projectile point styles have suggested to some researchers that San Rafael Fremont influence, as outlined by Marwitt (1970), may be present even though the sites do generally lack Fremont ceramics (Toll 1977; Copeland 1978a and 1980b; Kasper 1977; Crane 1977).

Some evidence for Anasazi influence in the absence of an actual occupation has been indicated recently at the Weimer Ranch sites on Cottonwood Creek about 26 km (16 mi) east of Nucla, Colorado (Crane 1978; Copeland 1980a). This information has been drawn from the excavations of Jiri Vondracek of Metropolitan State College in Denver and relates to masonry living sites on the southwest edge of the Uncompahgre Plateau in the San Miguel River drainage. These sites date from about AD 700 to 1150; they have been interpreted as indicating the presence of people depending primarily on an Archaic "type" of adaptation with limited horticulture commensurate with the marginal environment for maize production offered by the local area (Toll 1977; Crane 1978; Pierson 1978).

Pierson (1978) describes several Pueblo II-early Pueblo III masonry structures in the vicinity of Moab and the La Sal Mountains, and he also reports on excavations of several pithouses of Pueblo II age in the Moab area; pithouses may have been the most common Anasazi living structure in the northern periphery west of the Dolores River at this time (cf. Copeland 1980a:36). Pierson (1978:4.1.1 p.39) characterizes the Anasazi of the La Sal Mountain area as:

"...living in pithouse villages along the watered side-streams flowing out of the La Sal Mountain massif, but at the lower ends of the streams near where they entered the Colorado River and where there was farm land sufficient for their needs. There seems to never have been many of them, and the largest villages have probably disappeared under the town of Moab. The pithouses were circular, masonry walled affairs, some with ventilator shafts or entry ways, and with adobe lined fireplaces. Small square-roomed structures were in use in the Paradox Valley along with or succeeding pithouses. No indication of religious structures has been found, and, except for interment of the dead and a wide variety of pictographs and petroglyphs in the region, no indication of religion is present. Some circular masonry structures (usually des-
cried as dwellings) were built on hilltops and, although they suggest defense, it may be they were part of the religious pattern, for they occur alone (example: 42Gr178)."

As noted above, Anasazi occupation of the northern periphery ended by AD 1150-1200, their departure apparently unrelated to later abandonment of the Northern San Juan and Kayenta heartland. Perhaps the end of favorable environmental conditions marked by the onset of a regional erosion cycle at ca. AD 1200 (Richmond 1962, cited from Pierson 1978:4.1.1 p.41) once again made the northern periphery marginal for societies dependent on maize agriculture.

The Fremont cultural sphere as described by Morss (1931), Wormington (1955), Marwitt (1970), Jennings (1978) and Madsen (1979 and 1980), is described as a horticultural puebloid society that was not integrated in the overall development of southwestern cultures. Pottery, rock art, figurines, moccasin types and basketry are but a few traits used to differentiate the Fremont who existed generally at the same time as the Anasazi (Morss 1931). Five subareas are now recognized (Marwitt 1970), and that closest to the project area is defined as San Rafael Fremont. This regional variant shows numerous similarities to Anasazi patterns (Lindsay 1976:31) but is generally considered to be confined to the west side of the Colorado River (Jennings 1966); occurrence of Fremont habitations in the study area is to be considered very unusual (Lindsay 1976; Thompson 1979; but also see Crane 1977, Kasper 1977 and Copeland 1980a). Fremont traits found at puebloan sites east of the Colorado River may represent borrowed ideas (Sharrock 1966), but there is a danger of assigning a Fremont cultural affiliation to these sites without firm evidence (cf. Hunt 1953; Berry 1975a:24-27; Toll 1977; Kasper 1977). The present state of knowledge concerning possible Fremont occupations in this peripheral area is aptly summarized by Lindsay (1976:31): "Fremont occupancy of the La Sal Mountain area has yet to be substantiated", nor have Fremont habitations been identified anywhere east and south of the Colorado River.

Pueblo IV period Hopi temporary use of the area is proposed by Hunt (1953) and Lindsay (1976) on the basis of ceramics identified as Jeddito and Awatobi yellow wares but, overall, Hopi indicators in the area are generally absent. Pierson (1978:4.1.1 p.50) interprets the evidence more as an indication of trade than of a Hopi presence in the area.

Prehistoric evidence for Ute and Navajo in the area is generally meager and is based most often on ceramics and projectile point forms. A Ute micaceous ceramic pot, scraped with a punched design, is reported from the La Sal area (Pierson 1978:4.1.1 p.43). These groups are known to have been in the area during early historic times (Stewart 1966; Hunt 1953; Ellis 1974; Lindsay 1976) yet the subject of their time of arrival is much debated. It is assumed that their arrival post-dates the decline of the Pueblo domain at ca. AD 1300 (Jennings 1978), with the Navajos appearing in the area some 200 years after the Utes and from a different direction (Hester 1962; Lindsay 1976). Historically, the Utes
HISTORIC CONTEXT

The La Sal and Lisbon Valley areas were peripheral to interest by Euro-Americans for quite some time. It was outside of the area of major mineral exploration of the Colorado Rockies but did witness some early exploration attempts. Spanish and New Mexican merchants and traders were probably the earliest white travelers to see the area. A branch of "The Old Spanish Trail" between New Mexico and California passed through the area and this trail was in use from the late 18th through the early 19th centuries. A scattering of exploring parties and fur trappers touched on the area between the early 19th century and 1854. In 1855 the ill-fated Elk Mountain Mission set out to colonize the Moab and La Sal areas from western Utah. It was forced to retreat by the Utes (Peterson 1975:11-15). Between 1850 and 1875 a number of railroad, military, and geological surveying parties explored the area.

The official removal of the Utes from the Moab, La Sal, and Lisbon Valley area occurred in 1881. But in fact the Utes and other Indians continued to return to the area on hunting and trading expeditions until well into the 20th century (Tanner 1976:112-115). They had frequent conflicts with the Euro-American settlers who began to settle in the area before the official removal date of the Indians. The Tom Ray family settled in the La Sal area in 1877 (Tanner 1976 and Peterson 1975); the Ray's and a small group who followed them came from the western Utah settlements (Peterson 1975:30). The primary emphasis of these early settlers was on livestock, particularly cattle. Most of the ranchers were small operators who ran their own herds, which usually numbered in the thousands, and did most of the work themselves (Tanner 1976:175). They set up headquarters on the east side of the La Sals and in East Coyote Wash which were both well-watered locations. These early cattlemen were attracted by the ideal summer pastures available in the La Sal Mountains and the good winter ranges in the lower elevations such as around Kane Springs. While most of the early settlers in the La Sal vicinity came by way of the Old Spanish Trail from the western Utah settlements of Salina and Mount Pleasant, a number also came from western Colorado. The main centers of population in the Lisbon Valley area were Coyote (now La Sal) and La Sal (now Old La Sal). These were small communities of ranchers who also raised some vegetables and grain for their own use and dairy products for sale to outside markets. The main trading center for these early communities was the mining and smelting town of Durango, Colorado where there was a good market for dairy and meat products (Tanner 1976:79).
A new order appeared in the mid-1880s when most of the small scale ranchers sold their herds to large corporations. In the La Sal and Lisbon Valley area the Pittsburgh Cattle Company bought up the small herds and came to control most of the area (Peterson 1975:85; Tanner 1976:87). This company was later bought out by two local men who formed the LaSal Cattle Company, which still has extensive operations in the area under the leadership of the Redd family (Tanner 1976:180). However, beginning in 1895 sheep began to replace cattle as the main emphasis of the livestock industry in the La Sal area. The changeover in this region was peaceful compared to other regions in the West because many of the early sheep ranchers were well-respected local cattle ranchers who changed over for economic reasons. However, the sheep and wool markets soon became glutted and ranchers shifted to a combined cattle and sheep philosophy that has continued to the present day (Peterson 1975:104).

A brief spurt of homesteading on dry farms occurred in the early twentieth century around La Sal. Most of these newcomers were Mormons who had been expelled from Mexico (Peterson 1975:158). However, a series of drought years between 1915 and 1917 forced many of them to depart for other locales (Tanner 1976:88).

The Lisbon Valley and Big Indian Valley have a long history of mineral exploration and mining activities. As early as 1880 there was a stampede into the area by silver prospectors (Tanner 1976:209). That silver rush was a false one but soon real deposits of silver and copper were discovered in the region and exploited. The Big Indian Valley was and still is the scene of intense mining activity for copper and uranium (Tanner 1976:209). In the 1890s and early 1900s uranium prospectors searched the area with some success (Tanner 1976:211 & 215). Interest in silver, copper and uranium have continued in a typical boom and bust cycle down to the present day in Lisbon and Big Indian Valleys. In addition, oil and gas deposits under the valleys have drawn attention in recent years.

**PREVIOUS WORK AND KNOWN SITES WITHIN THE PROJECT AREA VICINITY**

Very little archaeological work has been done in the specific study area. What has been done include clearance surveys for a small number of well pads and seismic lines. Two lithic scatters of undetermined cultural affiliation (42SA7887 and 7888) were located along with an isolated ground stone tool by Centuries Research, Inc. in a survey of two well pads on the south rim of upper Lisbon Valley (Kvanme and Cope-land 1979). A search of the state site files in Salt Lake City revealed that no other archaeological sites were known within the project area (Dykman 1980). Lloyd Pierson of Moab, Utah, conducted a well pad survey in the northwest portion of the study area in 1978 and reported negative findings (Pierson 1978a). Nissley (1978) reports negative findings on a seismic line through the northeast portion of the study tract except for a non-diagnostic isolated projectile point fragment.
One lithic scatter within the project area (42SA9078) has been subjected to test excavations but the results revealed little depth to the deposits (Alexander n.d.).

From areas adjacent to the project tract come reports of numerous chipping and habitation sites. Copeland (1979, 1979b) has reported on several seismic transect surveys in the immediate area and all sites recorded were lithic, most of undetermined age. One open site, 42SA7704 located approximately 1 km southeast of the project area, yielded 14 slab-lined hearths and represented one of the most unique sites known at that date in the immediate area. Thompson's (1979) Class II BLM random sample survey investigated four quarter sections surrounding the specific project area and reported the presence of 29 lithic sites as well as one possible Basketmaker II-III habitation site (42SA5983).

Hunt's (1953) extensive survey of the La Sal Mountain area notes the location of nine chipping, quarry, and ceramic sites in the area east, south and southwest of the town of La Sal in T29S. Hauck (1979a) recorded three lithic sites in lower Lisbon Valley during a pipeline survey. Malone (1976) reports the presence of 50 sites, mostly lithic scatters, in the Two Mile Creek area northeast of the study tract. Wikle (1978) surveyed a northern extension of the same Two Mile Creek area and recorded five lithic scatters. Lischka (1977) found an Archaic lithic scatter during a gas well survey northwest of the project area. Portions of this scatter (42SA6218) were excavated prior to and during the construction of the well pad; two hearths yielded identical Late Archaic C-14 dates of 2,400 years BP, a third hearth was dated to 1,300 years BP, and projectile point evidence from another part of the site suggested a Basketmaker III/Pueblo I component was present (Weder et al. 1979). Klesert (1980) located an Archaic camp in the course of a 200 acre survey in Big Indian Valley just outside the project area. Finally, a puebloan structure reportedly occupies an overhang at Little Indian Spring in Section 32, T29S, R25E. Black-on-white ceramics, and both anthropomorphic and zoomorphic pictographs are said to occur at this unrecorded site (Steele 1980).
CHAPTER 3
SITE DESCRIPTIONS

RESULTS

The archaeological inventory of the Lisbon Valley study tract resulted in the discovery of 539 sites and 290 isolated finds that were previously unrecorded. Two other sites and two isolated finds within the project area had been discovered in earlier surveys (Kvamme and Copeland 1979; Nissley 1978), and eight additional sites were recorded during the present survey in areas just outside project boundaries. Thus, the locations of a grand total of 549 sites and 292 isolated finds are known in the Lisbon Valley study tract and immediate environs. Figures 24 and 25 show the distribution of these cultural resources, and the breakdown by section is given in Table 2.

Implicit in the discussion of site recordation methods in Chapter 1 is that the survey crews could identify cultural resources in the field, and make a determination of whether those resources were to be recorded as sites or isolated finds. Sites were defined on the basis of the number of artifacts within a reasonably well-defined space. There are definite problems within the profession in regard to the definition of a "site", particularly in non-structural sites such as lithic scatters. It is recognized by the study team that "sites" can and often have two different connotations, namely those for management needs and those implying archaeologically meaningful units. In order to maintain consistency with work in the area such as Toll (1977), Baker (1978) and the extensive works of Copeland (various) in the project vicinity, the following definition of a site was used. This is believed to be a consistent approach which addresses both the management and cultural implications of the term "site".

A cultural manifestation was called a "site" if ten or more aboriginal artifacts were present within a reasonably well-defined area or if cultural features, with or without artifacts, were present. Such features include hearths, rock shelters with bone or charcoal showing, structures or other aboriginal features.

If a manifestation contained less than ten artifacts and no features, it was termed an "isolated find" or I.F. Isolated finds ultimately may prove to mark the locations of sites and can include remains such as an isolated projectile point or a core and three flakes. In a few cases, resources consisting of more than ten artifacts were recorded as I.F.5s rather than sites when the remains were homogenous, highly localized and seemed representative of a single brief activity such as single core reduction.

Historic remains were termed "sites" if they contained structures or evidence of other than fleeting temporary activity, such as trash piles. Thus, a midden of 19th century tin cans perhaps marking a temporary
Figure 24: Map of study area showing plotted locations of all sites. Hatched areas represent unsurveyed private and state land. Contour interval is 200 ft.
Figure 25: Map of study area, showing plotted locations of all isolated finds. Hatched areas represent unsurveyed private and state land. Contour interval is 200 ft.
<table>
<thead>
<tr>
<th>Section</th>
<th>Sites</th>
<th>I.F.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>90</td>
<td>13</td>
</tr>
<tr>
<td>2*</td>
<td>--</td>
<td>1‡</td>
</tr>
<tr>
<td>3</td>
<td>73</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>20†</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>41</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>23†</td>
<td>30†</td>
</tr>
<tr>
<td>10</td>
<td>62</td>
<td>17</td>
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<tr>
<td>11</td>
<td>24</td>
<td>30</td>
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<tr>
<td>12</td>
<td>47</td>
<td>17</td>
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<tr>
<td>13</td>
<td>15</td>
<td>11</td>
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<td>14</td>
<td>21</td>
<td>13</td>
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<tr>
<td>15</td>
<td>36</td>
<td>25</td>
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<tr>
<td>16*</td>
<td>2</td>
<td>--</td>
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<tr>
<td>17</td>
<td>18</td>
<td>33</td>
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<tr>
<td>18</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>33**</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>34**</td>
<td>1</td>
<td>--</td>
</tr>
</tbody>
</table>

** Totals ** 549 292

* Uninventoried State of Utah-owned section
** Located in T29S, R25E and largely uninventoried; all other sections are in T30S, R25E.
† Includes 2 sites and one isolated find recorded by Kvamme and Copeland (1979).
‡ Isolated find recorded by Nissley (1978).
chuck wagon stop would be a "site" as would the ruins of a cow camp or ranch. Recent piles of beer cans or hunters' various manifestations were not sites and such artifacts were only rarely recorded as I.F.s.

The recordation of cultural resources emphasized the collection of data useful in determining a site's function, cultural affiliation, chronological placement, size and relationship to pertinent environmental factors. Site size is generally easy to determine for historic resources, even those without structural remains, since non-lithic artifact scatters tend to be more localized and also are usually more visible. Deciding the size of non-structural aboriginal sites can be an arbitrary process, however. The procedure our field crews used was to define the boundary of a site where artifact density fell below one or two items (e.g. flakes) per 10 m². Operationally, this was taken to mean one or two artifacts every five or ten steps. Once suspected site boundaries were reached, outlying areas were checked to insure that simple discontinuities in the scatter were not mistaken for the outer edge of a site.

Many aspects of site recording deal with relationships to environmental factors. Site sketch maps were drawn so as to indicate the types of landforms present at and around the site, as well as the distribution of different vegetation zones in the site area. Space on the site inventory forms also was utilized to detail a site's topographic situation, soils in the area, plant species present, water resources available, lithic resources available and overlook qualities from the area. Local topography was described in terms of six landform categories felt to reflect distinctive settings which might have been important in site location decision-making. These six landform categories are ridgetops/ mesa tops, mesa/canyon rims, slopes, benches/terraces, valley/drainage bottoms, and ledges. Drainages were accorded further attention in terms of being potential water sources. Such potential water resources were defined to include all located springs, all "blue line" intermittent drainages marked on the U.S.G.S. 15' Lisbon Valley topographic map, and all other large drainages noted in the field which may be considered likely areas to contain water after a storm or during spring run-off. Local vegetation patterns were described in terms of plant communities present at the sites and around the vicinity of the site edges; generally those communities were present within 200 m of sites. Individual plant species also were noted for the site areas themselves, in order to identify any vegetation differences between non-site and site areas.

Chronologies for the Colorado Plateau have been established from excavations at many sites in Utah and Colorado, few of which are particularly close to the study area (e.g. Buckles 1971 and Jennings et al. 1980a). Thus, assessing the chronological placement of sites involved comparisons of diagnostic artifacts (e.g. projectile points) with those from excavated contexts in surrounding areas (see Figure 22). Field observations indicate that past artifact collecting has been minimal, such that sufficient artifacts were encountered to make viable interpretations of past activities through time in the area. The temporal position of historic resources was similarly determined; most such resources were automatically assumed to post-date ca. 1880 before which the region was virtually unoccupied by Euro-Americans.
Common diagnostic items in the historic period include colored glass, tin can styles, KC baking powder lids, barbed wire, nails, masonry styles, etc. During the survey sites were identified that represented all four time periods known for the area: Paleo-Indian, Archaic, Late Prehistoric and Historic.

Determination of the cultural affiliation of archaeological remains was made in a process similar to that used to assess temporal placement. Artifact and feature styles, materials and spatial relationships were utilized and resulted in the positive identification of sites representing six different cultures: Paleo-Indian, Archaic, Anasazi, Navajo, Ute and Euro-American. Projectile point styles served to identify Paleo-Indian, Archaic, Ute and, to a lesser extent, Anasazi remains; projectile point evidence supplemented ceramic data for Anasazi sites. Navajo remains were identified via structural styles, and evidence for sheep herding activities. Euro-American remains were most often recognized by structures and artifacts related to mining, seismic exploration, drilling and cattle ranching activities.

Site function is one of the most difficult characteristics to determine when recording cultural resources. It is also one of the most important characteristics, since a detailed determination of functional activities carried out at a site can be of considerable help in assessing other site characteristics including cultural affiliation, chronological placement, the relative importance of locally available resources, and relationships with surrounding sites. Criteria important in the determination of site function include presence of hearths, ground stone and ceramics; number and diversity of tool types; site size; types of structures present; number and diversity of historic artifacts present; and artifact morphology and size. Tables 3-5 list pertinent data for the 837 previously unrecorded sites and isolated finds discovered in 1980.

**SYNOPSIS OF PREHISTORIC SITE TYPES IN THE PROJECT AREA**

Analyses of artifact and feature morphology, extent and spatial relationships have enabled us to recognize a total of nine prehistoric and historic site types, in addition to paleontological resources. Prehistoric cultural resources in the study tract are almost exclusively composed of lithic remains. Thus, characteristics of the lithic assemblages were the most important factors to consider in assigning sites to particular functional types. Of course, future excavations may alter the functional classifications of sites based herein upon surface evidence (Thompson 1979:122). The typology for prehistoric sites presented below is based on the work of Kenneth Kvamme with Archaic stage lithic scatters in Colorado (Kvamme 1980; Kvamme and Black n.d.), which expands upon the typology used by Toll (1977) and Thompson (1979).

Most of the nine prehistoric site types can be grouped into two major site classes, multiple activity sites and special activity sites. Multiple activity sites include habitation sites and short-term camps.
Table 3: Distribution of all site types by section. The totals shown in the last column do not agree with Table 2 because some sites were multicomponent.
TABLE 4 (in part only)

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Features Present</th>
<th>Elev. (ft.)</th>
<th>Site Size (m²)</th>
<th>Site Type</th>
<th>Cultural Affiliation</th>
<th>Suggested Date(s) of Occupation</th>
<th>Landform</th>
<th>Ecozone</th>
<th>Distance to Blue Line Drainage (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>42SA9078 LS</td>
<td>6840</td>
<td>15,900</td>
<td>short-term</td>
<td>aboriginal</td>
<td>unknown</td>
<td>ridgetop P/J</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42SA9915 LS</td>
<td>6380</td>
<td>560</td>
<td>chipping</td>
<td>aboriginal</td>
<td>unknown</td>
<td>slope on sage ridge</td>
<td>350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Site data for 547 previously unrecorded sites. Key: BB = burned bone; BS = burned stone; CH = charcoal; CO = corral; CS = ceramic scatter; FW = firewood; GL = glass; GS = groundstone; HE = hearth; HS = historic structure; HT = historic trash; IF = invertebrate fossils; IND = industrial; LAS = limited activity site; LS = lithic scatter; MD = midden; ME = mineral exploration; MN = mine; MR = masonry room/wall; PE = petroglyph; PI = pictograph; PJ = pinyon-juniper woodland; PW = petrified wood; RA = rock alignment; SC = slab-lined cist; SH = shell; TG = tool sharpening grooves.

TABLE 5 (in part only)

<table>
<thead>
<tr>
<th>IF Number</th>
<th>Elevation</th>
<th>Artifacts Present</th>
<th>Ecozone</th>
<th>Landform</th>
<th>Cultural Affiliation</th>
<th>Time Period(s) Represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF-1-1</td>
<td>6260</td>
<td>3 flakes</td>
<td>sage</td>
<td>slope</td>
<td>aboriginal</td>
<td>unknown</td>
</tr>
<tr>
<td>IF-1-1B</td>
<td>6080</td>
<td>1 biface, 1 flake</td>
<td>sage</td>
<td>slope</td>
<td>aboriginal</td>
<td>unknown</td>
</tr>
<tr>
<td>IF-18-2</td>
<td>6240</td>
<td>1 handstone</td>
<td>P/J</td>
<td>slope</td>
<td>aboriginal</td>
<td>unknown</td>
</tr>
<tr>
<td>IF-18-3</td>
<td>6920</td>
<td>1 projectile point</td>
<td>P/J</td>
<td>slope</td>
<td>Desert Archaic</td>
<td>unknown</td>
</tr>
</tbody>
</table>

Tables 4 & 5 (reproduced in part only)
Overall these sites exhibit relatively complex artifact assemblages with high tool numbers and diversity and generally large amounts of debitage; features are not uncommon (Figures 26 and 27). Because tool manufacturing activities are commonplace at multiple activity sites, average flake size is fairly small and few flakes exhibit a cortical surface. Site size of these two types is generally extensive as would be expected in areas of intense, diverse and often repeated prehistoric use.

Habitation sites are the most obvious examples of multiple activity prehistoric sites. A total of 27 habitation sites has been identified within the study tract and these sites exhibit the following characteristics: 1) site areas are the largest encountered in the study area, generally greater than 7,000 m²; 2) tools are very numerous and diverse, involving at least three different types and usually a total of more than eight tools; 3) great amounts of flaking debitage are present; 4) ground stone tools are common; and 5) features such as hearths are often present. These 27 sites represent areas of intensive, long-term and often multiple occupations by prehistoric hunter-gatherer groups engaging in a variety of activities.

Typical of habitation sites in the project area is 42SA9449 (Figure 29). It covers an area of over 40,000 m² on the mesa top in the northeast portion of the study area (Figure 24). Both millingstones and handstones are present among the 22 total tools located at this site, indicative of the diverse activities carried out here. An even more impressive habitation site is located further upstream along a southeast tributary of East Coyote Wash, site 42SA9476. It covers 44,000 m² of a rise on the south side of the tributary drainage (Figure 28) in a pinyon-juniper woodland. Ground stone tools are also present among the more than 50 total tools located here; bifaces are abundant and debitage is extensive with densities upwards of 50 flakes per square meter over a large part of the site. The site is also unusual in having seven hearth areas scattered among the artifacts. Such a hearth concentration is exclusively a characteristic of habitation sites, albeit an uncommon characteristic (see page 40).

Short-term camps are among the most numerous of site types identified, with a total of 199 such sites located in the project area. These sites have artifact assemblages similar to those at habitation sites except on a smaller scale. In the study tract such sites generally cover less than 15,000 m² and have fewer than ten total tools, although at least three different tool types are usually present (Figure 30). Exceptions occur on sites of small size and low artifact density where ground stone tools and/or hearths are present. Such artifacts and features indicate that camping activities took place, even in the absence of site characteristics like high tool diversity and large amounts of debitage. Thus, short-term camps represent less intensive though often multiple occupations of an area where relatively fewer activities took place.

Site 42SA9554 shows the typical characteristics of short-term camps (Figures 31 and 32). The site occupies 1,070 m² of pinyon-juniper woodland on a mesa rim in the northwest portion of the study tract (Figure
Figure 26: View of slab-lined hearth at 42SA9392. Negative number 123-80-875.

Figure 27: View west of vandalized cobble-lined hearth at site 42SA9686. Negative number 123-80-534.
Figure 28: Sketch map of habitation site 42SA9476.
Figure 29: View northeast of habitation site 42SA9449. Negative number 123-80-1154.

Figure 30: Photo of handstone and end scraper from short-term camp 42SA9711. Negative number 123-80-849.
Figure 31: Sketch map of short-term camp 42SA9554.
Figure 32: View of short-term camp 42SA9554 overlooking Lisbon Valley. Negative number 123-80-155.
Ground stone is present among the nine tools found here, but overall artifact density is not great. Thus, the low artifact numbers indicate relatively brief occupation of the site, while the high number of tools including ground stone identify the function of the site as a camp where somewhat diverse activities involving processing of floral resources were carried out.

Special activity sites include quarries, tool kit sites, chipping sites, and tool sharpening areas. These sites generally exhibit fairly homogenous artifact assemblages indicating that fewer activities were performed. Artifact density is usually low with few tool types represented. Site size is also usually small, except where multiple occupations took place, and both ground stone tools and features are absent.

Quarries are well-represented in the study area, as 31 such sites have been located (Table 3). Quarries have been defined as loci where the procurement of lithic raw material for stone tool manufacture, usually cryptocrystalline silicates, was the primary activity. Many quarries occur where bedrock outcrops of quartzite or chert are found, while a second type of quarry is a more opportunistic situation involving reduction of limited surficial, non-bedrock materials. The predominance of quartzite over other materials in the lithic assemblages of all site types likely is a function of the greater availability of quartzite in the project area (Toll 1977:61). The artifact assemblages are typified by cores, bifaces, large flake size and relatively high percentage of flakes with remnant cortex, as well as by a distinct paucity of both tool numbers and different tool types. Hammerstones used in percussion flaking of cores are occasionally found; unmodified cobbles were preferred over both prepared cobbles and spent cores for use as hammerstones.

Sites 42SA9865 and 9866 represent typical quartzite quarries in the study tract (Figures 33 and 34). Site 42SA9866 covers an area of nearly 12,000 m² on the top and southeast slopes of a ridgetop in the southern portion of the project area where abundant white and gray, fine-grained quartzite outcrops in the Dakota formation. Artifact density is quite high -- over 20 flakes/m² in some spots -- and most flakes are large secondary and interior flakes. As at many of the quarry sites in the area, moderately large bifaces were the only tools noted. Such bifaces represent an intermediate step in stone tool manufacture; there is abundant evidence that tool finishing activities were carried out at chipping and multiple activity sites but only very rarely at quarries.

Tool kit sites are among the rarest of site types as only seven such sites were recorded in the study area. Tool kit sites are defined as areas of high tool density, low tool diversity, and lowdebitage density in a relatively confined space. These sites represent special activity areas of a brief but intense nature. For example, a site with few flakes, several scrapers, some bifacial knives and utilized flakes may indicate that animal processing took place.
Figure 33: Sketch map of quartzite quarry 42SA9866.
Figure 34: View of quartzite outcrop at quarry site 42SA9865. Negative number 123-80-526.
A good example of a tool kit in the project area is site 42SA9419 (Figures 35, 36 and 37). It is small, only 705 m², and is found on a sloping terrace in a pinyon-juniper forest. However, the small size of the site belies the intensive nature of activities here as 17 tools are present, mostly projectile points. The uniform style and small size of the projectiles (Figure 37) identify the artifact scatter as a Late Prehistoric site likely involving animal procurement activities, possibly but not assuredly by a BMIII/PI Puebloan hunting group.

By far the most common site type is the chipping site, represented by 271 sites in the project area (Table 3). They are defined as artifact scatters almost exclusively composed of flaking debitage, thereby identifying the primary function of the sites as loci of stone tool manufacture (Figure 39). Tools are rare and often absent, but site size is variable. While most chipping sites are small -- usually less than 3,000 m² -- some exceptionally large sites are present and probably represent repeated visits to a single location for the same purpose.

Site 42SA9628 is an example of a rather large chipping site, covering 3,510 m² of a ridgetop and slope in a pinyon-juniper woodland toward the northwest corner of the study tract (Figures 38 and 40). While the site does cover a relatively extensive area, artifact density is not particularly high and only two tools are present. Neither ground stone tools nor features such as hearths were located here, as would be expected at special activity sites.

Three other site types do not fit into the multiple activity-special activity dichotomy. They are rock art sites, ceramic sites and rockshelters, which are morphological site types rather than functional types. Rock art sites are the second most rare site type in the study tract, definitely represented by only one site (42SA9756) and doubtfully present at one other locale (42SA9770).

An unusual pictograph is present at the rock art site 42SA9756 (Figures 41 and 43). While the theme of an artiodactyl, possibly an antelope or mountain sheep, is not uncommon in the Dolores drainage (Toll 1977), the method of application is indeed unusual. The pictograph was painted onto the smooth face of a sandstone boulder via simple strokes using one or two fingers and a whiteslip-like clay for paint. Schaafsma (1971:73-75) mentions the use of mud in pictographs but mineral and vegetal paints are far more common. Below the pictograph an overhang formed under the boulder was utilized as a Late Prehistoric campsite, as evidenced by the projectile point style (see Figure 81g) and high tool diversity.

The second possible rock art site, 42SA9770, also doubles as the fifth and rarest special activity site: a tool sharpening area. The rock art is a doubtful petroglyph on a small sandstone slab that is rather dog-like in appearance. However, the rock is quite weathered and the "petroglyph" may be nothing more than a fortuitous spalling of the outermost lamination in the sandstone. Overall, the site consists of a
Figure 35: Sketch map of tool kit site 42SA9419.
Figure 36: View looking northeast at tool kit site 42SA9419. Negative number 123-80-1062.

Figure 37: Photo of projectile points from tool kit site 42SA9419. Negative number 123-80-1059.
Figure 38: Sketch map of chipping site 42SA9628.
Figure 39: View of lithic concentration at chipping site 42SA9676. Negative number 123-80-561.

Figure 40: View east of chipping site 42SA9628. Negative number 123-80-489.
Figure 41: Sketch map of rock art site 42SA9756.
Figure 42: Sketch map of tool sharpening site 42SA9770.
Figure 43: Close-up of pictograph at site 42SA9756. Negative number 123-80-1029.
series of four adjacent rockshelters (Figure 42). On the south face of a boulder in the westernmost shelter, a series of 22 tool sharpening grooves has been incised into the relatively soft sandstone. Projectile point styles (e.g. Figure 81f) suggest but do not confirm that the tool honing was a Late Prehistoric activity at this site.

Ten ceramic sites have been recorded in the study tract, one of which is of Ute affiliation while the other nine are Anasazi (see Appendix 1). Eight of the Anasazi ceramic sites are found in the East Coyote Wash drainage, which is a major tributary of the Dolores River down which Anasazi settlement presumably spread northward in early Pueblo II times.

Site 42SA9390 is an Anasazi ceramic site, including a rockshelter, located toward the northeast corner of the study tract (Figures 44 and 45). Within the shelter a dry laid masonry wall represents a probable storage area. The entire site covers an area of over 15,000 m² on a pinyon and juniper covered ridgetop surrounding the rockshelter. Fifteen tools including ground stone have been recorded here, as well as a hearth area. Most of the other ceramic sites show evidence of camping activities, though most are smaller with fewer kinds and numbers of tools.

A total of 29 rockshelter sites has been recorded in the area (Table 3) and they are the most diverse site type encountered. Rock art, wind-breaks, storage areas, hearths, a tool honing area and the full range of ceramic and lithic artifacts (e.g. Figures 46 and 47) have been found in shelters within the study tract. Most are isolated overhangs or alcoves in free standing boulders or along cliff faces, although clusters of adjacent shelters also have been recorded (Figure 42). Many contain evidence of intensive and/or multiple occupations in the form of charcoal, heavy roof sooting, deep deposits and abundant tools. It is within dry shelters that exists the greatest potential for furthering our understanding prehistoric adaptive strategies and changes in those strategies through time.

Site 42SA9704 (Figures 48 and 49) is a typical small overhang utilized as a short-term camp. Total site area, including the artifact scatter outside the shelter, is only 360 m². Four tools are present, among them a millingstone; artifact density ranges from 0 to five flakes per square meter. The shelter is rather small, less than a meter high from floor to ceiling and about three meters in length. The cultural fill is apparently shallow as evidenced by a negative trowel probe, and the occupation of the shelter was likely of a brief nature.

One other prehistoric site type is not a cultural type and so does not fit into the multiple activity-special activity classification. This is the paleontological site type, of which three have been recorded in the study area (Table 3). Both floral and faunal fossil remains have been recorded; floral remains occur mainly as petrified wood while most observed faunal fossils were of marine invertebrates such as brachiopods, crinoids, and bryozoa.
Figure 44: View west of ceramic site 42SA9390 showing storage area in foreground. Negative number 123-80-884.
Figure 45: Sketch map of ceramic site 42SA9390.
Figure 46: Photo of hafted knife and two bifaces from rockshelter site 42SA9728. Negative number 123-80-1023.

Figure 47: View of shaped slab/millingstone from rockshelter site 42SA9707. Negative number 123-80-839.
Figure 48: Sketch map of rockshelter site 42SA9704.
Figure 49: View west of rockshelter site 42SA9704. Negative number 123-80-833.
Site 42SA9907 (Figure 50) is an exceptional outcrop of fossil wood on the southwest slope of a ridge in the southwest corner of the study area, near Big Indian Wash. The wood is in large fragments, some appearing to be the complete diameter of large logs. Apparently the wood is eroding out of a yellow sandstone in the Cutler formation, and this particular outcrop covers a total area of about 530 m². Site 42SA9632 is significant in another respect, being a very extensive (over 30,000 m²) invertebrate marine fossil outcrop in the Rico formation exposed along a canyon wall. The size and density of the site, along with the relatively rare outcrops of the Rico formation in this area, all contribute to its significance as a paleontological resource, albeit the fossils themselves are not uncommon in the southwest.

SYNOPSIS OF HISTORIC SITE TYPES IN THE PROJECT AREA, by Steven M. Horvath

The most common site type associated with the historic period is short-term camps. Forty-four of these sites were identified and recorded within the project area (Table 6). Short-term camps are identified by the presence of scatters of domestic trash that includes metal and glass food and beverage containers, tobacco cans, personal items, horse shoes, etc. These small trash deposits are indicative of brief occupations by historic period peoples who camped there while engaged in transitory activities such as sheep herding, cattle ranching and hunting. In some cases, the trash scatters are associated with features such as hearths, tent platforms, brush structures, corrals, sweat lodges, wood chopping areas, claim stakes, and camp furniture made out of branches. These short-term camps can be subdivided according to function into three sub-types. However, a large number (29) of short-term camps could not be associated with a particular function because they lacked diagnostic features.

Sub-type 1 short-term camps are associated with sheep herding. Sites were placed in this functional sub-type if there appeared to be a clear association of a trash scatter with features such as salt troughs, low brush corrals and lambing pens. A typical example of this type of site is 42SA9398 which is a multi-component site containing both a prehistoric and an historic component. The historic component consists of a tent platform, a wood chopping area, a small log pen, a trash scatter, and two salt troughs. Figures 51-54 and 56 illustrate features at other short-term sheep herding camps. A total of ten short-term camps was determined to be associated with sheep herding.

The second sub-type of short-term camps are those associated with cattle ranching. Site 42SA9644 is a domestic trash scatter located next to two substantial corrals (Figures 55 & 57), and 42SA9896 is a trash scatter connected with a series of corrals, a large stone reservoir, a watering trough and other features. These sites were probably reused on a seasonal basis as livestock were returned to the area yearly. Only two short-term camps were found to be associated with cattle ranching.
Figure 50: View of fossil logs at paleontological site 42SA9907. Negative number 123-80-292.
Table 6: Distribution of historic site types and sub-types by section.

<table>
<thead>
<tr>
<th>Site Type &amp; Subtype</th>
<th>Multiple Activity Types</th>
<th>Special Activity Types</th>
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<td></td>
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<tr>
<td></td>
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<td>Sec. 18</td>
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</table>

Totals 10 2 3 29 2 5 5 2 1 1 2 63

Key: B = butchering; Cc = cow camp; Cc-h = cow camp - homestead; Cm = copper mining; FT = feed trough; Ha = habitation; Hc = hunting camp; IND = Industrial; ISC = isolated sheep corral; ME = mineral exploration; Sc = sheep camp; SpC = specialized corral; Ss = stone structure; Us = unknown sub-type.
Figure 51: View of Navajo sweat lodge located at short-term camp 42SA9772. Negative number 123-80-1182.

Figure 52: View of brush corral and trash scatter at short-term camp 42SA9772. Negative number 123-80-1183.
Figure 53: Sketch map of Navajo short-term sheep camp 42SA9772.
Figure 54: View of tent platform at short-term camp 42SA9410. Negative number 123-80-976.

Figure 55: View of brush corral at short-term camp 42SA9644. Negative number 123-80-5.
Figure 56: Sketch map of short-term historic camp 42SA9410.
Figure 57: Sketch map of short-term cow camp 42SA9644.
Sub-type 3 short-term camps are associated with big game hunting activities. Three different sets of diagnostic features were used to attribute this function to three short-term camps. Site 42SA9593 contained a deposit of deer bones in addition to a hearth and trash scatter. The trash scatter at 42SA9897 includes shell casings from high powered rifle bullets, and site 42SA9581 contains a number of tent platforms, a cot frame, and car seats indicative of a large, well established camp of the type often occupied by hunters and reused in successive years.

The second historic site type encountered in the Lisbon Valley study area is the industrial site. These sites are locations at which large scale manufacturing or mining activities took place. They may or may not contain domestic or residential components. Two sites within the project area were assigned to this site type and were identified by the presence of industrial equipment, excavation and waste dumps. Both of these sites are associated with copper mining or the developmental stages of copper mining. Site 42SA9905 is typical; it contains a vertical shaft with shoring and ladders, a tailings dump, and a claim stake (Figures 58 & 59).

The third historic site type is the habitation site. Such sites were occupied for extended periods of time and are characterized by the presence of permanent houses, outbuildings, and other substantial features. One historic habitation site (42SA9902) was located in the study area. It contained the remains of a dugout, two stone chimneys that may have been attached to cabins, a root cellar, a cattle water trough hewn by hand out of ponderosa pine logs, and a trash scatter (Figures 60-62). The presence of the large water trough connected by pipe to a nearby seep indicates that ranching was one of the main functions carried out at this location. The habitation also may have been part of an attempt to patent the area as a homestead.

The fourth site type defined for the historic period is limited activity sites. A total of 16 limited activity sites was found. Such sites are characterized by the absence of domestic trash which would be indicative of a camp, and by the presence of a feature or features associated with a single type of activity such as isolated corrals, stone structures, animal butchering sites, drill pads, etc. Six sub-types of limited activity sites were distinguished on the basis of diagnostic features that gave evidence of their function.

Sub-type 1 of limited activity sites includes isolated brush corrals for sheep. These corrals are not directly associated with camps or trash scatters but are found by themselves. Site 42SA9415, a multi-component site, contains a historic component that consists of a brush corral approximately 25 m in diameter with a smaller pen built against one of the inside walls of the larger pen. This small enclosure within the large one may be a lambing pen. A total of five isolated sheep corrals was identified during the survey.

Sub-type 2 of limited activity sites is trash deposits associated with mineral exploration activities such as well pads and seismic lines.
Figure 58: View of mine shaft at industrial site 42SA9905. Negative number 123-80-294.
Figure 59: Sketch map of copper mine, industrial site 42SA9905.
Figure 60: View of cattle watering trough at habitation site 42SA9902. Negative number 123-80-60.

Figure 61: View of masonry root cellar at habitation site 42SA9902. Negative number 123-80-66.
Figure 62: Sketch map of historic habitation site 42SA9902.
These sites are characterized by the presence of numbers of motor oil cans, 55 gallon drums, and other heavy industrial equipment parts and tools. In addition, they are closely associated with drill pads and/or seismic lines. A drill pad is a prepared surface where drilling rigs are set up to explore for mineral deposits; a seismic line is an exploration technique for oil and gas that involves vibrating the earth's surface by way of explosions or mechanical shakers, and then recording the waves that bounce back from subsurface rock layers and, hopefully, petroleum deposits.

Site 42SA9523 is a multi-component site that has a historic component that consists of a drill pad and an associated trash scatter. The trash scatter contains a smashed 55 gallon drum, a 5 gallon bucket and an aluminum funnel. Five mineral exploration sites were recorded during survey of the study area. Two of these mineral exploration sites were superimposed over earlier historic period short-term camps.

Sub-type 3 of limited activity sites is a highly specialized type of corral that is found in isolated locations (Figures 63 & 64). They have wing fences extending out from their entrances in a "V" to form a funnel leading into the corral. Both of these corrals are located in the bottoms of draws and have their funnel shaped wing fences on the same orientation as the draw. They may have been used as traps for wild horses.

Site 42SA9552 is one of two such specialized corrals (Figure 63). It consists of a circular corral approximately 12 m in diameter. One wing fence extends 80 m down the east side of a draw and the other wing fence extends 28 m down the west side of the draw.

Sub-type 4 limited activity site is a butchering site. Only one such locality was discovered during the survey. Site 42SA9629 is a multi-component site containing a historic component that consists of parts of a butchered buck deer and some 30/30 shell casings.

Sub-type 5 is an isolated feed trough. Only one such site was identified during the survey. It forms the historic component on a prehistoric site (42SA9748).

Sub-type 6 limited activity sites are enigmatic stone structures that are not accompanied by trash scatters or other features. Two stone structures were identified during the survey. Site 42SA9906 is a square structure built into a hillside (Figure 65). It is built of sandstone and limestone slabs mortared with mud. The only associated features and artifacts are a pile of stone similar to those used in the construction of the structure, and a wooden dynamite box in a small overhang. The second structure is located in amongst the waste dumps at a copper mine (42SA9904) and it appears to predate the mining activity because the road constructed into the mine has partially destroyed the structure. It consists of a low wall of masonry between some large boulders. The function of these structures could not be determined.
Figure 63: Sketch map of limited activity site 42SA9552, a specialized corral.
Figure 64: View of isolated corral at limited activity site 42SA9733. Negative number 123-C80-122.

Figure 65: View of stone structure at limited activity site 42SA9906. Negative number 123-80-291.
CHAPTER 4
SUMMARY AND COMPARATIVE ANALYSIS OF SITE DATA

Analysis of data from the 547 previously unrecorded sites focused on five major parameters: site function, cultural affiliation, chronologi-cal placement, site size, and relationship of sites to topography, drainages and vegetation zones. These data have been previously sum-marized in Table 4 and will be discussed in some detail in this chapter; see Chapter 3 for details concerning the criteria used in assessing these parameters. In this section a chronologically ordered discussion of the culture history of the project area will be presented (see Table 7), followed by a diachronic analysis of the relative importance of certain factors in prehistoric adaptive strategies.

Paleo-Indian Period

All available evidence prior to the initiation of this survey (e.g. Hunt 1953; Lindsay 1976; Toll 1977; Jennings 1978; Pierson 1978; Thompson 1979; Nickens 1980) suggested that occupation of the southeast Utah area by Paleo-Indian hunter-gatherers was sparse and sporadic. Most Paleo-Indian artifacts recovered could be assigned to the late Paleo-Indian Plano tradition, with only cursory evidence of Clovis and Folsom cultures. The results of the present survey support these conclusions, as only one site and two isolated finds yielded evidence of Paleo-Indian occupation (Figure 66).

The sole site with evidence of a Paleo-Indian component is 42SA9799, a short-term camp on the south rim of Bullhorn Wash. There, amidst gray quartzite and green chert debitage, was discovered a basal fragment of an orange chert Clovis projectile point (Figure 67). Clovis points are exceedingly rare in Utah with only a few specimens previously reported for the entire state (Schroedl 1976:Figure 8; Nickens 1980:Figure 2), and both were from surface contexts. The specimen from 42SA9799 has all of the "classic" Clovis features: overall large size, bifacial fluting extending only part of the distance up the blade, ground basal edges, and gently concave base. However, the fragment shows evidence of re-use in the form of attrition on the fractured distal end. Given the fact that none of the flaking material at the site is similar to that of the point fragment and that a Navajo sheep pen is also present on the site, it is quite possible that the Clovis point was picked up elsewhere and carried to the site by the Navajo sheepherder. Another possibility is that post-Llano Indians who left the gray quartzite and green chert scatter reused the point; use wear patterns suggest that the point was reused as a scraping tool. In any event the projectile point has un-deniable Clovis attributes and offers one more bit of evidence for a Clovis presence in Utah, regardless of its history of use.
<table>
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<th># Isolated Finds</th>
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<tr>
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<tr>
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</table>

Total Components & Isolated Finds Identified 607 291

Table 7: Temporal distribution of the 607 components identified at the 547 previously unrecorded sites, and of the 290 isolated finds. (One isolated find, IF-9-6, had both aboriginal lithic and Euro-American historic artifacts.)
Figure 66: Distribution of three paleontological sites, as well as one site and two isolated finds of Paleo-Indian age.
Figure 67: Close-up of Clovis point base recovered from site 42SA9799. Negative number 123-C80-181.
The two Paleo-Indian isolated finds, IF-1-12 and IF-12-5, are similar in form (Figure 68) and both resemble James Allen-type points of the Plano tradition. Originally defined as a distinct point-type from a bison kill site in southeast Wyoming (Mulloy 1959), James Allen points generally date at 9,000 to 8,000 years BP. Their characteristic features include parallel-oblique flaking pattern, deeply concave base, lanceolate outline, and ground stem-base edges.

Overall, the three diagnostic Paleo-Indian artifacts yield little information concerning settlement patterns and adaptive strategies of these early hunter-gatherers. However, one line of evidence is revealing; all three artifacts were found on the canyon rim or slopes overlooking major drainages (i.e. Bullhorn and East Coyote Washes). From such locations access to a variety of floral, faunal and water resources is easy, and overlooks for observing and ambushing watering game are available. Thus, while data are completely lacking concerning the subsistence base of Paleo-Indians in Utah, the Lisbon Valley area evidence suggests that locations with good overlook qualities, near large drainages were important in their adaptive strategies (cf. Judge 1973).

Archaic Period

Frequent utilization of the project area is indicated for the several thousand years following the Paleo-Indian period. Based on projectile point morphology (Holmer 1978; Buckles 1971; Hibbets et al. 1979) 125 Archaic components have been identified at the 547 recorded sites in addition to 30 isolated finds diagnostic of the Archaic period. The 125 components occur at 121 sites; only four sites yielded good evidence of occupation during more than one sub-period in the Archaic. Of the 125 components, 15 date to the Early Archaic period (ca. 8,000-5,000 years BP; Figure 69); 12 have artifacts dating to the Middle Archaic period (ca. 5,000-3,000 years BP; Figure 70); six yielded Elko eared points characteristic of the Early to Middle Archaic time frame (Figure 71); eight belong to the Middle or Late Archaic period (ca. 5,000-1,500 years BP; Figure 72) based on the presence of Gypsum points; and 84 components are placed in the Archaic-subperiod undefined category (Figure 73) due to the discovery of Elko series points (other than Elko eared) at those locations.

A wide variety of points styles is diagnostic of the Early Archaic period (Holmer 1978), the full range of which is present in the study area (Figures 74 & 75). Figure 69 shows that the 15 Early Archaic components identified via projectile point styles include seven habitation sites, five chipping sites and three short-term camps. There is a marked concentration of these sites along East Coyote Wash and its tributaries, suggesting a preference for that drainage basin over the Lisbon and Big Indian Valleys. However, the large number of Archaic-subperiod undefined components may include some of Early Archaic age, such that any conclusions about settlement patterns must be made with caution.
Figure 68: Plano projectile points, James Allen type. The points are drawn actual size.
Figure 69: Distribution of 15 Early Archaic sites and six isolated finds.
Figure 71: Distribution of six sites and one isolated find of Early or Middle Archaic age.
Figure 72: Distribution of eight Middle or Late Archaic sites and three isolated finds.
Figure 73: Distribution of 84 Archaic-subperiod unknown sites and 17 isolated finds.
Figure 74: Representative Early Archaic projectile points: a) Pinto Single Shouldered; b & c) Pinto Shoulderless; d - h) Pinto Shouldered; i - n) Humboldt Concave Base. All points are drawn actual size.
Figure 75: Representative Early Archaic projectile points: a - b) Sudden Side-notched; c - f) Hawken Side-notched; g - h) Rocker Side-notched; i - j) Northern Side-notched. All points are drawn actual size.
It is interesting that two-thirds of the Early Archaic components are represented at multiple activity sites, many of which are quite large. Irwin-Williams (1973) found Early Archaic sites with diverse artifact assemblages but most were quite small, usually less than 50 m². Buckles (1971) recovered only minimal Early Archaic materials on the Uncompahgre Plateau, i.e. the Buttermilk Assemblages from the Christmas Rock Shelter sites. Schroedl (1976) detected evidence of a shift in subsistence patterns toward increased utilization of grasses after ca. 6,300-6,000 years BP -- apparently due to changing climatic conditions (the widely discussed Altithermal drought [see Mode 1980; Benedict 1979; Reeves 1973; Hurt 1966; Frison 1978 for varying views on the Altithermal]). Schroedl (1976) interpreted a decrease in the number of radiocarbon dates from that part of the Early Archaic (ca. 6,200-5,000 years BP) as suggestive of a population decrease. Unfortunately, our survey data do not provide sufficient chronological control to assess possible short-term demographic fluctuations, but they do indicate a more complex hunting and gathering lifestyle during the Early Archaic period than has been surmised from work in surrounding areas.

Middle Archaic components are represented at twelve sites, as inferred from projectile point styles (Figures 76 & 77; Holmer 1978; Buckles 1971; Huse et al. 1978; Irwin-Williams 1973). These twelve sites include four habitations and eight short-term camps, paralleling the trend toward the predominance of multiple activity sites seen in the preceding period. Figure 70 shows that the distribution of these sites is somewhat similar to that for Early Archaic sites, i.e. settlement occurs mainly along East Coyote Wash and its major tributaries. However, there does appear to be a shift toward heavier utilization of the pinyon and juniper vegetation zone; ponderosa pine and scrub oak also occur in the vicinity of the Middle Archaic sites and may have been another factor in site location decision-making in that period.

Middle Archaic remains are abundant on the Colorado Plateau and adjacent areas (Schroedl 1976; Frison 1978; Buckles 1971; Irwin-Williams 1973; Black 1980), perhaps indicative of a population increase as Schroedl (1980:Figure 7) illustrates for the later portion of the period. A further increased utilization of grasses has been hypothesized from excavations in many areas (Frison 1978; Schroedl 1976; Irwin-Williams 1973) based on sharply higher frequencies of ground stone tools on sites and, indeed, two-thirds of the Middle Archaic sites in the project area yielded ground stone artifacts. However, the postulated reason for such a shift in subsistence strategies -- increased effective moisture following the "Altithermal drought" -- is still in some dispute. Certainly the slight decrease in the number of Middle Archaic components (12) from Early Archaic components (15) is not indicative of a population increase, but again, the large number of Archaic-subperiod undefined components in the study tract may mask significant changes in behavioral patterns within the Archaic period. One unique trait of the Middle Archaic period in this area is the split twig figurine (Schroedl 1977a), an example of which reportedly has been found in the East Coyote Wash area (Pierson 1978:4.1.1 p.21).
Figure 76: Representative Middle Archaic projectile points: a) San Rafael Side-notched; b) McKean Lanceolate; c - e) Simple stemmed dart points. All points are drawn actual size.
Figure 77: Other Archaic projectile point types: a - c) Elko Corner-notched points resembling Roubideau points of Middle Archaic age (Buckles 1971); d) possible Middle Archaic point type (cf. Huse et al. 1978:50 & figure 13d); e) "La Sal complex" point type (Hunt & Tanner 1960:figure 5); f) possible Middle Archaic expanding stem point (cf. Irwin-Williams 1973:figure 4). All points are drawn actual size.
Six components in the study tract date either to the Early or Middle Archaic period based on the presence of Elko eared projectile points (Figure 78), which are diagnostic of the long span of time between ca. 7,600 and 3,800 years BP (Holmer 1978). These six components include one chipping site, one habitation, three short-term camps and one combination short-term camp and quarry site. Little new information regarding settlement patterns during the Early-Middle Archaic period is supplied by these sites. Three of the six sites yielded ground stone tools.

Eight components are believed to date either to the Middle or Late Archaic period based on the presence of Gypsum points (Figure 79). While Holmer (1978) notes that Gypsum points also occur in Fremont contexts in Utah, the Fremont did not inhabit the Lisbon Valley area and, thus, the Gypsum points in the project area are considered evidence of Middle/Late Archaic occupation (Lindsay 1976). Figure 72 shows that the eight components include two chipping sites, one habitation site and five short-term camps. All are found along East Coyote Wash and several of its larger tributaries but, once again, sites yielding Elko series points which may date to the Late Archaic period are not included.

No exclusively Late Archaic period sites have been identified. Berry (1975:80), in fact, argues for an occupational hiatus on the Colorado Plateau by 3,000 years BP. However, excavations on the Uncompahgre Plateau (Buckles 1971), in the Four Corners area (Irwin-Williams 1973), and on the Northwestern Plains (Frison 1978) contradict this and indicate that medium sized corner-notched dart points are most common during the Late Archaic in those areas. We classified the abundant corner-notched varieties in the project area as Elko corner-notched points which Holmer (1978) states are prevalent throughout the Archaic time frame. Thus, many of the sites placed in the Archaic-subperiod undefined category may date to the Late Archaic.

By far the most abundant Archaic remains are categorized under the Archaic-subperiod undefined rubric, based on the presence of Elko corner-notched and/or Elko side-notched projectile points (Figure 80) in the absence of other more diagnostic point types. Holmer (1978) places the Elko series points in the 7,600-1,000 years BP time frame; an Elko corner-notched variety with a long, narrow and serrated blade may be diagnostic of the Middle Archaic period, however (Figure 77a-c; "Roubideau points", Type 24 in Buckles 1971). Holmer (1978:Figure 21) recognizes three peaks in the use of Elko series points, at ca. 7,600-6,200 years BP, 5,000-3,400 years BP, and 2,000-1,000 years BP, and also suggests from Great Basin evidence that eastern versions of the point style occur in earlier contexts than do the western specimens (1978:62, citing Hester 1973). Buckles (1971) documents long term Archaic period use of Elko series projectile points on the Uncompahgre Plateau.

The latest of the three peaks in the occurrence of Elko points, ca. 2,000-1,000 years BP, overlaps in time with the presence of Formative stage cultures in the Southwest. Madsen and Berry (1975) and Holmer (1978) point out that Elko points are found in Fremont contexts but, as with Gypsum points, this possibility is discounted here given the apparent absence of Fremont sites in the vicinity of the project area. Medium-
Figure 78: Elko eared projectile points of Early or Middle Archaic age. All points are drawn actual size.
Figure 79: Gypsum projectile points of Middle or Late Archaic age. All points are drawn actual size.
Figure 80: Representative Archaic projectile points - subperiod undefined: a - f) Elko Corner-notched; g - l) Elko Side-notched. All points are drawn actual size.
sized Elko corner-notched points are also considered common at Basketmaker II sites in the Four Corners area (cf. Irwin-Williams 1973, En Medio phase; Kidder and Guernsey 1919:183; Guernsey and Kidder 1921:87; Chapman 1977), and thereafter their occurrence becomes quite rare as the Anasazi replaced the atlatl with the bow and arrow by ca. AD 500 (Hayes and Lancaster 1975).

Again, however, the possibility that some of the Elko points in the project area represent Basketmaker II occupancy must be considered quite unlikely given the lack of proven Basketmaker II sites in the area (Pierson 1978:4.1.1 p.40). Only one lithic site in the study tract has been considered a potential Basketmaker II site, 42SA9496. It contains a burnt stone concentration 5 m in diameter; a trowel probe into this feature indicated the presence of a hard-packed "floor-like" soil level just below the surface. One Elko corner-notched point was recovered here, but the presence of a Gypsum point and a Northern side-notched point at this site also indicates an Archaic affiliation.

Thus, present evidence neither supports nor fully refutes the notion that some of the Elko series points in the project area are of Fremont or Basketmaker II affiliation. While there is a possible 500 year span in the Late Prehistoric period between ca. 1,500-1,000 years BP when Elko points may have been in use in this area, the characteristics of nearly all the sites at which they are found clearly indicate an Archaic stage lifestyle is represented. Therefore, it is felt that assigning an Archaic affiliation to Elko points in the Lisbon Valley area is appropriate, all things considered (but see Weder et al. 1979). The 84 Archaic components so identified include 22 chipping sites, nine habitation sites, 47 short-term camps, three quarries, two tool kit sites, and one combination habitation-quarry site. It is obvious from Figure 73 that Archaic settlement was not confined to the East Coyote watershed although there was a clear preference for it.

Late Prehistoric Period

Two major innovations are hallmarks of the Late Prehistoric period, although the apparent lifestyle for many of the occupants of the project area did not change appreciably over that of the Archaic period. These innovations are ceramics and the bow and arrow. On the Colorado Plateau both items appear at about the same time, ca. AD 500, although there is some evidence that bow and arrow technology developed somewhat earlier (Pierson 1978:4.1.1 p.16; Berry and Berry 1976; Reed and Kainer 1978; Holmer 1978:71; Webster 1980). And while ceramics were first manufactured on the Plateau by the Anasazi in Basketmaker III times (Breternitz et al. 1974; Jennings 1978), they did not occur in the project area until ca. AD 900 (see Appendix I) in the Pueblo II period. Numic-speaking Utes and Paiutes also made pottery, but they did not occupy the area until ca. AD 1300-1500 (Jennings 1978; Reed and Scott 1980). Thus, in the project area corner-notched arrow points are the only diagnostic artifacts for the ca. AD 500-900 time frame; side-notched arrow points of puebloan and (later) Shoshonean affiliation first appear about AD 900 - 1000 (Figures 81 & 82; Hayes and Lancaster 1975; Holmer and Weder 1980).
Figure 81: Representative Late Prehistoric/Protohistoric projectile points: a - g) Rose Spring Corner-notched; h - l) Cottonwood Triangular. All points are drawn actual size.
Figure 82: Other representative Late Prehistoric/Protohistoric projectile points: a - d) Desert Side-notched; e) Uinta Side-notched; f) Pueblo II-III Anasazi style C; g - j) other Late Prehistoric period points. All points are drawn actual size.
A total of 38 Late Prehistoric components has been identified in the project area (Figure 83) and they include eight chipping sites, eight habitation sites, 21 short-term camps and one tool kit site. Ten of those sites yielded ceramics and six had rockshelters. The 38 components represent affiliations with both the Anasazi and Ute/Paiute cultures; nine sites are of Anasazi affiliation, three are considered Ute/Paiute, and 26 are of unknown Late Prehistoric affiliation. Two areas appear to have been preferred for settlement in the Late Prehistoric: the East Coyote Wash area and its tributaries (particularly preferred by the Anasazi), and the pinyon and juniper covered ridge composing the Lisbon-East Coyote divide.

As noted by many scholars (e.g. Lindsay 1976; Thompson 1979; Jennings 1978; Sharrock 1966) there is essentially no evidence of Fremont occupation south of the Colorado River (see Crane 1977; Kasper 1977 and Toll 1977 for differing views). No Fremont ceramics were found during the survey reported herein (see Appendix 1). However, that fact does not obviate the possibility of hunting and/or gathering forays into the area by the Fremont (Pierson 1978; Ambler 1970 in Schaafsma 1971:148; Kasper 1977). In fact, some of the Late Prehistoric projectile points found within the study tract (Figures 81 & 82) are similar to those found at Fremont sites elsewhere in Utah (Holmer and Weder 1980). Unfortunately, projectile points in the absence of other diagnostic artifacts are not good indicators of cultural affiliation (cf. Berry 1975a:24), being more suited to consideration of chronology. Therefore, given the presence of Anasazi habitations in the project area, the apparent lack of Fremont ceramics, and the apparent lack of substantial overlap between areas of Anasazi and Fremont utilization, none of the Lisbon Valley Project lithic sites are considered of certain Fremont affiliation although it is a possibility (e.g. sites 42SA9421 and 9756). Diagnostic artifacts known to occur in both Archaic and Fremont contexts, e.g. Elko and Gypsum projectile points, have been considered exclusively Archaic artifacts in this area where there is little evidence of Fremont (cf. Lindsay 1976:22; Thompson 1979:124). Likewise, no certain Basketmaker III-Pueblo I sites have been identified in the project area, in keeping with the very sparse indications for such sites garnered from previous work (Pierson 1978; Thompson 1979). The small stemmed arrow points in the area may represent Anasazi occupation in the AD 500 - 900 time frame (Hayes and Lancaster 1975), but again projectile point styles should not be used to assess Formative cultural affiliations in the absence of diagnostic ceramics, considering the proximity of the Uncompahgre Plateau area where Archaic stage populations resided during the late Prehistoric Period. A change in this unfortunate situation regarding projectile point affiliations would require a rigorous comparative analysis of Fremont, Anasazi, Ute/Paiute and other post-Archaic period projectile points.

Figure 84 illustrates the distribution of the three non-functional/morphological site types. Ceramic sites, mostly of Anasazi affiliation, are most common along the larger tributaries of East Coyote Wash where the deep alluvial soils would enhance the chances of successful horticultural activities (see Figure 21). This pattern follows that observed by Pierson (1978) and Toll (1977:157) for puebloon sites in the La Sal
Figure 83: Distribution of 28 Late Prehistoric/Protohistoric sites and ten isolated finds.
Mountains area. However, presently the soils presumed to have been farmed by the Anasazi in the project area are subjected to a 100 to 120 day frost-free period (BLM-Moab 1976), only marginal for maize agriculture (Winter 1976). If the period of presumed Anasazi occupation in the area was one of more favorable climate (Euler et al. 1979), deteriorating conditions toward the present environment may have substantially contributed to the Anasazi abandonment. Both rock art sites occur at rockshelters near Bullhorn Wash, and both are in association with Late Prehistoric artifacts. The 29 rockshelter sites not surprizingly tend to occur along the larger canyons where cliff alcoves, ledges and overhangs are best developed. One rockshelter yielded Early Archaic artifacts, seven are of Archaic-subperiod use, and 15 did not yield temporally diagnostic artifacts. Two of the six Late Prehistoric rockshelters are of Anasazi affiliation.

Prehistoric era -- Affiliation and Age undefined

Nearly seventy percent of the sites recorded in the project area had aboriginal components which lacked artifacts diagnostic either of cultural affiliation or of temporal position. These 380 sites are plotted in Figure 85 and include 233 chipping sites, three habitation sites, 114 short-term camps, 26 quarries and four tool kit sites. Geographically, their distribution is markedly more random than for sites of known age or affiliation, as would be expected given the large percentage of special activity sites like quarries and chipping sites. All are characterized by lithic artifacts, with no ceramics or structures present. Features such as hearths and ground stone tools do occur, however. With the exception of having no diagnostic artifacts, the assemblages at these sites are similar to those at lithic sites dating to the Paleo-Indian, Archaic and Late Prehistoric periods. Thus, unless the manufacture of archaeologically diagnostic tools was more prevalent in one time period than another, perhaps 76 percent or about 289 of these 380 lithic sites are of Archaic age and affiliation, with somewhat fewer (about 23 percent or 88 sites) dating to the Late Prehistoric period and even fewer (less than one percent, or only 2-3 sites) of Paleo-Indian antiquity. This conclusion is based on the temporal distribution of sites with diagnostics, the ca. 7,000 years of Archaic occupation in the study area, and the characteristics of these undated lithic sites which suggest nearly exclusive use of the study area by groups following an Archaic stage lifestyle.

Historic Period, By Steven M. Horvath

In all, 63 historic period components were discovered during the survey of the Lisbon Valley Project area (Figure 86). The evidence from these sites indicates that the historic period inhabitants of the valley utilized it on a temporary, seasonal basis and almost never made it a permanent residence. Eighteen (18) sites contain no evidence of overnight use whatsoever, and 44 sites are classified as short-term camps or places where shepherds, cowboys, hunters, and prospectors temporarily
Figure 85: Distribution of 380 aboriginal sites and 247 isolated finds of unknown age and affiliation.
Figure 86: Distribution of 63 Historic period sites and two isolated finds.
set up camp while they were engaged in their occupations in the immediate area. Only one site, 42SA9902, provides evidence of long term residence. This site appears to be a cow camp (probably occupied seasonally) and/or a homestead. In the absence of oral informant data and detailed documentary research it is impossible to say what was the nature of the seasonal scheduling that took place in the valley. However, it seems reasonable to assume that like other remote areas in the Rocky Mountain region the Lisbon Valley was primarily used during the spring, summer, and fall.

In terms of absolute numbers of components recorded, livestock raising was and is one of the dominant foci for historic peoples in the Lisbon Valley area. A total of 21 components is related to livestock production: 15 for sheep, four for cattle, and two corrals of unknown function. One of these sites is a habitation site that was probably used as a seasonal cow camp but all other sites were short-term camps, isolated corrals or other features.

A second major focus of activity during the historic period is mineral exploration and development. This activity is a very recent development so only seven (7) mineral exploration or industrial sites were recorded; most of these were older mining sites that formed a part of multi-component sites. However, this activity as a whole has had a major impact on the area -- many prehistoric sites have been damaged by past exploration activities.

Big game hunting by Euro-Americans played a small part in the history of the study area. Four sites were determined to be hunter's encampments and kill sites. Some of the short-term camps of unknown function may be associated with hunting; however, hunting seems to have played a minor role in the history of the study area.

Without detailed oral historical data it proved difficult to assign most of the short-term camps and other historic sites to a particular cultural or ethnic group. Two of the short-term camps associated with sheep raising were definitely linked with a Navajo occupation. A number of other short-term camps (8) and isolated corrals (5) were tentatively attributed to Navajo because they were associated with sheep herding; however, they also may be associated with Euro-American, Basque, New Mexican or other shepherds. There is a tendency for these sheep camps to be located in association with lithic scatters, perhaps indicating re-use of lithics by the shepherds as has been shown to occur with Navajo shepherds in northwestern New Mexico (Huse et al. 1978:41 & 89). Mr. Hardy Redd (personal communication 1981) has informed us that a Basque shepherd ran his own herd in the area and that another rancher used "Mexican" shepherds. To his knowledge, no Indians had ever herded sheep in the area in the recent (ca. last 50 years) past. They may have been in the area, however, to work in the local uranium mines.

All the components associated with cattle ranching (4), hunting (4), mineral exploration (5), and industrial (2) activities were attributed to Euro-Americans. Two specialized corrals, possibly wild horse traps,
and two stone structures were tentatively determined to be Euro-American. Twenty-nine short-term camps did not contain enough information to attribute them to any particular cultural or ethnic group. However, many of these short-term camps do have close parallels to Navajo summer season herding camps in northwestern New Mexico. Both Noisat (1978:101, 104-106) and Reher (1977:53-63) describe tent platforms associated with wood chopping areas, ash piles, and trash scatters. Bennally (1980) indicates that Navajos often used tents in the late 1940s and 1950s. Nonetheless, it remains to be seen whether Euro-American, Basque, or New Mexican sheep camps would look any different from Navajo summer sheep camps in the absence of distinctive traits such as sweat lodges, etc.

The settlement pattern for historic sites in the Lisbon Valley project area also reveals a focus on livestock raising. Areas that contain or are adjacent to large open spaces, i.e. Sections 1, 3, 8, 9, 11, 12 and 13, contain the most historic period short-term camps and components associated with cattle and sheep raising (Figure 86). Sections that are mostly forested, 7, 10, 14 and 17, contain no or at most one livestock related component. The correlation is not perfect, however, as there are four sections which contain open areas but have only one or no camps or livestock-related components.

Two other patterns are suggested for historic site settlement distribution; however, they are based on a small number of sites. The first of these tentative patterns is a clustering of Euro-American big game hunting components in Section 6. However, this cluster may be a phantom since some of the short-term camps of unknown function that are scattered all over the project area may have been occupied by hunters. The second tentative cluster is a group of two copper mines in Section 18. The distribution of such mining related sites would tend to cluster where surface indications or outcrops of the desirable minerals occur, and this appears to be the case in Section 18.

**Significant Trends in Project Area Settlement**

Tables 8-17 provide comparisons of site totals for the five major parameters of analysis. Table 8 illustrates the predominance of lithic scatters of unknown age and affiliation, with Archaic lithic sites also being relatively abundant. Table 9 shows that diagnostic artifacts can be considered common only at habitation sites, which constitute a very small portion of the sites recorded. Most of the other site types could not be assessed as to their chronological placement; chipping sites and short-term camps are the most common site types with the latter remaining prevalent into the Historic period. Although most of the site types could not be dated on surface evidence, there does not appear to be any significant shift in the relative abundance of any one site type through time.

Table 10 indicates that sites of Desert Archaic affiliation are the most diverse with six site types represented, ample evidence of the flexible lifestyle of those hunter-gatherers who exploited whatever resources
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Key:  A = Anasazi; Ab = aboriginal; DA = Desert Archaic; E-A = Euro-American; 
H = historic; N = Navajo; P-I = Paleo-Indian; U/P = Ute/Paiute.

Table 8: Site Comparison of Cultural Affiliation and Time Period.
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Key: Ce = ceramic; Ch = chipping; Ha = habitation; H/LA = historic/limited activity; I = industrial; Q = quarry; RA = rock art; R-Sh = rockshelter; S-TC = short-term camp; TK = tool kit.

Table 9: Comparison of Site Type and Time Period.
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<td>0</td>
<td>0</td>
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<td>10</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Key: Ce = ceramic; Ch = chipping; Ha = habitation; H/LA = historic/limited activity; I = industrial; Q = quarry; RA = rock art; R-Sh = rockshelter; S-TC = short-term camp; TK = tool kit.

Table 10: Comparison of Site Type and Cultural Affiliation.
<table>
<thead>
<tr>
<th>Site Size</th>
<th>Ce</th>
<th>Ch</th>
<th>Ha</th>
<th>S-TC</th>
<th>Site Type</th>
<th>Q</th>
<th>TK</th>
<th>R-Sh</th>
<th>RA</th>
<th>I</th>
<th>H/LA</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1000m²</td>
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<td>140</td>
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<td>19</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>1000-4999m²</td>
<td>4</td>
<td>110</td>
<td>3</td>
<td>101</td>
<td>8</td>
<td>2</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>5000-9999m²</td>
<td>0</td>
<td>15</td>
<td>4</td>
<td>42</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10,000-19,999m²</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>20</td>
<td>4</td>
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<td>1</td>
<td>0</td>
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<td>2</td>
<td>0</td>
</tr>
<tr>
<td>20,000-29,999m²</td>
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<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>≥30,000m²</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Key: Ce = ceramic; Ch = chipping; Ha = habitation; H/LA = historic/limited activity; I = industrial; P = paleontological; Q = quarry; RA = rock art; R-Sh = rockshelter; S-TC = short-term camp; TK = tool kit.

Table 11: Comparison of Site Type and Site Size.
<table>
<thead>
<tr>
<th>Site Size</th>
<th>L</th>
<th>U</th>
<th>E/M-A</th>
<th>M/L-A</th>
<th>Time Period A-US</th>
<th>EA</th>
<th>MA</th>
<th>LA</th>
<th>LP/P</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1000m²</td>
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<td>189</td>
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<td>2</td>
<td>0</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>1000-4999m²</td>
<td>1</td>
<td>45</td>
<td>3</td>
<td>4</td>
<td>32</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>5000-9999m²</td>
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<td>28</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>10,000-19,999m²</td>
<td>0</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>20,000-29,999m²</td>
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<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<td>0</td>
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<td>≥30,000m²</td>
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<td>0</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Key: A-US = Archaic, sub-period unknown; EA = Early Archaic; E/M-A = Early or Middle Archaic; H = historic; L = Llano; LA = Late Archaic; LP/P = Late Prehistoric/Protohistoric; MA = Middle Archaic; M/L-A = Middle or Late Archaic; U = unknown.

Table 12: Comparison of Time Period and Site Size.
<table>
<thead>
<tr>
<th>Site Size</th>
<th>P-I</th>
<th>DA</th>
<th>A</th>
<th>U/P</th>
<th>N</th>
<th>E-A</th>
<th>UA</th>
<th>UH</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1000m²</td>
<td>0</td>
<td>27</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>193</td>
<td>9</td>
</tr>
<tr>
<td>1000-4999m²</td>
<td>1</td>
<td>47</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>157</td>
<td>8</td>
</tr>
<tr>
<td>5000-9999m²</td>
<td>0</td>
<td>21</td>
<td>0</td>
<td>1</td>
<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>10,000-19,999m²</td>
<td>0</td>
<td>14</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>20,000-29,999m²</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>≥30,000m²</td>
<td>0</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Key: A = Anasazi; DA = Desert Archaic; E-A = Euro-American; N = Navajo; P-I = Paleo-Indian; UA = unknown aboriginal; UH = unknown historic; U/P = Ute/Paiute.

Table 13: Comparison of Cultural Affiliation and Site Size.
<table>
<thead>
<tr>
<th>Environmental Factors</th>
<th>&lt;1000m²</th>
<th>1000-4999m²</th>
<th>5000-9999m²</th>
<th>Site Size</th>
<th>10,000-19,999m²</th>
<th>20,000-29,999m²</th>
<th>&gt;30,000m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>ridgetop/mesa top</td>
<td>82</td>
<td>85</td>
<td>18</td>
<td>13</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>mesa/canyon rim</td>
<td>17</td>
<td>36</td>
<td>11</td>
<td>10</td>
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<td>3</td>
<td></td>
</tr>
<tr>
<td>slope</td>
<td>85</td>
<td>55</td>
<td>17</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>bench/terrace</td>
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<td>33</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>valley/drainage bottom</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>P/J</td>
<td>198</td>
<td>163</td>
<td>44</td>
<td>22</td>
<td>3</td>
<td>12</td>
<td></td>
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<td>sagebrush</td>
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<td>31</td>
<td>8</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>P/J-Ponderosa-oak</td>
<td>8</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>P/J-sagebrush</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>&lt;100m to large drainage/spring</td>
<td>29</td>
<td>42</td>
<td>11</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>101-500m to large drainage/spring</td>
<td>106</td>
<td>110</td>
<td>29</td>
<td>22</td>
<td>1</td>
<td>10</td>
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</tr>
<tr>
<td>&gt;500m to large drainage/spring</td>
<td>96</td>
<td>58</td>
<td>16</td>
<td>7</td>
<td>2</td>
<td>7</td>
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</tbody>
</table>

Table 14: Comparison of Site Size and Environmental Factors.
Table 15: Comparison of Site Type and Environmental Factors.

<table>
<thead>
<tr>
<th>Environmental Factors</th>
<th>Ce</th>
<th>Ch</th>
<th>Ha</th>
<th>S-TC</th>
<th>Site Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Q</td>
</tr>
<tr>
<td>ridgetop/mesa top</td>
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<td>12</td>
<td>95</td>
<td>11</td>
</tr>
<tr>
<td>mesa/canyon rim</td>
<td>2</td>
<td>37</td>
<td>3</td>
<td>44</td>
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<td>slope</td>
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<td>8</td>
<td>62</td>
<td>10</td>
</tr>
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<td>bench/terrace</td>
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<td>49</td>
<td>4</td>
<td>34</td>
<td>6</td>
</tr>
<tr>
<td>valley/drainage bottom</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ledge</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

- P/J 7 220 21 186 30 6 25 2 2 12 3
- sagebrush 1 37 3 35 1 1 1 0 0 2 0
- P/J-Ponderosa-oak 0 12 0 6 0 0 1 0 0 1 0
- P/J-sagebrush 2 3 4 15 0 u 0 0 0 1 0

<table>
<thead>
<tr>
<th></th>
<th>&lt;100m to large drainage/spring</th>
<th>101-500m to large drainage/spring</th>
<th>&gt;500m to large drainage/spring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 40 6 48 2 1 8 0 0 2</td>
<td>7 131 18 123 19 5 20 2 0 8</td>
<td>2 101 4 71 10 1 1 0 2 6</td>
</tr>
</tbody>
</table>

Key: Ce = ceramic; Ch = chipping; Ha = habitation; H/LA = historic/limited activity; I = industrial; P = paleontological; Q = quarry; RA = rock art; R-Sh = rockshelter; S-TC = short-term camp; TK = tool kit.
<table>
<thead>
<tr>
<th>Environmental Factors</th>
<th>L</th>
<th>U</th>
<th>E/M-A</th>
<th>EA</th>
<th>MA</th>
<th>L/M-A</th>
<th>LP/P</th>
<th>H</th>
<th>A-US</th>
</tr>
</thead>
<tbody>
<tr>
<td>ridgertop/mesa top</td>
<td>1</td>
<td>133</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>15</td>
<td>23</td>
<td>35</td>
</tr>
<tr>
<td>mesa/canyon rim</td>
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<td>2</td>
<td>6</td>
<td>0</td>
<td>9</td>
<td>9</td>
<td>15</td>
</tr>
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<td>3</td>
<td>4</td>
<td>2</td>
<td>9</td>
<td>16</td>
<td>21</td>
</tr>
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<td>2</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>valley/drainage bottom</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>3</td>
</tr>
<tr>
<td>P/J</td>
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<td>12</td>
<td>10</td>
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<td>31</td>
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<td>61</td>
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<td>2</td>
<td>4</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>P/J-Ponderosa-oak</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>0</td>
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<tr>
<td>P/J-sagebrush</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>&lt;100m to large drainage/spring</td>
<td>0</td>
<td>56</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>101-500m to large drainage/spring</td>
<td>1</td>
<td>184</td>
<td>5</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>21</td>
<td>30</td>
<td>44</td>
</tr>
<tr>
<td>&gt;500m to large drainage/spring</td>
<td>0</td>
<td>139</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>11</td>
<td>17</td>
<td>22</td>
</tr>
</tbody>
</table>

Key: A-US = Archaic unknown sub-period; EA = Early Archaic; E/M-A = Early or Middle Archaic; H = historic; L = Llano; L/M-A = Late or Middle Archaic; LP/P = Late Prehistoric/Protohistoric; MA = Middle Archaic; U = unknown.

Table 16: Site Comparison of Time Period and Environmental Factors.
<table>
<thead>
<tr>
<th>Environmental Factors</th>
<th>P-I</th>
<th>DA</th>
<th>Cultural Affiliation</th>
<th>U/P</th>
<th>N</th>
<th>E-A</th>
<th>UA</th>
<th>UH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ridgetop/mesa</td>
<td>1</td>
<td>49</td>
<td>A</td>
<td>1</td>
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<td>140</td>
<td>13</td>
</tr>
<tr>
<td>mesa/canyon rim</td>
<td>0</td>
<td>22</td>
<td>DA</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>56</td>
</tr>
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<td>3</td>
<td>7</td>
<td>121</td>
</tr>
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<td>bench/terrace</td>
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<td>A</td>
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<td>2</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>valley/drainage bottom</td>
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<td>0</td>
<td>A</td>
<td>0</td>
<td>0</td>
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<td>8</td>
</tr>
<tr>
<td>P/J</td>
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<td>A</td>
<td>6</td>
<td>2</td>
<td>14</td>
<td>16</td>
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<td>A</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>P/J-Ponderosa-oak</td>
<td>0</td>
<td>4</td>
<td>A</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>P/J-sage</td>
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<td>4</td>
<td>A</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>≤100m to large drainage/spring</td>
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<td>A</td>
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<td>1</td>
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<td>60</td>
</tr>
<tr>
<td>101-500m to large drainage/spring</td>
<td>1</td>
<td>65</td>
<td>A</td>
<td>6</td>
<td>1</td>
<td>12</td>
<td>7</td>
<td>198</td>
</tr>
<tr>
<td>&gt;500m to large drainage/spring</td>
<td>0</td>
<td>31</td>
<td>A</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>143</td>
</tr>
</tbody>
</table>

Key: A = Anasazi; DA = Desert Archaic; E-A = Euro-American; N = Navajo; P-I = Paleo-Indian; UA = unknown aboriginal; UH = unknown historic.

Table 17: Site Comparison of Cultural Affiliation and Environmental Factors.
were available at any one time of the year. Site size was an important factor in determining in which site type category a site was placed; Table 11 shows that chipping sites, quarries, tool kits and rockshelters tended to be smallish whereas multiple activity sites such as short-term camps and habitation sites were more variable in size. A problem in determining the accuracy of these figures is that frequent re-use of a particular locale can exaggerate the use-area of any one occupation (Buckles 1971:1190), as well as mask the function of previous occupations. For instance, repeated chipping episodes in one area, followed by a one night camp during which plant foods were ground might result in a classification of the area as a large short-term camp. In fact, repeated visits of that area had used only small portions of the "site" and the more frequent chipping activities carried out there were overshadowed by the presence of ground stone tools used only one night.

The range in site size seems to have remained fairly stable through time (Table 12), with the Late Prehistoric period witnessing a slight reduction in average site size. This may be explained by the 7,000 year span of time covered by the Archaic period, during which repeated visits to favored hunting, gathering, lookout and camp sites eventually expanded the surface extent of artifactual debris. It is believed that the relatively stable hunting and gathering lifestyle followed in the project area throughout the prehistoric era generally resulted in individual occupations covering small (less than 5,000 m²) areas -- sites covering more than 5,000 m² probably represent several occupations which could have taken place anytime in prehistory. Table 13 suggests a similar interpretation as sites of large size are generally of Desert Archaic or unknown aboriginal affiliation; Archaic hunter-gatherers occupied the area long enough to have revisited individual locations dozens of times.

Environmental factors such as on-site landform(s), vegetation zone(s) and distance to major drainage or spring are often considered of primary importance to hunter-gatherer populations dependent upon daily availability of wild floral, faunal and water resources (Jochim 1976). Tables 14-17 reveal several interesting trends in site settlement. A surprising degree of diversity is indicated in the landform upon which sites were located; ridgetops, mesatops, benches and terraces were popular as would be expected (Thompson 1979:137), but fewer sites were found on mesa/canyon rims than might be predicted from surveys in nearby areas (e.g. Martin 1977), and slopes were occupied much more frequently than expected. From Table 12, chipping sites appear to have been more randomly located in terms of landform, and this apparent randomness is present throughout the prehistoric era at sites of every cultural affiliation.

The pinyon and juniper vegetation zone was clearly preferred over all others as seen in site type distribution and sites of all different sizes, ages and affiliations. This was to be expected as Thompson (1979) noted an average site density of 29 sites/mi² in pinyon-juniper but only 6.5 sites/mi² in brushland, in the Indian Creek-Dry Valley planning unit. Fully 87% of the sites in the project area are in or
along the edges of a pinyon-juniper woodland. Particularly likely site areas are the small groves of pinyon and juniper which occur as tree "islands" dotting the sagebrush range along East Coyote Wash. Even isolated stands of only a couple trees were preferentially chosen site locations in this area.

Detailed soil correlations were not made but would be most applicable to settlement pattern studies of Formative stage sites; inspection of Figures 21 and 83 indicates an Anasazi preference for the deeper soils along East Coyote Wash, particularly the San Mateo and Hagerman series soils. The present marginality of these soils for maize agriculture may have been a factor in the apparently short Anasazi occupation (see Appendix I)(100-200 days average frost-free period, SCS 1981); cold air drainage into the East Coyote valley bottom probably accounts for the shorter growing season compared to the 154 day season reported at the town of La Sal (BLM-Moab). Overall, there was a slight tendency for sites, especially multiple activity ones, to be located relatively near large drainages and springs (generally closer than 500 m), except chipping sites which were located as randomly in terms of water resources as in terms of landform. Sites of Anasazi and Navajo affiliation were least likely to be located far from potential water resources.

Thus, lithic sites of unknown age and affiliation are the most common sites in the area. Archaic hunter-gatherers seem to be the most probable candidates to have left behind those lithics, as sites of Archaic age and affiliation are the second most common encountered (cf. Thompson 1979:164). Chipping sites and short-term camps are the most prevalent types of sites. Most single occupation sites were probably quite small, while the somewhat numerous larger sites likely represent areas of repeated use during the prehistoric and historic eras. Sites were relatively randomly located in terms of landform and somewhat less so in distance to probable water sources; however, the terrain itself is quite diverse and permanent water sources are larger and more reliable in the nearby LaSal Mountains and along the Dolores River -- the latter is easily accessible via East Coyote Wash, Bullhorn Wash or Lisbon Canyon. Pinyon-juniper woodland was the preferred environmental zone as determined from sites of all different ages, size and cultural affiliation.

**Sensitivity of Sites to Impacts**

The "sensitivity" of cultural resources to impacts from land disturbing activities of any kind is necessarily tied to the "significance" of those sites. Significance itself is a relative term, and one that is treated in more detail in Chapter 5. Individual sites can be significant at various levels of concern depending upon their quality, the presence of unusual features or artifacts, the depth of cultural deposits, etc. Perhaps most important with individual sites is the amount of information present at each site which can contribute to expanding our knowledge of a particular locale's prehistory and/or history. Groups of sites, on the other hand, can be significant as a whole; much
more information is present concerning total cultural behavior at the full range of site types than at individual sites, regardless of one site's depth or diversity. Such seems to be the case for the Lisbon Valley area.

While individual sites in the study tract are certainly distinctive, deserving of further attention, and likely candidates for furthering our knowledge of local events in the past (e.g. 42SA9756 and 42SA9772), the sum total of nearly 550 sites and 290 isolated finds in a relatively confined area is most significant. Surely, no previous surveys had encountered areas of such intense use (Thompson 1979; Hunt 1953; Toll 1977; Martin 1977; Copeland 1978a, 1979a, 1980) nor anticipated the likelihood of the high site densities seen in the area. Figure 87 graphically represents our version of projected sensitivity of various parts of the study tract to land disturbing impacts based both on observed site densities and the presence of individually significant sites. Thompson (1979:Figure 29) judged the project area to be within a zone of "medium" sensitivity to impacts, based on a 1% sample survey of the Indian Creek-Dry Valley planning unit.

Clearly, however, the East Coyote Wash area and the Lisbon-East Coyote divide are considered highly sensitive to impacts. Elsewhere, wooded areas are generally considered moderately sensitive overall, since the pinyon-juniper zone was the most heavily used vegetation zone. Finally, areas of steep slopes and open brush are considered least sensitive to impacts. Within the East Coyote Wash area of generally high sensitivity, certain locales that are especially sensitive to impacts can be isolated fairly easily. In particular, small groves of pinyon and juniper trees surrounded by open sagebrush range are very likely site locations in this area. These small tree islands are readily distinguishable on aerial photos but are not marked on the topographic maps. For future development projects in this general area, detailed study of aerial photo maps could identify such tree islands and they could be avoided in the planning stage as probable site locations.

Sensitivity zones can be projected into areas adjacent to the study tract. The northeastern, limestone-derived slopes of Big Indian Valley, considered of low sensitivity to impacts, continue to the northwest and southeast outside the project area. For future projects, landforms of similar topography and lithology can be considered very unlikely site locations posing few archaeological hinderances to development. Similarly, the valley floor extending southeast into Lower Lisbon Valley can be considered probably of low sensitivity to impacts; the valley floor of Big Indian Valley extending southeast and, especially, northwest from the project area is environmentally distinct, however, and present evidence suggests it may be of medium sensitivity overall. Adjacent areas likely to be highly sensitive to impacts include Lisbon Canyon (fed by a large spring), the northeast slopes of East Coyote Wash, and the Lisbon-East Coyote divide extending to the southeast. Still different environmental conditions and previous archaeological work (Copeland
1978a, 1979a, 1980; Thompson 1979) suggest that sensitivity zones as
determined for the project area probably do not apply to the west towards
Dry Valley, northeast beyond East Coyote Wash, or east in the Greasewood
Canyon area.
CHAPTER 5
SITE EVALUATIONS

General and Specific Classes of Significance and National Register Eligibility Criteria

When considering the significance of cultural resources, one must realize that "significance" is variable and dependent on the differing criteria of the agencies or legal and scientific instruments for which the resources are being evaluated. In the case of the Lisbon Valley Project, significance levels and criteria are determined by the Advisory Council on Historic Preservation through the National Historic Preservation Act (NHPA) of 1966, 36 CFR 800, 36 CFR 60.6, and Executive Order 11593.

In addition to specific levels of significance spelled out by the Advisory Council, there are at least six more general levels of significance which must at times be considered in evaluating cultural resources. These include scientific, historical, ethnic, public, legal, and monetary significance (Schiffer and Gumerman 1977:239-247). Although these various areas of significance frequently overlap, scientific, historical and legal are of the most concern in evaluating the resources from the Lisbon Valley Project.

Scientific Significance

A site or resource is said to be scientifically significant when its further study may be expected to help answer current research questions. That is, scientific significance is defined as research potential (Schiffer and Gumerman 1977:241).

Historical Significance

Sites may be historically significant if: ... they provide a typical or well-preserved example of a prehistoric culture, historical tribe, period of time, or category of human activity ... (or) if they can be associated with a specific individual event or aspect of history (or prehistory) (Scoville, Gordon and Anderson 1972: 244).

Legal Significance

As mentioned earlier, legal significance varies with the legal agency or instruments involved. As will be discussed, there are very specific criteria set forth by the Advisory Council (see Schiffer and Gumerman 1977:239-247).
In reference to the cultural resources in the Lisbon Valley project area, the paramount categories of significance are scientific and historical. As will be discussed, there are several sites which are scientifically and historically significant within the legal guidelines of the National Register. The National Register Criteria for Evaluation and procedures for nominating cultural resources to the National Register are outlined in 36 CFR 60.6; the basic steps for compliance with Section 106 of the NHPA and with Sections 2(b) and 1(3) of Executive Order 11593 are set forth in 36 CFR 800.

The National Register Criteria for Evaluation are as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and;

1. That are associated with events that have made a significant contribution to the broad patterns of our history; or

2. That are associated with the lives of persons significant in our past; or

3. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

4. That have yielded, or may be likely to yield, information important in prehistory or history.

Criteria considerations. Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

a) A religious property deriving primary significance from architectural or artistic distinction or historical importance.
b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event.

c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.

d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events.

e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived.

f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance.

g) A property achieving significance within the past 50 years if it is of exceptional importance.

In evaluating sites in terms of the National Register Criteria, it is important to stress that each criterion applies at three levels of significance, namely National, State, and Local. These levels of significance have been operationalized for archaeological resources by King, Hickman and Berg (1977:100). The definitions of State and Local significance are pertinent to the resources of the Lisbon Valley Project and are described as follows:

The State Level of Significance

States are uncomfortable entities with which to work as units of archaeological study. Few correspond with natural areas, and since prehistoric settlement patterns usually do relate somehow to natural environments, they tend to cross state boundaries with some abandon. This very lack of synchronism with the order of the environment provides historic archaeologists with some opportunities that might otherwise not exist: Where environment is held constant, what variations will we see in settlement patterns, use of resources, sedentism, or community organization
between, say, "wet" and "dry" states, or states
where prostitution is legal and those where it is
banned? To address these kinds of questions never-
theless requires the perspective of a natural re-
gion; the existence of the state line simply pro-
vides a useful independent variable.

The Local Level of Significance

When a property is judged to be significant or in-
significant in terms of research that focuses on a
particular region or locality alone, the judgement
is made in terms of local significance. When we
assert that stratified shell midden SX-10 can help
us construct a cultural sequence for the Texas coast,
we are dealing in local significance. The same is
true when we say that a group of surface scatters
of nails and glass can help us reconstruct proces-
ses of socio-economic change among early twentieth
century cowboys in the Little Belt Mountains of
Montana. These sites can, of course, immediately
attain national significance if the questions that
give them meaning are tied into some larger issues,
but this high level of significance need not be
demonstrated in order to bring the historic preser-
vation procedures to bear (King, Hickman and Berg
1977:100-102).

It is within the foregoing framework of significance that the cultural
resources of the Lisbon Valley Project have been evaluated.

The Philosophy Used in Evaluating the Cultural Resources

On the Lisbon Valley Project Steven G. Baker, Consulting Archaeologist,
has taken what is believed to be a moderate approach on the subject of
National Register eligibility. This is Baker's general procedure and
one that is a conscious attempt to avoid an overtly conservative or
radical interpretation of the evaluation criteria, most notably those of
the National Register. In presenting its evaluation for the Lisbon
Valley study area, Baker has adhered to two in-house policies. These
are:

1. All evaluations are made by a balanced professional
team rather than one individual who might represent only
one academic area of interest or expertise. In this in-
stance the team consists of one prehistoric archaeolo-
gist, two additional archaeologists with backgrounds in
both prehistoric and historic archaeology, and an his-
toric preservationist.
2. When there are inadequate data to allow a solid and defensible evaluation to be made, the site is considered to be potentially eligible for the National Register. In operation this usually means that test excavation data are needed, particularly for prehistoric lithic scatters. Until such data are obtained, resources are considered eligible until proven different. This approach protects the resource base and allows for an orderly systematic evaluation procedure to be applied. In keeping with this philosophy the table of site significance lists many sites as provisionally Register Eligible yet requiring more data. Once such data are acquired final evaluation can take place.

The Evaluation Philosophy For Aboriginal Resources

Aboriginal resources in the study area are almost exclusively restricted to surface and subsurface archaeological values relative to general Scientific Research significance and Criterion No. 4 of Legal significance relative to the National Register. Most of these resources are small lithic scatters which are not impressive by subjective standards when compared to sites such as those from the classic Anasazi area of southeastern Utah. As pointed out by the National Park Service, however, such sites can qualify for the National Register.

Archaeological properties do not have to be large, impressive, or rich in artifacts or data to qualify for the National Register, nor do they have to be suitable for public interpretation. Any archaeological resource is potentially eligible if one can legitimately argue that it is likely to be associated with a cultural pattern, process, or activity important to the history or prehistory of its locality, the United States, or humanity as a whole, provided its study can contribute to an understanding of that pattern, process, or activity (National Park Service n.d.).

The legal criterion for determining sites as eligible in the above regard is No. 4, namely archaeological sites: "...that have yielded, or may be likely to yield, information important in prehistory or history." Thus, if an aboriginal resource is believed to be capable of yielding positive information to the study of prehistory at the Local, State, or National level within research designs such as those articulated in Chapter 6, it is recommended as eligible for the National Register.

If a site is believed to lack the capability to contribute positive or useful information in keeping with the National Register, it is then judged in light of any possible value it might have, such as marginal research potential in prehistoric studies. If it is decided that the site can't, in any current or potential manner, be useful in prehistoric
studies, it is declared insignificant and deserving of no further consideration. Such sites are, of course, considered in light of specific suggestions from the Park Service for considering small or disturbed prehistoric sites (Talmadge 1977).

Occasionally a site might be thought to be just significant enough that it cannot, with good conscience, be declared insignificant and thus written off and allowed to be destroyed. Such sites are deemed potentially Register Eligible. In many cases, however, aboriginal sites in the Lisbon Valley study area are believed to be Insignificant, with a large number, as will be discussed, falling into each category.

The Evaluation Philosophy for Euro-American Resources

Historic Euro-American resources have not been given a great deal of attention in the formulation of local research designs due to their limited numbers in the study area. The National Register was originally developed primarily in an effort to protect historic Euro-American resources, although aboriginal resources were provided for in it. Nevertheless, prehistoric and historic archaeological values often have been relegated to the broadly encompassing Criterion No. 4 while such attributes as association with famous persons, historical events, architectural styles, or methods of construction have been emphasized over the years (National Park Service 1976). There are no apparent associations of Euro-American resources in the Lisbon Valley study area with famous people, historical events, characteristic architectural styles, or methods of construction. Most of the Euro-American resources have to be considered as historical archaeological resources in regard to their general research/scientific values and thus their Legal significance under Criterion No. 4. This in turn brings up the question of significance for historical archaeological resources as opposed to prehistoric ones.

The issue of National Register eligibility can be particularly thorny in regard to Euro-American archaeological sites of the late 19th and early 20th centuries. Among the more serious problems in determining eligibility of these sites under Criterion No. 4 is the widespread lack of information on the part of cultural resource managers and federal officials about the field of historical archaeology, its contributions and potentials. There is also a common misconception which suggests that American Victorian society and culture is very well recorded and understood. This is simply not true, particularly in regard to the ranching tradition on the Colorado Plateau.

Although portions of the cultural patterns associated with ranching are known today through oral history and actual survival of some cultural elements in the rural west, there has been very little effort directed toward formally recording the historical and cultural patterns. It is
frequently suggested by laymen that "we know" the history of ranching because an individual may have been born on a ranch or remembers the stories told by his grandfather who worked on one. Such views have led to the common but naive assumption in both the lay public and general archaeological and historical communities that the subject is well recorded. If one looks for published literature on the subject they will be very disappointed, however. Although the subject of ranching has frequently been considered by historians at a wide, general regional and national level, the literature on Utah and the Colorado Plateau is particularly empty in terms of formal discussion of cultural patterns and details of the traditions. This fact, in turn, is reflected in the historical archaeology so that few ranches or their outlying camps have ever been reported upon in the regional archaeological literature.

The above discussed problems were recently addressed in some detail by Baker (1978a) in a study of past and current trends in the archaeological study of late 19th century American Victorian culture originally sponsored by the U.S. Forest Service. The goal in doing this was to learn more about the thinking in the historical archaeology profession and, thus, the archaeological potentials of sites from this period so that site evaluations, such as those herein, could be approached from sound, realistic, and scholarly archaeological perspectives. This study led Baker to make several observations and suggestions. One of the most basic points is that Euro-American sites from the late 19th and 20th centuries are very abundant in Colorado, but until very recently have not received much attention as archaeological resources. This statement holds true for Utah as well. Significance and National Register eligibility for such sites have primarily focused on architecture and association with famous persons or events as provided for in the first three criteria of Register eligibility. Criterion No. 4 generally has been applied only to Indian sites by the prehistoric archaeologists; historians are, for the most part, not concerned with historic sites as sources of archaeological data since they do not generally rely upon such data in their own research. Thus, the prehistorians have been preoccupied with Indian archaeological sites and the historians have generally been unaware of or unable to view historic Euro-American sites as archaeological resources.

In the Lisbon Valley study area the focus of Euro-American occupation is upon small, short-term camps associated with livestock raising in the late 19th and throughout the 20th century. As archaeological sites, some appear to offer more potential than others, yet there are few standards from which to judge. As Fontana (1967) stated in discussing the archaeological study of ranches, no archaeologist had, up to that time, seemingly been engaged in "serious ranch archaeology" even though it held great contribution potentials. This situation has, in large part, persisted to the present day.

If historical archaeology is to continue to develop, it must have access to its resource base, namely the good quality Victorian era Euro-Ameri-
can sites. Such a perspective demonstrates that historical archaeological sites, as holistic entities which often include extant architecture, can be used in a regional research approach which can make them eligible for the National Register under Criterion No. 4 at the Local if not the State level of significance.

Summary Resource Evaluations

All resources in the Lisbon Valley study area have been categorized in terms of significance by "class" in Table 18. The reader is specifically referred to Table 18 for tabular presentation of the following summary. Most sites from the study area listed in the following table are aboriginal lithic scatters. Unless listed as Class 4 resources, these sites are believed to be generally significant as Scientific Research data resources. In terms of Legal Significance, some are believed to be eligible for the National Register of Historic Places in keeping with the intent of Criterion No. 4. No sites are believed to possess Ethnic or Monetary Significance. None of the cultural resources are believed to be eligible for the National Register at the National level of significance. All of the resources currently believed to be eligible for the Register are believed to be so eligible minimally at the Local level of significance, and possibly at the State level due to their scientific contribution potential within the Lisbon Valley research design, which is a regional or State level study approach.

As is shown in Table 18, six sites are now firmly believed to be of National Register quality and 115 more are considered eligible but require further examination in order to make a final recommendation. An additional 283 sites are classified as potentially eligible, also requiring further work, and 143 sites are listed as insignificant and ineligible for the National Register.

Isolated Finds

Consistent with accepted cultural resource management procedures, all 290 isolated finds in the Lisbon Valley study area have been considered to be "insignificant" or 4th class resources (Table 18).

National Register Quality Sites

Six aboriginal sites are now firmly believed to have qualities which qualify them for the National Register of Historical Places on the basis of present surface evidence. These sites are: 42SA9390, 9447, 9479, 9756, 9770 and 9772. Site 42SA9390 is an extensive habitation-ceramic site containing a probable storage area in a small rockshelter. White ware ceramics collected at the site are diagnostic of the Pueblo II-III time frame in Anasazi prehistory; similarities with diagnostic ceramics from nearby sites suggest 42SA9390 was occupied in the early Pueblo II period (see Appendix I). The number and diversity of stone tools in-
TABLE 18: NATIONAL REGISTER EVALUATIONS AND RECOMMENDATIONS FOR THE LISBON VALLEY PROJECT STUDY AREA
(42SA prefix has been omitted from the list presented below).

<table>
<thead>
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<th>2nd Class Sites</th>
<th>3rd Class Sites</th>
<th>4th Class Sites</th>
</tr>
</thead>
<tbody>
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<td>National Register Quality - No further testing or research believed necessary.*</td>
<td>Considered Eligible for National Register - Archaeological testing or other research necessary to determine Register eligibility.</td>
<td>Significant and Potentially Eligible for Register - Further work necessary for a determination of eligibility.</td>
<td>Insignificant category - Not National Register Eligible - No further consideration warranted.</td>
</tr>
</tbody>
</table>

<table>
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<tr>
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<th>3rd Class Sites</th>
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cluding ground stone, the presence of ceramics and a hearth, the great extent of the site (15,000 m²), and the presence of a storage area in an overhang demonstrate an intense occupation of the area as a habitation site. The site is believed to contain substantial important information on Anasazi subsistence and other adaptive strategies within the relative-ly unknown northern frontier of the Anasazi sphere of influence.

Site 42SA9447 is a huge multicomponent habitation site and short-term historic camp. Occupations during the Early and Middle Archaic periods, and in the Historic period after AD 1910 are indicated based solely on surface evidence; the site covers over 17 acres of pinyon-juniper woodland. Nearly 30 lithic tools have been observed at the surface alone and many areas of potentially deep soils are present. The site is believed to contain abundant evidence of the diverse base camp activities of Early to Middle Archaic hunter-gatherers on the eastern Colorado Plateau.

Rockshelter site 42SA9479 is an Archaic campsite in a large overhang which has good evidence of substantial depth. The site is in excellent condition except for a rodent hole which has revealed cultural debris such as charcoal, ashes, and artifacts to a depth of 38 cm. Sooting on the roof of the overhang and abundant and diverse tools including ground stone verify the intensity of the occupation. The site is believed to contain stratified deposits holding substantial information on Archaic adaptive strategies; preservation of perishable remains is likely and may reveal further information on the total Archaic material culture.

Another rockshelter site, 42SA9756, is the fourth site in the project area believed to qualify for the National Register. The site appears to have been used as a habitation area given the abundance and diversity of artifacts seen only in a small area of the floor of the shelter. Additionally, the front of the shelter has one of the few rock art panels noted in the area. The site is in excellent condition as the sandy shelter floor is essentially undisturbed. Charcoal was observed eroding from the floor of the shelter. Projectile point evidence suggests a Late Prehistoric date for the occupation, perhaps of Fremont affiliation. The shelter also faces east and the likelihood of preserved organic remains is high. This site is believed to contain substantial information on Late Prehistoric subsistence strategies along a major tributary canyon (Bullhorn Wash) of the Dolores River.

Site 42SA9770 is an unusual Late Prehistoric rockshelter-campsite containing four adjacent overhangs, a possible petroglyph, numerous tools including ground stone, and a series of tool sharpening grooves. The shelters face south toward Bullhorn Wash, and the immediate area surrounding the site including the mesa rim just above it contains evidence of substantial prehistoric activity. Deep, sandy soil is present in the shelters and, given the size of one of them, the potential for preserved remains appears high. The site is believed to contain substantial
information on Late Prehistoric adaptive strategies; projectile point evidence suggests that the site may pre-date the Puebloan occupation of the area.

Finally, 42SA9772 is an important Navajo sheep camp in the eastern portion of the study area. It contains a sweat lodge of unusual cribbed log construction that is in excellent condition, as well as a small sheep pen or summer shade, and a trash midden. The site is a prime example of Navajo camps located far north of the main area of Navajo occupation and, as such, may yield important information on Navajo life away from the reservation. Artifactual evidence places the time of occupation in the period between AD 1923 and 1960.

Summary Management Directions

The Central Lisbon Valley Study Tract survey has helped to refine our knowledge of prehistoric and historic patterns of occupation as outlined in Thompson (1979) for the Indian Creek-Dry Valley planning unit. Thompson (1979:136) acknowledges the predominance of "limited activity chipping sites" in the eastern portion of the planning unit. Due to the lack of diagnostic artifacts, he did not consider that fact as evidence of any substantial Archaic occupation (1979:164). However, the survey reported herein identified a large number of multiple activity sites, especially short-term camps, and chipping sites as well as substantial evidence of Archaic period occupation.

This survey did substantiate the prehistoric preference for the pinyon-juniper vegetation zone over all others. Thompson (1979:154) assesses site density in this zone of the planning unit at 29 sites/mi\(^2\) as opposed to 6.5 sites/mi\(^2\) in brushland and 19 sites/mi\(^2\) overall. In the Lisbon Valley study tract, overall site density is higher than predicted at 25.5 sites/mi\(^2\) overall, ranging from five sites in Section 8 to 62 sites in Section 10. Computations on field maps of vegetation zones (scale = approx: 1:24,000) using a compensating polar planimeter show that 67% or 9,081 acres in the study tract are in pinyon and juniper (including chained parcels), while 33% or 4,491 acres are in "brushland". With 479 sites in and along the edges of wooded areas, and 70 sites in brushland, the resultant site densities are 33.8 sites/mi\(^2\) in pinyon-juniper and 10.0 sites/mi\(^2\) in brushland.

The evidence gathered in the Lisbon Valley survey is a prime example of the degree of error involved in extrapolating data from 1% sample surveys (i.e. Thompson's [1979] Class II inventory), and illustrates the necessity for intensive survey work in study tracts that are relatively unknown archaeologically. Given Thompson's (1979) and Hunt's (1953) hesitation in ascribing much of an Archaic occupation to the area, the Lisbon Valley study tract and surrounding area certainly could have been considered archaeologically unknown prior to the present survey. The lack of recognition of frequent and intense Archaic use of the region also points out a topic deserving of substantial future research. Save for excavations in large caves to the west (Schroedl 1976; Jennings et
al. 1980 and 1980a) and the confusing excavation data from the Uncom- pahgre Plateau to the east (Buckles 1971), little is known of the adaptive strategies of Archaic hunter-gatherers on the northeastern Colorado Plateau.

High site densities can be expected in wooded areas of this part of the Colorado Plateau, particularly near open valleys like East Coyote Wash which are relatively well-watered. If the Lisbon Valley Project data are accurate -- and we estimate that fully 95-99% of the cultural resources present were recorded -- similar site densities can be expected in adjacent tracts except those to the west where Thompson (1979) found a somewhat lower site density. The potential for damage to significant cultural resources, therefore, is considered very high if project inspections are discontinued in tracts environmentally similar to the Central Lisbon Valley Study Tract.

In sum, the Central Lisbon Valley Study Tract inventory has documented an exceptionally heavy prehistoric occupation of an environmentally diverse area. Archaic hunting and gathering populations dominated the cultural scene for nearly 7,000 years; only minimal evidence of Paleo-Indian use of the area was found, with somewhat more but still sparse evidence of an Anasazi occupation probably in early Pueblo II times. Historic period occupation centered around Euro-American ranching, Navajo herding and oil, gas and mineral exploration. Evidence of Ute/Paiute occupation is, as for the Paleo-Indian period, minimal but present. Many areas of future research are possible given the abundant survey data; topics particularly amenable to further elucidation via structure surveys and excavations include all aspects of local Archaic period adaptive strategies, and better definition of northern peripheral Anasazi developments (cf. Thompson 1979; Lindsay 1976; Toll 1977). Specific research questions are outlined in the following chapter.
An archaeological survey of approximately 13,572 acres in the Central Lisbon Valley Study Tract, northern San Juan County, Utah, resulted in the discovery of 547 previously unrecorded sites and 290 isolated finds. These cultural resources range in age from the Paleo-Indian period Llano complex through the Historic period, with a majority of components with temporally diagnostic artifacts dating to the 7,000 year time span of the Archaic period. Diagnostic artifacts in the material culture also demonstrate occupation, or at least passing utilization of the area, by peoples of Clovis, Plano, Archaic, Pueblo II Anasazi, Ute/Paiute, Navajo and Euro-American affiliation; other projectile point styles hint at, but do not confirm, hunting-gathering use of the area by earlier Anasazi groups and, less likely, the Fremont culture.

Most of the archaeological remains consist of open scatters of lithic debris functionally classified as chipping sites and short-term camps, based on the number and diversity of chipped stone tools, the presence of ground stone tools, the presence of hearths, and the density and extent of lithic debitage. Other site types similarly identified in the study tract include paleontological sites, habitations, tool kits, quarries, a tool sharpening site, industrial sites and limited activity historic sites. Three site types have been identified based not upon presumed function, but upon morphological characteristics of the sites: rockshelters, ceramic sites and rock art.

Hunting and gathering activities dominated the cultural scene throughout most of the prehistoric era. Given the diverse environmental setting of the study tract, a wide variety of floral and faunal resources were available to be exploited; the proximity of the La Sal Mountains to the north likely enhanced wintertime availability of faunal resources, as well as spring-early summer water resources in East Coyote Wash, which heads at the south end of the mountains near the town of La Sal. Ceramics recovered from nine sites indicate an Anasazi incursion into the area in the tenth century (i.e., the early Pueblo II period), likely utilizing the deep alluvial soils along East Coyote Wash to support their largely agricultural society; it is also possible that these Anasazi depended heavily on wild floral and faunal resources with domesticates constituting a seasonal supplement to their diet (Toll 1977:163). These Formative level peoples did not remain in the area very long, however, as no certain Pueblo III ceramics were recovered.

After the departure of the Anasazi, use of the area again reverted exclusively to hunting and gathering cultures, such as the Ute/Paiute, who may have first appeared in eastern Utah around AD 1300. Perhaps 200 years later the Navajo culture passed through from the north, but the earliest evidence we have of that group in the study tract dates from the early twentieth century. The old Spanish Trail may have traversed Lisbon Valley in the early nineteenth century, but we found no traces of
it (Peterson 1975:8). Euro-American ranching has been one of the pre-
dominant activities in the area since the demise and removal of the Utes
after ca. AD 1870. Other archaeological evidence for Historic period use
of the area has established the presence of Euro-American copper mining,
oil and gas exploration, and hunting during the century.

This report has attempted to draw together an exceptionally diverse body
of data into a readable and, hopefully, informative format in a rela-
tively short period of time. It is inconceivable that such abundant
data could receive the attention to detail and intense overall scrutiny
that they deserve in a few short months. Nor was the full range of data
systematically gathered for lab analysis as, for example, virtually no
artifacts were collected; all primary site and isolated find analysis
was performed in the field. Especially frustrating was the necessity of
interpretation made largely on an intuitive, qualitative level, in spite
of recent successes in quantitative analyses of survey data (e.g. Kvamme
1980 and 1980a; Kvamme and Black n.d.). If ever a body of data deserved
a computer analysis as a first step toward the elucidation of cultural
processes, then this was it. It is our hope that the data presented
herein are in such a form as to permit archaeologists in the future to
perform the kinds of analyses the Lisbon Valley area so richly deserves.

RESEARCH DESIGN FOR FUTURE WORK

Theoretical Framework

A broad range of theoretical questions can be addressed either partially
or completely by investigations of the cultural remains in the Lisbon
Valley project area. As Schiffer and House argue (1977:47), problem
oriented research must be encouraged and even demanded by contractual
projects. The major theoretical issue addressed by this research design
is the nature of prehistoric change: "If the archaeological record is
anything, it is a record of long-term change" (Plog 1974:11).

Approaches to the study of culture change should emphasize change as a
process rather than as a sequence of discrete events. The causes of
culture change should be viewed as multiple and generalizable in nature,
as opposed to being unilineal, specific or historical (Klesert 1979).
In this approach, understanding the structure or relationship between
interacting cultural variables, not the delineation of specific or
accidental historical events, is the eventual goal of the study of
culture change (Binford 1968:14). A good example of such an approach is
Fred Plog's (1974) study of culture change in the Hay Hollow Valley of
east-central Arizona. Plog isolated four general determinants of cul-
ture change: population, integration, differentiation, and energy flow.
None of these variables is unique to the Hay Hollow Valley, and in fact
they were chosen precisely for their generalizable qualities. These
variables can be isolated in any cultural system, and change in a cul-
tural system can be attributed to any or all of these variables (Klesert
and Powell 1979).
More recently, the research design for the Dolores Archaeological Program (DAP) has developed a set of five problem domains, which can be used in conjunction with those stated above. These include economy and adaptation; paleodemography; social organization and settlement patterns; extraregional relationships; and culture processes (Breternitz 1979:1). The last of these is the only one considered to be diachronic in nature (Breternitz 1979:31-33), therefore it encompasses the first four in an effort to address culture change as envisioned by Plog. The theoretical orientation of our research design is based explicitly upon Plog's four-part division, supplemented by the problem domains of DAP, and has in turn structured our technical and methodological approaches to the data.

The problem domains and research orientations outlined below do not include detailed methodological recommendations, which are more appropriately elucidated in individual project designs (Nickens 1980a:27). Rather, the following outline stresses research questions which are felt to be generally applicable to that part of the Paradox Basin bounded on the north by the confluence of the Colorado and Dolores Rivers, on the east by the lower reaches of the Dolores and San Miguel Rivers, on the west by the Colorado River, and on the south approximately at the latitude of Disappointment Valley and Iron Canyon Point. Within this region, few large scale field projects have been completed to date, the most extensive being the early reconnaissance of the La Sal Mountains and vicinity (Hunt 1953), the Lisbon Valley survey reported herein, Thompson's (1979) one percent sample survey, and the various seismic surveys conducted by Copeland (1978a, 1979a, 1980). Even fewer excavations have been carried out, most of which have focused on structural sites (Kasper 1977, Crane 1978, Pierson 1978). Areas particularly in need of investigation include, but are not limited to, the major tributary canyons of the Colorado, Dolores and San Miguel Rivers, and the large anticlinal valleys of the Paradox Basin.

The above general discussion of our theoretical stance can be briefly and succinctly summarized by the following outline of problem domains, hypotheses and test implications. These are based on one or more of the above determinants of culture change, as presented by Plog (1974) and by the DAP (Breternitz 1979).

Problem Domain 1: Time-Space Systematics

According to Henry (1980:10), the "chronological ordering of archaeological entities" is a first priority goal in the development of regional research designs. As noted in Chapter 2 of this volume, the study tract and vicinity is located in an area such that the local culture history could be interpreted in terms of any one of several phase sequences (e.g. Buckles 1971; Irwin-Williams 1973; Schroedl 1976). Chronologically, the time depth of occupation in the area is in less dispute than topics concerning the timing of critical transitions in population size, adaptive strategies, cultural affiliation(s) of local groups, etc. Thus, a critical first step in future regional research should address the issue of chronology and the determination of the cultural affiliation(s) represented by the diverse cultural resources in the area.
Hypothesis #1.1: Initial occupation of the region occurred after 12,000 years BP by small bands of Llano complex affiliation.

Test 1.1a: Search for evidence of late Pleistocene, pre-Llano age deposits of any kind. Systematically describe all such deposits in terms of depositional environment, economic resources present, and evidence for cultural activity.

1.1b: Confirm presence of Llano complex sites in area to supplement meager data from isolated finds.

Hypothesis #1.2: Paleo-Indian occupation of the region ended by ca. 8,000-7,500 BP; Archaic occupation began somewhat earlier, unrelated to the demise of the Paleo-Indian population.

Test 1.2a: Identify sites dating to ca. 9,000-8,000 BP and determine whether occupation represented conforms more to Paleo-Indian or Archaic lifestyle.

1.2b: Search for stratified sites in late Paleo-Indian--early Archaic time frame possibly containing information on transition to Archaic occupation.

1.2c: Investigate possibility that contemporaneous early "Archaic" and late "Paleo-Indian" sites represent seasonal variants of sites of Paleo-Indian affiliation.

Hypothesis #1.3: The Uncompahgre complex, as presently defined by Wormington and Lister (1956) and Buckles (1971), is a regional variant of the Desert Archaic Technocomplex (Reed and Scott 1980) that includes the lower Dolores drainage and the La Sal Mountains area.

Test 1.3a: Identify distinctive constellation of traits in artifact assemblages of the area (if any) to establish validity of the complex, and to distinguish it from Archaic complexes in adjacent areas.

1.3b: If the Uncompahgre complex can be shown to represent a distinct regional Archaic adaptation, determine its spatial and temporal boundaries (cf. Schroedl 1976).

1.3c: Investigate whether the Uncompahgre complex, if it exists, has sufficient longevity as suggested by Buckles (1971) to redefine it as a tradition, or whether the complex is strictly a Late Prehistoric phenomenon as Berry (1975) believes.

Hypothesis #1.4: An Archaic stage lifestyle based on seasonally migratory hunting and gathering of modern fauna and flora (Reed and Scott 1980:35) was the predominate lifestyle throughout the prehistoric era; Formative groups arriving in the Late Prehistoric period did not sup-

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plant indigenous Archaic peoples, but rather invested considerable labor in hunting and gathering activities themselves.

Test 1.4a: Investigate possibility of Archaic continuity into Late Prehistoric period by determining range of site types and functions in 2,000-1,000 years BP time frame.

1.4b: Establish temporal span of use of region by Formative groups, and determine whether or not there was co-habitation of the region by Archaic and Formative cultures.

1.4c: Determine subsistence base at suspected Formative habitation sites to establish relative importance of hunting, gathering, and horticulture/agriculture.

1.4d: Investigate degree of sedentism represented at Late Prehistoric habitation sites.

Hypothesis #1.5: Occupation of the region by Formative stage cultures was limited to brief Anasazi use in the Pueblo II-early Pueblo III time frame. There was no indigenous development from Archaic to Basketmaker to Pueblo in this area.

Test 1.5a: Determine presence or absence of structural habitation sites of Basketmaker II, Basketmaker III and Pueblo I age.

1.5b: Determine nature of occupation at sites dating to ca. 2,000-1,500 years BP in order to identify as Basketmaker II (i.e. having evidence for sedentism) or "Late Archaic with corn".

1.5c: Conduct comparative analysis of Basketmaker, Northern San Juan Anasazi, Fremont, Ute/Paiute and Late Archaic projectile points in order to identify Late Archaic-Late Prehistoric affiliations during surface surveys and in excavations of lithic sites.

1.5d: Identify other artifacts or features diagnostic in terms of cultural affiliation and perform comparative analyses as in 1.5c.

In view of 1.5c above and recent antiquities legislation permitting amateur collection of "arrowheads" found on the present ground surface, we suggest that future archaeological surveys collect diagnostic artifacts whenever possible or, minimally, provide full measurements, descriptions, illustrations and proveniences of all diagnostics.

Hypothesis #1.6: Numic-speaking Ute Indians arrived in the region from the west and southwest shortly after AD 1300.

Test 1.6a: Using ethnographic and archaeological evidence, attempt to define characteristics and temporal range of Ute archaeological sites.
1.6b: Identify sites dating to ca. AD 1300-1600 time frame and perform comparative analyses regarding 1.6a above in order to determine possible Ute affiliation.

1.6c: Determine spatial distribution of suspected Ute sites at various intervals within Late Prehistoric-Protohistoric period, in search of evidence of past Ute movements compared to model of Shoshonean expansion from linguistic data.

Hypothesis #1.7: Navajos arrived in the Southwest after ca. AD 1500 but did not occupy the region in question before the twentieth century.

Test 1.7a: Identify sites of Navajo affiliation and determine their temporal distribution.

1.7b: On sites with diagnostic Navajo artifacts, determine their origin as via trade, "borrowed ideas", or actual Navajo occupation.

Hypothesis #1.8: Historic period use of the region since the 1870s has been primarily by groups of Euro-American affiliation.

Test 1.8a: Establish ethnicity of historic sites via oral and archival research when diagnostic artifacts, features, or architectural styles are not present.

Problem Domain 2: Economy and Adaptation

Differentiation and energy flow (economy) are treated together here, since in many cases they are closely related. Plog defines differentiation as "the number of different activities performed in a given place at a given time," and energy as "the gross quantity of energy produced and used by the inhabitants of a given region during a given period of time" (1974:58). Both are directly related to economics and subsistence. Clearly, the study of the complete subsistence picture requires an investigation of the full range of functional site types, as well as sites from the entire temporal range present (Klesert 1979). Simply looking at habitation sites, or Puebloan sites, will inevitably result in a distorted view of subsistence and economic processes through time.

Subsistence practices are generally seasonal in nature, and an investigation of probable "special use sites" will clarify and elucidate the scheduling decisions of the prehistoric groups in the area. Such sites include artifact scatters like tool kits, and small sheltered sites, with and without associated features. An understanding of the full seasonal round demands an examination of all known site types.

Paleoclimatic studies are also essential in subsistence studies (Henry 1980:10), and pollen and tree-ring samples can be extracted for this purpose. Such studies should address the question of climatic change.
through time and its effect on the resident population, as well as the residents' adverse effect on the natural environment (Casjens 1980:49).

Site location, via settlement analyses, can prove insightful in studies of subsistence practices. For instance, locations along the floodplain versus locations higher up on talus slopes or benches and mesa tops can be correlated with site function and related subsistence modes such as dry farming versus floodwater farming among the Anasazi. Changes from one time period to the next in favored locations for sites of all types can be similarly interpreted.

A final aspect of differentiation and energy flow is what the DAP refers to as "extraregional relationships," or "foreign interactions" (Breternitz 1979:28). Simply stated, we are talking here about trade, either of goods or ideas. As an example, Pierson (1978) considers the presence of Pueblo IV period yellow wares as probable evidence of Ute or Navajo trade with the Hopi.

Hypothesis #2.1: For the past 12,000 years the regional climate has undergone several fluctuations resulting more in the vertical shift of plant communities than in changes in the species composition of those communities.

Test 2.1a: Collect and analyze pollen columns from deposits from a wide variety of areas and environments representing long spans of time, such as lacustrine sediments, bogs, fluvial deposits and dry caves.

2.1b: Collect and analyze pollen columns and tree-ring samples from archaeological contexts. Compare results with regional paleoclimatic evidence and determine possible cultural effects through time on biotic environment.

2.1c: Employ, when possible, other methods of assessing paleoclimates to correlate with evidence from palynology and dendrochronology, e.g. malacology, soil flotation, and opal phytolith studies.

2.1d: Determine effects of such Historic period stresses as overgrazing and documented forest fires on present species composition of plant communities, and compare with evidence from 2.1a-2.1c above, as well as from presumably undisturbed extant communities.

Hypothesis #2.2: The Altithermal climatic interval as defined by Antevs (1948, 1955) was a period of reduced effective moisture from ca. 6,500-5,000 years BP, but this episode was no more severe than other periods of environmental stress in the prehistoric era.

Test 2.2a: Compare paleoclimatic information for proper time frame from wide region, and assess as to extent and severity of "Altithermal".
2.2b: Compare "Altithermal" evidence with evidence from other periods of increased warmth and dryness.

2.2c: Perform settlement analyses of Early Archaic sites to detect possible effects of Altithermal on regional population; compare Early Archaic settlement data with that from other time periods to cross-check the evidence.

Hypothesis #2.3: Paleo-Indian adaptive strategies in this region were merely attenuated forms of strategies utilized in the more heavily populated Plains area.

Test 2.3a: Identify sites dating to ca. 12,000-8,000 BP and assess differences in subsistence both through time and space.

2.3b: Compare regional evidence of Paleo-Indian subsistence, settlement and technology with evidence from Plains area.

2.3c: Identify methods of economic resource procurement, processing, storage, distribution, consumption and discard. Compare with resource use strategies outlined for Plains area.

Hypothesis #2.4: Subsistence strategies throughout the prehistoric era changed to accommodate environmental fluctuations.

Test 2.4a: Diachronically assess full range of subsistence base for each culture group from evidence gathered at all known site types.

2.4b: Correlate subsistence evidence within each time period or shorter subperiod with site types and paleoclimatic information. Determine range of economic resources available through time.

2.4c: Investigate differences in subsistence strategies at critical cultural transitions, e.g. between late Paleo-Indian and early Archaic subsistence, and between late Archaic and early Formative subsistence; correlate with site types and paleoclimatic information.

2.4d: Diachronically assess changes in resource use strategies as in 2.3c above and compare with evidence from site types within each time period, and with paleoenvironmental information. Investigate changes in patterns of scheduling in resource use through time.

Hypothesis #2.5: Pueblo II Anasazi groups in the northern periphery employed a different adaptive strategy than in the Anasazi heartland to the south.
Test 2.5a: Gather subsistence, settlement and technological data from full range of Pueblo II Anasazi site types in northern periphery. Identify resource use strategies as in 2.3c and 2.4d above.

2.5b: Compare data in 2.5a with extant literature on Pueblo II adaptations in the Anasazi heartland.

2.5c: Compare paleoclimatic/environmental information in Pueblo II time frame from northern periphery with similar information from Anasazi heartland, to investigate possibility that Pueblo II Anasazi adapted to different areas.

Hypothesis #2.6: Increased effective moisture in the ca. AD 800-1200 time frame expanded the limits of dependable maize cultivation, permitting the Anasazi to expand into previously marginal areas.

Test 2.6a: Correlate paleoclimatic information region-wide from proper time frame.

2.6b: Investigate limits to cultivation for all varieties of maize known to have been grown in the Pueblo II period.

2.6c: Assess degree to which Anasazi in northern periphery were dependent on maize for subsistence.

Hypothesis #2.7: Pueblo II Anasazi in the northern periphery were not closely integrated economically with Anasazi living further south in the heartland.

Test 2.7a: Analyze ceramics from northern periphery and compare technology, styles and material sources with those ceramic characteristics from the heartland, to investigate possibility of movement or no movement of ceramics between areas.

2.7b: Analyze other Anasazi material culture items as in 2.7a to determine direction and degree of flow of information (if any) between areas.

Hypothesis #2.8: Few extraregional relationships existed in the region before Pueblo II Anasazi times.

Test 2.8a: Determine presence of exotic goods and structural styles, or unusual changes in site location preferences, etc. through time.

2.8b: Correlate presence of evidence for outside contacts with site types, cultural affiliation, and time frame.

Hypothesis #2.9: The Ute subsistence base included greater amounts of meat from big game animals after they acquired the horse.

Test 2.9a: Identify early Ute sites as in 1.6a above.
2.9b: Diachronically assess changes in Ute subsistence via ethno- 
graphic evidence, soil flotation, palynology, faunal analyses, 
etc.

2.9c: Compare ground stone to projectile point ratios diachroni- 
cally to assess relative importance of hunting vs. gathering 
through time.

Hypothesis #2.10: Regional ranching evolved from an emphasis on cattle 
to an emphasis on sheep, to the present emphasis on mixed cattle and 
sheep ranching.

Test 2.10a: Gather oral and archival information on changes in Historic 
period land use through time.

2.10b: Diachronically assess changes in the range of site types 
among Historic period ranching sites.

2.10c: Investigate function(s) of Historic artifact scatters with 
no structural features via oral and archival research and 
intra-site patterning; incorporate evidence into model of 
ranching activities.

Hypothesis #2.11: Small-scale mining in the region was tied to in-
creases in the prices of hard rock minerals, especially copper, uranium 
and silver.

Test 2.11a: Document price fluctuations in those hard rock minerals 
throughout the Historic period.

2.11b: Gather oral, archival and artifactual evidence to assess the 
age of small mining sites, and compare those dates with 
periods of high mineral prices.

Problem Domain 3: Paleo-demography

Population (paleodemography) dynamics can be profitably studied both 
through survey and intensive excavation of selected sites. While syn-
chronic population estimates constitute a first step in demographic 
studies, analysis must eventually become diachronic if explanations of 
population change are to be derived. No specific site type or time 
period can be studied in isolation if one can hope to construct an 
adequate explanation for these processes (Klesert and Powell 1979). 
Excavation of just habitation sites, or the exclusion of potentially 
very early, Paleo-Indian sites in the area will inevitably lead to 
skewed interpretations of the processes involved. Similarly, a study of 
abandonment that ignores the causes of the initial occupation and popu-
lation expansion also must be an incomplete exercise.

In order to study such population trends, certain specific data are 
required. Relative and absolute occupational dates for sites in the
region are needed, and an investigation of the extent of multiple occupation of sites is also warranted. Many sites in the area may have multiple or long-term occupations (e.g. see Table 4); a selected examination of such sites in the region could determine the extent of such an occurrence, and its effect on population estimates and trends. The presence of hidden structures, especially on sites having no apparent structures, also could have a great effect on our understanding of population dynamics. Finally, a vast number of lithic scatters are present in the area, which are of unknown affiliation and may or may not be Archaic in origin, and could possibly be Basketmaker II or even Puebloan. The recovery of radiocarbon dates from such sites, and/or the discovery of structural components to these sites could have a great and direct effect on explanations of population trends.

Hypothesis #3.1: The numerous and featureless lithic scatters in the region primarily represent hunting and gathering activities of small groups over a very long period of time. Population of the region was never high even in Pueblo II times.

Test 3.1a: Using ethnographic and archaeological evidence, estimate size of groups involved in single component archaeological lithic sites of all types and ages.

3.1b: Conduct studies as in 3.1a for non-lithic and structural sites in region, as well as for multicomponent sites.

3.1c: Confirm absence of structures on lithic sites of all types via testing.

3.1d: Estimate maximum population within each time period using 3.1a-3.1c above; compare with population estimates for adjacent regions.

Hypothesis #3.2: Population of the region was relatively lower in the approximate intervals 11,000-9,000 years BP; 6,000-5,000 years BP; 3,000-2,000 years BP; and AD 1200-1500, primarily due to unfavorable environmental conditions.

Test 3.2a: Identify number of sites dating to each interval.

3.2b: Estimate population within each interval using evidence from all site types, as in 3.1a above.

3.2c: Compare estimates of population within those intervals with population trends and raw estimates for succeeding and preceeding time periods.

3.2d: Compare minima in population estimates with paleoclimatic and other paleoenvironmental data for region.

Hypothesis #3.3: Regional populations were quite mobile throughout the prehistoric era. Most major population fluctuations were the result of
actual migrations into or out of the region, rather than of internal demographic changes within a single, indigenous group.

Test 3.3a: Compare population estimates through time for region with estimates for adjacent regions, to identify possible source areas for immigrating populations or recipient areas for emigrating populations.

3.3b: Investigate possibility of internal demographic changes via diachronically-oriented analyses of artifact assemblages, features, activity areas, site types, settlement patterns, etc. Continuity over time in the characteristics of these entities may be evidence for lack of migrations in pre-history.

3.3c: Identify possible causative factors in population fluctuations (e.g. environmental, social).

Hypothesis #3.4: Past regional population age group ratios, sex ratios and health characteristics were fairly stable through time.

Test 3.4a: Using ethnographic and archaeological evidence, identify possible age-linked and sex-linked artifacts, assemblages, activity areas, site types, etc. Diachronically analyze distribution and number of these age- and sex-linked entities.

3.4b: Employ evidence from physical anthropology whenever available.

Problem Domain 4: Social Organization & Settlement Systems

Integration (social organization) deals with processes that "coordinate a set of activities" (Plog 1974:58). As the DAP research design has suggested (Breternitz 1979:19-20), integration can be defined on a number of levels: the site, site components, or groups of sites. All three of these levels can be studied in terms of their evolution through time for each culture in the region. The appearance of surface masonry structures in the region by Pueblo I-II times apparently marks dramatic changes in regional architecture and site formalization from preceding Archaic customs in this area. It has been suggested (Plog 1974; Klesert 1979a; Casjens 1980) that such changes in functional architecture and site formalization within the Anasazi culture, common throughout the Southwest, are indicative of a major evolution of social and economic integration among the Anasazi at the community level or higher. In this regard, a number of sites in the region may date to this transitional period, and a study of site architecture and site formalization between Archaic and Anasazi sites could be very informative.

The possibility exists that community level networks of sites might have existed and evolved in the region; or else such networks may have included parts of the region but extended beyond it. Investigation of
economic and social symbiosis between contemporaneous sites will help address this question, and such an effort requires an examination of the full range of functional site types present in the region, not just habitation sites.

At this point, a brief discussion of settlement analysis is in order. As Breternitz notes (1979:17), settlement patterning should be considered more as a means to a variety of ends, rather than as an end in itself; an understanding of settlement systems can provide direct evidence pertaining to population, integration, differentiation and energy flow. Further, while a settlement study can be performed using a circumscribed area as the data base (such as is the case with the current project area), definitive settlement studies generally require extensive survey data in conjunction with intensive excavation. Presently, such data for many parcels in the region are absent; the current project can supply only the former data set from a limited area.

Nickens (1980a:27) points out that the development of a regional predictive-explanatory model of site location, function and settlement structure is an important function of regional research designs. The model(s) thus presented should be framed in terms of environmental or geographic patterning. The abundant evidence from Lisbon Valley is valuable in this regard, since it serves as a very extensive data base from which to extrapolate important factors in regional settlement systems.

Hypothesis #4.1: Site level integration in the region throughout most of the prehistoric era was a band organization as described by Steward (1938).

Test 4.1a: Using ethnographic and archaeological evidence, compare range in functions and size of contemporaneous site types within each time period with documented site types of band level populations.

4.1b: Investigate larger artifact scatters for evidence of repeated visitation of those sites by small bands or, alternatively, for evidence of intensive occupations by groups integrated into macro-band or higher organization.

Hypothesis #4.2: Social and economic integration did not increase in intensity and complexity before the arrival of the Anasazi in early Pueblo II times.

Test 4.2a: Search for evidence of architectural permanence (i.e. not as temporary as a wickiup), and increased complexity in site formalization and inter-site integration in the pre-AD 900 time frame.

4.2b: Determine degree of increase in social/economic integration among Pueblo II Anasazi in region via comparative analyses of site complexity and inter-site integration between pre-
Pueblo II sites in region, Pueblo II Anasazi sites in region, and Pueblo II sites in Anasazi heartland.

4.2c: Assess degree of organization involved in procurement, processing, storage, distribution, consumption and discard of economic resources; compare with that determined for previous time periods.

4.2d: Assess degree of idealogical/ceremonial/ritual complexity among Pueblo II Anasazi via artifactual, architectural and ethnographic evidence; compare with such evidence from preceding time periods.

Hypothesis #4.3: Pueblo II Anasazi preferred the pithouse for habitation in the La Sal Mountains-Moab area, but preferred surface masonry structures along the main valley and east of the Dolores River.

Test 4.3a: Plot distribution of known pithouses and surface masonry habitations of Pueblo II age.

4.3b: Determine location and density of surface masonry structures in underinventoried areas.

4.3c: Determine likelihood of buried pithouse structures on Pueblo II Anasazi sherd and lithic scatters (cf. Powell and Klesert 1980).

Hypothesis #4.4: Prehistoric hunter-gatherer groups in the region preferred wooded, level landforms near water for camp sites; special activity site location decisions were more opportunistic with few rigid criteria applied to those decisions.

Test 4.4a: Using both reconnaissance and excavation data, quantitatively and qualitatively describe site locations of all hunter-gatherer site types in terms of environmental and geographical variables.

4.4b: Perform diachronically-oriented analysis of hunter-gatherer settlement patterns to detect changes in site location preferences for all site types.

4.4c: Correlate settlement pattern evidence with paleoenvironmental and non-site location data.

Hypothesis #4.5: Anasazi settlement in the region was concentrated along major rivers (i.e. the Colorado, Dolores and San Miguel Rivers), and in the wide open, well-watered valleys draining the La Sal Mountains.

Test 4.5a: As in 4.4a above, quantitatively and qualitatively describe site locations of all Anasazi site types in terms of environmental and geographical variables.
4.5b: Perform diachronically-oriented analysis (if possible) of Anasazi settlement patterns in region to detect changes in site location preferences for all site types.

4.5c: Correlate settlement pattern evidence with paleo-environmental and non-site location data.

Hypothesis #4.6: Historic period camp sites associated with ranching were located according to seasonal considerations of calving/lambing, grazing range conditions, availability of shade and water, and protection from the elements.

Test 4.6a: Using oral and archival research, and archaeological evidence, correlate site types with seasonality of use.

4.6b: Perform settlement analyses as in 4.4a-c and 4.5a-c.

Hypothesis #4.7: As described by Kvamme (in Kvamme and Black 1981), general site function can be inferred via quantitative analyses of site size, tool type diversity, tool-to-debitage ratio, feature characteristics, and artifact morphologies.

Test 4.7a: Describe site types encountered in region in terms of variables described by Kvamme, and compare and contrast with his model of site functions.

4.7b: Using archaeological and ethnographic data, as well as information from ancillary studies such as palynology and soil flotation, assess range of activities represented at sites of all types and compare those fluctuations with site function determined using Kvamme's criteria.

4.7c: Identify other possible criteria shown to provide evidence of site function.
APPENDIX 1

ANALYSIS OF CERAMICS FROM SITES IN LISBON VALLEY

By
William A. Lucius
CERAMIC ANALYSIS AND INTERPRETATION

Analysis of one hundred twenty-six sherds from nine sites was accomplished by the use of a ceramic analysis program developed by the author for the Dolores Archaeological Program (D.A.P.), located near Dolores, Colorado. The data derived from the analysis, in addition to being provided to Steven G. Baker, Consulting Archaeologist, will be added to the computerized data files of the D.A.P. to allow for enlargement of that data base. Description of the techniques and orientation of the analysis system is available in Lucius (1979). Relevant information for the interpretation of the results of the current analysis is summarized in the data summary located in Table 1, and reflects the systematics of the analysis. Placement of ceramics into a Culture Category is based primarily upon the identification of tempering agents known to be diagnostic of particular geographical areas. Culture Categories roughly coincide with the large cultural divisions termed "Branches" by Colton (1939:12). Each Culture Category has known geographical boundaries and a defined temporal range.

Within the Mesa Verde Culture Category there are several distinct manufacturing traits which can be characterized by specific temper/clay combinations, which in turn can be tied to specific areas within the Culture Category. These tracts have been previously defined by the ceramic analysis program of the D.A.P. The ceramics recovered by the investigation of the Lisbon Valley area, with the exception of those from site 42SA9599, are all defined as belonging to the Mesa Verde Culture Category because of the primary criterion of a specific temper agent in those sherds. This temper is a sand which apparently is the product of the breakdown of coarse sandstone and conglomerate facies, and has been documented only in sherds of Mesa Verde origin. The lack of this particular sand temper in ceramics from Culture Categories adjacent to the Lisbon Valley (Fremont and Kayenta) further dictates the placement of the ceramics into the Mesa Verde Culture Category.

Location of the specific manufacturing tract responsible for the Mesa Verde ceramics of the study area must await application of the analysis system to ceramics in the areas adjoining Lisbon Valley. Additionally, investigation of resource availability and utilization would be required to more accurately define these locations.

Within each Culture Category wares are defined on the basis of the following attributes: a combination of surface finish and firing atmosphere, and the use to which the vessels were put. Wares are named after their Culture Category.

White and gray wares are present in the Mesa Verde ceramics of the collection; no red wares were observed. Mesa Verde Gray Ware constitutes the majority of the ceramic items. Gray ware ceramics are those
<table>
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<th>Wares/Types by Site Number</th>
<th>Bowls</th>
<th>Jars</th>
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<th>Total Count</th>
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<tr>
<td>Mesa Verde Gray Ware Corrugated Body Sherds 42SA9394</td>
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showing neutral to reduction firing atmosphere, lack of paint and/or polish, and plain or manipulated surfaces. Gray wares appear to have been constructed primarily for cooking or storage purposes. Jars are the predominant form.

White wares constitute a small percentage (six percent) of the study area ceramics belonging to the Mesa Verde Culture Category. White wares are defined as having neutral firing atmosphere and polished and/or painted surfaces. Both bowl and jar forms are common; serving and special storage purposes are indicated for this ware.

Within each ware a series of types is defined. Traditional Types are defined primarily by stylistic elements (e.g. rim form, painted decoration) and as such are temporally distinctive. Gray ware types after AD 900 are characterized by the presence of indented corrugations (pinched coils) on the exteriors of jars; the majority of the gray ware sherds in the collection represent portions of such vessels. Corrugated vessel fragments (sherds) from the bodies of such vessels cannot be placed in a diagnostic type (e.g. Mancos Corrugated) as the rim fillet width and degree of eversion are required for such a determination. Such items are assigned to the Corrugated Body Sherds category, which indicates only a broad time span (AD 900-1300) of manufacture and use. Four sites (sites 42SA9394, 42SA9403, 42SA9457, and 42SA9491) contained only corrugated body sherds. The cultural activity represented by those ceramics thus could fall anywhere within the above time span. As is evident in Table 1, site 42SA9457 exhibits one rim sherd from a corrugated vessel, but the sherd was too fragmentary for determination of diagnostic type placement.

The ceramics from one site (site 42SA9459) include one sherd with a rim form characteristic of Mancos Corrugated (Figure 1a). Mancos Corrugated is characterized as having a narrow terminal fillet in a profile vertical to the vessel wall. The type is well-dated to AD 900-1050, in the Early Pueblo II period (Breternitz et al. 1974).

Traditional Types of the white ware category are determined primarily on the basis of painted decorative styles. White ware sherds without sufficient decorative elements to allow for Traditional Type placement (such as those from site 42SA9390) are placed into the Late Pueblo White category. Sherd temper (crushed pottery used as temper) is diagnostic for this Pueblo II-III period. Current analysis of D.A.P. materials indicates that the addition of crushed sherd as a tempering agent became common at about AD 900 and persisted throughout the remainder of the Anasazi occupation of the area. Of the three sites in Lisbon Valley with white ware ceramics (sites 42SA9390, 42SA9486, and 42SA9489), only the single rim sherd from site 42SA9486 can be assigned to a Traditional Type. Its painted rim and sherd temper define the item as Cortez Black-on-white (Figure 1b). Cortez Black-on-white has been consistently dated as being manufactured and used from AD 900-1000 (Breternitz 1966).
Figure 1. Temporally diagnostic ceramic sherds. a. Mancos Corrugated, 42SA9459; b. Cortez Black-on-white, 42SA9486; c. Shoshonean Brown Ware, 42SA9599.
White ware bowl forms with corrugated exteriors are not uncommon in the Mesa Verde Culture Category and the ceramics from site 42SA9489 represent such a vessel. The lack of painted designs on the sherds and their polished interiors allows for placement of the sherds into the Late Pueblo White category (AD 900-1300).

One site (site 42SA9599) exhibits ceramics assigned to the Shoshonean Culture Category (Figure 1c). The placement is due to the presence of quartz-sand/mica temper in an oxidation-fired vessel. The sherds represent culinary brown ware that has been tentatively assigned a date range of AD 1700-1900. No Traditional Types for Shoshonean Brown Ware have been developed.

During the process of analysis of the ceramics, several additional characteristics of the ceramics became apparent, the most noticeable of which is the presence of sooting on the majority of the sherds. Sooting is the term used to describe the buildup of carbon within the body wall of the vessel, which is most often thought to be the result of use above an open fire. Corrugated vessels often exhibit sooted pastes and all corrugated sherds in the collection (with the exception of those from site 42SA9403) show heavy sooting. The Shoshonean ceramics also show sooting. In addition, the white ware sherds from sites 42SA9390 and 42SA9489 also show heavy sooting. Sooting on white ware is not commonly observed on white ware sherds of the D.A.P. What appears to be indicated is that the basic dichotomy seen elsewhere between gray ware and white ware usage is not reflected in the cooking activities of the people who used this pottery.

The analysis of temper types indicates that all the ceramics in the Mesa Verde Culture Category probably were derived from a single source. The temper types show little variation in appearance and are therefore probably indicative of a point source rather than of contribution from several areas. Also, the sherds from each site represent the breakage of only one vessel at each of those sites. The most parsimonious explanation of the consistency of temper types and of the isolated "pot drops" is that the people responsible for the ceramic items were all affiliated with a specific area of ceramic manufacture and were not involved in long-term occupation or re-occupation of those sites.

The duration of utilization can be estimated from the ceramic types of the collection. The diagnostic types of the collection indicate a firm date of AD 900-1000, as both Mancos Corrugated and Cortez Black-on-white are the predominant types for that time period. The Late Pueblo White and Corrugated Body Sherds from the other sites could easily represent use during the same time period. Given the nature of the ceramic remains, it is possible that all use of the area by people affiliated with the Mesa Verde Culture Category could have occurred during the early Pueblo II period. The lack of Pueblo I ceramics in the collection and the lack of characteristic Pueblo III attributes in any of the ceramics can be interpreted as positive evidence of a short-term usage of those sites by a group from a specific area.
In summary, the system for identification of the ceramics of the Lisbon Valley Project has been presented and interpretations of those ceramics within the analysis framework have been advanced. Difficulty in making strong interpretations from the ceramic evidence is partially due to the small number of items in the collection as well as to the lack of controlled information on the ceramic diversity of the La Sal Mountains area. The study has pointed out the need for identification of the ceramic manufacturing tracts in that portion of the Mesa Verde Culture Category.

The lack of more than a single vessel at any one site is suggestive of mobile groups from an adjacent area as being responsible for the ceramic assemblage. However, definition of the location of that area would require a broader data base than is possible from the analysis.

The analysis has attempted to characterize the ceramics from the various sites, but it also has fulfilled the goal of enlargement of the ceramic data base concerning diversity in the Mesa Verde Culture Category and in doing so, has raised a number of additional questions about the cultural activity responsible for the ceramics of the Lisbon Valley Project.
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