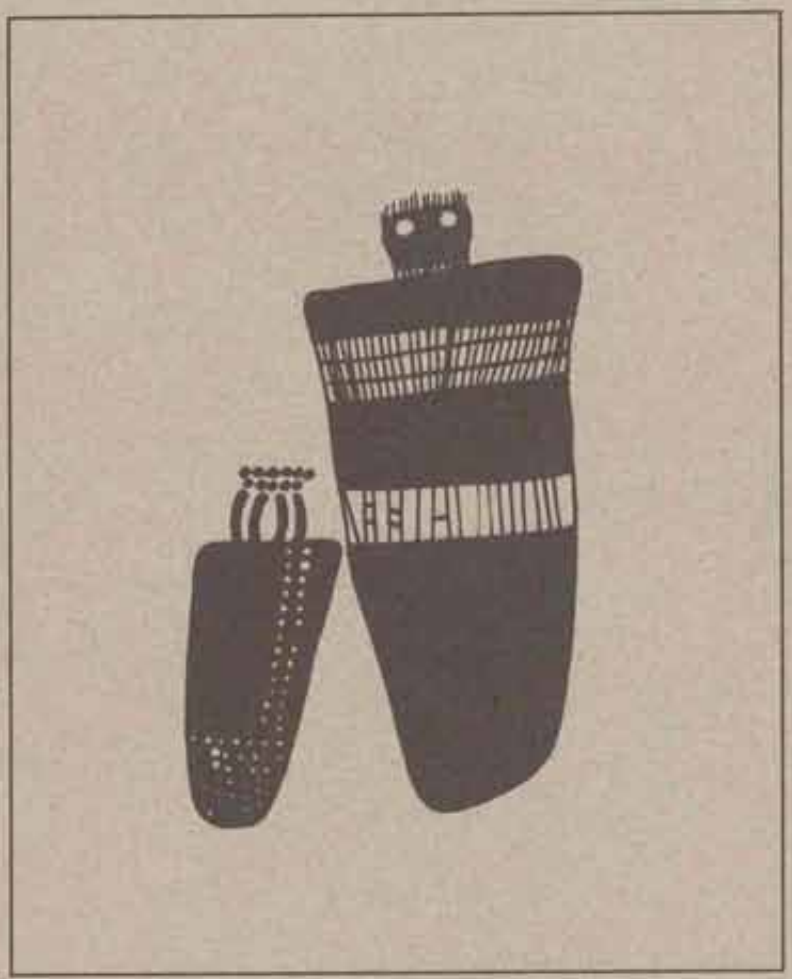
UTAH ARCHAEOLOGY 1990



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UTAH ARCHAEOLOGY 1990

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Copeland, James M., and Richard E. Fike
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Grand County

The so called "meandering maze" or "abstract maze" is one of the most enigmatic and obscure complexes in rock art. It is these figures that are featured in the small drawings throughout this edition of *UTAH ARCHAEOLOGY*. A representative sample from diverse areas in Utah has been chosen to illustrate that this feature occurs in all parts of the state. These figures have been interpreted as maps. Everything from trail maps to topographic maps to lost treasure maps has been suggested. Their meaning remains speculative.

UTAH ARCHAEOLOGY 1990

Editors: Joel C. Janetski, Utah Professional Archaeological Council
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Front Cover: Barrier Canyon Style rock art from Horseshoe Canyon

MESSAGE FROM THE EDITORS

This volume is the third in the *UTAH ARCHAEOLOGY* series. We hope we have established a trend. Readers of this volume will note that nearly 50% of the papers are from amateurs. We hope this is also a trend. From the onset *UTAH ARCHAEOLOGY* was intended to strike a balance between professional and amateur writings.

While encouraging the submittal of papers by amateurs, we recognize that most amateurs have limited experience in producing technical reports. Therefore, we encourage collaboration between amateurs and professionals either as joint authors or in the initial stages of their own paper writing. Several of the amateurs who have submitted papers for review had established relationships with professional who provided feedback on such things as content, organization, and graphics and that effort has benefitted us on the editing end of things. We urge all amateurs (and professionals) to go through such a preliminary "proofreading" stage. That process, combined with careful reading of the manuscript guidelines included in the back of this volume and published journal articles, will prepare papers for the professional reviews that all manuscripts must undergo in order for *UTAH ARCHAEOLOGY* to maintain quality and to qualify as a refereed journal.

On a similar theme, the editors would like to suggest the establishment of an Editorial Board for *UTAH ARCHAEOLOGY* to assist them in the review process. This board could consist of as many members as the respective sponsoring groups feel appropriate; we suggest seven to nine members. Individuals on the Board would not review all papers; rather they would be asked to review those within their area of research interest or experience. Having an agreed-upon group to whom incoming papers would be automatically submitted, and who have agreed to participate in the review process, would eliminate the somewhat opportunistic search the editors go through with each volume to identify someone willing to read papers thoroughly and make recommendations. (At the same time we acknowledge the many who have reviewed papers in a timely and thorough manner). We submit this idea to the memberships for discussions at upcoming meetings.

You will note that this edition of the journal includes some comments on archaeological issues and/or previous articles or reports. We encourage such comments as *UTAH ARCHAEOLOGY* is, we feel, an appropriate forum for such a dialogue. This encouragement is offered in the spirit of productive interaction and with the knowledge that such interaction commonly results in refining our knowledge of Utah's past.

We also wish to draw attention to the new subscription option for individuals not interested in either Utah Statewide Archaeological Society (USAS) or Utah Professional Archaeological Council (UPAC) membership, yet who wish to subscribe to *UTAH ARCHAEOLOGY*. This option is detailed in the fine print on the inside front cover but repeated here since this is the first time the option is available. To subscribe, submit a check for $10 to:

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Salt Lake City, Utah 84101

Finally, we recognize that this volume is late. We are grateful for your patience, and promise this is not a trend.

Joel C. Janetski, editor for UPAC
Steven J. Manning, editor for USAS

FREMONT TRANSITIONS

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ABSTRACT

A historical preoccupation with defining the Fremont has outgrown its usefulness. The concept is a stereotype, routinely confusing the variables of material culture, techno–economic patterns, language, and ethnicity. This presents a naive and reductionistic scenario of prehistoric cultures to the reading public. Acknowledging Fremont unity, variability in the material culture of the time can be examined from a behavioral rather than cultural perspective. On–going study in northern Utah of the Fremont transition into archaeological obscurity and the subsequent Late Prehistoric period provides a context to examine a more dynamic approach. A working model illustrates the approach to the transition as an ecological phenomenon. Also, the relationship between the Fremont and the "Numic spread" hypothesis begs for critical examination and may be approachable with new evidence in the form of human skeletal remains from the Great Salt Lake.

INTRODUCTION

Seems like archaeologists have felt compelled to define the Fremont with the tacit hope that understanding will be an intrinsic by-product of classification. The litany of hand-wringing over an acceptable definition reads like a history of the Fremont themselves (see Anderson 1983 for an overview). Perhaps archaeologists have put themselves in the untenable position of studying the behavior of the definitions and categories we make up rather than human behavior in prehistory. Even though classification is a fundamental part of the scientific enterprise, there has been a shift in perspective on the part of many anthropologists as to the role and consequences of classification. Part of this shift relevant to the notion of "Fremont transitions" is the view that simple, unitary, rigid, and distinct categories of past cultures are nothing more than stereotypes—whether we call them "cultural cores," "normative characterizations," or other fancy terms. Archaeologists increasingly understand that such definitional types can be as much of an obstacle to explanation and understanding as they are useful tools (Madsen 1989 provides an excellent Fremont example). In fact, we now realize that variability, once seen as a bothersome obstacle to "characterization" is actually the key to the explanation of cultural form and change. The very thing that we often used to abhor, that darned "variation," is finally being explicitly embraced as a major strength of anthropological study. Furthermore, it seems tenuous to allow ourselves to reduce the past to a set of simple categories called "cultures," each humming along in clearly bounded ethnic and linguistic bliss, occasionally encountering other like categories as if the world of human behavior was a huge pinball machine. We do not tolerate such reductionistic stereotyping of peoples and ethnic groups in our modern world, so there is no reason to exploit the dead in this way.

The Fremont literature and references to Fremont "origins," their "demise," or the received wisdom about their relationships to the "Numics" are guilty of stereotyping and of assuming the very things begging for empirical investigation including behavior, language, ethnicity, and culture in general. We have employed as a crutch a classification which carries a dangerous burden—it may be nothing more than a reflection of our limited experience in the social present forced onto transitions spanning centuries or millennia. Is it possible that we assume simple, past societies to be reducible to neat categories since our own modern world is so difficult to comprehend?

Some anthropologists have similarly questioned how we abuse the past. Eric Wolf, in his book, "Europe and the People Without History" writes:

> Concepts like "nation," "society," and "culture" name bits and threaten to turn names into things. Only by understanding these names as bundles of relationships,

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pp. 1-18

> and by placing them back into the field from which they were abstracted, can we hope to avoid misleading inferences and increase our share of understanding. . . . One need have no quarrel with a denotative use of the term society to designate an empirically verifiable cluster of interconnections among people, as long as no evaluative prejudgments are added about its state of internal cohesion or boundedness in relation to the external world. . . . Yet the concept of the autonomous, self-regulating and self-justifying society and culture has trapped anthropology inside the bounds of its own definitions (Wolf 1982:3,18).

Challenging our assumed simplicity of the primitive, Wolf writes:

> Indeed, has their ever been a time when human populations have existed in independence of larger encompassing relationships. . . . Just as the sociologists pursue the will-o'-the wisp of social order and integration in a world of upheaval and change, so anthropologists look for pristine replicas of the precapitalist, preindustrial past . . . (Wolf 1982:18).

Have we been doing this with the Fremont, seeing "them" as a neatly identifiable "people" with the implication that archaeology has actually shown the learning public the ethnic and linguistic identities for the past inhabitants of Utah? Are we really assuming that we have a grasp of the Fremont "demise" into the later "Numic" peoples that invaded and replaced the elusive Fremontors? Are we reducing the past to add comfort to a contemporary world where such categories are not only difficult to see, but considered racially and ethnically bigoted?

Some of the problem in archaeology may center around a loss of the early twentieth century realization in cultural anthropology that ethnic identity, language, and material culture do not intrinsically co-vary, but rather vary independently, often very independently. Colin Renfrew, author of, "Archaeology and Language: The Puzzle of Indo-European Origins" (1987) laments about some of the same things in a retrospective upon his book:

> It is the central thesis of my book that these early models—used by successive generations of scholars all too ready to equate a culture with a people (from Gordon Childe to Irving Rouse) and a people with a language—have yielded reconstructions for the origin and spread of languages which amount to a travesty of archaeological interpretation. . . . They are based upon the cardinal error, propagated by Childe in 1927, that when contemporary archaeologists define a "culture" on the basis of a "constantly recurring assemblage of artefacts" (often itself in practice reduced to a single trait, such as painted spirals or impressed cord decoration on pottery) they are simultaneously reconstructing an early ethnic group distinct from other groups and probably speaking its own language (Renfrew 1988:438).

We certainly do this in the case of the Fremont-Numic issue, and perhaps to the Fremont in general. But all is not hopeless and in his retrospective Renfrew hints at a solution:

> I argue that the task can indeed be attempted without the simplistic equation of specific cultures or traits with specific hypothetical languages. . . . They (languages) change because their speakers are within societies where significant economic and social changes are also taking place. The key to the analysis must be change and an attempt to understand how language change correlates with other kinds of change within the society in question. Archaeological research in favorable circumstances should allow the elucidation of social and economic change. In place of the old framework of linkages—specific languages—people/ethos—specific archaeological culture, it may be possible to develop in a systematic way a rather different framework of inference: language change-economic/social/demographic change-change in the archaeological record. This may be termed a "processual" approach, in which emphasis is to be laid upon the processes of change of each kind rather than upon specific notional archaeological "cultures" as supposed ethnic units (Renfrew 1988:438).

Here, I examine the above issues using a brief tour of Fremont transitions, changes during the history of the Fremont from the initial crystallization of the phenomenon, to the time when it can no longer be archaeologically recognized. The ability to explore these issues reflects an increasing comfort among archaeologists with Fremont diversity within the context of a certain acknowledged unity in material remains. We do not know what this unity means in terms of the social, ethnic, and linguistic categories that were relevant to humans living at that time, and may never know. On the other hand, new questions and perspectives come into focus. I pursue this by emphasizing the "last" Fremont transition into archaeological obscurity using current research in one of the most persistent and dense areas of Fremont occupation, the northern Wasatch Front. This example offers a means of identifying questions that archaeology is in a position to explore, but which do not necessarily speak to neatly defined packages of past "peoples" or "cultures," or invoke implications of ethnic and

linguistic groups sweeping across the landscape like Great Basin weather systems. Discussion of these issues is increasingly relevant to how we present our understanding of prehistory to the reading and listening public.

CLASSIFICATION AND MATERIAL REMAINS: BEHAVIOR AS AN ALTERNATIVE VIEW

One of the strongest lines of evidence for Fremont unity is seen in the initial development of the Fremont phenomenon. There is strong continuity from a widespread earlier tradition, the Archaic, a period spanning thousands of years (Jennings 1978; Marwitt 1970). Because the Archaic was so widespread over the desert west and because it spans so much time, it is a category which certainly embodies a great deal of cultural, linguistic, and physical diversity. In the eastern Great Basin and on the northern Colorado Plateau, Fremont development produced distinctiveness out of this continuity with the Archaic. Distinctiveness which was represented by: the use of domesticated crops to varying degrees; settlement oriented toward farming; and the appearance of a material culture associated with decreased residential mobility and a more complex logistic system—especially the use of pottery, a greater investment in housing, and the development of more socially formalized trading networks. The Fremont is also distinctive among its contemporaries. It seemed to have developed in place, but this certainly does not preclude the possibility that people from other regions colonized portions of the "Fremont" area, taking on "Fremont traits" (see Berry and Berry 1976, for instance).

Fremont Transition and Basketry

It is appropriate here to mention Fremont basketry, an item of material culture sometimes offered as proof that the Fremont are not only distinct, but are ethnically and linguistically homogeneous (e.g., Adovasio 1986). Fremont basketry is indeed distinct from all contemporary traditions in surrounding regions. It is also distinct from later traditions in the Great Basin. Fremont basketry is however, part and parcel of a prior, Archaic basketry tradition that was widespread over the Desert West of the United States (Adovasio 1974). As with other aspects of the Archaic, this widespread basketry tradition covers such a large area and so much time that it must certainly include a tremendous diversity of linguistic and ethnic identities. Yet, when Archaic basketry is discussed, it is not used to argue for the identity of particular peoples lurking in the shadows of time—it simply cannot speak to such issues on a consistent level. While it is true that in some cases, ethnic identity, language, and material culture do indeed co-vary, an equal number of contrary cases can be also be held up, precluding an intrinsic relationship among them. The absence of a consistent relationship between ethnicity, language, and basketry means that we are left with no method to routinely identify such relationships in the absence of additional, difficult to muster, evidence.

Why then, when we refer to the Archaic basketry tradition, a realm that has resisted the temptation to identify "peoples," but which persists into the so-called Fremont, must it be taken as proof of Fremont homogeneity as a "people"? As an alternative view, I suggest that Fremont basketry, or the Utah type metate, a few stone balls, some hock moccasins held up as virtual Fremont icons, or even minute variations in rock art styles may tell us no more about language and ethnic affiliations than does the style of automobile you drive testify as to your primary language. As Payson Sheets (1975) pointed out, "Possessing a small, side-notched, and basally concave arrowhead does not make you a Ute any more than owning a Volvo makes you a Swede." What the basketry, points, and other items are telling us is that the first Fremont transition produced a material culture, as opposed to language and ethnicity, distinct from other evolving farming cultures in the region. While Fremont basketry is different from that of other farmers of the Colorado Plateau, it is less distinct from groups who remained hunter-gatherers in the Great Basin. This probably results from the common Archaic roots, a cultural stage likely to have encompassed more than one ethnic and linguistic group.

The Fremont As Distinct

As farming spread over the Southwest, the eastern Great Basin, and onto the northern Colorado Plateau, mobility decreased as a function of the rise of farming, producing **regionalization** in material culture. Decisions to incorporate domesticated resources into the economy and diet tended to tether people to locales, even when the farming was casual. Once farming became fundamental to the economy, further tethering ensued, and traditions in material culture (and I suspect ideological aspects of culture as well—perhaps represented in rock art), become relatively more regionalized or compartmentalized than in previous times when mobility was in general, higher. Thus, the distinctiveness of the Fremont from their contemporaries is associated with fundamental shifts in **adaptive strategy** occurring on local levels, but cumulatively over a spatial context far larger than the Fremont. The shift in adaptive strategy toward farming favored a process by which the earlier, Archaic cultural "substratum" became differentiated into more readily recognizable entities: the Fremont; various Southwestern traditions, and others in the western U.S. Regionalization is not a synonym for isolation, but the character of interaction among regions began to occur in the context of an increased reliance on domesticates and the effects of this on the remainder of the cultural system.

Fremont Boundaries and Behavior

Let us examine Fremont boundaries from this more contextual view and introduce a slightly different way to know the past—by attention to the relationships between material culture and **behavior**. For the purpose of example, I refer here to gender.

Archaeologists around the world increasingly understand that cultural boundaries may inform us about gender, or be conditioned by relationships between material culture and gender (e.g., Conkey and Spector 1984). While the employment of this perspective is relatively rare in Fremont studies, there are some interesting possibilities when we examine cultural boundaries in relation to gender behavior. For instance, the easiest way to detect the Fremont boundary is to refer to what is commonly assumed to be women's technology, especially pottery and baskets (conceivably a false assumption, but one that does have considerable ethnographic support in the American west). It is possible to distinguish Fremont baskets and pots from those of the Anasazi, or the Late Prehistoric. On the other hand, if you look at arrowheads, perhaps more frequently men's technology, it is much more difficult to identify the Fremont boundary. For example, along the southern tier of the Fremont region, the same projectile points are given different names when they occur with Fremont or Anasazi pottery. At the Bull Creek sites, there are "Bull Creek" points. To the south, where Kayenta Anasazi pottery becomes more common, they are called "Kayenta" points. To be fair, archaeologists seem to recognize the problem in practice, but cling to the same holistic categories and stereotypical perspectives to describe the past to the non-professional reading world. The mere presence of this taxonomic charade demands a change in how we describe the past to others. Rather than informing us of boundaries between monolithic cultures, the perspective from gender suggests that we may be seeing something more real— culture in the form of actual human behavior such as the movement or affiliations of men and women. By comparing the boundaries formed by different classes of material culture, we may either learn more about the role of gender in shaping past social systems, or we may employ gender to learn about the nature of the boundaries. Holmer and Weder (1980) quietly implied this line of investigation years ago and have been courteously ignored. The nature of this boundary could be controlled by behaviors such as mobility for trading, hunts, raiding, marriage, or perhaps more basically, farming practices. Even in the absence of understanding the particulars of these behaviors, what a different view we gain of the Fremont as a culture when we pay attention to behavior rather than a relentless concern with developing broadly employed stereotypes of past "peoples." Does the public really thirst for such reductionism, or is it that archaeologists are unwilling or unable to describe prehistory in a more realistic manner to the world at large?

Fremont Economic Transitions

I have suggested there are various sides to the notion of Fremont as a category, a category implying some sense of unity, but also a varying mix of characteristics that serve as indirect reflections of past human behavior. Let us proceed by examining some other Fremont transitions. After the Fremont became detectable in the archaeological record, and over at least the next eight centuries or so, Fremont lifeways made a variety of detectable transitions. These can be described as shifts in the mix of farmed or wild foods, shifts in the location and size of settlements, and accompanying shifts in mobility and the kinds of material culture used, to name a few. From the initial transition into farming life, there were times when more people in the region seemed to rely on farmed foods and lived in stable villages of perhaps several dozen to several hundred people. There were times when these settlements split into smaller groups, capitalizing on microenvironments capable of supporting some crops, but also in proximity to easily retrieved wild foods. There were times when the Fremont relied less on farming—times when greater mobility probably provided a better life than farming. Finally, there were fluctuations spanning multiple human generations in which the Fremont material presence expanded and contracted across the region. While Fremont archaeologists have long recognized the variable nature of life across space and to a lesser extent, through time (e.g., Marwitt 1970), the search for diversity has accelerated and become more explicit in the past decade (e.g., Madsen 1982, 1989; Simms 1986; Talbot and Wilde 1989). In taking this perspective, a more fluid, dynamic, and humanly realistic picture of the past begins to emerge. Let us further examine how transition can be studied in the absence of stereotypes by examining the "final" Fremont transition into archaeological obscurity.

THE FREMONT/LATE PREHISTORIC TRANSITION IN NORTHERN UTAH: AN EXAMPLE AND SOME HYPOTHESES

One thing that has come out of all the years of hand wringing about Fremont definitions and identity is the realization that we will only explain Fremont life by careful examination of adaptive systems on a regional level (Hogan and Sebastian 1980). A research project along the northern Wasatch Front has been attempting this since 1986. Upon beginning the study only a handful of sites had been excavated, most of them Fremont. Over four hundred more are now known (largely due to the efforts of avocationists), and recorded to varying degrees. Early in the project we realized that if we wanted to know how the Fremont made the final transition into archaeological obscurity, we had to study what came after the Fremont. To avoid yet another definitional debacle like the Fremont, and to study rather than assert the "Numic influx" issue, we refer to the period after the Fremont by the mundane term, the Late Prehistoric period. It extends from the fourteenth century to historic contact with little concern for precise temporal placement of the "boundary" between it and the Fremont. We hold no illusions that definitional precision constitutes an understanding or explanation of the processes associated with this transition. The ascription of a name, albeit mundane, belies the fact that the Late Prehistoric is one of the least understood periods in all Utah prehistory. In our study area along the eastern shores of the Great Salt Lake (Figure 1) only one suspected Late Prehistoric site had ever been excavated: Injun Creek, located west of Ogden (Aikens 1966). A radiocarbon date from this site dating to A.D.1605+100 (calibrated range is A.D. 1440-1660, using Stuiver and Pearson 1986) has sometimes been quietly doubted by local archaeologists because an earlier date was also present and the site produced abundant Fremont ceramics "in association" with Promontory ceramics (Aikens 1966:14, who did by the way, trust the date). After all, we had studied the devil out of the Fremont, and we thought we knew when it ended. So the date had to be wrong, did it not? By now, I think many understand that the occupation at Injun Creek, as well as at other locations around the lake, extended from within the Fremont well into the Late Prehistoric and that there were elements of continuity as much as there were distinct differences.

Figure 1. Map of study area on the eastern shores of the Great Salt Lake.

Fremont Transition, Numic Influx, and Transition Within the Late Prehistoric

Archaeology had marked the terminus of the Fremont not by an examination of what came after, but only by the application of a stereotype of what we thought Fremont had to be. At that time we had to rely on a long-standing model of the Fremont demise, one that may indeed be right, but that is long-standing because it has been subject to little archaeological test (that is, test by attempted falsification). This model, one of "Numic expansion" was prompted in the 1950s and 60s by linguistic study (Lamb 1958; Miller et al. 1971). Linguists have convincingly shown that the Numic languages (which include the Shoshoni and Ute languages common to northern Utah), **moved** into their present distributions. The controversial part of the model revolves around using assumed rates of language change to predict **when** they moved. Lamb (1958) suggested this movement occurred within the past 1,000 years and lexicostatistic estimates suggest it happened between 500–700 years ago (Bettinger and Baumhoff 1982). Thus, the Numic spread may match the "demise" of the Fremont. This has been a convenience for the archaeologist, offering a tidy explanation and one in tune with our existing stereotypes. Archaeological evidence has been mustered to reify that aspects of Great Basin material culture did change about 1,000 years ago or less (e.g., Adovasio 1986; Madsen 1975). However, the means of using language to estimate antiquity is subject to debate. One recent study found that the rates of linguistic change used to argue for a recent Numic migration may be too fast, being based on rates of linguistic change for horticulturalists rather than the hunter-gatherers the Numic were (Shaul 1986, another politely ignored article). If that is so, then the Numic presence would be predicted to have occurred earlier. Even though we have seized upon the Fremont to Late Prehistoric transition as a convenient correlation to explain both the arrival of the Numic groups and the demise of the Fremont, we have to remember that there is no shortage of earlier transitions in prehistory with which we could make the same match (see Holmer 1986). Why not the upheavals of the mid-post glacial (the Altithermal)? Or, the Neo-glacial climatic event which correlates with settlement change and shifts in projectile point styles followed by the adoption of horticulture (the "origins" of the Fremont)?

In contrast with the above and more consistent with existing lexicostatistic estimates, perhaps the Numic spread occurred later than the Fremont to Late Prehistoric transition. Perhaps we have avoided looking for change **within** the Late Prehistoric period as archaeologically defined because we tend to see this time as fully described by the ethnographic record, hence unworthy of critical archaeological attention. While ethnographic variability has been acknowledged, it is largely described as spatial variability across the region (e.g., Bettinger 1978). The ethnographic present has been extended into the past as a temporally static entity.

One unexplored possibility for transition that occurred not at the Fremont to Late Prehistoric juncture, but within the relatively unstudied Late Prehistoric period is prompted by evidence for massive depopulation from the introduction of European disease beginning **early in the sixteenth century.** Disruption of aboriginal life from the depopulation of large game such as bighorn sheep caused by European-introduced disease has been proposed (Bettinger and Baumhoff 1982). Here, I refer to disease among the aboriginals themselves, not just some of the game they hunted. Spanish exploration in Florida and Mexico introduced the effects of smallpox, bubonic plague, measles, typhoid and a host of other diseases, **beginning in the 1520s,** much earlier than previously thought (see Crosby 1972; Dobyns 1982; Ramenovsky 1987; Thornton 1987). These studies use ethnohistorical documents and archaeological evidence to document dozens of successive waves of disease-induced depopulation. These debacles occurred across eastern and central North America reaching Puebloan groups of the southwest. They also expanded both north and south from Mesoamerica affecting the Pacific coast. The diseases were transmitted Indian to Indian, preceding **face-to-face Indian/Euro-American contact by centuries in some regions.** While these studies suggest the upheaval could have been continent-wide, until recently evidence for early depopulation has been minimal in the Intermontane West where population densities are generally lower. There is

now some evidence for sixteenth century depopulation on the Columbia Plateau (Campbell 1990). Pockets of higher density occupations such as the wetland environments of the Intermountain West or Great Basin may have been susceptible to epidemics. The Southwest, California, or the Columbia Plateau are all candidates for a source of introduction. Documented cases of depopulation suggest mortality in excess of 70% in many cases and such a calamity would have been a likely context for migrations of people. To date this possibility has not been employed to study transition within the Late Prehistoric period in the eastern Great Basin, nor has it been employed as another potential correlate of the Numic migration. It is offered here only as a hypothesis for operationalization with the view that the Fremont, Late Prehistoric, and Numic issues have become extremely intertwined and are in need of separation and broader examination.

In the case of the Great Salt Lake area, well dated late sites are not common, but those that have been dated (seven dates, three sites) fall into the fifteenth century or earlier. A similar situation exists in the better chronological context of Utah Valley (Janetski 1990), and while some dates later than A.D. 1525 are present there, most dated Late Prehistoric sites fall into the previous two centuries. In our work along the Great Salt Lake and in Utah Valley (Joel Janetski, personal communication 1990) there is the increasing suspicion that the fourteenth and fifteenth centuries were somewhat different from the ethnographic present. Accounts from mountain men and government explorers suggest that the northern Utah wetlands were underexploited, given the seemingly high carrying capacity of the land (e.g., Dewey 1966) introducing another possible anomaly. Better chronological control may permit an assessment of whether the early to mid-sixteenth century was a time of discontinuity in the archaeological record and possibly linked to the first, "anonymous" wave of European contact in the region.

The Numic expansion model is one encountered in the literature, and surely it is a reasonable one to describe the Fremont to Late Prehistoric transition. The matter is far from closed as an empirical issue, and this affects how we categorize artifacts, allocate research emphasis, and describe our current knowledge of the past regarding the Native Americans currently present in the region.

The Northern Wasatch Front Project and the Orbit Inn

Initially, I entered the project along the Wasatch Front bound and determined to test the Numic expansion model with the belief that until we could better evaluate the transition (or others at later times) **archaeologically**, we could not close the issue (Simms 1983). Indeed, there is archaeological evidence for a replacement of the Fremont by groups that were distinctive from the Fremont. The basketry of the Fremont and Late Prehistoric seems fundamentally different, but the sample size of Late Prehistoric basketry is embarrassingly small. This is particularly true for non-ethnographic, hence **early** Late Prehistoric basketry, dated to the actual period of transition. The pottery seems different, but there are many aspects of continuity as well. Ceramic thin sections show that like the Fremont, many Late Prehistoric ceramics (including those called "Promontory" from the Promontory caves and dated context at the Orbit Inn) are coiled, and not distinguished by paddle and anvil construction (Patricia Dean, personal communication 1990). There is such a high degree of variability among the two types that it seems the Fremont made some pottery very similar to much Late Prehistoric pottery. That is, pottery with thick walls, undulating surfaces, large temper size, and lower firing temperatures. In other words, expediently made pottery to serve certain functions. This difference is apparent in northern Utah in the overlap of crude "Promontory" ceramics with both Fremont and Late Prehistoric sites. By the same token, there is thin-walled, well made pottery from sites that would on the basis of projectile points have to be classified as Late Prehistoric (Mark Stuart, personal communication 1990). Again, the variability may be best explained by functional requirements of shifting mobility through time. Projectile point styles between the Fremont and Late Prehistoric also contrast to some degree, but the more points I see from the lake-edge sites, the more intermediate styles and continuity I see (a study to quantify this is currently underway). Perhaps these similarities

and differences are more informative of behavior and cultural process than of ethnic boundaries and language.

It was clear that we needed to begin by excavating a Late Prehistoric site to better understand what we were dealing with. The true limits of our knowledge had become clearer and our work during 1986-87 seasons using archaeological field schools focused on the Orbit Inn site near the Brigham City airport. The Orbit Inn (Simms and Heath 1990) produced five closely aligned radiocarbon dates showing occupation in the late fifteenth century. The site was a residential camp occupied repeatedly over decades during the early summer and fall by people using lightly built structures—windbreaks or small huts. They collected marsh seeds, possibly shellfish, hunted waterfowl, and fished. They left caches of perhaps food, or equipment, indicating the intent to return soon. Each occupation was long enough for trash to be removed to secondary contexts, tools to be repaired, ornaments and possibly pottery to be manufactured. In may ways, it seems similar to the Injun Creek site. It differed from the Bear River "Fremont" sites only in that there were no shallow pit structures for habitation. Ceramics from the Orbit Inn were variable in quality. Seventy-three percent were Promontory with the remainder different only in the use of material other than calcite for temper. The well-dated Orbit Inn confirms the Late Prehistoric dating of Promontory ceramics indicated years before by the excavations at Injun Creek.

Fremont Transition As An Ecological Problem: A Working Model

Our work is proceeding by additional survey and recording of surface sites in the areas shown on Figure 1 and excavation of other Late Prehistoric sites. Over 400 sites have been encoded onto computer with over 80 categories of attributes for each site, ranging from locational and environmental information to features and artifacts. The continuing investigations are providing much needed quantified information because existing data are primarily nominal or ordinal in scale. However, some relationships between the Fremont and Late Prehistoric use of the Great Salt Lake marshes are indicated, especially with respect to residential and logistic mobility (see Binford 1980, or better yet, Chatters 1986 for discussions of these concepts).

The Bear River Fremont sites have long been argued to represent less reliance on agriculture and more on hunting and gathering in the marshes than other Fremont cases (Jennings 1978; Marwitt 1970). There are indeed many similarities between the Bear River Fremont sites and the Late Prehistoric Orbit Inn which suggest little agriculture. On the other hand, the Bear River Fremont sites exhibit more substantial dwellings and overall, more evidence of stability in occupation.

In regional perspective and considering the areas outside of the marshes, the interpretation that the Great Salt Lake Fremont was relatively less reliant on horticulture than other Fremont is to some extent an artifact of research. First, in the absence of comprehensive excavation, using the absence of direct subsistence evidence for domesticated plants to argue for little or no agriculture is a risky use of negative evidence. Even the larger Fremont agricultural sites do not offer up huge quantities of such evidence. Second, urbanization along the Wasatch Front has likely destroyed large Fremont agricultural mound sites. Fortunately, there are several hints that we may have studied only a fraction of the Fremont settlement system in the Great Salt Lake region. Some of these Wasatch Front horticultural bases have been located, but are poorly described. Such sites exist at Willard, and at Warren (Figure 1), west of Ogden (Hassel 1960, 1961, 1964; Judd 1926; Stuart 1980). Those cases yield the remains of adobe structures, corn cobs, and well-made ceramics. Furthermore, there are Fremont sites located in places where farming would be expected, on or near the toes of alluvial fans, well back from the marshland occupying the nearly flat terrain bordering a fluctuating Great Salt Lake. These sites are in the same topographic situations as other eastern Great Basin Fremont farming sites. Only a few, such as the Willard site, on a bluff just above the marsh at (4,220 feet) or the Warren site (elevation 4,212 feet) occur close to the marsh, but still located on sediments cleansed of salts and replenished for agriculture by fresh water inflow from mountain streams. Other possibilities are

known from the Ogden and Salt Lake City areas, but were likely covered with pavement long ago or intentionally leveled by early residents, some of who made their living leveling Indian mounds.

During the Fremont period, agriculture, centered at what were probably hamlet or village sites, may in fact have been the pattern along the northern Wasatch Front, just as it was elsewhere along the eastern rim of the Great Basin. In addition, there were large tracts of productive marshland that could support either: (1) Fremont logistic groups processing and retrieving resources from the marshes to the agricultural bases; or (2) Fremont residence in the marsh during agricultural failure, or times when the larger residential farming bases broke up into smaller groups with an accompanying decrease in reliance on farming. The non-agricultural Bear River Fremont sites as well as other Fremont residential sites could be associated with either one of these options. To date, our understanding of the northern Utah Fremont has been conditioned by a sample biased toward the marshes, with inadequate attention to the effects of early urbanization on archaeological interpretation.

As study continues, some differences between the Late Prehistoric (at least the early Late Prehistoric) and the Fremont are becoming evident on both a regional scale and within the marshes themselves:

1. Unlike the Fremont, there is no evidence for Late Prehistoric large farming villages. At a minimum this means farming scaled back from the levels practiced during Fremont times. We should not however, use the negative evidence to assume farming completely ceased in the Late Prehistoric. It seems safe to say that agriculture no longer was a recognizable settlement determinant during the Late Prehistoric period.

2. Our data indicate there is a relationship between elevation and the age of sites with a significant decrease in Fremont sites below 4,208 feet (Aikens 1967; Russell et al. 1989). Late Prehistoric sites are commonly found at least as low as 4,202 feet (Aikens 1967) with others known, but poorly described from lower levels (Mark Stuart, personal communication 1989) (the historic low is 4,193 feet). Figure 2 shows the zones likely to have been most available as marshland during the respective spans of the Fremont and Late Prehistoric periods. Of course, short term lake fluctuations can be great, so the map and the noted contrasts in site location only speak to lake trends on the scale of several centuries. When Fremont sites are found at very low elevations, below about 4,205 feet, available evidence suggests they may be early Fremont, dating prior to A.D. 500 when lake levels may have been lower than later in Fremont times. It is also conceivable that there were other, brief periods within the Fremont time span when the lake regressed below 4,205 feet.

3. The Late Prehistoric marsh sites suggest an adaptive system more residentially focused on the marsh. There are fewer Fremont residential camps in the marsh than Late Prehistoric residential camps, acknowledging that each period represents the accumulation of several centuries of occupation. In contrast, the Bear River Fremont sites are residential bases, but the numbers of such sites are few when compared to the numbers of Fremont and Late Prehistoric residential camps showing a relatively strong presence in the marsh. A residential focus need not imply sedentism, and it is possible that the Late Prehistoric marsh sites were not occupied as long during each visit as Fremont marsh sites. There are many of them, and they seem to have been used repeatedly, with occupations intermittent in almost rapid fire sequence.

4. As for changes in logistic systems, both periods are represented by a host of special use sites in the marsh. While the contrasting residential patterns suggest there should be differences in logistic systems, thus far, these cannot be teased apart, a problem similar to that encountered by David Thomas in the Monitor Valley survey (Thomas 1988).

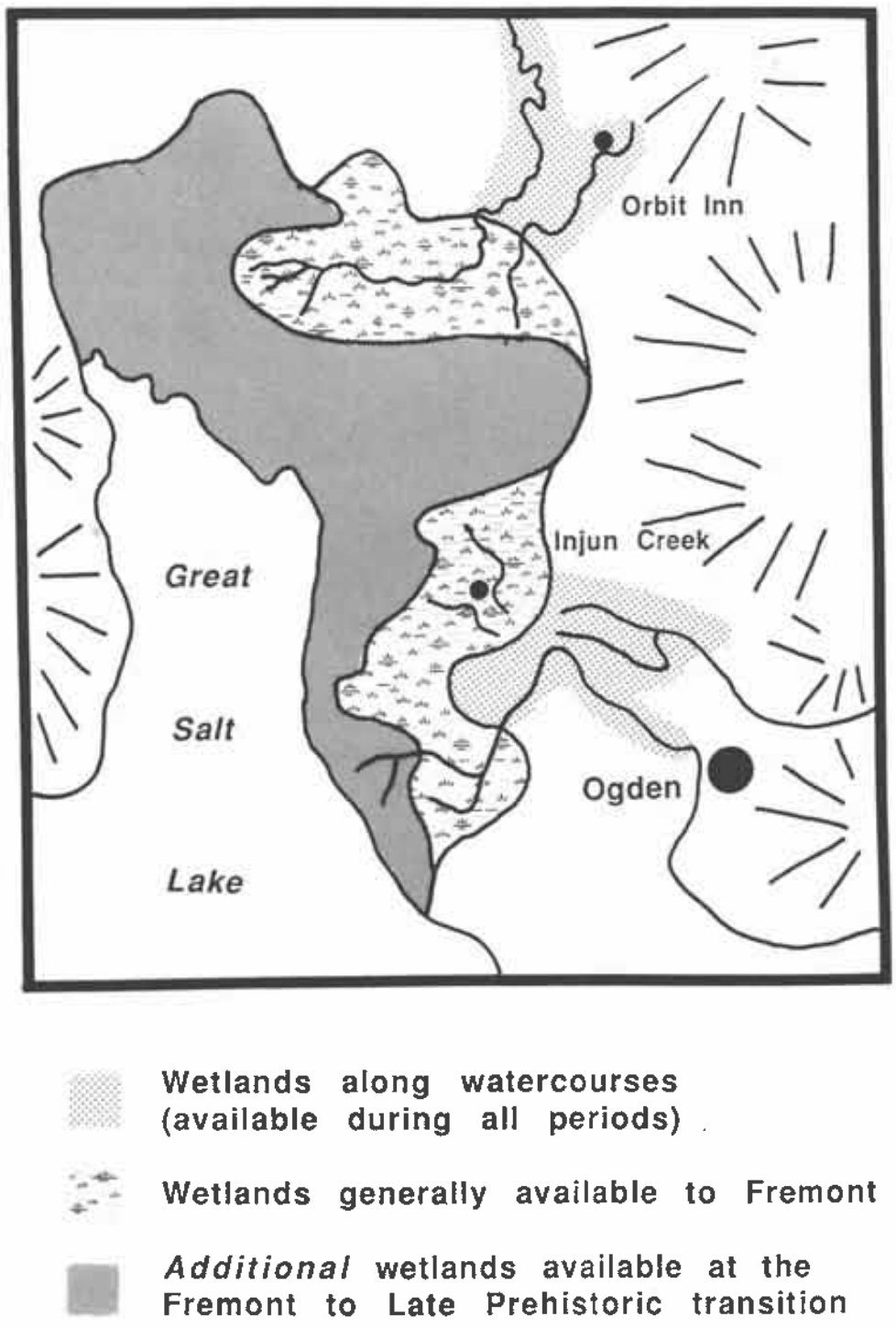

Figure 2. Schematic representation of available wetlands at the Fremont to Late Prehistoric transition.

In reconstructing the system, however, we must remember that the marsh is only one part of the regional settlement picture. On a regional level, Late Prehistoric mobility likely was higher than Fremont (at least when Fremont farming was successful). The generally higher level of mobility during the Late Prehistoric, and at some undated Fremont sites as well, is attested to by relatively expedient forms of ceramics, use of raw material, and possibly housing as well. However, considering only the marsh, Late Prehistoric use of the marsh may have been more regular than the Fremont use of the marsh, since Fremont decision making exhibited the additional influence of a varying agricultural fate placing constraints on marsh residence. This is reflected in the distribution, number, and type of sites.

As for artifacts, a degree of continuity between the Fremont and Late Prehistoric can be argued for. Given the degree to which we have assumed there is a contrast between the two temporal and cultural stereotypes, perhaps it is time we examined the possibility of continuity as a counterbalance in the scientific process. Ceramics show that the old distinctions between Fremont, Promontory, and Late Prehistoric may be overstated, or at least better seen as variations in the frequency of specific morphological attributes, rather than completely different ceramic industries. Pat Dean's study of ceramic thin sections mentioned previously provides some of the most compelling evidence for continuity. By showing that Promontory and other "Late Prehistoric" ceramics were actually constructed by coiling as were the Fremont, not necessarily the paddle and anvil technique that has been used as the basis of a technological contrast, she increases the likelihood of continuity. A high degree of variability in other attributes is being found in a study underway to quantify ceramic traits and provide the basis to study the ceramics with something other than cultural type in mind. The past practice of examining ceramics only to identify a Fremont or Late Prehistoric type is a significant problem. In the absence of reliable absolute dating on most of the "Late Prehistoric" material, we are left in the potentially dangerous position of using artifact types with spotty chronological control to infer the existence of contrasting cultural stereotypes. The practice fosters a self-fulfilling prophecy.

Projectile points, while requiring further, quantified study, also may suggest a higher degree of continuity than is now accepted for the Fremont to Late Prehistoric transition. Projectile points can be grouped into various clusters of small side notched points, but a high degree of grading between groups is also apparent. Continuity seems especially apparent between the Bear River side-notched (Fremont) and the general subtype of the Desert side-notched (Late Prehistoric) types.

As for other site characteristics, sites of both periods yield numerous subsurface pits, which are evidence for short term storage not necessarily restricted to food, but which could include clothing and equipment as well (Zeanah 1988). Evidence for nonfood pit contents such as lithic raw material has been observed during the work and is known at a number of sites in the area (Mark Stuart, personal communication 1990). Residential architecture for the Late Prehistoric requires more study, but evidence suggests a range of types from windbreaks to bulrush or brush huts to larger earth-covered houses (Aikens 1966; Janetski 1986; Simms and Heath 1990).

What could have caused a transition in subsistence, technology, and mobility? The final Fremont transition has, like Anasazi transitions, long been associated with climatic change affecting agriculture. However, anthropologists know that people are not automatically **pulled** toward agriculture, nor are they exclusively **pushed** out of it. The pushes and pulls which shape human decision-making about behavior can be expressed in a variety of ways, and can come from many directions. One "push" that may have occurred by the thirteenth or fourteenth centuries is an increase in the cost of agriculture. Already a marginal pursuit in this region, an increased frequency of drought and/or a shift from summer to winter dominant rainfall would have affected the costs of agriculture. The declining levels of the Great Salt Lake at the Fremont/Late Prehistoric transition suggested by the site distribution described here, along with other lacustrine data (e.g., Currey 1990; Murchison 1959) and pollen data from central Utah

(Newman 1989), suggest these things may have occurred.

Costs are only meaningful in a relative sense. What about the costs of the alternatives to agriculture? Add to the equation the potential "pull," or attraction of a marshland that was doubling or tripling in size as the lake receded, but fresh water inflow across a shallow gradient guaranteed the development of extensive ponds, channels, wet meadows, and saline grasslands well back from the actual lake edge. Lake levels only partially control the development of marshes in this case, with the extent of the marsh largely a function of the distance and gradient between the toes of the alluvial fans and the lake edge. In the case of some floodplains along the lake, the marshes could form a band over 10-15 km wide (Figure 2). Given that wetlands offer resources including small mammals, waterfowl, and large seeds that are relatively high ranked in a Great Basin hunter-gatherer diet (Simms 1987), and fish as well, marshes should always be exploited to some degree. As the Great Salt Lake declined from lower precipitation, huge tracts of marshland, and saline grasslands attracting large game such as the bison which appear in the archaeological record, would have offered the inhabitants a much larger area to exploit than those available during the latter part of the Fremont period.

A wetland on this spatio-temporal scale would have been a previously unavailable attraction presented in the face of increasing agricultural costs, but would have required a fundamental shift in settlement to exploit. It would have required some basic decisions as to whether to employ domestic crops as the driving focus of settlement, and selected for an increased, but spatially flexible residential focus on the marsh. Settlement stability on a regional scale, encompassing nearby mountains and interior valleys, as well as lake-edge contexts may have decreased in the Late Prehistoric. A product of increased mobility (that is, relative to Fremont mobility and not intended as an argument for Late Prehistoric nomadism) would have been changes in technology, especially ceramics, but in architecture, and raw material management as well.

On the other hand, there is continuity between the Fremont and Late Prehistoric and the emerging picture is not one of wholesale substitution in adaptive strategy. Rather the changes may better be seen as **frequency shifts** in the characteristics of sites, features, artifacts, and the activities they reflect. Mobility may have increased from Fremont times, but was still quite stable relative to other Great Basin environments (Janetski 1986). Perhaps the transition would mark a time of social, technological, demographic, and perhaps ideological adjustment. While each of these represent threads of culture, notice that the emphasis is upon the various processes, not upon, as Renfrew (1988) says "specific notional archaeological 'cultures' as supposed ethnic units."

THE NUMIC INFLUX QUESTION?

Notice that I have not been able to speak to the issue of the Numic expansion and questions about whether the various groups exhibiting what we call Fremont culture packed up and moved, stayed put and died out, stayed put and blended in with new arrivals, or stayed put because they were "Numic." As the research has progressed, it has become apparent that we still do not have the means to resolve the "Numic influx" issue. However, in recent years, since the Great Salt Lake reached its historic high stand in 1987, and is now regressing, a new line of evidence has become available which will foster examination of the problem—at least in the northern Wasatch Front. This line of evidence is a collection of over 70 human skeletons eroding at the surface and endangered by erosion and vandalism (Russell et al 1989; Simms 1990; Stuart 1990). The remains have been excavated for study and protection.

These skeletons aid investigation of population blending or replacement because the sample size is fairly large, there are skeletons spatially associated with Fremont sites, and others associated with Late Prehistoric sites. While spatial association with sites in an area of high site density does not guarantee the age of the skeletons, it is likely they span the time from the Fremont into the Late Prehistoric period. Anthropometric study, along with recent success in extracting genetically specific proteins

(Schell and Blumberg 1989) and DNA from prehistoric bone (Hagelberg and Sykes 1989; Paabo et al. 1989; Shearin et al. 1989), open the door to knowing whether the Fremont and Late Prehistoric sites represent genetically distinct populations. This is something the other archaeological data cannot do, no matter how much we wish artifacts mirrored these things.

Perhaps we will be able to suggest that the ancestors of the modern Numic groups in our area are genetically distinct, hence more distantly related to the Fremont, and likely to have replaced the Fremont. Or, perhaps the ancestors of modern Native Americans in our area have been here longer than previously thought, either because their ancestors were Fremont in a direct sense, or represent a high degree of admixture of two populations that were distinct earlier in time. If distinct Fremont versus Late Prehistoric populations are found, then the Numic spread model is supported. If no distinction is seen then we must look to either a different timing of the Numic spread as previously suggested or explore the possibility of admixture.

The image of blending populations is interesting in the ecological context of a vast marshland. People with different cultural histories may have interacted over decades and even centuries, a level of temporal precision common to archaeology in this region. The huge, but spatially and temporally dynamic marshes could have served as refugia, attracting people from many disparate kin groups and cultural backgrounds, especially during times of resource stress such as the Fremont to Late Prehistoric transition. Perhaps the Fremont were similar enough to the recent Numic arrivals, or actually were Numic speakers, that interaction was routine. If such admixture was occurring in the context of an in-migration of people (the Numic spread) it may be reflected in some material realms (perhaps basketry is one, Adovasio 1986). Just as easily, other traits may not reflect distinctions, suggesting continuity. Such a view may better represent the continuity between the Fremont and Late Prehistoric occurring in the a context of a certain acknowledged transition. The situation described would have fostered the integration of cultures and increased bilingualism, alliance formation by marriage, and insured genetic exchange. Over the course of generations in these marsh habitats, there may have been admixture occurring both in the context of peaceful interactions such as marriage or trade and in the context of violent interactions such as disputes or perhaps warfare. History is replete with examples of cultural and biological blending occurring in both contexts. The marshlands of the northern Wasatch Front would provide an environment conducive to such interaction during a period like the Fremont to Late Prehistoric transition.

The outcome will have to await further study, but a similar case of human skeleton recovery in the Stillwater marshes of western Nevada has produced tantalizing results. Anthropometric analysis by Stark (1983) and Brooks and Brooks (1990) of the Stillwater human remains dating from about 3000 B.P. to the protohistoric period shows a great deal of continuity within the series, leading to the conclusion there is, "no evidence of replacement by other peoples or migration" (Brooks and Brooks 1990:71).

SOME CONCLUDING REMARKS

Here, the point has been to place the Numic migration problem and the Fremont to Late Prehistoric transition in a perspective attendant to the potential of archaeological data. The current status of continuing study of prehistoric human ecology along the Great Salt Lake is offered to illustrate a research strategy for studying Fremont transition. These topics and research illustrate how some of the most interesting and tractable research problems may have little to do with existing stereotypes of "archaeological cultures." The determination of such categories is really not the focus of the discipline. While the categories can be useful tools, they are just as easily toxic byproducts. The fleshing of labels and their careful employment are also important in fulfilling our obligation to convey to others the deepest possible understanding of prehistory and humanity, not just stereotypes that uncritically reflect contemporary social perceptions.

As for approaching explanations as to how and why culture change occurs over large expanses of

time, the importance of variability to our enterprise can be graphically seen in the example of the Fremont to Late Prehistoric transition. Lindsay (1986) has shown the Fremont did not all go away **en masse**, further implying we are not dealing with a unitary problem. Thus, even if we can resolve Fremont transition in the northern Wasatch Front, it will not imply that the same fate befell all carriers of Fremont material culture. Thus, when you encounter "explanations" of the Fremont demise, remember we are talking about many people, many hundreds of years of transition, and a large piece of real estate. I suggest wariness of any simplistic, unitary account of where they went, whether it be a conclusion that they went to become the Hopi, went to become a Plains culture, or went into outer space. Just as it is with assessments of race and ethnicity today, the danger centers around how much importance is placed on the word "they."

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VIRGIN ANASAZI ARCHITECTURE: Toward A Broader Perspective

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ABSTRACT

A review of Virgin, Kayenta, and Mesa Verde Anasazi architecture suggests temporal and spatial variability in structural shape and the occurrence of certain internal features. This variability indicates that Virgin area architecture, although at times slow to develop, is generally much more dynamic internally than previously thought. It also suggests an adherence to the broad patterns of regional architectural change. Temporally variable economic and social requirements or pressures probably had the greatest impact on Virgin architecture. Placing Virgin Anasazi architecture in a regional context provides a better perspective on its origins and development.

INTRODUCTION

No other characteristic, with the exception of ceramics, has been presented as more representative of the Virgin Anasazi than architecture. Yet, for the most part, a convincing distinctiveness of Virgin architecture continues relatively undefined in the current literature. In fact, the distinguishing characteristic of Virgin architecture most researchers are able to agree upon is its complacency. Definitions of and reasons for this complacency are less clear.

The premise of this paper is that in order to define Virgin architecture, one must first understand the mechanisms behind its development. The primary focus is on temporal and spatial variability in architecture among the major Northern Anasazi groups—the Virgin, Kayenta, and Mesa Verde—as evidenced by general structural form or shape and, to a lesser degree, certain internal features. The paper attempts to demonstrate that Virgin Anasazi architecture is not nearly as complacent as thought to be, but instead conforms to the dynamic nature of Southwestern architecture in general. It argues that Virgin Anasazi architecture developed from a complexity of influences, most notably economic and social change and continuity, through time and space.

BACKGROUND

Regional Studies

Architectural studies have been an integral part of Southwestern archaeology almost since its inception, mostly in the form of either detailed site descriptions, or more complex discussions of feature development or formal transitions (i.e., Morris 1939; Brew 1946; Bullard 1962; Gillespie 1975; Lipe and Breternitz 1980; Hewitt et al. 1983; Kane 1986; Gilman 1987; Wilshusen 1988a). Beginning in the 1950s and continuing to the present, some researchers have also taken a hard look at functional determiners in Anasazi architecture (i.e., Smith 1952; Hill 1968, 1970; Sullivan 1974; Jorgenson 1975; Gillespie 1976; Clemen 1976; McGuire and Schiffer 1983; Bagley-Baumgartner 1984; Ciolek-Torrello 1985; Wilshusen 1988b). Each of these researchers relied upon formal attributes of architecture at least to some degree, while many went even farther, utilizing artifact inventory- and/or activity-oriented characteristics as well in deriving functional interpretation.

One work in particular has influenced many archaeologists' views on Anasazi architecture. Bullard (1962) went to great lengths in comparing and contrasting formal pit house architectural features in specific areas and sites, from pit house size to numerous types and sizes of subfloor pits. His analysis provided an insight into regional styles and attributes on a scale that would be difficult to match today, given the continually expanding data base. On the other hand, this increasing data set provides a wealth of information not available to

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Bullard three decades ago, and much of his discussions and interpretations are certainly now out of date. Interestingly, however, some of his terminology and typology still appears in Virgin area reports.

Virgin Anasazi Studies

The vast majority of Virgin Anasazi site reports are primarily descriptive, and attempt little beyond conjecture about the formal and functional development of architecture. Notable exceptions include Dalley and McFadden's (1985) discussion on roomblock development, and Lyneis's (1986a) analysis of room size correlation. Most recently, Dalley and McFadden (1988; see also 1985) and Thompson and Thompson (1983; see also Walling et al. 1986, and Walling and Thompson 1988) have reviewed and/or expressed opinions on general aspects of Virgin Anasazi architectural development. In addition, Fairley (1989) has presented a thorough review of research to date, including architectural information, for the Virgin area.

SOUTHWESTERN ARCHITECTURE ORIGINS

The roots of Southwestern architecture are generally thought to come from two sources (Woodbury 1979; Martin 1979; Jennings 1989). The first was the early spread of pit house architecture into North America from Northern Asia. The growing data base here indicates a long tradition of pit house use, especially in the western United States (Daifuku 1952; Jennings 1978; Cressman 1986; Butler 1986; Elston 1986; McGuire 1984). These are typically shallow circular features, some quite large.

The second source of Southwestern architecture is much later Mesoamerican influence northward into the Southwest (Plog 1979; Martin and Plog 1973). The Hohokam, for example, seem to represent this influence quite well. Hohokam pit structures are distinctly rectangular to square, with rather complex roofing and floor plans. Mogollon pit structures, which early on were typically circular to ovoid, by A.D. 700 take on a distinctive subrectangular shape (this, coincidentally, during the Hohokam Colonial Period expansion).

It was the blending of these influences coupled with an impressive flare for localized innovation that created the distinctive Formative architectural styles in the Southwest. How the Anasazi built upon these influences has never been thoroughly explored, although it seems they were quite adept and even prolific at changing styles and forms to meet their needs. Still, certain regions apparently advanced socio-politically, economically, and/or technologically much more quickly than others. Differential rates of diffusion from these areas, as well as locally variable stylistic preferences further cloud the picture. It is not surprising that every Anasazi site demonstrates a certain degree of architectural individuality, in an overall matrix of regional commonality of form and function.

THE NORTHERN ANASAZI

The dynamics of Southwestern architectural development described above apply equally to what is here referred to as the Northern Anasazi area. The Northern Anasazi includes the Virgin, Kayenta, and Mesa Verde Anasazi (Figure 1). The direct and/or indirect influence of both the Kayenta and Mesa Verde Anasazi can be found to varying degrees across much of southern Utah and northern Arizona, and it is these two groups which are assumed to have had the greatest influence upon the Virgin Anasazi. This, plus the fact that relative chronologies and a wealth of architectural information are available for these areas, makes the Kayenta and Mesa Verde areas excellent yardsticks from which to compare Virgin area architecture. For this analysis, the Virgin area was subdivided into Upper (southwestern Utah) and Lower (Nevada) Virgin, to provide a better prospective on variability within the Virgin Anasazi region (for now, too little is known of the Arizona Strip area to include in this analysis). The Mesa Verde area likewise was separated into the Central (southwestern Colorado) and Western (southeastern Utah) Mesa Verde, since an abundance of comparative data from both areas is available. Architectural information was drawn from published

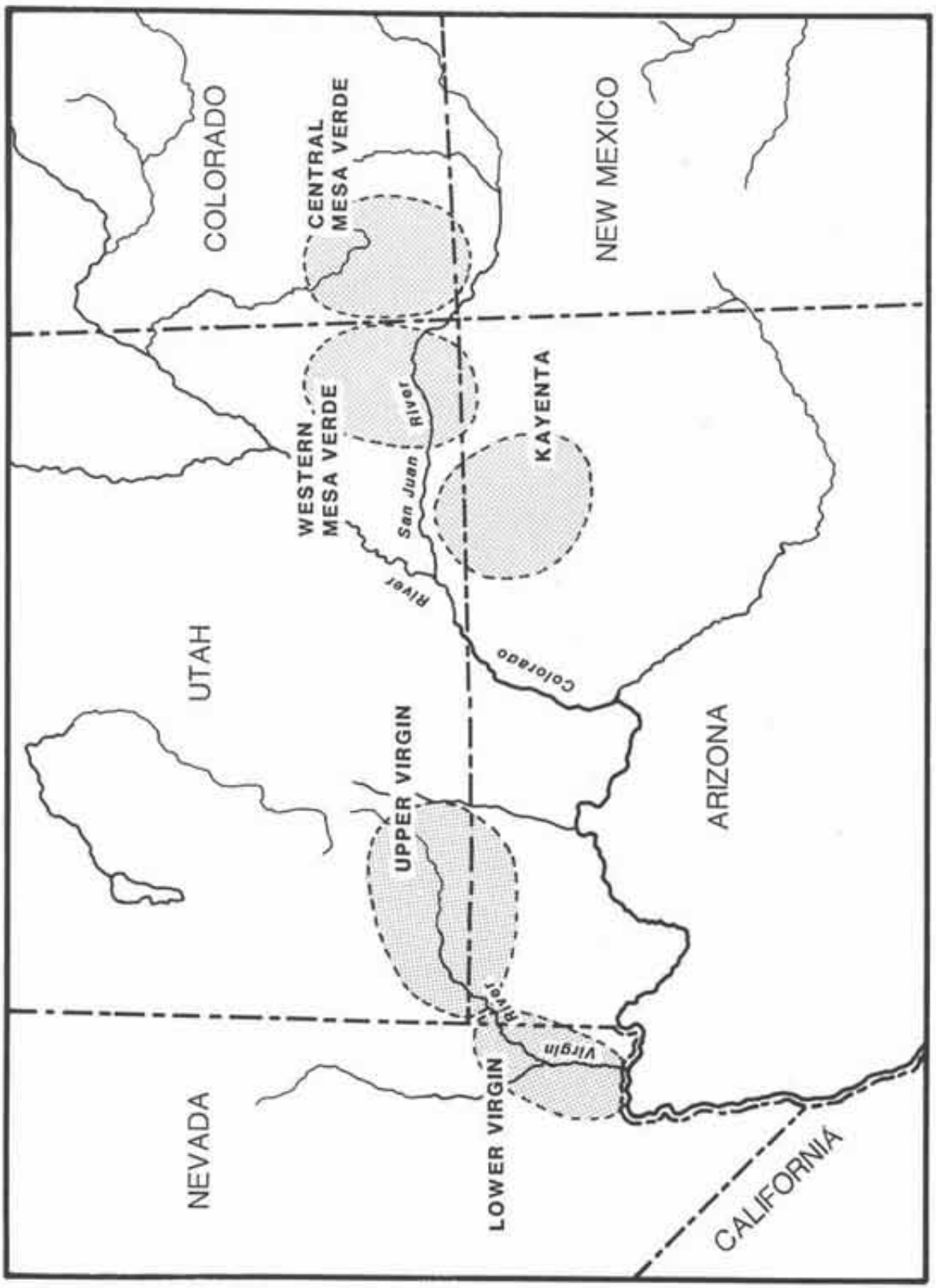

Figure 1. Central areas of the Northern Anasazi cultural subdivisions described in the text.

sources representing the central areas of the five subdivisions described in the text. The primary references for each of these subdivisions are summarized below.

Upper Virgin

Numerous excavations have been carried out in or very near the upper Virgin River drainage (Billat 1990; Dalley and McFadden 1985, 1988; Walling and Thompson 1988; Walling et al. 1986; Thompson 1980; Nickens and Kvamme 1981; Allison 1990; Schroeder 1955; Aikens 1965, 1966; Day 1966; Gunnerson 1962; Pendergast 1960; Wade 1967). Unfortunately, absolute dating has been attempted only in the most recent excavations, and then with often limited success. Still the overall data set is sufficiently large to permit general comparisons with other Anasazi areas.

Lower Virgin

Information from the lower Virgin River drainage (Lyneis 1986a, 1986b; Lyneis et al. 1989; Myhrer 1989; Jenkins 1981; Shutler 1961; Wade 1967) is somewhat sparse, with data on architectural variability only recently beginning to increase. Adequate dating of most sites is still lacking. The area, however, appears sufficiently distinct architecturally from that of the Upper Virgin to provide a comparative sample.

Kayenta

The Black Mesa project (Gumerman 1970; Gumerman et al 1972; Gumerman and Euler 1976; Klesert 1978; Klesert and Powell 1979; Powell et al. 1980) and a few additional survey and excavation projects (Lindsay et al. 1968; Ambler et al. 1964; Ambler and Olson 1977; Stein 1984), have succeeded in refining localized architectural styles for the central Kayenta area. Likewise, chronology is fairly well established.

Western Mesa Verde

In addition to Brew's (1946) classic study on Alkali Ridge, more recent work on or near White Mesa (Agenbroad et al. 1981; Davis 1983; Davis et al. 1985; Talbot et al. 1982; Lindsay 1981; Nielson et al. 1985), and to the east in Montezuma Canyon (Wilde and Thompson 1988; Thompson et al. 1988; Christensen 1980; Nielson 1978; Harmon 1979; D. Miller 1974; B. Miller 1976; Patterson 1975;) have greatly increased the data base on Anasazi sites in southeastern Utah. Chronology is well-developed, although certainly not to the extent of the nearby Central Mesa Verde area.

Central Mesa Verde

The recent Dolores Archaeological Project (Kane and Robinson 1986, 1988; Kohler et al. 1986) was the principal source for comparative data from the Central Mesa Verde area, although Mesa Verde proper (Hayes and Lanchaster 1975; Rohn 1971, 1977; Swannack 1969) and other nearby site reports (Gillespie 1975, 1976; Morris 1939) were also consulted. These reports generally present a wealth of detailed and chronologically tight information on architectural change.

TEMPORAL AND SPATIAL COMPARISONS

For reasons discussed previously, architectural forms vary considerably in the Virgin area, as well as in the Anasazi area as a whole. Still, we are dealing with a single cultural construct—the Anasazi—and general functional classifications should be expected to cross-cut regional boundaries. To demonstrate architectural temporal and spatial variability, this study will focus on three functionally distinct architectural forms: pit houses, kivas, and roomblocks. These structural forms represent the primary loci of habitation, ceremonial, and storage activities.

No other characteristic of Northern Anasazi pit houses, kivas or roomblocks demonstrates variability over time and space better or more clearly than does structural shape or form. This analysis, then, will address directly the regional evolution of structure shape. Local or regional variability in

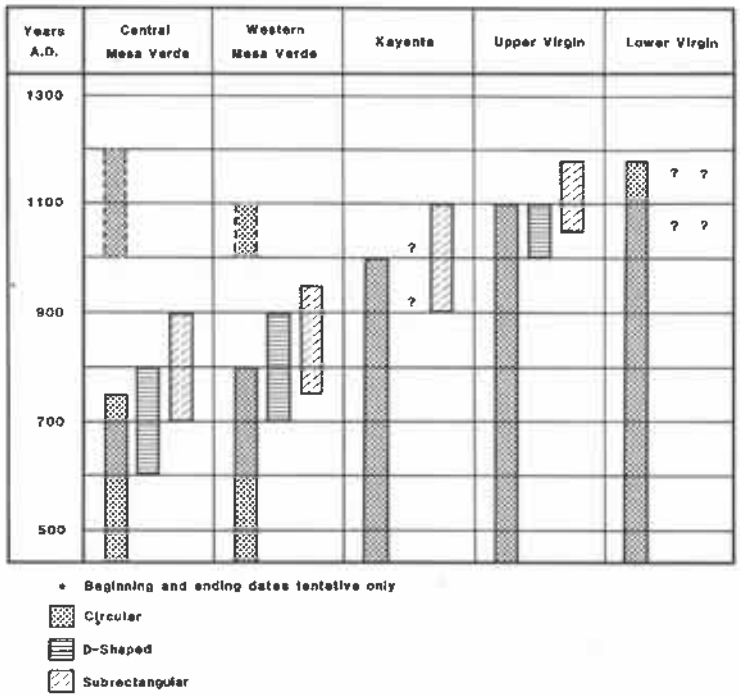

Figure 2. Temporal variation in pit house shape by region.

other characteristics (e.g., size, depth, wall or roof construction, etc.) or internal features (e.g., subfloor pits, vent shafts, hearths, etc.) likewise can illustrate architectural dynamics quite as well. Unfortunately, inherent complexities in site or feature descriptions and interpretations make some of these features more difficult to address at this level of analysis. A few of these, however, will be discussed briefly.

Pit Houses

Early pit houses in the Northern Anasazi area are basically circular in plan (Figure 2). Circular structures are found until ca. A.D. 750 in the Central Mesa Verde area. Distinctly D-shaped pit houses, however, appear ca. A.D. 600, and last until A.D. 800. Around A.D. 700 (possibly earlier) a subrectangular pit house shape also appears and continues in use for at least 200 years. The result of this change is an intriguing 200 year span (A.D. 600–800) where change from circular to D-shape to subrectangular shapes occurs. The A.D. 700–750 period in particular demonstrates extreme diversity. Some circular structures present during the succeeding A.D. 900–1000 period are identified by Kane (1986) as more closely related to kivas. Circular pit houses reappear between A.D. 1000–1200; however, these are likely seasonal field houses, having been constructed with little effort (Kane 1986).

The changes occurring in the Central Mesa Verde area are reflected to varying degrees in other areas. The Western Mesa Verde area has circular pit houses to A.D. 800, D-shaped between A.D. 700–900 and subrectangular between A.D. 750–950. Possible field houses similar to those in the Central Mesa Verde appear at least between A.D. 1000 and 1100. The Kayenta area saw the continued use of circular pit houses until A.D. 1000. Subrectangular structures appear ca. A.D. 900.

The Upper Virgin area shows much the same transitional pattern as other areas, with circular structures occurring at least until A.D. 1100,

D-shaped structures between A.D. 1000 and 1100, and subrectangular structures appearing ca. A.D. 1050 (Figures 3 and 4). The Lower Virgin area appears to use the circular shape until abandonment. Although no D-shaped or subrectangular pit houses are described in published sources, Shutler (1961) mentions their occurrence in limited numbers.

Kivas

The transition from pit house to kiva appears to be temporally variable across the Northern Anasazi area (Figure 5). Generally, what most excavators are comfortable with calling a true "kiva" is recognized in the Central and Western Mesa Verde areas as early as A.D. 875-900. Slightly later, perhaps around A.D. 950, kivas begin appearing in the Kayenta area. Limited evidence from the Upper Virgin area includes a questionable kiva, with indeterminant but possibly early dating, from Zions Park (Schroeder 1955; see Fairley 1989:131-135 for a discussion), as well as post-A.D. 1050 kivas from Little Creek Mountain and the Kaibab Paiute Reservation (Walling and Thompson 1988; Thompson 1980), at Colorado City (Gardiner Dalley, personal communication, 1990), and further to the east at Bonanza Dune (Aikens 1965). No acceptable evidence for kivas has yet been presented for the Lower Virgin area.

Like pit houses, kiva development exhibits evidence of change in shape through time. Early Central and Western Mesa Verde area kivas are basically circular, with a somewhat crude construction. Kivas with recesses (keyhole-shaped kivas) appear as early as A.D. 1000, although they become much more common in the A.D. 1100-1300 period. Square kivas are rare but present in the Mesa Verde area ca. A.D. 1200-1300. A variation commonly found during the later period is a keyhole-shaped kiva within a square outer frame, typical of cliff dwellings and larger open pueblos.

Kayenta area kivas are essentially circular (or occasionally D-shaped) until at least ca. A.D. 1100. Keyhole-shaped kivas become common after this time. Some square kivas appear ca. A.D. 1200-1250, with recesses present at least by A.D. 1250-1300.

The few possible Virgin Anasazi kivas appear to be circular only. Evidence of keyhole-shaped or square kivas has yet to be found, at least in the upper and lower Virgin River drainages (although the Arizona Strip area may yet reveal such forms).

Roomblocks

Surface roomblocks, like pit houses and kivas, demonstrate a wide range and variety of forms through time and space. In general, evolution of certain distinctive styles can be traced through much of the Northern Anasazi area (Figure 6).

The precursors to surface roomblocks at the earliest Anasazi sites are circular or oval, slab-lined subterranean cists. The cists may be either non-aligned and randomly placed, or in distinct clusters. Often, although not always, these cists are situated somewhere between north and west of the pit house(s). Later the cists are aligned in a slight crescentic arc.

Cists are followed by surface slab, jacal or adobe rooms, still in somewhat of an arc. As time progresses, these crescentic roomblocks can become quite elaborate, with masonry construction becoming dominant, and with shapes that range from a C-shape to a horseshoe or D-shape, and even a full circle. Crescentic and linear roomblocks are contemporaneous for a long period of time throughout the Northern Anasazi area, and it is not uncommon to find sites that utilize both styles or even blend the two styles in one pueblo construction. Like the crescentic form, linear roomblocks are at first quite simple, consisting of a simple line of two or three rooms. This form is then expanded to include L-, V- or U-shaped pueblos, with jacal rooms often utilized as the wing portions of this expanded style. Late in the Anasazi period these linear units often become fully square or rectangular pueblos, with storage rooms, habitation rooms and kiva(s) all in an enclosed unit.

The review of Northern Anasazi roomblock evolution is here divided into two parts: roomblock

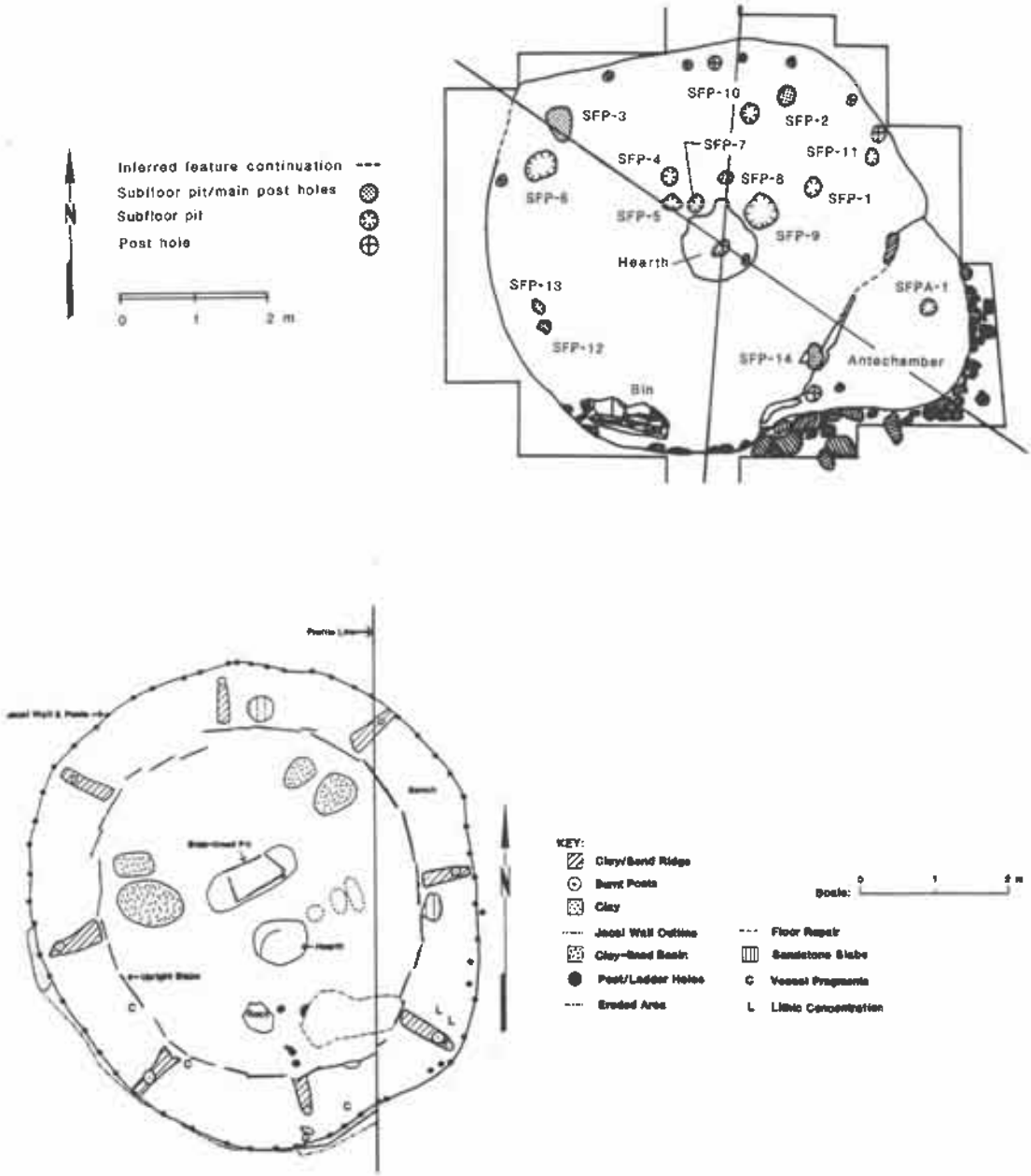

Figure 3. Examples of Early Virgin Anasazi pit houses. Top: 42Ws326, ca. A.D. 650–750 (Billat 1990). Bottom: 42Ws388, ca. A.D. 800–850 (Walling et al. 1986).

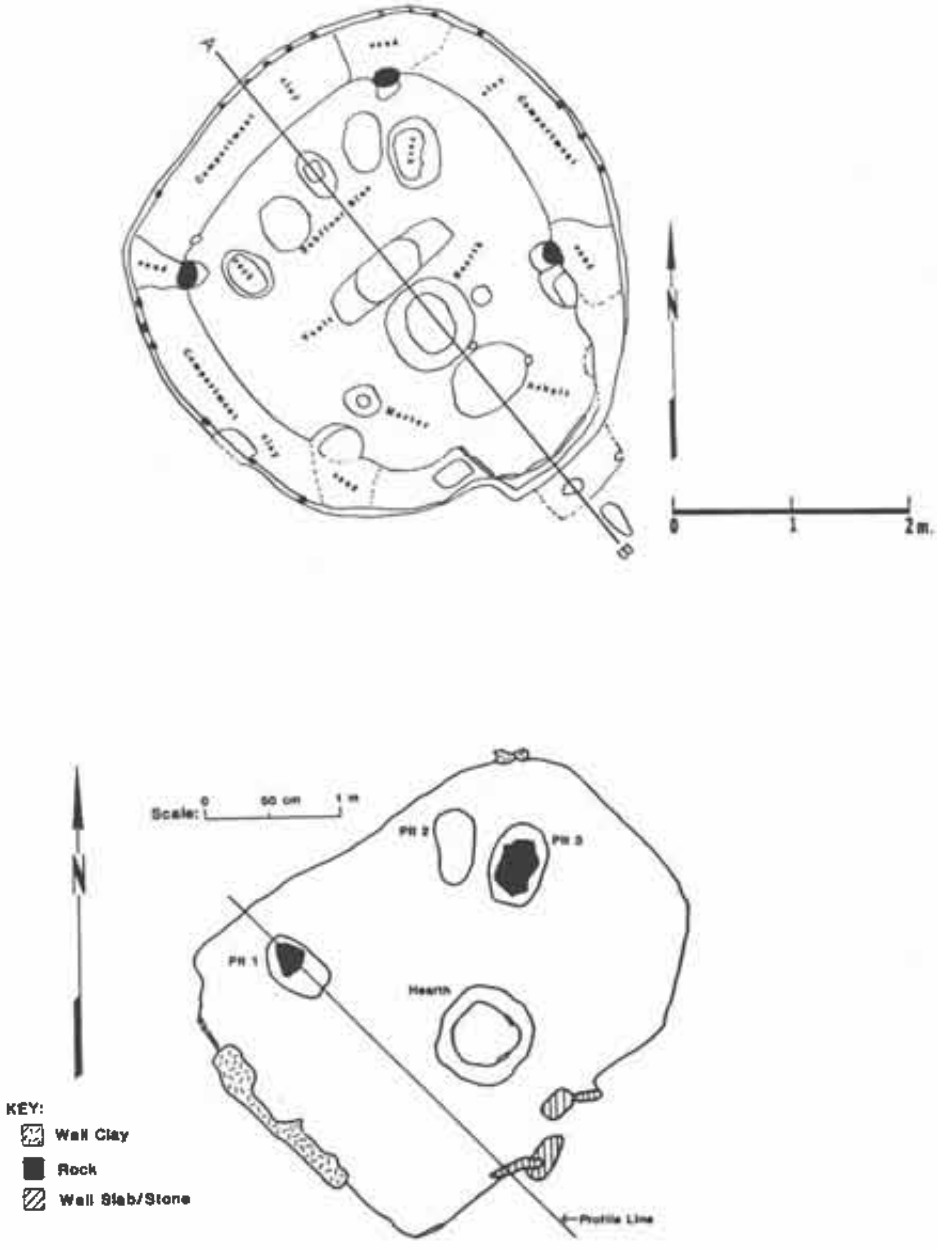

Figure 4. Examples of Later Virgin Anasazi pit houses. Top: 42Ws1346, ca. A.D. 1000–1050? (Dalley and McFadden 1988) Bottom: 42Ws395, ca. A.D. 1100–1150 (Walling et al. 1986).

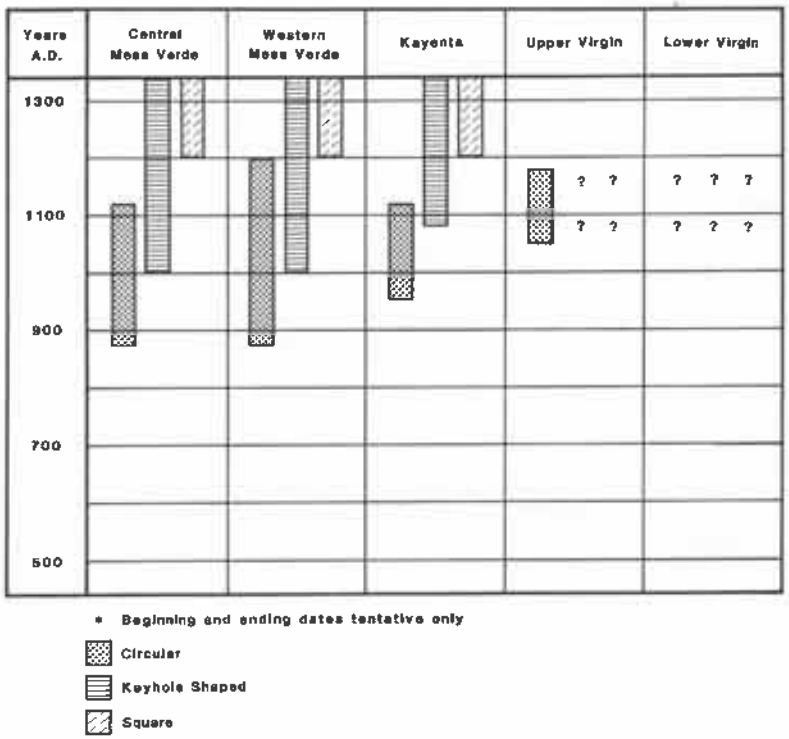

Figure 5. Temporal variation in Kiva shape by region.

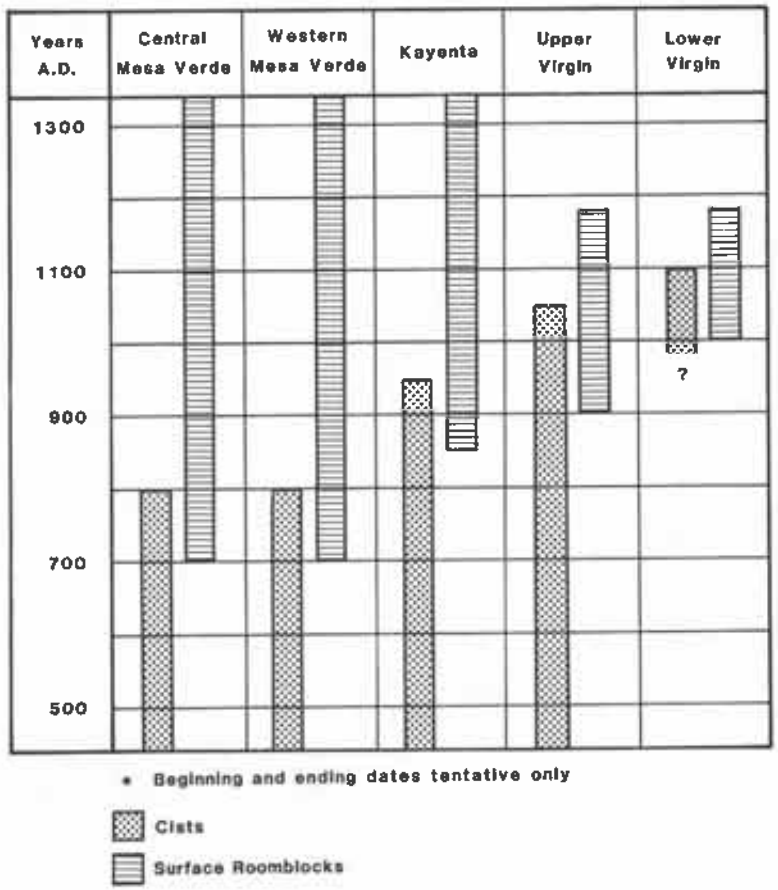

Figure 6. Temporal variation of cists and roomblocks by region.

alignment and room function associations. The first addresses directly the different forms Northern Anasazi roomblocks may take, while the second describes regional variability in the storage room/habitation room relationship, which directly affects structural form.

Roomblock Alignment

Cists are common in the Central and Western Mesa Verde areas until ca. A.D. 750–800. However, beginning ca. A.D. 700–750, surface rooms appear, sometimes scattered and sometimes in definite arcs. The early crescentic roomblocks (although apparently less common in the Western Mesa Verde) continue in use and become increasingly complex (to C-shape or horseshoe shape) until ca. A.D. 900–1000. After that time crescentic pueblos become much less common than the more formalized linear pueblos. Still, a few impressive D-shaped or other crescentic forms can be found. Linear roomblocks, on the other hand, appear at about the same time (A.D. 700–750), but by A.D. 900–1050 tend to become very formalized in L-shapes. By A.D. 1150–1250 U-shapes as well as some fully enclosed units are being utilized.

The use of cists in the Kayenta area continues until ca. A.D. 900–950, while scattered surface rooms appear at least by ca. A.D. 850. No indications of crescentic roomblocks were found in the available literature of the study area, although such roomblocks are present on the Paria Plateau in the transitional area between the Kayenta and Virgin areas (Mueller et al. 1968). Definite linear construction styles appear at least by A.D. 950 as well-developed single line, L- or V-shaped forms. By A.D. 1050 a U-shape is being utilized as well.

The Upper Virgin area appears to utilize scattered, clustered and/or contiguous cists up until ca. A.D. 1050 (Figure 7). By A.D. 900 some locations (specifically the St. George Basin) begin utilization of a linear form of roomblock, at least contemporaneously with, if not earlier than, crescentic roomblocks (Figure 8-top). Both styles continue in use until abandonment. The more complex U-shaped linear units appear only late in the Anasazi occupation of the area. Circular-shaped (including horseshoe, D-shaped or nearly full-circled; Figure 8-bottom) sites probably best represent late occupations, although they may be utilized as early as A.D. 900–1050 (i.e., ZNP-3 [Schroeder 1955] and some sites to the south on Yellowstone Mesa [Jim Allison, personal communication 1990]).

Again, extensive site information is lacking for the Lower Virgin. A small number of cists dating roughly to the A.D. 1000–1100 period have been found. Whether external cists were used before then, or whether pit house interior storage received greater emphasis, is unknown. Roomblocks appear at least by ca. A.D. 1000–1050. The early roomblocks, like those of the Upper Virgin, seem to be both linear and crescentic. Thereafter, crescentic forms seem to quickly become dominant.

Habitation and Storage Rooms

A discussion on the functional development of roomblocks is beyond the scope of this analysis. Still, from a purely formal view, the differences in roomblock development are intriguing. Specifically, the habitation room/storage room relationship can be shown to have developed two or three distinct forms, depending on the location within the Northern Anasazi area.

Some of the first surface habitation rooms to appear in the Central and Western Mesa Verde areas are formally separated from the storage units. By ca. A.D. 750, larger habitation rooms begin to be placed in front of the smaller storage rooms, especially in the larger sites. This pattern is generally maintained throughout later puebloan development in these areas.

In contrast to the Western and Central Mesa Verde, the Kayenta area developed a distinctive habitation-storage room ground plan. As roomblocks developed, surface jacal structures were at first separate, and then incorporated into the roomblocks. However, instead of being placed in front of the masonry storage rooms, jacal (and occasional masonry) habitation structures are more commonly placed at the ends of the roomblock, either as the "wings" in a distinctive U-shape, or as

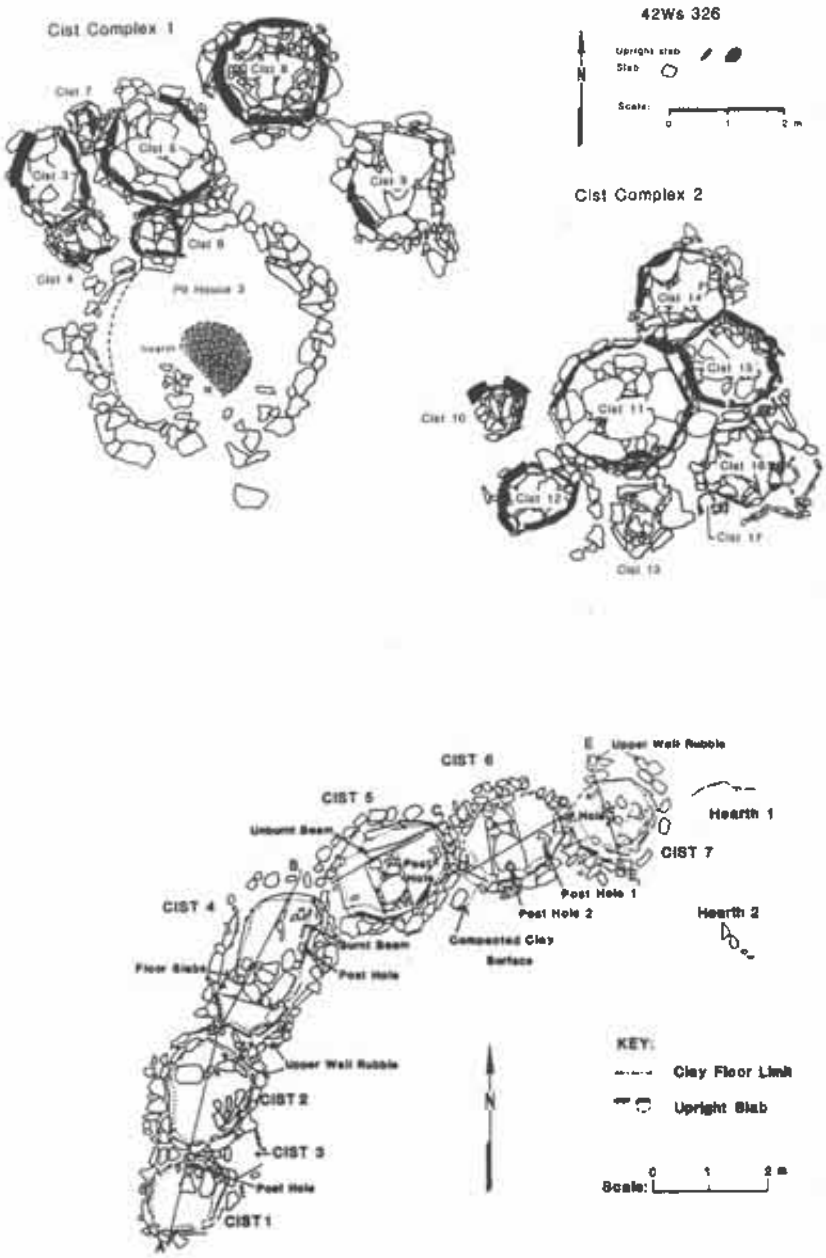

Figure 7. Examples of Virgin Anasazi cists. Top: 42Ws326, ca. A.D. (Billat 1990). Bottom: 42Ws388, ca. A.D. 800–850 (Walling et al. 1986).

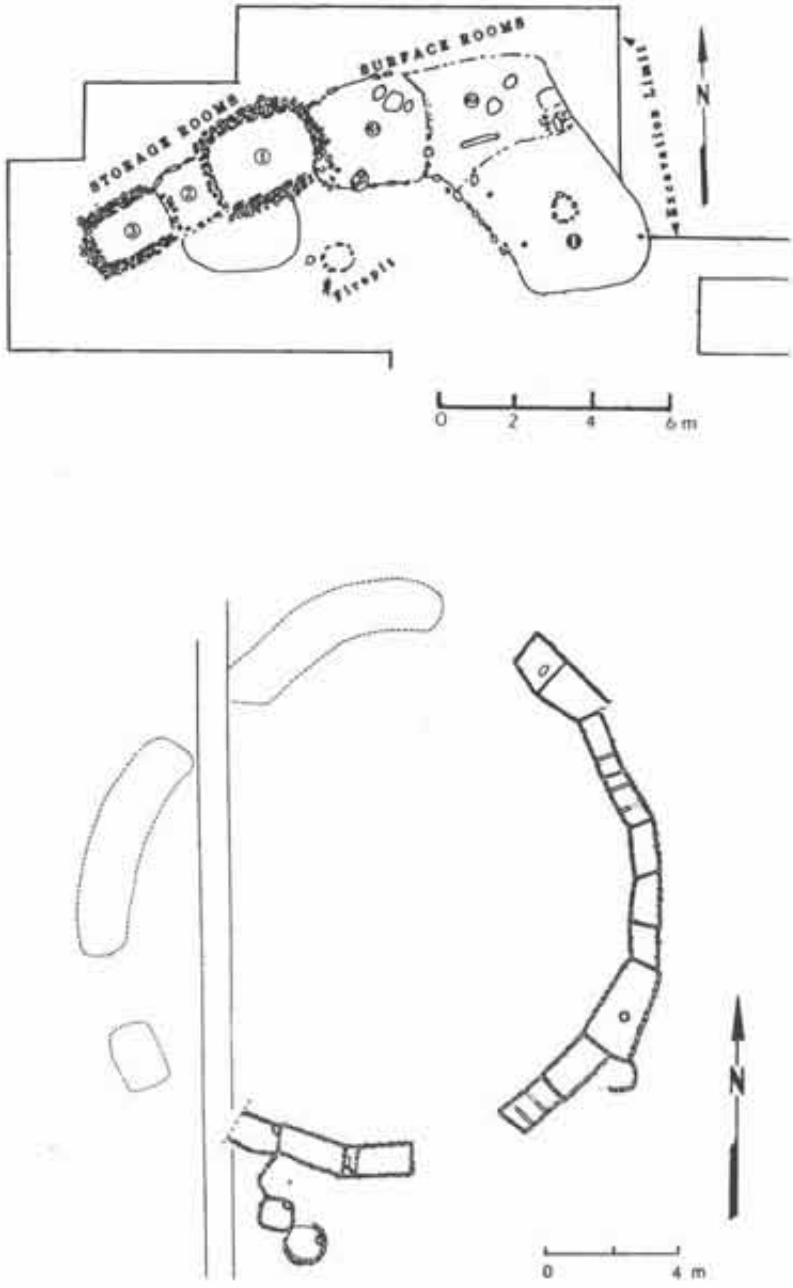

Figure 8. Examples of Virgin Anasazi surface roomblocks. Top: 42Ws1346, ca. A.D. 1000–1050 (from Dalley and McFadden 1988). Bottom: 42Ws50, ca. A.D. 1050–1150? (Aikens 1965; metric scale and north arrow added).

the circular-to-subrectangular ends to a bar-bell or baton shape. Often a group of habitation rooms are found in a linear arrangement, separate from the storage units. The equally distinctive Kayenta mealing room is typically set in an area to the northeast of the kiva/pit house, in front of or next to the roomblock.

Small to medium-sized Upper Virgin roomblocks tend to follow the general pattern of the Kayenta area, with jacal or masonry habitation structures often attached to the end(s) of the storage structure alignment (Figure 8-top). Many sites incorporate the habitation rooms into the actual roomblock alignment interior (see Figure 8-bottom). Lower Virgin sites are similarly constructed, with jacal wings, end and/or interior roomblock habitation rooms. Alignments of habitation rooms only are also known for later (A.D. 1000s-1100s) occupations.

Internal Features

Although structural shape is one of the best demonstrators of temporal and spatial architectural variability, other characteristics or features can also provide valuable comparative data. Unlike structural shape, however, comparisons of these features can be rather challenging, especially when such features are present in some structures, but not in others. Likewise environmental constraints such as ground conditions and materials availability, and interpretational variability by area researchers can mask the true nature of these features or characteristics. As a result, beginning and/or ending use dates of many of these features are still somewhat obscure, as are reasons for their apparent randomness in occurrence. Still, general temporal and spatial variability was noted in some of these features as this analysis progressed, and it was felt they could also provide important comparative data. To this end, observations on a few of these are made below.

Entrance/Ventilation

One of the most obvious features associated with Northern Anasazi subterranean structures is the entrance and/or ventilation system. Orientation is similar throughout the region, being primarily to the south or southeast. Antechambers persist until at least A.D. 700 in the central Kayenta area, A.D. 775 in the Central Mesa Verde, A.D. 850-900 in the Western Mesa Verde, and A.D. 950 in the Upper Virgin. In the latter area, however, most antechambers are recognizably distinct from those to the east, being little more than small recesses (see Figure 3-top and Figure 4-top).

Ventilator tunnels appear early in both the Western Mesa Verde and Kayenta areas around A.D. 600, and by A.D. 700 in the Central Mesa Verde. In the Upper Virgin literature vents are rare, although Walling and Thompson (1988:23) indicate they appear "frequently" in pit structures. Kivas also contain ventilator tunnels. Freestanding deflectors, common in both the Western and Central Mesa Verde areas, are somewhat more rare in the Kayenta area, and almost nonexistent in the Virgin area.

In contrast to the typical roof ladder entrance portrayed as common for Northern Anasazi sites, the Kayenta area began utilizing ramps in pit structures between A.D. 600-700. Upper Virgin pit houses, on the other hand, occasionally contain a step-slab, depression, or small recess against one wall, suggestive of a step entrance. Evidence is lacking from the Lower Virgin area for both ventilation and entrance systems.

Benches

The use of full, three-quarter, half or even smaller benches around subterranean structures is variable for the Northern Anasazi area. In the Central Mesa Verde, benches are common in pit houses between A.D. 600-800, but are less common after that. By contrast, benches are rare in both Western Mesa Verde and Kayenta pit houses. The Upper Virgin area use of benches was common, although certainly not prevalent, beginning at least in the A.D. 600s, and likely continuing until abandonment (see Figure 3-bottom and Figure 4-top). Some Lower Virgin pit houses also apparently contained benches, at least early on (e.g., Shutler 1961). The use of benches in kivas is much

more common across most of the Northern Anasazi area, often being the norm rather than the exception.

Wingwalls

Wingwalls are slab, adobe or occasionally jacal separation walls extending from the side walls inward toward the hearth. They appear in early Central and Western Mesa Verde sites by A.D. 600–650. Wingwalls may occur for only a short period (ca. A.D. 600s–700s) in the Kayenta area, and apparently not at all in Virgin sites.

Platforms

Platforms are small triangle-shaped areas usually created by low adobe ridges extending out from the pit house hearth to a wall (usually either the southern or eastern wall). Although the term platform suggests a raised area, it seems more often to be at or even below floor level. These are found in the Western Mesa Verde area as early as A.D. 750, and at least by A.D. 850–900 in the Central Mesa Verde. Examples from the Kayenta area date roughly between A.D. 600–850. The entry boxes in later Kayenta surface habitation rooms may also be variations of this feature. The Upper Virgin area began utilizing platforms ca. A.D. 1050. This feature has yet to be noted in the Lower Virgin area.

Vaults

Vaults, also often identified as ceremonial vaults, magic pits or as footdrums, are rectangular to elongated oval, often slab-lined, deep pits or trenches located near the hearth. These pits are usually either capped with adobe or exhibit evidence of wood roofing. Their presence in later well-developed kivas in the Central and Western Mesa Verde suggest that these are ceremonial features.

Vaults may appear in the Central Mesa Verde area ca. A.D. 775–850 or earlier, in either a position lateral to, or less frequently behind, the hearth. Interestingly, only one or possibly two early (ca. A.D. 750–900) vaults could be located in the entire Western Mesa Verde area, although they become more common in later times. Vaults may be present in some Kayenta pithouses by A.D. 800–850. However, in this latter area the vault is exclusively situated behind the hearth. The Upper Virgin area also contains evidence for vaults as early as A.D. 800–850, in the same position (behind the hearth) as in the Kayenta area (see Figure 3–bottom and Figure 4–top). Again, no recognizable vaults are present in Lower Virgin structures.

Sand-filled Pits

Oblong to almost rectangular sand-filled pits in Northern Anasazi pit houses are often referred to as warming pits or heating pits (and may be occasionally confused with floor vaults). The sand is usually very clean, although charcoal and rocks or slabs may be present.

Sand-filled pits are found in a moderate number of pit houses as early as A.D. 650–700 in the Central and Western Mesa Verde areas. Individual pits may be found between the hearth and a side wall. When two are present they are usually located on opposite sides of the hearth, parallel to each other. Kayenta pit houses do not contain warming pits, at least not in a recognizably regular shape or pattern as in the Mesa Verde area. Many Upper Virgin pit houses (possibly as early as A.D. 800–850), on the other hand, contain groups of from 2–5 oblong-to-rectangular pits. Rather than being located on opposite sides of the hearth, however, these pits are distinctively situated near the back wall, often in an arc and pointing toward the hearth (see Figure 3–bottom and Figure 4). As with the Central and Western Mesa Verde pits, these are typically filled with clean sand and often capped by adobe. Many contain a stone slab in the fill or on the pit bottom. Such pits have yet to be reported in the Lower Virgin area.

Slab/Masonry Construction

Methods of wall construction are determined, to a large extent, by structural type, location, etc. For

example, slab-lining in a structure was often necessary to shore up slumping walls, while masonry construction may have been more practical for the deepest structures. Still, temporal and spatial variability are evident in the use of these construction methods.

Limited full or partial slab-lining (especially in antechambers), may appear as early as A.D. 650–700 in the Western Mesa Verde area, yet not until A.D. 850–900 in the Central Mesa Verde, and then only occasionally. In kivas the slab-lining may front the bench, or the wall above the bench. Slab-lining is occasionally found in Kayenta pit houses (examples in the study area date to ca. A.D. 850–900, although they may occur earlier), but becomes more common when combined with masonry construction in kivas. Slab-lined (or occasionally boulder-lined) pit houses in the Upper Virgin area are common beginning ca. A.D. 600–700, although in many cases the slab-lining is partial only (see Figures 3 and 4). Full or partial slab- or boulder-lined pit houses are rare but still present in the Lower Virgin, apparently contemporaneous with those in the Upper Virgin area.

The use of formal masonry in subterranean structures appears almost exclusively limited to kivas, with its introduction corresponding to the appearance of kivas in each of the Northern Anasazi areas discussed above. The only exceptions are a few pit houses from the Dolores area dating between A.D. 840–900. Since the dating coincides closely with the appearance of kivas, it is possible this initial use of masonry reflects the transition from pit house to kiva that is happening at this time.

DISCUSSION

This analysis has focused on demonstrating how spatial and temporal variability are reflected in Northern Anasazi architecture, with structural shape a prime example of that variability. The Virgin area follows, for the most part, the same patterns of architectural development as are present in the Kayenta and Mesa Verde areas. This is not, or at least should not be news to anyone familiar with the Virgin area (see, for example, Aikens 1966), and does not take away from the recognition of at least differing degrees of Virgin Anasazi "in situ development" (Dalley and McFadden 1988:277). Yet Virgin area research, including architecture, is increasingly presented from a decidedly introverted, isolationistic perspective. This seems, as much as anything, to be part of a defensive posture against characterizations of the Virgin Anasazi as a subgroup of the Kayenta Anasazi. The evidence presented here suggests that, just as certain architectural characteristics are indeed sufficiently distinct from those of the Kayenta (or Mesa Verde) area to support Virgin area taxonomic equivalency arguments, other characteristics directly or indirectly reflect significant outside influence. Therefore, while Virgin architecture can and should be studied internally, its regional context deserves as much if not more attention.

Perhaps the most striking aspect of this analysis is the evidence for temporal disparity in architectural change between the Northern Anasazi groups. The complacency of Virgin Anasazi architecture referred to by some researchers (i.e., Walling and Thompson 1988; Dalley and McFadden 1988) is likely a manifestation of this temporal disparity. Indeed, certain major architectural forms (e.g., kivas, D-shaped or subrectangular pit houses, surface roomblock construction) occur as much as 150–300 years earlier in the Mesa Verde area, and 50–150 years earlier in the Kayenta area. Other characteristics or internal features likewise seem temporally variable in their appearance in and across the Virgin area.

If a complacency exists within Upper Virgin architecture, it occurs prior to A.D. 900. After that time, surface roomblocks, then variation in pit house shape, and finally kivas appear. These all represent major changes which together reflect a dynamic period of architectural flux. Changes prior to A.D. 900 are less dramatic, but still evident. Pit houses, for example, display significant internal variability. Vaults, warming pits and likely numerous other internal features were often incorporated into pit house construction during this early period, while randomly placed cists became grouped or aligned in arcs. At the SR-9 sites (Billat 1990) pit house size, construction, and

internal features vary considerably, even though the structures are generally contemporaneous. Therefore, caution must be taken not to equate what may be an initial slow response to regional architectural developments with an absence of internal change in Virgin architecture. In a sense, Virgin as well as Northern Anasazi architecture was probably never truly complacent, but instead responded to, and was a manifestation of, individual, local, and regional variability.

The same evidence for Upper Virgin peoples adopting most Northern Anasazi architectural developments at a gradual pace is even more prominent in the Lower Virgin area. Lower Virgin subterranean structures seem to carry on the earlier, simpler styles for a much longer period of time, with little evidence of major shifts. Still, very little is known regarding the early Anasazi inhabitants of the lower Virgin drainage, and it seems likely that future research will show the architecture to be dynamic in its own right.

To this point the primary focus of this analysis has been on how Virgin architecture compares to that of other Northern Anasazi groups. Temporal disparity in the occurrence of many architectural features also suggests, in part, why architecture often appears different. Other factors likely are involved. Referring to complacency in the archaeological record, Dalley and McFadden (1988:277) suggest that "while some change may be from outside impetus, it is obviously well screened through a Virgin cultural filter." Fairley (1989:101) sees site type and settlement pattern diversity as reflecting general "adaptive flexibility," complemented by temporal differences and social factors. This analysis likewise sees a complex mixture of temporally variable internal and external influences, some stronger than others, that affect architectural development.

The complexity of influences on Virgin architecture can best be understood by examining the factors most likely to provide these influences. Nabokov and Easton (1989:16), expanding on Rapoport's (1969) work, have described six primary "modifying factors" for architecture: technology, climate, economics, social organization, religion and history. Each of these factors can affect the type, style and function of architecture at any particular time. For example, environment, maintenance concerns, subsistence intensification, population aggregation, and increased social integration are all commonly seen as possible major influencing factors in the Southwestern pithouse-to-pueblo transition (Gilman 1987; Hegmon 1989, 1990; Plog 1974; Wilshusen 1988b; McGuire and Schiffer 1983). Certain modifying factors may have greater impacts on architecture in particular places and during particular, often "critical," time periods, and one cannot assume or expect Anasazi groups in the Virgin area to respond to those factors or influences at the same time or in the same manner as groups in other areas.

Consideration of the factors described above should help in understanding why Virgin architecture seems to have changed at a generally slower rate than in other areas. Since the Virgin area contains basically similar environmental zones as are found in the rest of the Anasazi area, climate probably had the smallest direct effect on Virgin architectural change. Likewise, Virgin Anasazi history and religion appear generally to follow that of other Anasazi areas. Technology may have been a slightly greater influencing factor for Virgin architectural variability, not for a lack of basic knowledge of construction techniques, but rather in their application. This is most obvious in the Lower Virgin use of adobe and jacal rather than the masonry found more commonly in other areas. Still, this is more likely a reflection of the availability of construction materials than a purposeful attempt to be different (Lyneis 1986a). This leaves two remaining factors which are posited as having the most significant influence on Virgin architecture—economics and social organization.

Economically and socially, the Virgin Anasazi changed at a much slower rate than their counterparts in the Kayenta or Mesa Verde heartlands. Specifically, the large population aggregations, subsistence intensification and increased social complexity which took place in those areas did not occur as early or on nearly the same scales in the Virgin area, although Lyneis's (1986a) argument for the late emergence of corporate lineages suggests such changes were beginning to occur prior to abandonment.

Consequently, early simpler architectural forms were probably acceptable for a much longer period of time. The change in pit house shape, which Hunter-Anderson (1977) correlates with increased sedentism, occurs well after such changes in other Northern Anasazi areas. The construction of large pueblos, thought to be associated with increased subsistence intensification and demographic pressures (Gilman 1987), occur later and at much reduced levels in the Virgin area than they do to the east. Even the kiva, a primary focus of Anasazi social integration (Hegmon 1989), appears only late, and then somewhat rarely, in the Upper Virgin, and apparently not at all in the Lower Virgin. In sum, Virgin Anasazi architecture is in large part a product of the economic and social requirements of, and pressures on, the Virgin peoples, which in turn appear generally much less intense than in the rest of the Northern Anasazi area.

Although architecture reflects the gradual pace of economic and social change in the Virgin area, it cannot explain why these changes did not occur more rapidly. Still, more detailed analyses of Virgin architecture and its influencing factors can provide greater insights into Virgin Anasazi cultural development. At the very least, a change in perceptions of, and approaches to, Virgin architecture is needed. It is hoped that, in the process of defining area culture history and chronology, Virgin architecture does not become entrenched in normative characterizations such as Bullard's (1962:180) southwestern Utah "standard and specialized pithouse type." Rather than repeating generalizations about, or establishing set definitions of, Virgin architecture, we need to address directly the evidence of architectural change and variability through time and space, with an eye toward its origins and influences. Architectural studies also need to be better integrated into settlement/subsistence, paleodemographic, regional interaction, and social organization analyses.

Perhaps, then, what this paper is really crying out for is the need to not only recognize, but to begin treating architecture as a dynamic part of Virgin Anasazi life. The data base is growing rapidly (although some important past research data are still unpublished, and likely lie gathering dust on forgotten shelves), and before too long significant gaps in area culture history may be filled in. Architecture, as a prime distinguishing characteristic of the Virgin Anasazi, can and needs to be at the forefront of future research.

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Garfield County

BARRIER CANYON STYLE PICTOGRAPHS OF THE COLORADO PLATEAU. Part One: Hypothesis and Evidence for the Existence of Post Circa A.D. 1300 Panels

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ABSTRACT

The date most commonly accepted for the creation and temporal span of the Barrier Canyon Style rock art of the Colorado Plateau is the Archaic period (ca. 7500–1500 B.P.) (Schaafsma 1986:225). A hypothesis is developed here that states many of the Barrier Canyon Style panels were constructed in circa A.D. 1300 to 1600. The Barrier Canyon Style may have developed or been introduced onto the Colorado Plateau in the Archaic period, but evidence advanced to date supporting this theorization is based upon conjecture and inference. Evidence for the extension of the Barrier Canyon Style, nearly to the Pueblo Historic Period, was initially indicated by the presence in the panels of elements strongly suggestive of fox pelt pendants. The fox pelt pendant, a characteristic feature of the Kachina Cult of the southwestern Pueblos, has not been found in any archaeological context in the Pueblo area before circa A.D. 1500. It is believed that the Kachina Cult entered the Anasazi culture from the Jornada Mogollon between A.D. 1325 and 1350. The fox pelt pendant, apparently appearing about 150 years later, may have been incorporated into both the Kachina Cult of the Anasazi-Pueblo culture and the existing Barrier Canyon Style at about the same time. This appears plausible because of the proximity (and possible overlap) of the Barrier Canyon Style province with that of the Pueblo IV Anasazi. Evidence to support concurrent acceptance is the absence of any object comparable to the fox pelt pendant in all known rock art in Utah from all time periods except the Barrier Canyon Style. Additional detailed evidence is presented that supports the hypothesis. Included in this evidence is the first reported presence of bows and arrows in the Barrier Canyon Style, an apparent temporal relationship between the Barrier Canyon Style artists, and the early historic Pueblo artists, and parallels of the Barrier Canyon Style with the Kachina Cult.

INTRODUCTION

The existence of a unique style of prehistoric pictographs, limited in extent to the west central region of the Colorado Plateau, was first hypothesized by Schaafsma (1971). Schaafsma maintained that the style was distinct from that of the Anasazi, Fremont, or Numic inhabitants, and she provided a name for it: "The name Barrier Canyon Style has been chosen as an overall designation for these paintings after the tributary of the Green on which the largest number of the striking panels has been recorded" (1971:68).

A brief generalized description of Barrier Canyon Style was presented by Schaafsma, and is quoted here for the convenience of the reader.

> The dominant motif in the Barrier Canyon Style is the dark, tapering, immobile anthropomorphic form, painted in a dark red pigment. These figures are frequently ghostly in appearance, hovering in rows against a sandstone backdrop within arched alcoves and rock shelters. Isolated compositional groupings, centered on one or two large human forms, flanked by smaller ones or tiny birds and quadrupeds, as well as by zigzags or unidentifiable objects, sometimes occur. In other instances a number of these figures may be painted together as a group or arranged in long lines across the cliff. Large staring eyes, bulging heads, and the absence or near absence of arms and legs serve to emphasize the spectral aspect of these beings. Some border on the fantastic. Headgear may take the form of horns or "antennae" painted in delicate thin lines. Many figures wear a crown of white dots, and occasionally white dot patterns decorate their faces and bodies. Stripes and textilelike decoration are also depicted on the torso, as if robes were intended. Figures with arms may hold snakes or plants, and as

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> mentioned above, zigzags and small naturalistic portrayals of animals may occur at their sides. Some are accompanied by dogs [Schaafsma 1980:61-64].

In the above statement, and others quoted below, Schaafsma mentions only painted figures (pictographs). This is because only pictographs were known when the style was first defined. It was not until recently that extensive panels of Barrier Canyon Style petroglyphs (hammered or pecked) were reported (Manning 1986, 1987). Therefore, both pictographs and petroglyphs panels of Barrier Canyon Style rock art exist. Pictographs appear to be predominant in the Barrier Canyon Style. Both types of panels exhibit a variety of anthropomorphic and other forms. Not all figures, however, fit into these poorly defined categories. Many Barrier Canyon Style figures (as well as Fremont) are both painted and pecked and were constructed utilizing a variety of techniques.

An absolute date for the inception and temporal span of the Barrier Canyon Style has not been immutably ascertained, nor has the style been unequivocally ascribed to any culture. There are four reasons for this:

First, direct dating methods do not yet exist for the rock art itself. Promising analytical techniques (for example, accelerator mass spectrometry radiocarbon dating [Hedges and Gowlett 1986]) have not yet been attempted in dating the Barrier Canyon Style. Such procedures are destructive because they require removal of pigment and are, therefore, not acceptable under normal conditions.

Second, few Barrier Canyon Style sites that contain unique associations with distinctive or datable artifactual materials have been identified and investigated. Material remains adjacent to most of the few Barrier Canyon Style panels thus far examined, show mixed occupations; i.e., varied combinations of Archaic, Anasazi, and Fremont material (Steward 1941; Gunnerson 1957, 1969; Lucius 1976). Several Barrier Canyon Style sites have been visited by the author where the only surface materials present were lithics and Fremont ceramics. Gunnerson (1969:37) reports the presence of a moccasin fragment from a Barrier Canyon Style site in North Wash (42Ga443—The Moki Queen) that, "resembles Basketmaker II type described by Guernsey (1931:66-68)." The moccasin fragment was located below what was later designated a Barrier Canyon Style panel (Schaafsma 1971:77, 128).

An aceramic open site (42Sa17092—Salt Pocket Shelter), in close association with a single possible Barrier Canyon Style figure under a small overhang, was recently tested and yielded a date of 1750-1500 B.C. (Tipps and Hewitt 1989). The date was obtained from charcoal found in an unlined buried hearth. The figure consists of a red horizontal painted band from which descend thirteen vertical, tapering, red lines about 64 cm long. An indistinct pecked horizontal band 25 cm down from the top was pecked through the paint. No head or other appendages were visible. There are two problems with accepting this date as confirming an Archaic date for the Barrier Canyon Style: One, the figure type resembles the Chihuahuan Polychrome Abstract Style (Schaafsma 1972:61-71, 1980:49-55, see also plate 3) more than it does the Barrier Canyon Style. The Chihuahuan Polychrome Abstract Style is believed to predate the Basketmaker Period (Schaafsma 1980:54), therefore, the associative Archaic date at this site more likely supports this conclusion rather than an Archaic date for the Barrier Canyon Style. Two, as is true for the majority of material culture/rock art associations, and as was concluded by Tipps and Hewitt: "Based on limited testing it cannot be certain whether the site was occupied during more than one time period, nor whether the midden deposit, hearth, artifacts and date are associated with the Barrier Canyon Style pictograph." Data from this site then provides valuable but inconclusive information.

Before a firm cultural association for the Barrier Canyon Style can be derived under existing conditions, a statistically significant number of sites need to be located that contain either datable materials or artifact assemblages assignable to a specific culture. This has yet to be accomplished. The greatest difficulty in using associative dates is the uncertainty that the rock art was constructed by the people responsible for the material remains. This uncertainty is compounded when there are only a few associative dates, and when these dates conflict.

Third, a paucity of elements appearing in the Barrier Canyon Style, which would provide information to date the panels, has been reported (Schaafsma 1971).

Fourth, superposition, which has the potential of demonstrating that Barrier Canyon Style preceded (or postdated) other cultures, has not yet provided evidence that is irrefutable. This is because of the difficulty in assigning a cultural affiliation and a time period to overlying rock art figures. Superposition of rock art over Barrier Canyon Style is discussed below.

PREVIOUS RESEARCH

Various ideas have been expressed regarding the age of the Barrier Canyon Style. Most estimates place the creation and temporal span of the style in the Archaic period. Early investigators, however, placed the cultural association mainly with the Fremont, or occasionally derivative of, or associated with the Basketmaker (Morss 1931:39; Malouf 1941; Steward 1941; Gunnerson 1957, 1969:158-159; Taylor 1957; Lister 1959; Grant 1967:117). Schaafsma was the first to propose an Archaic date. She noted: "Because of the heavy emphasis on anthropomorphic representation, very few objects are portrayed in the paintings. It is of considerable interest that the bow and arrow, which is commonly represented in Fremont art, is absent in all recorded examples of the Barrier Canyon Style" (1971:129).

Citing this as evidence, Schaafsma concluded that the Barrier Canyon Style predated the introduction of the bow and arrow into southeastern Utah. She referenced the introduction of the bow and arrow as taking place, ". . . sometime between A.D. 650 to 700", which is in the Basketmaker III period. Also citing parallels to what are believed to be Archaic paintings along the Pecos River in Texas, Schaafsma tentatively concluded that: "The specific similarities between the Barrier Canyon Style and the Western Archaic Pecos River Paintings support the possibility that the Barrier Canyon Style artists were indeed participants in a wide-ranging Western Archaic Period rock art tradition, which was distinct from the Desert Culture rock art of the Great Basin" (Schaafsma 1971:131-135). In a later publication she refined this conclusion: "Comparisons of the Barrier Canyon Style with other rock art in the Colorado Plateau suggest that the Barrier Canyon Style falls late in the Archaic sequence. It may have been, in part at least, contemporaneous with the Anasazi Basketmakers to the south and a rough tentative dating between 500 B.C. and A.D. 500 is suggested" (Schaafsma 1980:70).

Schaafsma later revised this date for the Barrier Canyon Style extending it back even further: "Estimated dates for this art style fall somewhere between 2000 B.C. and A.D. 1" (1988:2). Schaafsma noted also that, "typological similarities between Barrier Canyon style painted anthropomorphs from the Great Gallery and clay figurines found in an early context in a nearby cave (Hull and White 1980:122-125) suggest that much older dates are possible, perhaps as early as 5500 B.C." (Schaafsma 1986:225). Recently Schaafsma (1990) reiterated this position. Schroedl (1989:16-17), also citing the resemblance of the same figurine (found in Cowboy Cave from a layer radiocarbon dated to about 4000 B.C.) to the Barrier Canyon Style, in addition to a growing mass of data showing an extensive Archaic occupation in the Canyonlands National Park region concluded: "Barrier Canyon rock art could be much older than Polly Schaafsma hypothesized. Perhaps it could be the oldest rock art in the Southwest, dating to as early as 6,000 to 8,000 years ago." As is shown above, the result of continuing inquiry has been to inexorably push back in time the date for the Barrier Canyon Style.

DEVELOPMENT OF HYPOTHESIS

The objective of this paper is to report on the development of a hypothesis that significantly alters the period established for the Barrier Canyon Style. The objective is also to provide additional detailed supportive evidence for the hypothesis. The hypothesis is that many, although not all, of the Barrier Canyon Style panels were constructed in circa A.D. 1300 to 1600 and is, therefore, not restricted to the Archaic and/or Basketmaker period.

This statement does not imply that all Barrier Canyon Style rock art was constructed between circa A.D. 1300 to 1600. Barrier Canyon Style rock art may have originated in the Archaic, but the date of the appearance of the first Barrier Canyon Style figure is unknown. Even the physical appearance of what would be considered the first Barrier Canyon Style figure is unknown. Evidence of a relationship between the Barrier Canyon Style and other Archaic styles of rock art present in Utah has not yet been shown to exist. For example, Glen Canyon Style 5 (Turner 1963), which occurs abundantly in southern and eastern Utah and which Turner (1971) believes to be archaic (dating 2000-6000 B.C.), should exhibit parallels to Barrier Canyon Style if it and the Barrier Canyon Style coexisted in the Archaic period. Additionally, if Barrier Canyon Style had its origins in the late Archaic, Glen Canyon Style 5 could be the precursor of the Barrier Canyon Style. Answers to these questions regarding the origin of the Barrier Canyon Style are unknown.

One of the major impediments to arriving at a clear understanding of the Barrier Canyon Style's origin, and what limits an analytical discussion of the Barrier Canyon Style, is the lack of a clear definition of what constitutes the Barrier Canyon Style. There are considerable differences and variations in the rock art being designated by various people as Barrier Canyon Style. A wide variety of anthropomorphic types have been assigned to Barrier Canyon Style affiliation. For example, Morss (1931) distinguished two different types of painted figures in two adjacent panels in eastern-central Utah. Both of these types were later designated by Schaafsma (1971) as Barrier Canyon Style. Explanations for these variations within the Barrier Canyon Style are unknown. They may indicate changes over time or area, different ethnic groups within the same culture, or functional differences. This paper is presented without attempting at this time to remove the obstacles discussed above. (The above subjects are now being researched for later publication; however, be referred to Schaafsma's description at the beginning of this paper.) Additionally, since the purpose of this paper is to present evidence for the extension of Barrier Canyon Style into circa A.D. 1300 to 1600, panels with evidence of earlier affiliation will not be discussed at length here. Limitations of space require that subject to be presented separately.

Fox Pelt Pendant in Barrier Canyon Style

The first possibility for determining the age of certain Barrier Canyon Style panels was from an object that was discovered in the panels. The pictographs in which this initial discovery was made are located in a side canyon of Barrier Canyon[1]. The site is designated by Smithsonian number 42Wn369, and is popularly named The Blue-Eyed Princess (Figure 1). This name originated because of an anthropomorph in the panel apparently with blue eyes (Figure 1c) (Gary Smith, personal communication 1973, and G. Smith 1976:147). Suspended from the waist of an anthropomorph in the panel is what appears to be a fox pelt pendant (Figure 1f).

The pendant appears in the pictograph as a wide painted stripe that begins at the area just below the waist of the figure. It is painted with the same pigment as the anthropomorph. The pendant continues downward at about a 20 degree angle out from the axis of the anthropomorph's body, and it ends below the anthropomorph's feet. The end of the pendant is divided into three points or elongated triangles. The center point is longer than the two adjacent points, and it curves away from the feet of the figure. I suggest that the long center point represents the tail of a fox, while the two adjacent points represent the feet of the fox. The pendant appears to be attached to the back of the anthropomorph, not to the side, because the anthropomorph's feet are pointing away from the pendant. An important feature (to be discussed below) is that the head and upper torso of the anthropomorph are portrayed in a different perspective from the legs and lower torso. While the lower part of the figure is painted in a profile view, the upper portion is painted in a frontal view. Apparently the Barrier Canyon Style artist(s) who painted this figure was not sufficiently advanced artistically to use correct perspective in drawing the human figure, or the artist purposely chose not to use correct perspective. Two other anthropomorphs in the panel may also have a fox pelt pendant

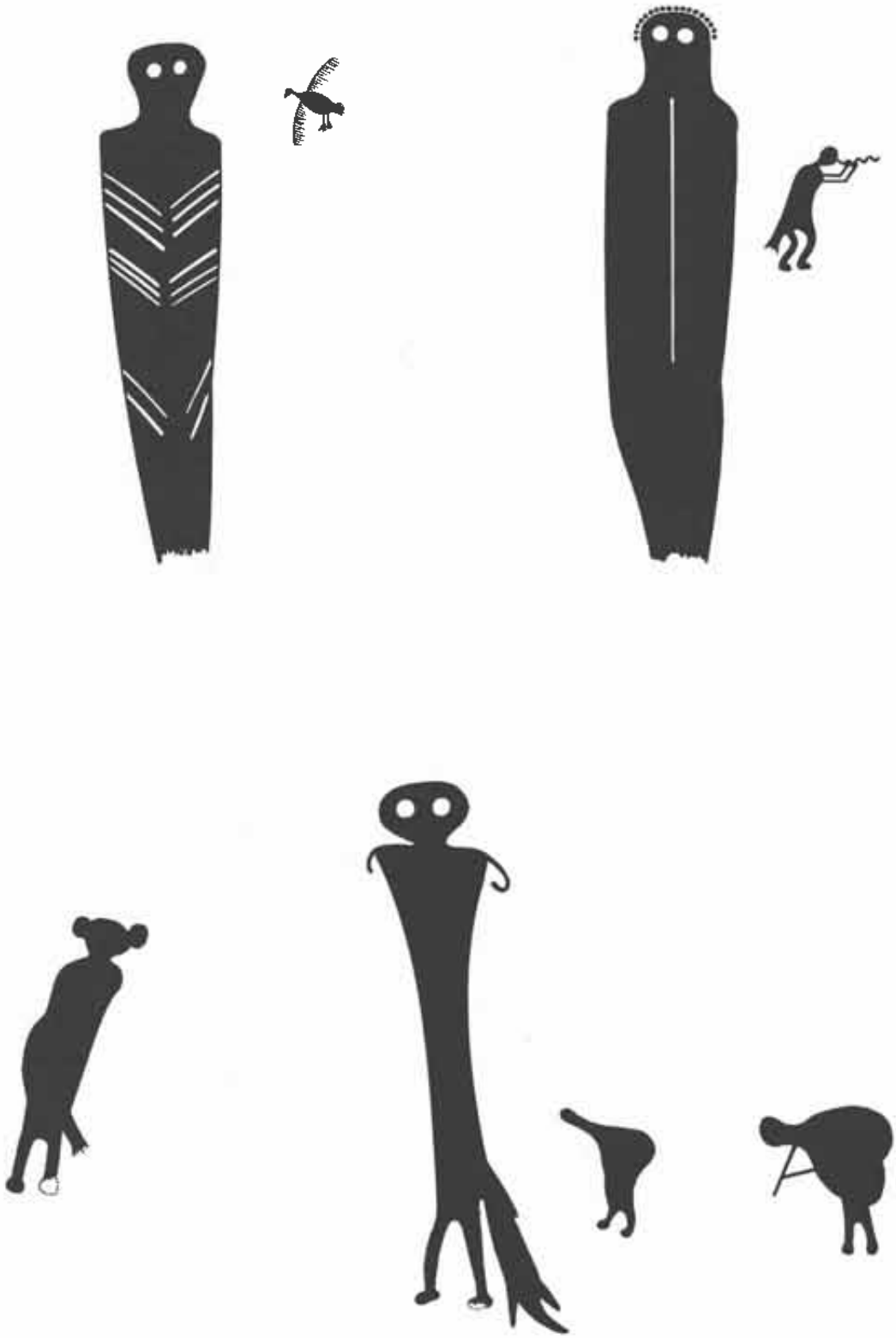

Figure 1. 42Wn369, "The Blue-eyed Princess" panel.

attached, but because of weathering the possible pendants are indistinct.

Fox Pelt Pendant at Other Utah Locations

Following the initial discovery of what appeared to be a fox pelt pendant at The Blue-Eyed Princess site, other Barrier Canyon Style panels were examined to determine if additional examples of the fox pelt pendant were present. Similar elements were found in pictographs in Barrier Canyon, Ferron Canyon, the San Rafael Reef, Canyonlands National Park, and Buckhorn Wash (Figure 2). This suggests, by association, that many of the Barrier Canyon Style pictograph panels with typological similarities to these panels may be temporally affiliated with the fox pelt pendant.

Alternative Explanations for the Fox Pelt Pendant

Alternative explanations for the pendant objects illustrated on Barrier Canyon Style anthropomorphs are almost nonexistent. Animal skins represent the main prospect. Animal skins were worn as clothing by most, if not all, prehistoric North American people, but they did not attach, or leave on their clothing, long cumbersome animal tails that touched the ground. Many of the Hopi drawings collected by Fewkes (1903) illustrate objects of clothing that apparently are animal skins. These have occasional dangling appendages, i.e., portions of the leg and tail skin. However, these objects of apparel appear to be robes. They are illustrated differently from the fox pelt pendants. It is easy to distinguish them. The pendant objects also do not appear to be animal tails alone, because the ends of the pendants are divided into three distinct parts. The fox pelt pendants are such a unique and distinctive feature that it would be difficult to misinterpret their representation in the rock art.

Additionally, other styles of rock art in Utah—for example, those that are identified as Fremont (Morss 1931; Schaafsma 1971; Hurst and Louthan 1979; Castleton 1978, 1979) and Glen Canyon Style 5 (Turner 1963)—have not been found to contain objects resembling in any way fox pelt pendants. Therefore, it appears that objects resembling the fox pelt pendants were not part of normal clothing, if normal clothing was illustrated on the human figures in the panels. A review of the literature encountered no object in the rock art record of the United States, outside of the Southwest, that contains an element resembling the fox pelt pendant (Jackson 1938; Heizer and Baumhoff 1962; Grant 1967, 1983; Hill and Hill 1975; Wellmann 1979; McKern 1983; Keyser and Sundstrom 1984; Faulkner 1986, and others). Therefore, the uniqueness and the clarity of portrayal of the fox pelt pendant allows a rather precise definition.

The Fox Pelt Pendant in Pueblo Context

The possibility of the presence of fox pelt pendants in Barrier Canyon Style pictographs is significant because the fox pelt pendant is a widely occurring, and often recorded, element in the rituals of the early historic Pueblo Indians of Arizona and New Mexico. It remains in use today. If a temporal relationship between the Barrier Canyon Style artists and the Pueblo people could be established concerning the development and period of use of the fox pelt pendant, the information could assist in determining a general date for the Barrier Canyon Style panels with fox pelts. The following describes the fox pelt pendant in Pueblo context and suggests the existence of a temporal relationship between the Barrier Canyon Style artists and the early historic Pueblo people. This relationship is based upon proximity and the presence of Pueblo IV material remains in Utah.

Occurrence

The fox pelt pendant, as an article of ceremonial adornment, appears widely in historic Pueblo rites. Its use is well documented by early ethnographers, and others, throughout the southwestern Pueblos, for example: Bourke (1884:37-38), Hopi; Mendelieff (1886:509), Mishongnovi; Dorsey and Voth (1901:42, 44, 45), Oraibi; Voth (1901:89), Oraibi; Hough (1902:6), Hopi; Dorsey and Voth (1902:220), Mishongnovi; Fewkes (1903:103), Hopi; Voth (1903:237, 306, 345), Oraibi; Voth (1912:65), Oraibi; Bunzel (1932:870,

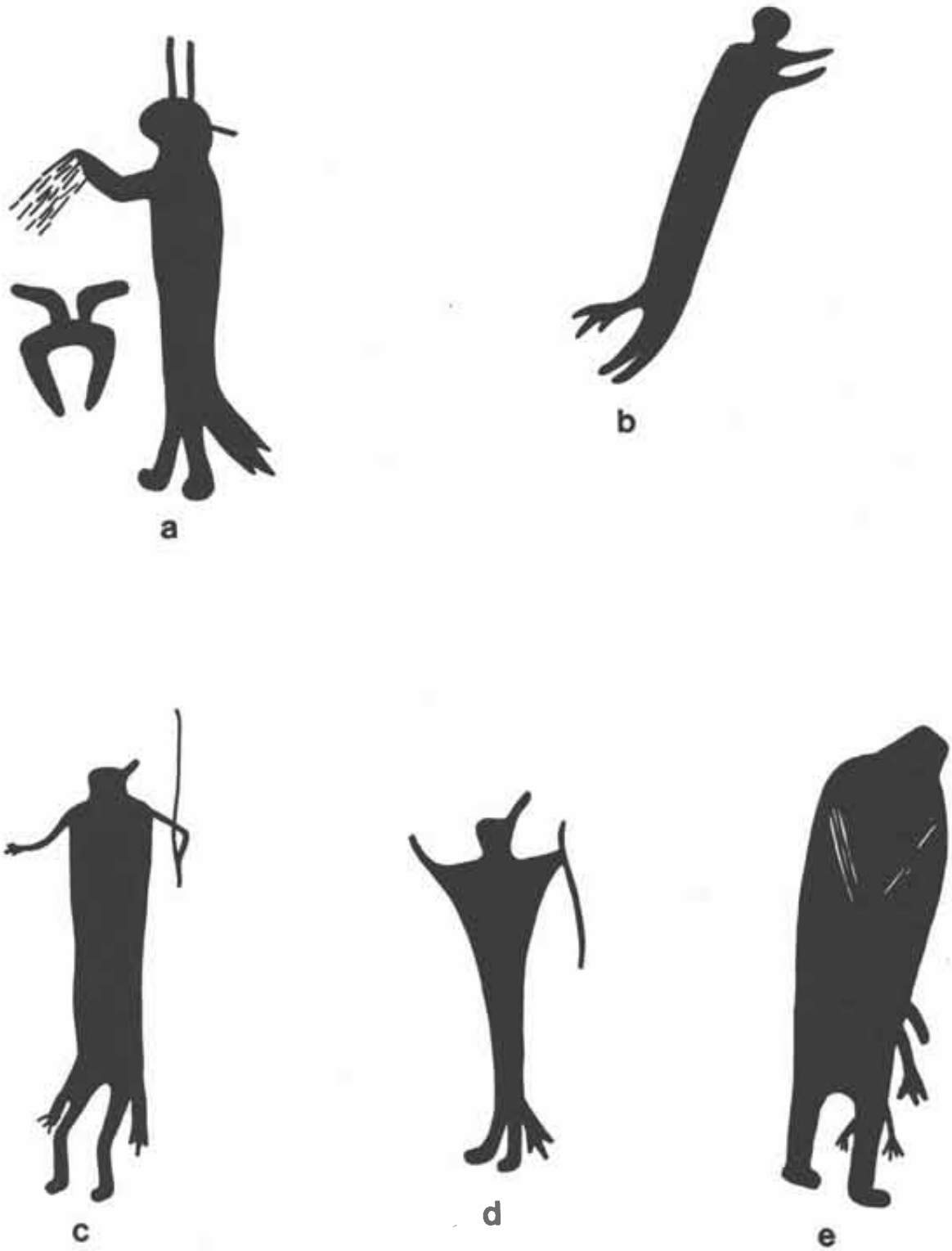

Figure 2. Barrier Canyon Style pictographs with fox pelt pendants: (a) San Rafael Reef, (b) Ferron Canyon, (c) Barrier Canyon, (d) Buckhorn Wash, and (e) Canyonlands National Park.

908, 920, 924, 936, 976, 1003, 1006-7, 1012, 1016, 1018, 1020-21, 1024, 1028, 1031, 1040-41, 1055-57, 1065, 1070, 1072-76, 1080, 1082), Zuni; White (1932:104, 115), Acoma; Stephen (1936:26, 28, 35, 114, 120, 167, 171, 174, 191, 207, 235, 242, 339, 359, 401, 409, 425, 440, 444, 474, 477, 486, 505, 531, 551, 570, 581, 708, 751, 754, 947, 974, 986, 990), Hopi; Keech (1937a, 1937b), Santa Clara; Parsons (1939:647, 648, 652, 666, 679, 682, 732, 773, 844, 851), Taos, Jemez, Walpi, Acoma, Zuni, and Shipaulovi; Roediger (1941:69, 136, 139, 182, 195, 200, 207, 213, 219, 220, 223, 224), Hopi, Zuni, Tewa; Titiev (1944:157, 166, 236), Oraibi. (These references are being cited to this extent for the convenience of the reader, since indexes are absent in many of the references.)

Description

Early writers observed that the fox pelt pendant was associated almost exclusively with kachina costumes, and that it was a primary characteristic of that ceremonial attire (Bunzel 1932:870; Parsons 1939:732; Roediger 1941:136). Virginia Roediger described the fox pelt pendant and its use in kachina ceremonies:

> A noticeable feature of many of the costumes is the pendant fox skin, worn tail downward at the back of the belt (pls. 24, 35). This particular fox, formerly indigenous to the mountainous country of the Pueblos, is a small animal with gray hair intermingled with amber. It was hunted during the season of the year when the hair was long and thick and the hide tough. When killed, the body of the animal was skinned very carefully and all the parts were retained: the paws remained on the legs, and the ears were kept on the full head covering. For several days previous to each occasion on which they are worn, the pelts are buried in damp sand in order to bring suppleness to the skin and a soft, live quality to the fur. In most of the ceremonies the men dancers wear foxskins (Roediger 1941:136-137).

Ruth Bunzel noted:

> A striking feature of the katchina costume is the fox skin, suspended by its head from the back of the belt. This is worn by practically all the dancing katchinas and many others. It is considered as a relic of the earliest days of man, for the katchinas were transformed while mankind was still tailed and horned (Bunzel 1932:870).

Thomas E. Mails observed:

> A fox skin with the hair left on hangs at the performers back and extends from the tops of the kilt to within a few inches of the ground. This is the katchina emblem, and it completes the standard katchina outfit. The tip of the fox head is either tucked under a roll of the kilt or tied to the kilt, and the body and tail hangs straight down. Usually, the skin is not decorated, but I have seen a few specimens that had the animal's four paws wrapped and decorated with yarn and special appendages (Mails 1983:110).

The animal whose pelt is used for the pendant is referred to throughout most of the literature as a fox. There are, however, a few references to the pelt as a "coyote-skin" and "wolf-skin" (Mendelieff 1886:509), and "coyote or fox skin" (Bourke 1884:160). Stephen indicates that the Hopi used both gray and yellow fox skins. For example: "Just at the small of the back, the head end of the skin of a gray fox (called pukya'ha'iini) is thrust in between kilt and girdle, the tail of the fox dangling back of the legs" (1936:401), and "Yellow fox (sikya'taiyo) hanging behind also" (1936:339). These references indicate the variability in the animal skins used. Roediger's description of the fox with "gray hair intermingled with amber" accurately describes the animal most commonly referenced.

Distribution and Proximity

The use of the fox pelt pendant appears limited in extent to the Colorado Plateau (with two known exceptions: Merriam [1962:35] and Bowen [1983:236],[2] both of which are within the realm of Pueblo influence [Dockstader 1985:4-6]). In the Southern Colorado Plateau fox pelt pendants appear to occur abundantly only in Pueblo kachina ceremonial context. In the northern Colorado Plateau fox pelt pendants have been found only in Barrier Canyon Style panels. This suggests that they may be temporally related (and perhaps also functionally related). Since both kachina ceremonies and the Barrier Canyon Style are in the same geographic province, and are in proximity to each other (and may even overlap), ideas and concepts could easily have been simultaneously shared or, at the very least, influence could spread from one to the other within a very short time.

The distribution of the Barrier Canyon Style and the speed at which Hopi people could travel are important points to consider in the diffusion of the fox pelt pendant. Barrier Canyon Style rock art has a greater distribution than as first defined by Schaafsma (1971:65-68, 128). Barrier Canyon Style rock art has been discovered in many locations in northern Arizona (Allen 1984, 1986, 1988; Manning 1985b; Schaafsma 1988, the Grand Canyon) and one location in northwestern New Mexico (Manning 1984:12, Chaco Canyon) (Figure 3). Additional sites are continually being found that expand the distribution of the Barrier Canyon Style. Thus the province of the Barrier Canyon Style and that of the Puebloan fox pelt pendant border on each other. Barrier Canyon Style rock art may exist within the boundaries of the historic Pueblos and the Kachina Cult. Information on the presence of Barrier Canyon Style rock art from this area is not available. Reliable statements, therefore, about the presence or absence of Barrier Canyon Style in these areas cannot be made at present. However, Barrier Canyon Style rock art occurs approximately 160 miles away from the Hopi mesas—traveling north, northwest or northeast.

The time required for an individual, or a small group, to travel from the Hopi mesas, for example, to the nearest Barrier Canyon Style site is a lot less than might be expected. Long distance running is an integral part of Hopi life, and apparently always has been. Mails observed:

> Males are trained for this from childhood, and they often run for miles across the boiling desert without resting. Many of the fields are long distances from the villages, and although pickup trucks are in vogue, some farmers still make the round trip there and back on foot in a single day. In former times a sixty year old citizen of Oraibi had a corn field forty miles away. During the planting and growing season he camped at the field, and whenever he made the journey home for supplies he ran the entire distance, going both ways in less than twenty-four hours. George Wharton James on several occasions engaged a young man to take a message from old Oraibi to Keams Canyon, a distance of seventy-two miles. The youth ran all the way, delivered the message, and brought back the message within thirty-six hours. One old Oraibi man of James's acquaintance ran over ninety miles in one day (James 1919:90-91). Fred Volz, a trader at Canyon Diablo and Oraibi, once hired a number of the best Hopi runners to round up wild horses for him. They gathered in not only the horses, but also deer and antelope (Mails 1983:16).

Barrier Canyon is about 175 miles due north of the Hopi mesas. If people traveled at rates like those above, they could be in Barrier Canyon itself in only three or four days. Even walking, a person could travel to Barrier Canyon in little over a week. Thus, the Barrier Canyon Style and the Kachina Cult of the Pueblos are not far apart in distance. Therefore, the concept and use of the fox pelt pendant could easily have been shared between the people or cultures in these two areas. This discussion is not meant to imply that the Pueblo people themselves constructed the Barrier Canyon Style rock art, only that the physical distance separating the two is minimal. (Physical evidence for the presence of late Pueblo people in the Barrier Canyon Style area is discussed below.)

Date for Development of Fox Pelt Pendant

If the date of the development or incorporation of the fox pelt pendant among the people of the Colorado Plateau could be ascertained, the information could form the basis for determining a "no-earlier-than" date for the construction of the Barrier Canyon Style panels with fox pelt pendants. The date of the introduction of the elements here interpreted as the fox pelt pendant into the Barrier Canyon Style area of the northern Colorado Plateau is unfortunately unknown. Since it is plausible that the fox pelt pendant could have been adopted at nearly the same time by both the Barrier Canyon Style people and the Pueblo culture, considering the proximity of the Barrier Canyon Style to that of the Pueblo Kachina Cult as discussed above, a determination of when the fox pelt pendant first appeared in kachina ceremonies may provide evidence for when the fox pelt pendant first appeared in Barrier Canyon Style pictographs. Unfortunately, the date for the first appearance of the fox pelt pendant in kachina ceremonies also has not been determined.

There is, however, information available that suggests an approximate date. The inception of the Kachina Cult into Anasazi religious ceremonials is suggested by Schaafsma and Schaafsma (1974) to have taken place between A.D. 1325 and 1350. (This date is without archaeological substantiation.) Since the fox pelt pendant is characteristic of the

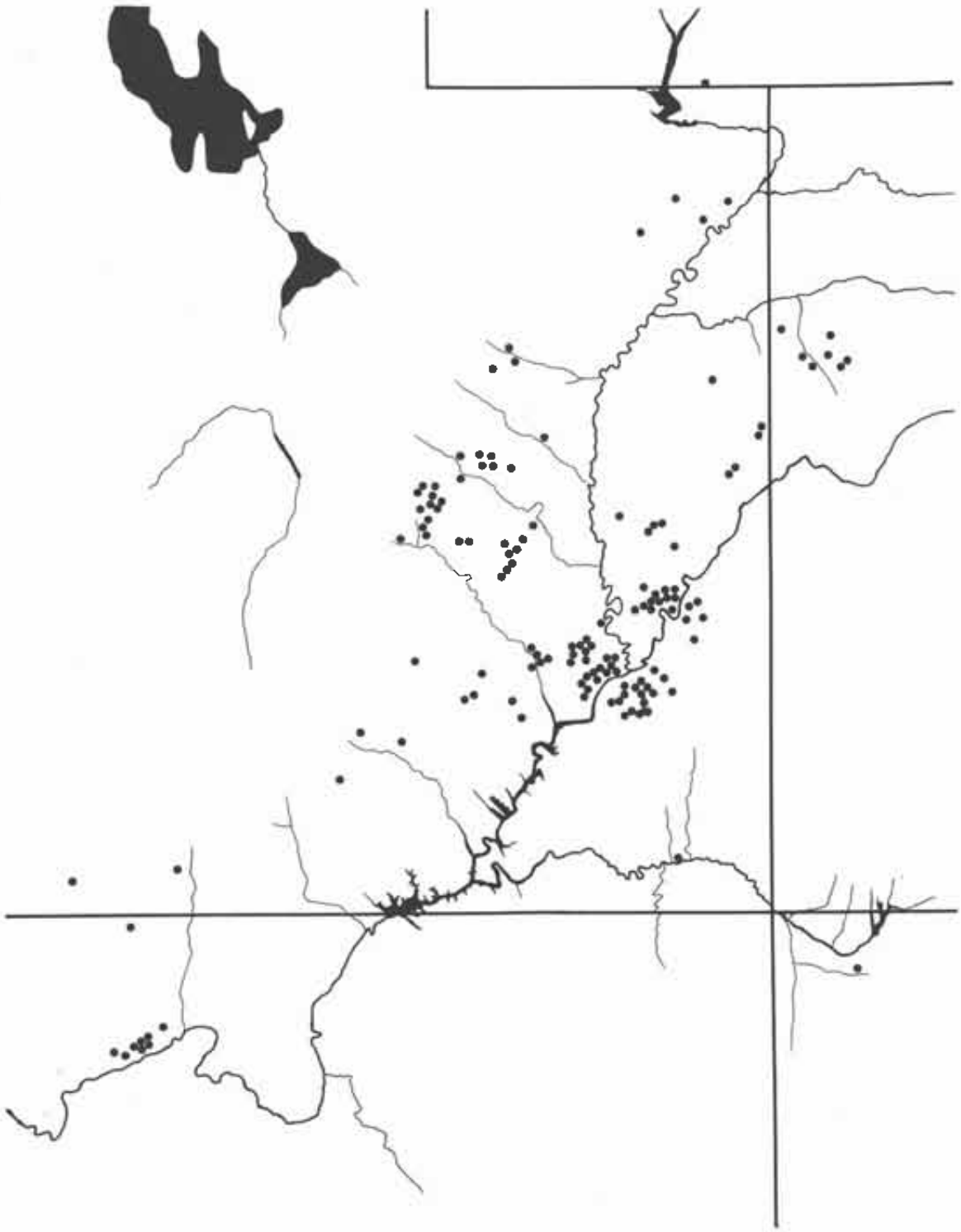

Figure 3. Distribution of Barrier Canyon Style rock art.

Kachina Cult, and if Schaafsma and Schaafsma's deduction is correct, its use would be expected to correspond to the introduction of the Kachina Cult, and thus be introduced at A.D. 1325 to 1350. However, the introduction of the fox pelt pendant into kachina ceremonial attire appears to have taken place, not at the cult's beginning, but during the efflorescence of these religious rites. Fox pelt pendants have not been reported as appearing in Pueblo IV kiva wall murals where kachina ceremonies are depicted. They do not appear in Awatovi murals that are dated by dendrochronology to circa A.D. 1300 to 1498 (W. Smith 1971:601) with final destruction at A.D. 1700 (Montgomery et al. 1949:20-24), Pottery Mound murals (Hibben 1975) dated circa A.D. 1300 to 1450 (W. Smith 1952:xii), nor Kuaua murals dated "between the late fourteenth and early sixteenth centuries" (Dutton 1963:22-25). Furthermore, no examples of fox pelt pendants appear on earlier elaborately decorated Sikyatki pottery (Fewkes 1919) nor on Mimbres pottery (found farther south) dated A.D. 1100 to 1200 (Brody 1977). Dockstader suggested an explanation for the paucity of kachina figures on ceramics: "There may have been a tabu against the decoration of utilitarian objects with religious figures" (1985:39). However, the difficulty of classifying ceramics as non-utilitarian and figures as religious or non-religious makes this statement difficult to substantiate. From the above information it appears that the fox pelt pendant did not become a part of the Pueblo religious ceremonies, at least in the areas where these sites and pottery occur, until sometime after circa A.D. 1500.

A statement made by Fewkes in 1895 supports both of the above observations. He stated in describing the Kokop, or Firewood people:

> They were late arrivals in Tusayan, coming at least after the Flute people, and probably before the Houani or Badger people, who brought, I believe the Katchina Cult. Although we cannot definitely assert that this cultus was unknown at Sikyatki, it is significant that in the ruins no ornamental vessel was found with a figure of a katchina mask, although these figures occur on modern bowls (Fewkes 1898:633).

Additional evidence for the incorporation of the fox pelt pendant into kachina ceremonies following the Pueblo IV period is found in the difference between Ololowishka (Ololowishkya or O'lolowicka) in his appearance in kiva wall murals at Kuaua (dated A.D. 1300-1500) (Dutton 1963:165-168) and his appearance at Zuni as recorded by Bunzel (1932). A conspicuous addition was a fox pelt pendant. Bunzel observed that elements of the costume consisted of, "white skirt, embroidered kilt, sash, red belt, fox skin" (1932:1007, also plate 33d).

Although the above information does not provide an exact date, it does suggest a time frame for the introduction of the fox pelt pendant into the Kachina Cult; and, therefore, by extension, into Barrier Canyon Style pictographs. Based upon this information, a general date for the appearance of the fox pelt pendant on the Colorado Plateau is post A.D. 1500. This information suggests that Barrier Canyon Style pictographs with fox pelt pendants were painted after circa A. D. 1500.

Location of Origin

The location of the origin of the fox pelt pendant is also, unfortunately, unknown. If the source of the fox pelt pendant could be ascertained, the information would be applicable to further refining the date for the Barrier Canyon Style. As indicated above, Schaafsma and Schaafsma have proposed that the influence of the Kachina Cult diffused from south to north: "Recent rock art surveys in Arizona and New Mexico have led us to propose that many modern Pueblo religious concepts and ceremonial institutions, including the Katchina Cult, either entered the Anasazi world directly from the Jornada Mogollon (Lehmer 1948; Marshall 1973) between A.D. 1325 and 1350, or were rapidly developed in response to the new ceremonial concepts from this direction" (Schaafsma and Schaafsma) 1974:535).

If this proposal is correct, and the fox pelt pendant was part of a Mogollon Kachina Cult, or was developed by the late Anasazi in response to Mogollon ceremonial concepts, then the incorporation of the fox pelt pendant into the Barrier Canyon Style pictographs would likely be later than its acceptance into the Anasazi-Pueblo Kachina Cult; since the fox pelt pendant concept most likely would have to travel through the Pueblo

area to reach the Barrier Canyon Style artists. However, if the fox pelt pendant originated with the Barrier Canyon Style artists (in response to new ceremonial concepts?), then the presence of the fox pelt pendant in Barrier Canyon Style rock art would predate its acceptance into the Kachina Cult. There is at present no evidence to suggest that the fox pelt pendant did not occur first in the Barrier Canyon Style area. In response to these limitations the exact date for the appearance of the fox pelt pendant on the Colorado Plateau cannot be ascertained with absolute certainty. It is likely that the time required for the diffusion of the fox pelt pendant, in either direction, could not be great because of the proximity of the historic Pueblos to the Barrier Canyon Style area. Therefore, the date for the beginning or occurrence of the fox pelt pendant is broadened to between A.D. 1300 to 1600.

SUPPORTIVE EVIDENCE

The above information provided initial evidence sufficient to formulate the hypothesis. There is also additional information that contributes significantly to the substantiation of the hypothesis. The remainder of this paper will cover this additional evidence.

The Fox Pelt Pendant in Pueblo Rock Art

Since Pueblo rituals contain fox pelt pendants, and since much rock art is believed to be ritualistic, it should follow that Pueblo rock art should contain evidence of fox pelt pendants. If the Barrier Canyon Style is related temporally to the Pueblo IV-early Pueblo V people, it should also follow that there would exist parallels of illustration and use of the fox pelt pendant in pueblo rock art.

This is found to be the circumstance. Hopi and Zuni petroglyphs and early historic paintings contain examples of fox pelt pendants, and parallels of illustration and use with the Barrier Canyon Style exist. A detailed discussion of one example is presented below.

A fox pelt pendant is illustrated in what appears to be an early historic petroglyph on Second Mesa in northeastern Arizona near the center of the present Hopi Tribal Lands (Figure 4). The panel contains an anthropomorph with a small animal positioned vertically below its waist. The animal is in the likeness of a coyote, a dog, or a fox. Its snout is just touching the anthropomorph's waist. The animal appears to be attached to, or hanging from, the anthropomorph's side because of the frontal view of the upper torso. However, the animal (which will here be called a fox, since that is most likely correct) is attached to the back of the anthropomorph. This is apparent because of the appearance of the anthropomorph's feet. They are drawn in a profile view, and are pointing away from the fox pelt pendant.

Schaafsma noted that the petroglyph on Second Mesa, "closely resembles the Hopi drawing of Tcakwaina, a warrior being, which is illustrated in Fewkes (1903:Plate IV)" and is, "probably rather recent" (Schaafsma 1980:293). This age estimate appears accurate because of the slight amount of patination on the petroglyph. The panel appears to have been constructed 100 to 300 years ago. Additional evidence for the construction of the petroglyph in early historic times is that the fox pelt pendant on the anthropomorph is depicted similarly to a fox pelt pendant in a Hopi painting from Fewkes's 1903 collection (1903:Plate XLI). This 1903 painting is a representation of the Tcub (Antelope) Kachina. The fox pelt pendant on the Tcub Kachina, like the Tcakwaina petroglyph (called that here for convenience), is positioned so the nose of the fox just touches the waist of the kachina. Ears also appear to be illustrated. The painting thus shows that an apparently unique, but limited method of illustrating the fox pelt pendant existed in the late 1800s on the Hopi mesas. A single person could easily have made both figures.

The significance of the Tcakwaina petroglyph is that it demonstrates that the lower portion of the fox pelt pendant (i.e., the legs and tail) on a Pueblo (Hopi) petroglyph is depicted identically to the fox pelt pendants on the Barrier Canyon Style pictographs. This equivalence also provides evidence that the element in the Barrier Canyon Style pictograph panel is a fox pelt pendant.

Figure 4. Teakwaina kachina, Second Mesa. (Drawn from a photograph, Scott Files, Peabody Museum, Harvard University.

Additionally, the Tcakwaina petroglyph is shown holding a bow and an arrow. This indicates that the use of the bow and arrow existed concurrently with the fox pelt pendant. (The association of bows and arrows with the Barrier Canyon Style is discussed below.)

One obvious difference is apparent between the Hopi petroglyph and the Barrier Canyon Style anthropomorphs. This is the additional detail shown in the Hopi petroglyph. The upper portion of the fox pelt in the Hopi petroglyph shows the front legs and ears while the Barrier Canyon Style pictographs do not. The additional detail shown in the rest of the Tcakwaina anthropomorph corresponds to the additional detail in the fox pelt on the petroglyphs. The characteristic of detail in illustration is representative of all the Hopi figures in Fewkes's collection. It is not surprising, therefore, that the fox pelt in the Hopi petroglyph is shown in more detail than on the Barrier Canyon Style anthropomorphs, even though the artists appear to be representing the same object.

While the fox pelt pendant on the Hopi petroglyph in the example above was depicted by showing details of the whole pelt, the most common method of illustrating the fox pelt pendant in the Hopi paintings is to portray only the tail and the two rear legs. Of the twenty-five paintings of kachinas collected by Fewkes that have a fox pelt pendant shown, twenty-three were drawn showing

only the tail and two rear legs. The Barrier Canyon Style artists illustrated the fox pelt pendant on their anthropomorphs in this same manner, i.e., they did not show the ears and front legs—at least none have been discovered so far.

In addition to the fox pelt pendant being positioned (at the waist and side) and terminated identically (in three elongated triangles) on both the anthropomorphs of the Barrier Canyon Style painting and the Hopi petroglyph, the feet of the anthropomorphs in both examples are also depicted identically. The feet are painted in a profile view and they point away from the fox pelt pendant. Additionally, both artists combined a full frontal view of the upper torso and head of the anthropomorph, with a profile view from the waist down to the feet. Both anthropomorphs then are portrayed analogously. The equivalent method of portrayal of the anthropomorphs by both artists, in addition to the presence of the fox pelt pendants, presents further evidence for a sharing of traditions between the Barrier Canyon Style artists and the Pueblo (Hopi) Culture. (Again, this could occur either through a contemporaneous association or a common origin.)

Geographic Context

The very position and nature of many of the Barrier Canyon Style panels suggest they are of recent origin. All the Barrier Canyon Style panels exist in exposed positions on cliff faces or on walls of rapidly eroding rockshelters or shallow caves. None have been found in deep stable caves that parallel the Paleolithic paintings in Europe. Since most examples of this style are paintings, the erosive properties of sand, wind and rain would rapidly erase fragile paint in exposed locations. They would weather many times more rapidly than petroglyphs. That these pictographs appear as distinct as they do in some of their exposed locations suggests that they are of recent origin. Additionally, rock art on rockshelter walls may disintegrate rapidly because of the continued processes of formation of the rockshelter. Rockshelters or shallow caves in sandstone exist most often because the material that previously filled the rockshelter disintegrated at a faster rate than the material surrounding it. This is primarily due either to a weakness in the material that formed the rockshelter or to the presence of excess moisture, which, as it freezes at or just below the surface, expands and breaks off small fragments of the rock. In these instances the pictographs are lost when the rock surface containing the pigment flakes off or exfoliates. The rate of formation of these rockshelters may be constant over long periods, following, of course, climatic conditions.

If the rate of deterioration of the surfaces containing Barrier Canyon Style figures could be determined, the information would provide data on the age of the panels. This has not been studied. However, rapid deterioration of several of these pictograph panels has been observed to have taken place since their discovery and documentation. If this deterioration has been occurring at a constant rate since the figures were constructed, then their considerable antiquity is seriously in question. Unfortunately, not many Barrier Canyon Style sites were known 40, 50, or more years ago. Thus photographs and documentation of unvandalized sites that could be used in a comparative way to determine rates of natural deterioration are nonexistent. However, there are many general observations that demonstrate that rapid rates of natural deterioration have occurred historically. Seven examples should suffice.

1. A zoomorphic figure, at a well protected Barrier Canyon Style site in North Wash, shows historically observed deterioration. The site is on the back wall of a large deep rockshelter or alcove. The panel is about 4 m above the ground, and thus well protected from casual abrasion and vandalism. The site, called The Moki Queen, was first reported and photographed in 1932 by Julian H. Steward (Steward 1941:Plate 128A). Although faded in comparison with the rest of the figure, four legs, ears and a muzzle could still be seen in his photograph. In 1979 no evidence remained of these features. Dr. Castleton describing the site said: "The other figure, also painted in red, has an oval body with a head and tail. It has been referred to as a dog, bird or six legged duck, despite the fact that no legs are visible!" (Castleton 1979:136, Figure 4.1).

2. The diminutive figures in a small and detailed painting in Horse Canyon have weathered so badly since E. J. Bird first copied them forty-nine years ago that they are now almost gone. The figures are at a panel called the Bird Site or Harvest Scene (Schaafsma 1971:Figure 77). Bird recorded them while working as an artist with the Utah Art Project (see below). The site is at the base of a high inward sloping cliff face formed by erosion and exfoliation.

3. Two anthropomorphs near the center of the panel called The Great Gallery in Barrier Canyon appear to have weathered extensively in the last fifty years. A comparison is possible because The Great Gallery (42Wn418) was accurately reproduced in 1940 by the Utah Art Project of the Work Projects Administration (WPA). Great effort was expended to accurately portray the figures (E. J. Bird, personal communication 1979; Anderson 1978). The painting is now on display at the University of Utah's Museum of Natural History. The two anthropomorphs on the cliff face that were faint when they were painted, are now so much more faded that they are almost indiscernible. This suggests rapid erosion. Several adjacent figures do not appear to have changed much in this interval. This is perhaps because the paint on the adjacent figures is thick enough that even weathering of 0.25 mm (for example) of the pigment would be difficult to distinguish in a photograph. Weathering of the thinner painted figures would, however, be easy to observe because removal of the same amount of paint—0.25 mm—would nearly destroy them. Pearl Baker, who grew up near Horseshoe Canyon and visited the site many times since her youth, provides additional information on the deterioration of the panel. She commented about The Great Gallery: "It seems to me that the figures are not as bright as they were forty or fifty years ago" (Baker 1976:152).

4. Comparison of photographs taken in 1968 by the author at Thompson Wash (a site located on a cliff face) with those taken in 1989, and a re-examination of the panel, show a general fading of the pictographs. This could be due to weathering over this 21 year interval.

5. A large Barrier Canyon Pictograph panel in a shallow rockshelter near the San Rafael River has been almost destroyed—just in the last 40 years. It has suffered extensive exfoliation. An individual from Castle Dale, Utah, whom I met while at the panel, saw the panel about 40 years ago when it was intact. At that time the panel was composed of three large animals, like dogs, with 20 to 30 human figures in two rows above the animals. Today almost nothing remains. He also said that once when he was passing the panel, he saw a large piece leaning out from the cliff just ready to fall. Sitting in the saddle of his horse, he rescued the piece of the panel and took it home with him to save it from destruction. Without his efforts, this piece of the panel would have shattered to small pieces when it fell from the back wall of the overhang. (If anyone observes a similar situation existing on public land today, they should report it immediately to the land managing agency.)

6. A previously extensive panel of Barrier Canyon Style pictographs in a shallow rockshelter near Green River, Utah, has suffered a similar fate as those above (Figure 5). An informant from Price, Utah, who provided directions to the panel, first discovered the remote site about 25 years ago. At that time the panel was almost complete. The elaborately painted figures have slowly been destroyed as the rock, on which the figures were painted, unremittingly exfoliated in small fragments. Today only a few small scattered remnants remain.

7. Sally Cole illustrates damage that has occurred to a panel of Barrier Canyon Style pictographs in the White River drainage in northwestern Colorado (Cole 1990:5, plates 3 and 4). The deterioration of the panel is shown by a photograph taken before 1987 and one taken after 1987. The latter photograph shows that three figures at the eastern end of

Figure 5. Spalling Barrier Canyon Style pictograph in rockshelter near Green River, Utah.

the panel have been almost completely obliterated. Other adjacent figures have suffered moderate erosion. Cole (1990:199) also indicates that similar deterioration occurred at another panel in northwestern Colorado (between 1976 and 1986), which "may represent art of Fremont people remaining in the area after A.D. 1250-1300." She indicates "that the paintings could not have survived more than a few centuries," yet Cole does not derive this same conclusion regarding the Barrier Canyon Style panel that is also undergoing comparatively rapid deterioration.

These seven examples of historically observed natural deterioration—in roughly the last 50 years—show that these Barrier Canyon Style pictographs have, and are, rapidly undergoing various forms of degeneration. The examples also suggest that natural deterioration is occurring under different environmental conditions. The apparent rate of deterioration and the appearance of these Barrier Canyon Style Pictograph panels today suggests that they were painted in the very recent past. It is unlikely that they could have survived 6,000 to 8,000 years of the same rate of deterioration.

Additionally, no evidence exists to suggest that these sites are being rapidly impacted by certain modern environmental conditions such as acid rain, auto exhaust, etc. Only two of the sites discussed above are near paved roads, and all but one are in sheltered areas protected from the impacts of potentially acid rainwater. Also, many of the Barrier Canyon Style pictographs are in remote, infrequently visited, wilderness locations. Of course, like other rock art panels from a variety of other cultures and periods (for example, Fremont and

Ute), there are Barrier Canyon Style pictograph panels that appear as if they were painted within the last few years. These panels are in well protected locations that are not subject to rapid deterioration.

Fox Pelt Pendant Incorporation into Barrier Canyon Style

There are also Barrier Canyon Style panels that do not contain fox pelt pendants as anthropomorphic attire. This may be attributable to differences in subject matter. However, another possible explanation for this omission in some panels is that the same situation existed among the Barrier Canyon Style artists as existed with the Anasazi-Pueblo in regard to their utilization of the fox pelt pendant. The ceremonies involving the Barrier Canyon Style may have already been established before the incorporation of the fox pelt pendant. (This idea does not conflict with the hypothesis.) Substantiating the suggestion that the fox pelt pendant was incorporated into Barrier Canyon Style rock art painted after A.D. 1300 is the observation that there appears to be a distinct difference between Barrier Canyon Style pictograph panels where fox pelt pendants are illustrated and those where they are not. The difference appears to be that at sites where fox pelt pendants occur there is also the abundant use of white paint. The white paint is used as a main feature of adornment. It occurs principally as rows of dots on the head and torso of anthropomorphs. At panels where the fox pelt pendant is absent, white paint is usually absent.

Further evidence suggesting that a time difference is associated with the use of white paint is found in Canyonlands National Park. Under a deep overhang, white Barrier Canyon Style figures are superimposed over faded, weathered-appearing, red Barrier Canyon Style anthropomorphs (Owen Severance, personal communication 1984) (Figure 6). The white figures superimposed over the plain red figures appear to be evidence of changes in the Barrier Canyon Style over time. White paint, principally in the form of rows and columns of dots, handprints, wavy lines, and occasionally anthropomorphic figures painted completely in white paint, occur at nearly every Pueblo II-III site with masonry structures in the Canyonlands area. In most instances white paint appears to have been used exclusively. In conjunction with this observation it appears that one specific figure—white painted handprints—exist at nearly all Pueblo II-III structural sites in and around the Canyonlands National Park area. (No statistics have yet been compiled to indicate the actual percentage of structural sites with these features.)

The above evidence suggests that the abundant use of white paint occurred in this area during the Pueblo II-III period. Therefore, the Barrier Canyon Style artists may have been present during the Pueblo II-III period where they also began to use white paint extensively. Following this incorporation they then may have painted some figures exclusively in white paint, as the completely white Barrier Canyon Style figures suggest. Another Barrier Canyon Style Panel in white paint is present a few miles east of Canyonlands National Park. These white painted figures suggest the possibility of using the presence and non-presence of white paint as a broad temporal indicator for later Barrier Canyon Style rock art, and even more likely for Pueblo II/III petroglyphs. Additionally, if this difference could be substantiated, then there is a possibility that Barrier Canyon Style could be divided into two separate styles or sub-styles. Statistical compilations of the occurrence of white paint and fox pelt pendants, along with investigating possible stylistic differences associated with the use of white paint, needs further study before any firm conclusions can be reached.

Barrier Canyon Style as Pictographs

Perhaps another indication of a late date for many of the Barrier Canyon Style panels is the observation that they are almost exclusively elaborate paintings (pictographs). Very few are hammered or cut into the rock surface (petroglyphs). A gradual change in the nature of Pueblo graphic arts, which appears to have taken place in the Pueblo III through IV periods, may account for this general difference. The development of the kiva wall paintings is proposed to be responsible for this change. The first kiva wall paintings appear to develop at approximately

Figure 6. White Barrier Canyon Style pictographs superimposing faded Red Barrier Canyon Style pictographs.

A.D. 1000--in the Pueblo II period (A.D. 800 to 1100). Four early kiva wall painting sites with accurate dates in this period are: (1) Alkali Ridge, Utah (Brew 1946), (2) Near Cortez, Colorado (Prudden 1914), (3) Mancos Canyon, Colorado (Jackson 1875), and (4) Chaco Canyon, New Mexico (Ingersoll 1877). It is perhaps significant to note, in view of the above discussion concerning white paint, that most early kiva wall paintings are done in white paint. Kiva wall paintings gradually grew in complexity as they spread throughout the Pueblo region. They appear to culminate in the artistic, intricate, and beautiful paintings of circa A.D. 1300-1600 such as those located at Pottery Mound, Awatovi, Kuaua, and Kawaika-a.

The introduction and efflorescence of kiva wall paintings appears to have led to the development of greatly improved painting techniques: fine detailed lines, great complexity, pigments of many different colors, etc. These techniques exist at later kiva wall painting sites but not at earlier sites. Some Barrier Canyon Style pictographs exhibit these same characteristics. The same colors are also used; i.e., reds, oranges, greens, purples, whites.

As kiva wall painting became an accepted and established practice in the Pueblo areas, the concepts and technology may have spread to the Barrier Canyon Style artists. They then could have shifted almost completely from pecking, incising, and chiseling to painting. Additional evidence for this change is the apparent lack of intricacy and ornateness in the petroglyphs of the Pueblo III/IV period when compared to earlier petroglyphs. It appears that the ceremonially related artistic

endeavors of the people became redirected, presumably from rock art to kiva art, as the kiva evolved into a ceremonial center. Kiva wall painting was at its peak in the 1400s through the 1600s when it is theorized that the Barrier Canyon Style pictograph panels with fox pelt pendants would have been painted. Thus, there may have been a parallel development in artistic techniques among the Barrier Canyon Style and Pueblo kiva art or a major influence from the Pueblo, indicating some relationship between the two groups.

Superposition

The principles of stratigraphy also apply to rock art. Superposition is a primary indicator of the relative age of rock art styles and types. When figures are constructed over the top of others, it indicates that the last ones added are the most recent. There is, however, a significant limitation to the amount of information obtainable from superposition. Lacking direct dating methods and patination differences (for petroglyphs), it is not possible to determine a time span between construction periods. The superimposed figures could have been added the next day or hundreds of years later.

Barrier Canyon artists appear to have been selective in the placement of their panels. This may be attributable to their perceived sacred ceremonial nature. No Barrier Canyon Style sites have yet been reported where the style is superimposed over other styles. There are, however, at least three instances where the Barrier Canyon Style appears superimposed over itself. One site (in Canyonlands National Park) was discussed previously.

Superpositioning of later rock art over Barrier Canyon Style, although not rare, is infrequent. Superpositioning seems to appear only along prehistorically well-traveled routes where the presence of other styles and ages of rock art occur in abundance. The literature contains three examples. A brief discussion of each of these follows. (Others exist, but an analysis of them has not yet been completed. A detailed discussion of superposition of the Barrier Canyon Style will be published in a following part of this series.)

Site 1: Temple Mountain Wash, 42Em65. Here a, "large broad shouldered figure . . . believed to be of Fremont origin . . . is superimposed over a bug-eyed Barrier Canyon Style anthropomorph" (Schaafsma 1971:73). The cultural affiliation assigned by Schaafsma to the large figure (an anthropomorph) appears incorrect. More likely, it is also Barrier Canyon Style. Its shape is the same as other Barrier Canyon Style anthropomorphs found in Barrier Canyon, and so is its scale. (For comparison to Barrier Canyon Style figure shape see Schaafsma 1971:75.) Additional evidence that the later figure is Barrier Canyon Style is that no other painted Fremont anthropomorphs of this size have ever been found. Thus evidence suggests that Fremont artists did not paint extremely large figures (unless the Barrier Canyon Style is Fremont). Therefore, the superposition of Fremont over Barrier Canyon Style is at least a debatable conclusion.

Sites 2 and 3: "At Moab and Thompson carved Fremont type quadrupeds overlay Barrier Canyon Style figures" (Schaafsma 1971:130). Quadrupeds in these instances are Mountain sheep. Mountain Sheep like these have not been shown to be assignable to a specific culture. The quadrupeds referred to also appear in Ute rock art. Panels of Ute rock art that also depict horses and shields (some of the horses have riders) occur next to the panel in Thompson and in the same drainage as the panel at Moab. Two large white painted shield designs are superimposed over the panel of Barrier Canyon Style pictographs at the Moab panel (Grant 1983, Figure 98) and are possibly Ute. Also bison, a principal indicator of Ute rock art, appear in the panels at both sites. Therefore, it is possible that late Ute rock art, not Fremont rock art, superimpose the Barrier Canyon Style figures at these two locations.

A similar situation exists at an archaeological site in Westwater Canyon near Grand Junction, Colorado (Castleton 1978:174). A rock art panel here is said to prove that Fremont rock art is superimposed over Barrier Canyon Style. However, a close examination shows that the overlying panel consists of two petroglyphs, both quadrupeds that appear to be horses. One seems to have a rider. The mounted figure is superimposed over a Barrier

Canyon Style anthropomorph. A bison and two anthropomorphs are part of the panel and exhibit the same degree of patination and similar percussion marks as the other figures. The petroglyph panel with the horse, rider and bison could have been placed over the Barrier Canyon Style figures as late as the 1800s. Therefore, like the other panels discussed above, superposition of Fremont rock art over Barrier Canyon Style pictographs at this site is seriously questioned.

Additional evidence that some of the Barrier Canyon Style panels are post circa A.D. 1300 is the observation that in no instance where fox pelt pendants occur in Barrier Canyon Style rock art is there any evidence of superposition of that panel. Therefore, these panels could have been painted late enough in time that there was little opportunity for the early historic Indians to superimpose their rock art over them before European acculturation occurred.

Fox Pelt Pendant Absent in Archaic and Fremont Rock Art

The occurrence of the fox pelt pendant in the northern Colorado Plateau appears to be unique to Barrier Canyon Style pictographs and rock art of the Hopi. The fox pelt pendant has not been found in the most common and well defined Archaic period rock art, e.g., Glen Canyon Style 5 (2000 to 6000 B.C. [Turner 1971] and which apparently continued through to the Basketmaker period), or in what has been identified as rock art of the Fremont (circa A.D. 500 to 1300 [Marwitt 1970; Jennings 1978; Lindsay 1986]). If the Barrier Canyon Style with the fox pelt pendant came into existence in the Archaic period, it would be expected that the fox pelt pendant would appear in Archaic rock art. Likewise, if the Barrier Canyon Style with the fox pelt pendant came into existence in the Fremont period it would be expected that the fox pelt pendant would appear in what has been defined as Fremont rock art. Also the fox pelt pendant might be expected to occur in Fremont rock art since the Fremont appear to have descended from the late Archaic (Jennings 1966). However, the fox pelt pendant is absent in all known panels of both Glen Canyon Style 5 rock art and Fremont rock art. Therefore, it appears that the fox pelt pendant's introduction came after the demise of both the Archaic and the Fremont Cultures, or post circa A.D. 1300.

Parallels Between Barrier Canyon Style and Anasazi Pueblo IV-V

So numerous are the parallels between the Barrier Canyon Style and cultural evidences from both the Anasazi Pueblo IV and early Pueblo V periods, reported as occurring only in Arizona and New Mexico, that the people responsible for the rock art in these two areas appear in direct communication—and thus are related in time. Some specific comparative examples are:

A. A symbol appearing to represent a rain cloud appears in Barrier Canyon Style panels. Figures appearing to be rain clouds are found in Barrier Canyon (Figure 7) (from author's photo, 1972; Smith and Long 1980:101), in the Maze district of Canyonlands National Park (Lucius 1976), and in panels around Moab, Utah (Figure 8). The rain cloud symbol appears to have been in common use early in the historic period throughout the Southern Colorado Plateau Pueblos (Mallery 1893). It also appears commonly in late prehistoric kiva wall paintings (W. Smith 1952). In Utah the rain cloud has only been found in the Barrier Canyon Style. I have not yet seen a similar figure representing a rain cloud in any of about 5,000 Fremont or Anasazi rock art panels in Utah. Nor apparently has any rain cloud symbol been reported in the literature (Turner 1963; Schaafsma 1971, 1980; Castleton 1978, 1979; Weaver 1984, and others).

B. An anthropomorph next to The Blue-Eyed Princess (Figure 1a) has a chevron torso decoration. Chevron torso decorations have not been reported as occurring in Utah Fremont or Anasazi rock art (see references above). They do, however, exist as a decorative element among the New Mexico and Arizona Pueblos (Fewkes 1919).

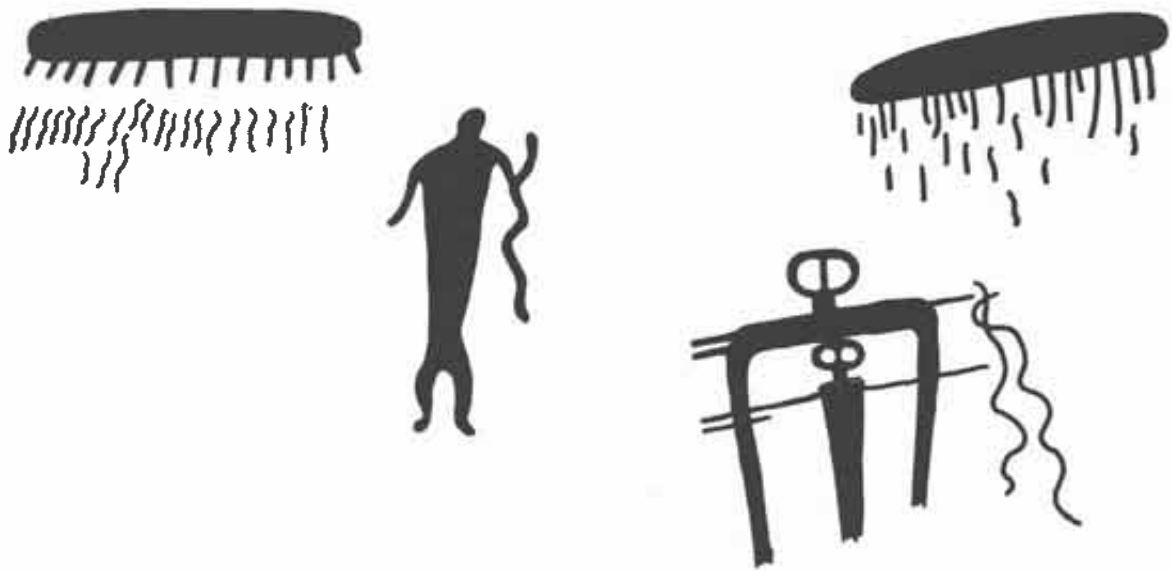

Figure 7. Barrier Canyon rain cloud symbols.

C. An apparent Squash Blossom hair style appears on an anthropomorph (Figure 1e) adjacent to The Blue-Eyed Princess. Schaafsma (1971:82) suggested the appearance of an example of this distinctivchair style on a Barrier Canyon Style pictograph in Buckhorn Wash. The Squash Blossom hair style is a well known early historic Pueblo characteristic. It is still in use today. Its presence in the Barrier Canyon Style suggests an association of the Barrier Canyon Style artists with the early historic Pueblo culture.

D. Birds appear in unusually high numbers in the Barrier Canyon Style, and they are given significance in the panels. This practice stands in direct contrast to the small number of birds in other rock art style panels in the Northern Colorado Plateau. This disparity may be accounted for by the observation that there is a great interest with birds in Pueblo ritual and ceremony. Hamilton A. Tyler noted:

> "The Pueblos have been watching their birds for centuries and during that time have incorporated these creatures into every aspect of community life. Even . . . mundane tasks . . . require the presentation of feathers from particular birds, while in the rituals that support religious ceremonials birds and their feathers become counters that keep a complex symbol system in order. As signs, birds relate to gods, act as messengers between men and gods, or stand as signals between man and man. As part of the surrounding world, birds relate to all manner of natural phenomena and to weather control" (Tyler 1979).

Figure 8. Rain cloud symbol in Barrier Canyon Style pictograph panel near Moab, Utah.

The existence of many birds and the importance given to them by the Barrier Canyon Style artists, in comparison with the paucity of birds in other rock art styles from Utah, provides evidence that the Barrier Canyon Style artists may have been participants with the Pueblos in the incorporation of birds into their social and religious orders.

E. Similarities between Barrier Canyon style anthropomorphs and clay figurines found in Cowboy Cave, which were cited as evidence by Schroedl (1989) and Schaafsma (1971, 1980, 1986) to suggest Barrier Canyon Style presence in the Archaic, were discussed above. Using the same features and the same method of analogy, Barrier Canyon Style anthropomorphs could also be theorized to be late Anasazi or historic Pueblo. Early historic Pueblo "figurines" or effigy figures, called kachina dolls, share typological similarities to some of the Cowboy Cave figurines illustrated by Hull and White (1980:124). The kachina dolls, both early historic and modern, also have distinctive parallel rows of dots along and across the torso, as do the "human" kachina figures they represent. Zuni artist Duane Dishta illustrates many modern kachina dancers that have vertical parallel rows of white dots on the arms and torso (Wright 1985). These dots are analogous to many white dot patterns on the Barrier Canyon Style anthropomorphs.

Figure 9. Barrier Canyon Style anthropomorph with snake in hand, near Green River, Utah.

> Clay figurines have also been found in Basketmaker III period sites (Morris 1951). These figurines, with parallel rows of punctate dots, long tapering shape, and absence of arms, legs and facial features are as suggestive of Barrier Canyon Style, if not more so, than are the Archaic figurines.

These examples represent only a few of the similarities that exist between the Barrier Canyon Style and the late Anasazi and early historic Pueblo cultural evidences of post A.D. 1300. The parallels between the two stand in contrast, and become more significant, when compared with the paucity of these parallels with other styles from other periods in Utah rock art.

Parallels with Kachina Cult

There are many parallels between characteristic anthropomorphs of the Barrier Canyon Style and "human" dancers in the Kachina Cult of the Pueblos. Kachina figures are assiduously described in ethnographic data that was recorded in the early historic period (Fewkes 1903; Bunzel 1932). (The historic period, as used here, began with Coronado's visit in A.D. 1540, and is defined as the Pueblo V period. It is recognized that the influences of European contact took time to spread throughout the Pueblo and adjacent areas, so that this period occurs at different times in different areas.) Comparisons, therefore, are easily made. A few examples are given here.

Figure 10. Barrier Canyon Style pictographs near Hanksville, Utah.

Holding Snakes

Anthropomorphic figures holding snakes appear at many Barrier Canyon Style rock art sites. Anthropomorphs appearing with snakes exist in many rock art panels in the Colorado Plateau, but only in the Barrier Canyon Style are they commonly found holding snakes in their hands (Figures 5, 7, 9, 10). In at least one instance a snake appears in the mouth of an anthropomorph (Figure 8). These Barrier Canyon Style figures exhibit a graphic resemblance to Hopi snake dance ceremonies where snakes are held in the hands and mouths of performers (Bourke 1884; Mendelieff 1886; Fewkes 1894, 1897; Politzer 1894a, 1894b, 1894c; Hough 1902; Voth 1903, and others). Smith and Long (1980) and Martineau (1973) have also suggested that a relationship existed between some of the Barrier Canyon Style panels and the Hopi Snake Dance.

Masks and Costumes

Parallels exist between early historic drawings of kachina masks and costumes (Figure 11) and the Barrier Canyon Style anthropomorphs (Figure 12). Fewkes made a comparison between Barrier Canyon Style anthropomorphs and early kachina costumes achievable by assembling in 1899 a collection of kachina figure drawings made by native Hopi artists. These drawings were practically unmodified by European influence (Fewkes 1903:15-16).

Figure 11. Hopi kachinas drawn by native artists after Fewkes.

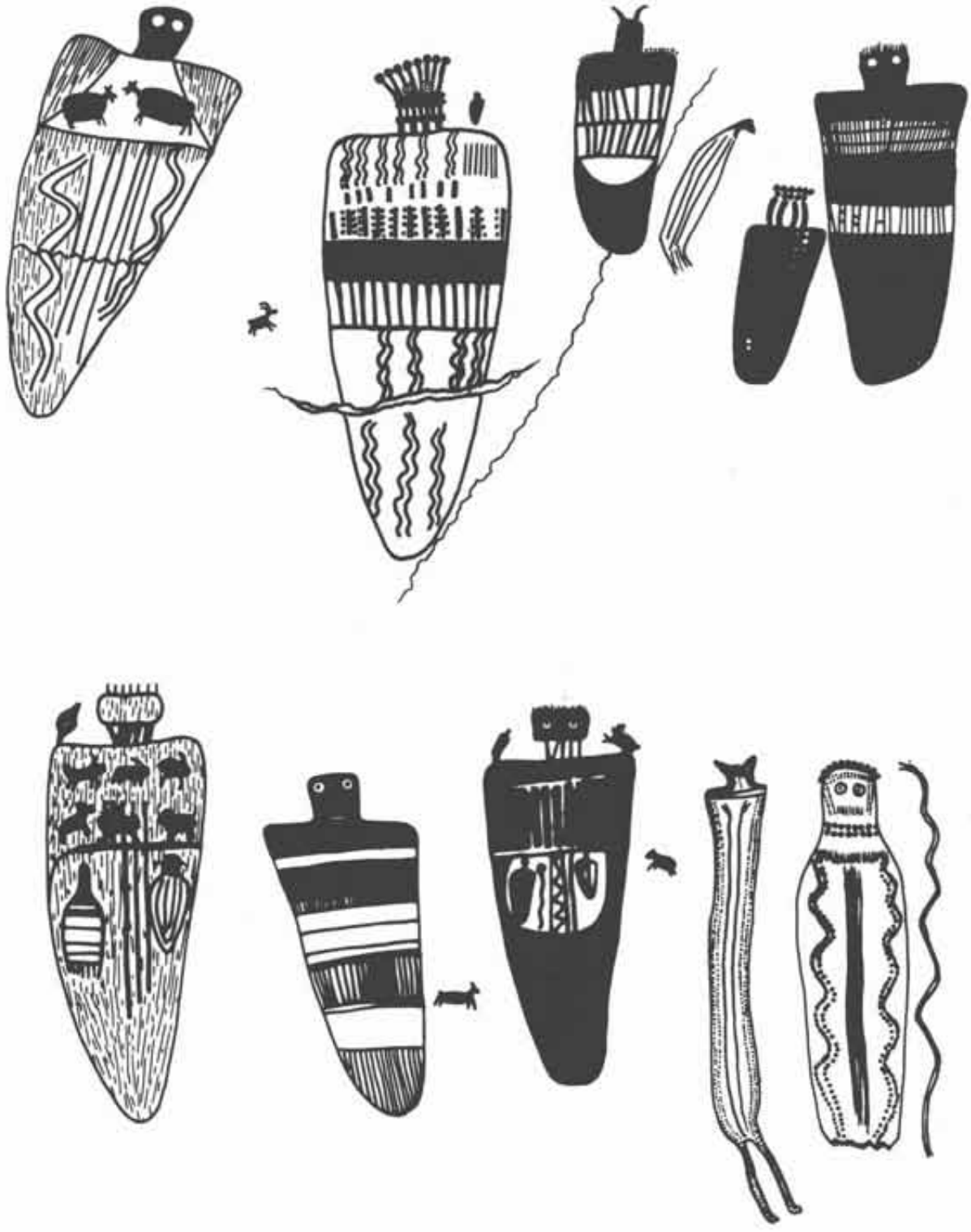

Figure 12. Typical Barrier Canyon Style figures.

Parallels between Barrier Canyon Style pictographs and kachina masks and costumes become more important when the explanation of what the kachina dancers represent is understood. The Hopi religion is both pantheistic and very ritualistic. Within this context the word kachina is used in three different ways—with some variation. First, and perhaps foremost, the word refers to the supernatural beings of legends and myths—the "original" kachinas. Kachinas, in general, were supernatural beings who at one time lived with the people. They have the power to bring rain, exercise control over the weather, punish offenders of ceremonial or social laws, and help in the everyday activities of the Pueblo. They left for various reasons—each Pueblo seems to have a slightly different version of the legend. One version states that the kachinas were all killed and exist today only as spirits. The kachinas return during the kachina dances that are held at specific times of the year. (The date on which each dance was to be held was previously determined by tradition, solar and lunar observations, and also by personal decision—depending upon the specific kachina.) Second, the word refers to the dancers who wear the masks and costumes representing the spirits. Young children and the uninitiated were told that these were actually the original kachinas. Fewkes stated: "The Hopi Indians represent their gods in several ways, one of which is by personation—by wearing masks or garments bearing symbols that are regarded as characteristic of those beings" (Fewkes 1903). In so doing they acquire the supernatural power of those beings: "A Hopi believes that when he wears the costume and mask of a particular katchina, he loses his personal identity and is imbued with the spirit of that being. As he not only gains certain spiritual powers but assumes tremendous responsibilities, the role is not lightly undertaken. He is subject to the requirements of pure thinking, pure action, ritual celibacy, and other prescriptions" (Dockstader 1985:10). At Zuni: "The mask is the corporeal substance of the katchina, and in wearing it a man assumes the personality of the god whose representation he bears. The Zuni expression for this process of transformation is 'to make him (the god) into a living person' (ho'i yakanaka)" (Bunzel 1932:847). At Acoma "the spirits of the katchina come and possess the persons of the masked dancers" (White 1932:67). Third, kachinas may also mean the small painted wooden dolls that are given to children and sold to tourists.

Some of the anthropomorphs in the Barrier Canyon Style, especially those of the Great Gallery, appear to have masks and costumes of kachina figures. (No other rock art in Utah approaches the parallels to kachina figures as does certain of the Barrier Canyon Style pictographs.) If the masks, costumes, and symbols in both the Barrier Canyon Style pictographs and the kachina figures are equivalent, then these Barrier Canyon Style pictographs could conceivably represent, not the impersonated kachinas, since for the most part the pictographs do not have arms and legs, but the actual spirits or spirit beings that, "come and possess the persons of the masked dancers." The Great Gallery mural may contain the most impressive and significant depiction of early kachina spirits in existence.

A detailed comparison of the Barrier Canyon Style anthropomorphs with kachina figures is outside the scope of this paper. Included here for illustrative purposes is Figure 11. Some of the similarities to Barrier Canyon Style are: large staring eyes (a primary characteristic of the Barrier Canyon Style), elaborate head and torso decorations consisting of vertical bands, zigzag lines, dots, etc. (I have seen no other rock art in Utah with features comparable to these), and elaborate masks (only a few early Basketmaker and Archaic petroglyphs appear to have masks, and they are simple when compared with the Barrier Canyon Style).

One of the difficulties in directly comparing Barrier Canyon Style anthropomorphs and kachina figures (for example, Fewkes's Hopi paintings) is that the Hopi paintings are of the dancers impersonating the kachinas, rather than the original kachinas themselves. It is unfortunate that Fewkes did not make this distinction when collecting the paintings. One wonders what would have happened had Fewkes requested representations of the actual kachina spirits.

Unique Color

One of the principal characteristics of the Barrier Canyon Style pictographs is the distinctive and unique purplish color of many of the figures. This color appears to be entirely different from the pigment used by the Fremont. The Fremont characteristically used a distinctive bright red hue in their pictographs. The Pueblo people apparently painted themselves with a similar, or even the same color, as the Barrier Canyon Style pictographs. This was done as part of their impersonation of the kachina spirits: "A purplish body stain (kekwine) is obtained from the stalks and husks of black corn. The stalks are chewed and the mixture spread over the body" (Bunzel 1932:861). The paint is also considered to be sacred and spirit embodying, as are the kachina masks: "When no mask is worn, the same magical power that resides in the mask is imputed to the body paint" (Bunzel 1932:869). The uniqueness of an identical hue of body paint is further evidence of a direct relationship between the Kachina Cult and the Barrier Canyon Style artists, especially when that specific color appears absent in all recorded rock art in Utah, except the Barrier Canyon Style.

Parade Formation

Further relating the pictographs to the Kachina Cult is the observation that the Barrier Canyon Style anthropomorphs are characteristically depicted in what appears to be a parade formation. The figures typically form a continuous line with individual figures separate from each other. This characterization is suggestive of a kachina ceremony. Parsons noted: "The katchina stand in line; with one exception, the Ky'anakwe, there are no circle katchina dances" (1939:732). This method of portraying Barrier Canyon Style figures stands in direct contrast to most other rock art panels in the Southern Utah Anasazi area.

Many parallels exist then between the Barrier Canyon Style and the Kachina Cult of the Pueblos. These equivalencies suggest that a direct relationship existed between the Kachina Cult and the Barrier Canyon Style. The parallels become more significant when the absence of these parallels in other rock art styles in Utah is noted.

Additionally, the relationships stated above appear to suggest that the Barrier Canyon Style is principally, perhaps even exclusively, ceremonial in character. For example, the historically recorded use of the fox pelt pendant is exclusive to ceremonial functions of the Pueblo Indians—to a lesser degree, so are plants held in the hands of performers and rain cloud symbols in Kiva wall murals. The presence of the fox pelt pendant in the Barrier Canyon Style suggests that the panels functioned in a ceremonial context—perhaps even a counterpart to the kiva wall paintings of the Pueblo ceremonies.

Bows and Arrows in Barrier Canyon Style Rock Art

The absence of bows and arrows in the Barrier Canyon Style, as objects providing dateable information, has previously been mentioned. Schaafsma (1971:129 and 1986:225) stated this absence as evidence for assigning an Archaic date to the Barrier Canyon Style. There are, however, circumstances in which bows and arrows might not ordinarily be portrayed in the Barrier Canyon Style, thus rendering this conclusion unfounded. The context of the topic illustrated might not be one where bows and arrows are normally found. For example, the gathering and processing of wild plants, the harvesting of crops, supplicating the gods for rain, or fertility rites, would not include bows and arrows since these objects are associated with hunting or warfare. There would, of course, be a few exceptions. For example, a fertility ritual may include bows and arrows as part of a desire to bear a child who would be a great hunter to provide meat or a great warrior to protect the people. The principal theme of Barrier Canyon Style rock art appears to be horticulture or the gathering of wild plants. If these deductions are correct, it would help explain why bows and arrows have not been reported as occurring in Barrier Canyon Style panels.

Presented here for the first time is evidence suggestive of bows and arrows in Barrier Canyon

Figure 13. Barrier Canyon Style anthropomorph holding bow and arrow.

Style pictographs. Two examples are known. These consist of one petroglyph panel and one pictograph panel. (There is one other petroglyph panel, but the bow and arrow in it is not defined incontrovertibly enough to make a firm determination, so a discussion of it is omitted here.) The single painted example located so far appears to be in Red Snake Cave[3]. Red Snake Cave was excavated by the Claflin-Emerson expedition in 1930 (Gunnerson 1969). It was relocated by the author in 1981 and is now designated 42Ga2458. The cave contains a pictograph that appears to illustrate a bow and arrow (Figure 13). The anthropomorph appears in an action pose, one leg raised above the other, with both bent at the knee. (Figures showing action occur in several Barrier Canyon Style panels.) In the anthropomorph's right hand is painted a short arc with a line connecting the ends, thus appearing to represent a bow. The figure appears to be holding the bow in the middle of the bowstring. In its left hand is an object indicated by a long straight thin narrow painted line. This line appears to represent an arrow.

The anthropomorph appears to have something attached to its back. The object is suggestive of an animal pelt. If so, this may suggest a hunting context for the panel. Other panels of rock art (likely Fremont) show crouched or crawling human figures holding bows and arrows with animal skins on their backs. A panel west of Moab, Utah (Castleton 1978:190) and several in Nine Mile Canyon are good examples of their pattern. In these panels human figures are shown approaching mountain sheep, as if they were hunters in disguise. If a hunting context is represented in the panel, then the presence of bows and arrows would be appropriate. Further suggesting a hunting context for the panel is the presence of what appears to be a human figure confronting an upright bear or other

Figure 14. Barrier Canyon Style anthropomorph with bow.

large animal (see Schaafsma 1971:79, Figure 78). On the opposite side of the animal are two vertical wavy lines and what appears to be a dog on its hind legs. The dog seems to be confronting the animal from behind. This scene suggests that the context of the panel is hunting, and, therefore, one in which bows and arrows would appear.

The second example, and much more conclusive, is from a site recorded by the author near Hanksville, Utah. This Site, designated 42Ga3398, contains a petroglyph panel that shows a Barrier Canyon Style anthropomorph shooting a bow and arrow at what appears to be a deer (Figure 14). The anthropomorph is one of the typical Barrier Canyon Style anthropomorphic figures. It also has a head or headdress identical to those on Barrier Canyon Style anthropomorphs in Barrier Canyon. The representation of the bow is on the figure's right. It is next to, and parallel with, the body. The bow is depicted as a long arc with a straight line connecting the ends of the arc. The arc curves away from the anthropomorph's body. The bow is almost as tall as the body of the anthropomorph. At right angles from what appears to be the center of the bowstring, there is a horizontal line drawn so it connects to the front chest area of the deer. This line probably represents the desired path for the arrow to follow, or the outcome of shooting the arrow. This portrayal of a bow and arrow is analogous to many other rock art figures throughout Utah, and is unmistakable.

The Barrier Canyon Style then, contains illustrations of bows and arrows and, therefore, was constructed after the inception of the bow and arrow into southern-central Utah. The date of the introduction of the bow and arrow into the Barrier Canyon Style area of Utah is at present undergoing revision. Geib and Bungart (1989:32-47) propose that proto-Fremont populations in certain portions

Figure 15. Barrier Canyon Style pictographs displaying plants held in hands and possible lightning symbols.

of the northern Colorado Plateau were using the bow and arrow in Basketmaker II times (see also Reed this volume).

Horticultural Association

The characteristic presence in the Barrier Canyon Style of rain cloud symbols, harvesting implements (some of which have been found in late Anasazi and possibly Basketmaker context [Schaafsma 1971:77, 129]), plants held in the hands of anthropomorphic figures, (Figure 15) and the relationship to the Kachina Cult (primarily a rain making ceremony) are evidence that many Barrier Canyon Style panels center on the principal theme of horticulture or the gathering of wild plants. The dearth of bows and arrows occurring in a ritual to promote rain, germination, or fertility was discussed above and may be further evidence of horticultural activities. If some of the Barrier Canyon Style rock art is part of a horticultural based economy, as the evidence suggests, then this rock art would be associated with a later sedentary culture, where crop production is practiced, and not with an Archaic hunter-gatherer economy. Horticultural activities then would be additional evidence to suggest that the Barrier Canyon Style continued into the Formative period.

Two points are appropriate to discuss here. First, if the Barrier Canyon Style is associated with a late horticultural population, it would have to be the population that has been defined as the Fremont, because no other horticultural population has been defined in the Barrier Canyon Style area. The areal distribution of Barrier Canyon Style almost exactly parallels Fremont rock art (excluding

the Sevier Fremont [Jennings 1960] in the western half of Utah). Unquestionably, more research needs to be done to elucidate the cultural association(s) of the Barrier Canyon Style.

Second, if the Barrier Canyon Style existed in the Archaic period, the nomadic hunter-gatherer activities of these people suggest that their rock art would be the same over a large area, since they traveled extensively. Hunters and gatherers have been shown to exploit large areas, as much as 300,500 square km (116,000 square miles), and to travel about 200 km (129 miles) or more in one annual round of settlement (Binford 1983 [The Nunamiut]; Silberbauer 1972 [The G/wi Bushman]). Steward (1938) also reports extensive movement within subsistence and trading areas in the Great Basin and in Idaho. If the Barrier Canyon Style is associated with later cultures, where agricultural activities limited the range of the people, then localized variations in the rock art would be expected to occur. If Barrier Canyon Style developed in the Archaic period, and continued through to circa A.D. 1600, then evidence should be found of a consistent character trait assemblage with underlying regional variations. Evidence from about 155 Barrier Canyon Style sites appears to suggest that regional variations exist. However, determinations of whether these apparent variations indicate temporal, areal, functional or ethnic variations have not been studied. Conclusions will have to wait for further analysis.

One of the problems with determining variations is paucity of data. Schaafsma defined the Barrier Canyon Style from only approximately 15 panels at 11 sites. The author has now located about 155 sites (Figure 3). Therefore, the number is approaching a point where a study of regional variations may provide significant results. If certain of the Barrier Canyon Style panels are at some point proven to be present in the Archaic period, then regional variations will need to be explained.

Horses in Barrier Canyon Style Rock Art

The presence of illustrations of horses in the Barrier Canyon Style would certainly be an indication of a late date, since horses were not introduced into Utah until around one hundred years after the Spanish first arrived at the Pueblos. Like bows and arrows, horses would not be expected to occur in horticultural or gathering ceremonies, given the information that draft animals were not used by the Indians, so they might not be illustrated in the apparent ceremonial Barrier Canyon Style panels. At a Barrier Canyon Style pictograph site near Thompson, Utah, there are two horses painted with apparently the same color pigment and exhibiting apparently the same degree of weathering as the Barrier Canyon Style pictographs nearby. These horses appear stylistically different from about 50 Ute horse petroglyphs in surrounding areas. Mud runoff covered most of the horses at the site near Thompson for many years. Mud obscured the figures in 1968, as noted in the author's photographs. How long the horses were covered with mud is unknown. Sometime in 1987 or 1988 a major rainstorm apparently washed enough mud off the cliff surface that the paintings depicting the two horses became more visible.

There are arguments for and against accepting these painted horses as Barrier Canyon Style. Arguments against such a conclusion are at least two: First, this site contains the only known instance of horses associated with a Barrier Canyon Style panel and appearing to be painted with a Barrier Canyon Style pigment. Second, the Utes were in the same area and could have painted the horses. There is a Ute rock art petroglyph panel directly across the canyon. The Utes could have painted the horses using a similar pigment, or even pigment from the same source if it was obtained locally. Supporting arguments include: First, the evidence that the horses are stylistically different from horses identified as Ute suggests that someone other that the Utes painted the horses. Second, there are no pictographs in the area that are attributable to the Ute where this same pigment was used; therefore, evidence for Ute use of this pigment is lacking.

The possibility that horses exist in the Barrier Canyon Style then, cannot be entirely dismissed. Until direct dating methods are developed, or additional examples of horses are found painted in

similar pigments, their presence in the Barrier Canyon Style remains a possibility.

Physical Evidences

Physical remains (besides the presence of rock art) that provide evidence for either the presence of Late Pueblo people in Utah or the association of Barrier Canyon Style artists with the Pueblo IV area have been found. They consist of painted stone slabs or tiles and ceramics. Each of these is briefly discussed below.

Concerning painted slabs Watson Smith observed:

> An item of paraphernalia that often is used in certain modern Hopi ceremonies is a flat slab or tile on which are usually painted a variety of designs, including rain clouds, birds, butterflies, tadpoles, masked faces, and the like. These may collectively be called tiles, although they are made of stone wood or fired clay. They measure usually about 12 cm or 15 cm in each dimension, and for ritual use are set vertically against the kiva wall or the upright altar (W. Smith 1952:261).

(Note that rain clouds, birds, and masked faces are characteristic of the Barrier Canyon Style.) Painted stone slabs like those described above were found at Kawaika-a in graves with Sikyatki Polychrome and Jeddito Black-on-Yellow pottery, and, therefore, are associated with the Pueblo IV period. Painted slabs have been found at many prehistoric Pueblo sites (W. Smith 1952:265). They have been found at: Awatovi, Chevlon, Canyon del Muerto, Homolovi, Kawaika-a, Kinishba, Pecos, Pinedale, Point of Pines, Petrified Forest, Pueblo Bonito, Showlow, Sikyatki, Winona, and others. In Utah painted stone slab fragments occur at two sites. One example was excavated from Floating House Ruin in southern Utah, and the other came from Barrier Canyon:

> Two fragments of a similar sandstone slab were found at a Pueblo ruin in Barrier Canyon, Utah showing two parallel bands in red, about 1 cm wide, one of them bordered by narrow black lines about 1 mm wide. The surviving specimen is about 8 by 11 cm and is 15 mm thick. This specimen was collected by Henry B. Roberts and is in the Peabody Museum, Catalog Number 33-3-10/411, 412 (W. Smith 1952:267) (emphasis added).

The use of painted stone slabs appears to have been wide spread in Pueblo III and IV times, and to have extended into the historic period (DiPeso 1950). Their existence in a Pueblo ruin in Barrier Canyon itself provides evidence for a Pueblo influence in the heart of the Barrier Canyon Style rock art area.

It should be noted here that objects of stone with evidence of paint have been found to occur in other time periods, as would be expected. For example, Hull and White (1980) described the presence of twenty-three stones with paint in Cowboy Cave. They were found from Stratum IIb (8275 B.P.) to the surface and it was observed that there was no specific concentration of the stones either vertically or horizontally in the fill of the cave. The importance of the Pueblo painted slabs, irrespective of the fact that stones with paint exist far back in time, is that painted stone slabs are present in Pueblo contexts in both Barrier Canyon and the Pueblo area.

Jeddito Corrugated and Jeddito Black-on-Yellow ceramics, associated with the Pueblo IV Anasazi, have been identified at sites in the La Sal Mountains of Utah (Hunt 1953:161, 216). They also occur at site 42Gr583, on a tributary of the Colorado River, circa 25 miles to the northwest of the La Sals—well into the Barrier Canyon Style area. Jeddito Black-on-Yellow and Jeddito Tooled were reported at a site in Squaw Park, North of Arches National Park (Wormington 1955), very close to a Barrier Canyon Style site. A summary of the occurrence of yellow ware in southern Utah was compiled by La Mar Lindsay:

> Yellow ware has been identified at several sites on both the right and left banks of the Colorado River in the Glen Canyon (Fowler et al. 1959; Lipe et al. 1960; Sharrock et al. 1961; Sharrock et al. 1963). However, yellow ware, including Sikyatki Polychrome from the Red Rock Plateau (Lipe 1970), is principally concentrated in the "San Juan triangle" (Weller 1959). In addition a few sherds have been reported from the adjacent Kaiparowits Plateau (Gunnerson 1959; Lister 1959). Surface associations of the yellow ware at these sites run the gamut of Pueblo II and III Mesa Verde and Kayenta wares, but at the only two excavated sites, the ware is either unprovenienced or without artifact associations (Sharrock et al. 1961) (Lindsay 1976:36).

Additionally, Hunt and Hunt (1967), discussing the relative abundance of Tsegi Orange wares and the later Tusayan Black-on-Red ceramics from the Henry Mountains area, suggested that the people "shared close ties and traditions with the

Tsegi-Rainbow Plateau Kayenta country of Northern Arizona."

The existence of Pueblo IV ceramics, sparse but widespread in southern Utah, provides additional evidence for Pueblo IV presence in the Barrier Canyon Style region, thus strengthening the possibility for the introduction or sharing of ideological concepts from that period—ideological concepts that correlate the Barrier Canyon Style to the post circa A.D. 1500 Kachina Cult of the Pueblos.

ADDITIONAL DISCUSSION

It appears that there are two primary plausible explanations, given the available data, for the origins and presence of the Barrier Canyon Style panels associated with fox pelt pendants. The first postulate is that in the Pueblo IV period, sometime after circa A.D. 1300, there was an expansion and modification of an undefined religious cult, which existed (with alterations) from the Archaic period on into the Kachina Cult (with possible influence from the Mogollon) changing artistic symbolism. This undefined Archaic cult, which evidence suggests expanded areally in the Basketmaker Period, was apparently responsible for a wide spread (both areally and temporally) anthropomorphic rock art tradition. Remnants of the Fremont were perhaps influenced by this expansion. Later, the fox pelt pendant was added to the Kachina Cult and the Barrier Canyon Style Rock Art. The remnants of the Fremont people then, before totally abandoning the northern Colorado Plateau circa A.D. 1600, or losing cultural identity, painted the Barrier Canyon Style panels associated with the fox pelt pendant. The apparent concentrated emphasis in many of the Barrier Canyon Style panels on ceremonial activities related to rain and harvesting activities may be a representation of a subsistence system under stress.

Additional evidence in support of this postulate is that the northern and central Colorado Plateau area may not have been completely abandoned (Rudy 1953:169; Taylor 1957:160-166; Cordell and Plog 1979:418, and others). It is possible there was instead a very large and drastic reduction in population. A few tenacious people could have remained. These people may have been responsible for some of the Barrier Canyon Style panels. The sparseness of Barrier Canyon Style panels, when compared with other styles, combined with what appear to be regional variations, may be evidence that only sparse, limitedly mobile, small groups of people participated in their construction.[4]

A second postulate is that a sparse remnant of the Fremont developed the fox pelt pendant and other elements present in the Kachina Cult of the Pueblos, which were absent before circa A.D. 1500, and added them to the anthropomorphic rock art tradition a short period of time before the Pueblo Historic period began. These concepts could then have been incorporated into the expanding Kachina Cult in the late Pueblo IV-early Pueblo V period.

Which of these possible hypotheses, or others not considered, is correct may be determined by future research. The paucity of material remains at Barrier Canyon Style sites may make it difficult to substantiate, by current archaeological methods, both the presence of people at Barrier Canyon Style sites after circa A.D. 1300 and the late date hypothesized here for many of the Barrier Canyon Style panels.

Jennings (1978) has proposed that there was a change of the climate and a corresponding change in cultural patterns on the Colorado Plateau at the time it is hypothesized the pictographs with fox pelt pendants were painted. The people were forced to return to a more nomadic hunting-gathering way of life, away from farming, permanent dwelling construction, and non-portable implements. If this were so, then the surviving material remains of these people would be few, thus difficult to locate and identify.

Evidence of such a late semi-transient culture, which might have been responsible for many of the Barrier Canyon Style panels, would, in many instances, be surface materials in rock shelters and might now be missing. Vandalism, both intentional and unintentional, poses the greatest threat to the gathering of information. Increasing numbers of uninformed people because of publicity, ease of access, more off-road vehicles, and energy

developments, in addition to a rapidly expanding interest in antiquities and the commercial value of artifacts, have increased vandalism and artifact collecting to devastating proportions in the Northern Colorado Plateau (Jennings 1978:243; Manning 1985a; U.S. General Accounting Office 1987; U.S. House of Representatives 1988). Many of the Barrier Canyon Style sites are heavily visited. Sites in Buckhorn Wash, Thompson Wash, and Mill Creek are very badly vandalized. An attempt to destroy a panel of Barrier Canyon Style pictographs near Courthouse Wash was made in the recent past. A panel in Barrier Canyon itself was vandalized in January 1990 (Barker 1990). Black Dragon Canyon pictographs have and are being defaced with heavy chalking. Sites in the Maze, and the San Rafael Swell are showing increased evidences of vandalism and adverse impacts like erosion. This vandalism is principally due to an increasing number of irresponsible "guide book" publications and popular articles both in newspapers and magazines. Considerable illegal digging occurred at four Barrier Canyon Style sites around Moab in 1989. If Barrier Canyon Style rock art is of recent origin, then material remains needed to date these pictographs would be located on or near the surface. It is these easily visible artifacts that people collect. They have been, and are, vanishing rapidly. Data gathering activities at Barrier Canyon Style sites need to have the highest priority if the hypothesis presented here is to be tested.

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NOTES

[1]The Blue-Eyed Princess is about two miles south of the location described on the site form in the files of the Utah Division of State History.

[2]The presence of a fox pelt pendant outside of the southwest has been reported by Merriam (1962:35). He describes the presence of a fox pelt pendant in a Pomo Indian ceremony west of Sacramento, California. Considering that Hopi Indians state that they traveled to the ocean to trade and collect shells, it is not surprising to find evidence indicating Pueblo presence there. Perhaps the Pomo acquired some of their ceremonial practices from the visiting Hopi.

The Seri Indians of the east cost of the Gulf of California also used a fox pelt: "The men's breechclouts are simple fox pelts, while the women's skirt is made of animal skins" Bowen (1983:236).

[3]The Claflin-Emerson expedition in 1930 (Gunnerson 1969) excavated an archaeological site and named it Red Snake Cave. They assigned number SR 16-10 to the site. In Gunnerson's discussion of Red Snake Cave there is no reference to the presence of any paintings on the back wall of the cave. This lead to some doubt that Red Snake Cave had been located, but a site matching Gunnerson's locational information was found by the author in 1981. However, in addition to other pictographs, several very small red painted snakes were found on the back wall of the cave. These could be the site's namesakes.

Adding to the confusion is Schaafsma's statement that the paintings illustrated in her Figure 78 (1971:79), which are present on the back wall of the cave found by the author, are from SR 16-5. However, site SR 16-5 (now 42Ga2459) was also located in 1981, and there are no paintings present at this site. (Site 42Ga2459 and its identity as SR 16-5 was recently discussed by Geib and Bremer [1988]).

This second site is unmistakably SR 15-5. It is easily identified because of the structures present and the site sketch and description provided by Gunnerson (1969:523). The site also fits the limited site locational information provided by Gunnerson, which states that the site is "located on the east side of Willow Tank Canyon." Therefore, the pictographs illustrated in Schaafsma's Figure 78 are not from SR 15-5 as she stated. They are in the cave located on the west side of Willow Tank Canyon, which, from all evidence, is Red Snake Cave or SR 16-10. Additionally, the cave believed to be Red Snake Cave is situated in a white ledge about 13 m above a side canyon entering from the northwest. This is the same description as that given for Red Snake Cave. Therefore, the site on the west side of Willow Tank Canyon appears to be SR 16-10, Red Snake Cave, 42Ga2458.

Gunnerson's omission of the rock art from Red Snake Cave and Schaafsma's assigning the wrong site number to a panel of Barrier Canyon Style pictographs appear to indicate that there is some confusion in the records left by the Claflin-Emerson expedition. These errors are also indicative of the problems inherent in the analysis of archaeological sites when the person doing the analysis has not visited the sites.

Also making it difficult to determine the correct designations and locations for these sites is the fact that neither the site forms nor any field notes, which could be used to relocate these sites, could be found. They were not in the possession of the Utah State Historical Society, Bureau of Land Management, nor the University Of Utah (Personal correspondence 1981). Despite all these difficulties Red Snake Cave was finally located, but only after several days of intensive searching.

[4]Out of approximately 7,000 panels of Utah rock art visited by the author, only approximately 155 are Barrier Canyon Style. That is only 2.14%. And, this percentage is biased because of the priority given to locating Barrier Canyon Style rock art. In areas where I have conducted intensive rock art surveys, like

Indian Creek near Canyonlands National Park, the percentage is less than 1%. This is likely a more realistic figure for the percentage of Barrier Canyon Style rock art on the northern Colorado Plateau. Northern San Juan County and Grand County contain a substantial number of Barrier Canyon Style panels, therefore, the percentage of Barrier Canyon Style panels, when compared to other styles, would be expected to be high. However, in a major drainage in the area, which is being intensively inventoried for rock art, and which so far contains about 200 panels, only three are Barrier Canyon Style. This is only 1.5%. Thus Barrier Canyon Style rock art is not common. Some possible explanations for this are: (1) the people making Barrier Canyon Style rock art were not spending a commensurate amount of time producing rock art when compared with other cultures, or (2) the style existed for only a short period of time, or (3) there were fewer people producing it.

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REPORTS

LIMITED EXCAVATIONS AT BIGHORN SHEEP RUIN (42SA1563) CANYONLANDS NATIONAL PARK, UTAH

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INTRODUCTION

Bighorn Sheep Ruin (42Sa1563) is a late Pueblo II–Pueblo III Anasazi cliff dwelling. The site is in the National Register of Historic Places Salt Creek Archeological District of Canyonlands National Park, southeastern Utah. Bighorn Sheep Ruin has 28 structures along a relatively narrow ledge in a low alcove. Next to Big Ruin, it is the largest cliff site in the park.

Bighorn Sheep Ruin was first recorded in 1930 as LS 14–11 by the Claflin–Emerson Expedition, led by Henry Roberts (Gunnerson 1969). The University of Utah rerecorded the site as 42Sa1563 in 1965 (Sharrock 1966). Nickens and Associates of Montrose, Colorado, performed limited stabilization at Bighorn Sheep Ruin in April 1985, under contract to the National Park Service, Rocky Mountain Region. Todd R. Metzger served as Stabilization Project Director. Susan M. Chandler and Gary M. Matlock directed the limited archaeological excavations conducted at the site as part of the stabilization effort. Reports detailing the stabilization activities (Eininger and Chandler 1986) and excavation results (Chandler 1988) are on file at the National Park Service, Midwest Archeological Center, Lincoln, Nebraska.

SITE DESCRIPTION

Bighorn Sheep Ruin (42Sa1563) is a cliff site on the left bank of Salt Creek, above its confluence with Horse Canyon (Figure 1). The site is constructed along a relatively narrow ledge in a low, southeastern–facing alcove above the floor of the canyon. The vegetation of the surrounding area is characteristic of the Upper Sonoran life zone. Desert shrub and piñon–juniper vegetation communities dominate the landscape. Riparian species grow along the Salt Creek drainage. The Salt Creek drainage is a natural corridor for travel. It also contains both plentiful water and deep alluvial deposits suitable for agriculture. It is thus not surprising that there was a significant agriculturally–oriented occupation of Salt Creek during late Pueblo II to early Pueblo III times (cf. Anderson 1978:32, 58).

The Bighorn Sheep Ruin alcove is one of the few alcoves in the area large enough to allow the construction of substantial structures. The alcove is shallow, measuring roughly 95 m long and 1 m to 6 m wide. The site has 28 structures, including habitation, storage, and granary rooms and plazas (Table 1; Figure 2). Although there is no clearly defined kiva, one or more of the large habitation rooms may have served dual habitation/ceremonial functions. Intact cultural deposits are present within open use areas and beneath the rooms as construction fill. Their exposed profiles reveal midden layers, redeposited cultural refuse, and natural debris. This alcove fill is supported by a series of extensive retaining walls along the outer edge of the alcove and was used to level and widen the usable surface area of the ledge. Most of the structures rest precariously on this foundation of cultural and noncultural fill. Mortar remnants and fire–blackening on the alcove back are associated with existing structures and also outline structures that no longer exist.

Many pictographs, including anthropomorphs, bighorn sheep, a bird figure, abstract designs, handprints, spray blotches, and mudballs, are present along the alcove back. Petroglyphs are present within Structure 8 and on the boulders by Structure 10. A panel of handprints is present at the base of the cliff. The distinctive, San Rafael Fremont–style pictographs located on the back of the Bighorn Sheep Ruin alcove are anthropo–

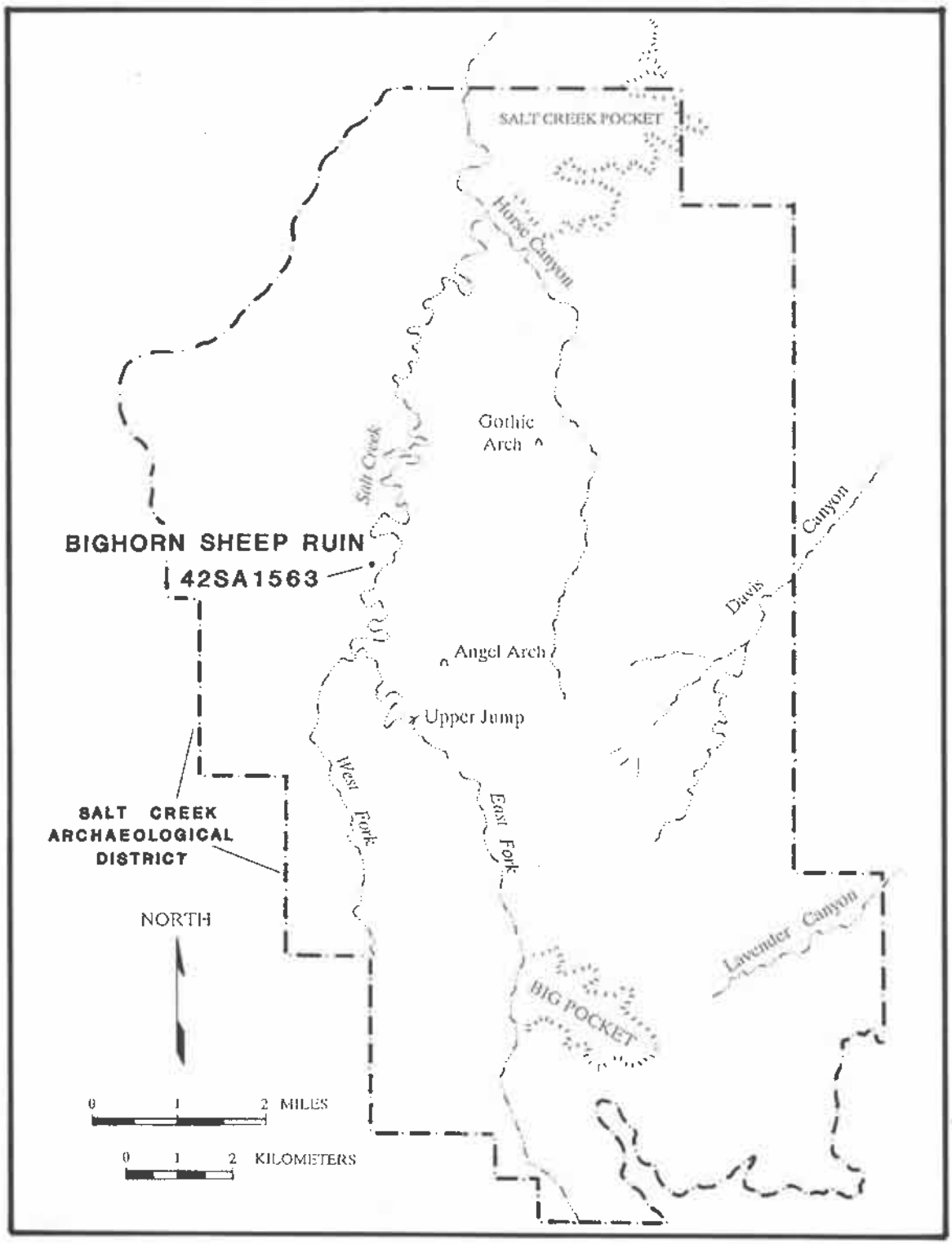

Figure 1. Location of Bighorn Sheep Ruin in the Salt Creek Archeological District of the Needles District of Canyonlands National Park, Southeastern Utah (source: Chandler 1988).

Table 1. Bighorn Sheep Ruin Structure Descriptions*

Structure	Shape	Construction	Dimensions (m)	Floor Area (sq. m)	Floor Features	Interior Wall Features	Function
1	D-shaped	Dry-laid/mudded, semicoursed, single stone masonry forms three walls; west wall is the alcove back.	0.77 x 0.60	0.4	—	Upright slabs for roof beam support.	Storage?
2	Rectangular	South wall is Str. 1's north wall; north wall formed by south walls of Strs. 4 and 25. West wall is the alcove back. No east wall.	?	—	—	None	Storage?
3	D-shaped	Wet-laid masonry incorporating vertical slabs and horizontal coursing form the north and south walls. West wall is the ledge face. No east wall.	1.10 x 0.85	0.9	—	Roughcast plaster on west wall	Storage
4	D-shaped	Wet-laid, single stone masonry forms a continuous north, east and south wall. West wall is the alcove back.	0.87 x 0.72	0.6	—	None	Storage
5	?	Dry-laid/mudded, single stone south wall remnant. West wall is the alcove back.	?	—	—	None	Storage?
6	oval	Upright slabs and wet-laid, semicoursed single stone masonry.	1.8 x 1.4	2.1	Dish-shaped floor plastered with a 3-4 cm thick layer of mortar.	Niche in the NE corner.	Storage unit filled with cultural trash behind retaining wall to level and widen ledge.
7	?	Two dry-laid stones stacked beneath a large monolith.	?	—	—	—	Unknown

Table 1. Bighorn Sheep Ruin Structure Descriptions* (Continued)

Structure	Shape	Construction	Dimensions (m)	Floor Area (sq. m)	Floor Features	Interior Wall Features	Function
8	oval	Dry-laid/mudded and wet-laid, semicoursed single stone masonry incorporating a monolith and bedrock face.	2.85 x 2.02	5.4	East half excavated. Plastered floor, which has been destroyed by rodents in the NE quad. Slab-lined hearth with adobe collar (F1). Elliptical, shallow depression directly in front of ventilator.	Roughcast	Habitation
9	oval	Subterranean cist with straight-sided walls formed by wet-laid masonry, an upright slab, and sterile fill.	1.02 x 0.78	0.6	Fractured bedrock. Mortar used to fill cracks. No floor features.	None	Storage. Reused as a trash pit and latrine. Two bent-stick fasteners SW of the pit may have held a light over it.
10	rectangular	One dry-laid masonry wall along the outside; mortar remnants and fire-blackening on the alcove back. No east or west walls are apparent.	4.8 x 3.5	15.0	Stratified, use-compacted surfaces. "Use Surface 2" forms the floor in most of the room, with patches of earlier and later surfaces above and below. Slab-lined firehearth (F1) and slab-lined cist (F2).	Fire-blackening on alcove back defines the extent of the walls. A plaster sawtooth design is applied over fire-blackening but extends beyond it. Two boulders with petroglyphs on the west side may have once been part of the west wall.	Habitation. Possible use as a plaza/open use area.
11	curvilinear	Dry-laid, uncoursed to semicoursed masonry. Single stone and compound.	Extends the length of the site.	—	—	Entryway (87 cm wide) located between Str. 14 and Str. 15.	Retaining wall.

Table 1. Bighorn Sheep Ruin Structure Descriptions* (Continued)

Structure	Shape	Construction	Dimensions (m)	Floor Area (sq. m)	Floor Features	Interior Wall Features	Function
12	sub-rectangular	Wet-laid and dry-laid/mudded, single stone semicoursed masonry forms three walls; the north wall is formed by the face of a siltstone ledge with 2-3 courses of masonry on top. The south wall is built atop the retaining wall.	2.75 x 3.25	7.6	West half excavated. Plastered floor. Slab-lined, hexagonal hearth (F1); subfloor cist lined with upright slabs (F2); shallow, ash-filled depression in front of vent (F3); small posthole (F4); small slab-lined depression near the hearth (F5).	Roughcast covers the face of a siltstone ledge forming north wall. Vent opening in south wall. Bench/shelf formed by two masonry courses atop siltstone ledge in NW corner. Small niche in east wall.	Habitation
13	?	Dry-laid stack of stone five courses high. North wall is the alcove back.	?	—	—	—	Storage?
14	rectangular	Dry-laid/mudded, semicoursed, single stone masonry forms three walls; north wall is formed by face of a siltstone ledge. South wall is built atop the retaining wall.	3.15 x 2.2	5.3	South half excavated. What little remains of the floor is plastered. Shallow depression with compact fill (F1) in front of the vent. Shallow hearth (F2).	Roughcast and fire-blackening on south wall. Vent opening in the south wall.	Habitation
15	rectangular?	West wall is the east wall of Str. 14; north wall is face of siltstone ledge. South wall is dry-laid, single stone masonry. No east wall.	?	?	—	Entry through retaining wall (Str. 11).	Open use area
16	D-shaped	Dry-laid/mudded, single stone masonry forms three walls. North wall is alcove back.	1.06 x 0.77	0.8	—	Shallow bench formed by stepped bedrock on alcove back.	Storage

Table 1. Bighorn Sheep Ruin Structure Descriptions* (Continued)

Structure	Shape	Construction	Dimensions (m)	Floor Area (sq. m)	Floor Features	Interior Wall Features	Function
17	D-shaped	Dry-laid/mudded, single stone, semicoursed masonry forms three walls. North wall is alcove back.	1.72 x 0.87	1.5	—	None	Storage
18	sub-rectangular	The north wall is formed by the face of a siltstone ledge; west wall is formed by a monolith; south wall is dry-laid masonry; east wall is represented by a 3.2m long juniper beam.	3.4 x 4.5	13.5	West half excavated. Plastered floor with loom anchors. Circular hearth with mortar collar (F1). Upright slab deflector. Shallow oval depression between vent and deflector (F2).	North, west, and south walls are plastered. Vent opening in south wall.	Habitation room, with possible ceremonial function.
19	D-shaped	Dry-laid/mudded, single stone masonry forms three walls. North wall is alcove back.	1.72 x 0.90	1.5	—	None	Storage
20	D-shaped	Dry-laid/mudded, single stone masonry forms three walls. North wall is alcove back.	1.07 x 1.6	1.7	—	None	Storage
21	D-shaped	East, south, and west sides are formed by a continuous, semicircular masonry wall, which has dry-laid/mudded basal courses and wet-laid upper courses. The north wall is formed by the face of a siltstone ledge.	4.0 x 3.75	10.6	North quarter not excavated. Plastered floor with loom anchors. Pit in floor—possibly a noncultural break (F1). Subfloor cist (F2). Firehearth with mortar collar (F3). Clay-lined depression (F4) in front of vent. Slab deflector.	North wall has plaster atop fire-blackening. The other three walls are fire-blackened. Vent opening in south wall. Niche/recess in west wall above Feature 2 cist.	Habitation room, with possible ceremonial function.

Table 1. Bighorn Sheep Ruin Structure Descriptions* (Continued)

Structure	Shape	Construction	Dimensions (m)	Floor Area (sq. m)	Floor Features	Interior Wall Features	Function
22	D-shaped	Dry-laid/mudded, single stone, semicoursed masonry forms three walls. North wall is alcove back.	1.4 x 0.7	0.9	—	—	Storage
23	D-shaped	Dry-laid/mudded, single stone, semicoursed masonry forms a continuous, semi-circular wall on three sides. North wall is face of siltstone ledge.	2.4 x 2.1	4.0	Vent at floor level along south wall.	Roughcast plaster. Fire-blackening.	Habitation
24	D-shaped	Wet-laid masonry	0.8 x 1.2	1.0	—	None	Storage
25	?	Wet-laid, single stone masonry south wall. West wall is the east wall of Str. 4.	?	—	—	Roughcast plaster on west wall.	Storage?
26	?	Wet-laid, single stone masonry north wall. West wall is ledge face. Mortar remnants indicate the former location of the south wall.	1.04 x 2.00	2.0	—	—	Storage
27	irregular	Dry-laid and dry-laid/mudded slabs.	—	—	—	—	Stairway
28	rectangular	Two small remnants of wet-laid masonry north and south walls. West wall, the bedrock face, has mortar remnants. No east wall.	0.93 x 0.94	0.8	—	—	Storage

*Structures in bold type were excavated.

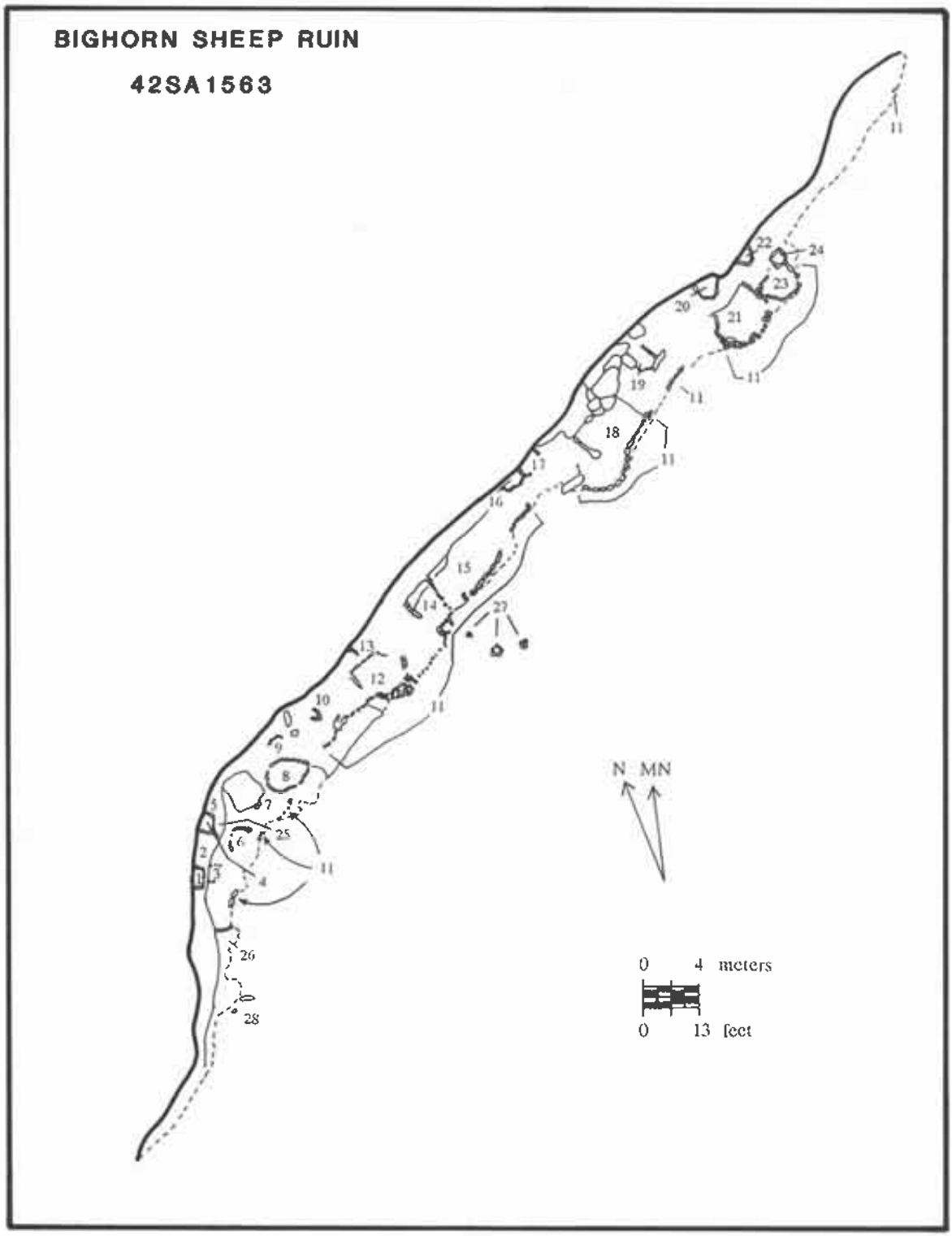

Figure 2. Planview map of the alcove structures at Bighorn Sheep Ruin.

morphic figures without appendages and with complex headgear, facial decoration, and necklaces, traits which are also characteristic of Fremont figurines (Gunnerson 1969:150; Schaafsma 1971:51–42, Figure 52). Noxon and Marcus (1982), however, classify the pictographs in the Salt Creek Archeological District as the "Faces Motif." They attribute the Faces Motif to Anasazi imitation of either the Barrier Canyon style rock art or Fremont culture rock art (Noxon and Marcus 1982). Sharrock also attributes the anomalous situation of the apparent association of late Pueblo II–early Pueblo III Anasazi architecture and artifacts with Fremont rock art to borrowing of Fremont design motifs by the Mesa Verdeans without distinguishable population interchange (Sharrock 1966:62). Ambler (1970) believes, however, that the presence of Fremont-style rock art in the area south and east of the Colorado River where there is little evidence of Fremont occupation indicates seasonal use of the region by Fremont hunters, predating or contemporaneous with the Mesa Verde occupation.

EXCAVATIONS

Fieldwork conducted at Bighorn Sheep Ruin before stabilization included detailed architectural and rock art documentation, planview and profile mapping of the site alcove and structures, surface artifact collection, and testing of cultural deposits and removal of structural fill.

The limited excavations at Bighorn Sheep Ruin were undertaken from the standpoint of site preservation. Excavations were restricted to disturbed or endangered middens and structural fill. Areas with unthreatened cultural deposits were avoided. This approach enabled a large amount of data to be retrieved from the site that would have otherwise been lost through deterioration, yet preserved additional deposits *in situ* for future excavation and research efforts. Because of this focus on preservation, however, archaeological data recovery was often incomplete. For example, intact floors were not excavated to examine subfloor features, and only half of each hearth was excavated.

Three test units were excavated in areas of deteriorating cultural deposits. A fourth was excavated along the exterior west wall of Structure 21. In addition, fill was cleared from the interior of eight structures: Structures 6, 8, 9, 10, 12, 14, 18, and 21. All fill was screened through ¼-inch (6 mm) mesh. Excavation within the structures was restricted to half of the floor area in all but four instances. Structures 6, 9, and 10 were completely excavated, and three quadrants of Structure 21 were excavated. The area excavated was dictated by the need to define the limits of the structure and the disturbance within before developing the stabilization plan. Most of the rooms excavated were habitation rooms because these rooms are located at the edge of the alcove and so are more subject to deterioration.

MATERIAL CULTURE

Ceramics

The ceramic types identified are predominantly Mesa Verde, Pueblo III types (Breternitz et al. 1974). Most sherds have crushed rock temper. Mancos Black-on-white, which dates from A.D. 900–1150 in the Mesa Verde Region (Breternitz et al. 1974), and Mancos Gray, which dates from A.D. 900–950, were the earliest ceramic types found at the site. Only four Mancos B/w sherds and one Mancos Gray sherd were recovered, however. The remaining 305 sherds are Pueblo II/Pueblo III ceramic types, most of which are unidentified PII/PIII corrugated sherds. McElmo Black-on-white sherds, which date from A.D. 1050 to 1300, and Mesa Verde Black-on-white sherds, which date from A.D. 1200 to 1300, were found in nearly equal numbers. Three intrusive Pueblo III Kayenta sherds were found: one Tusayan Black-on-white and two Moenkopi Corrugated. There was no discernible intrasite variation in the distribution of the various ceramic types. The proportion of bowl sherds (44%) to jar sherds (52%) is almost equal in the Bighorn Sheep assemblage. Most of the bowl sherds are slipped, but most jar sherds are not. The vessel forms suggest that the predominant activities involving ceramics at Bighorn Sheep Ruin were short-term storage, food preparation, and serving.

Several unfired clay artifacts were recovered from the Bighorn Sheep Ruin excavations. The clay is untempered and is a pink color. Six unfired clay human figurine fragments were found, including one head and five terminus fragments. Twenty-two unfired clay items that may be debris from on-site figurine manufacture were also recovered.

The figurine head (Figure 3) was recovered from the deeply disturbed area in the southeast corner of Structure 14. This context suggests the artifact predates the final occupation of Bighorn Sheep Ruin. The figurine head from Bighorn Sheep Ruin resembles Fremont-style figurines, of which the best described are the Pillings Figurines found in Range Creek in west-central Utah (Morss 1954) and those from the Old Woman Site (Taylor 1957) in central Utah. The eyes are represented by shallow indentations, and the nose by a pinched ridge. The chin is the "disengaged chin" typical of Fremont-style figurines; that is, there is a marked separation between the lower plane of the face and the plane of the torso (Morss 1954:4). A series of concentric bands around the neck apparently indicate a necklace. This ornamentation resembles the neck decorations of the anthropomorphic "Faces Motif" pictographs found on the Bighorn Sheep Ruin alcove and elsewhere in Salt Creek.

As is typical of Fremont-style figurines, the figurine from Bighorn Sheep Ruin was intended to be viewed from the front only (Morss 1954:5). The dorsal surface is flat and stippled, suggesting that it may have been placed on a piece of sandstone while wet. No hair bobs are evident; however, the artifact is too fragmentary to speculate whether it represents a male or female.

The figurine terminus fragments are all of the "handle terminus" variety (Morss 1954). One such figurine base, which was collected from the alcove surface on the ledge south of Structure 1, is incised to indicate an apron or breechclout (Figure 4). A tiny land snail shell was incorporated into the clay and is visible in the broken end of this artifact. The other terminus fragments are undecorated.

Archaeologists have found many unfired clay figurines and figurine fragments at Anasazi sites in the Glen Canyon area of southeastern Utah. Gunnerson found figurines at several Kayenta or Virgin Pueblo II and Pueblo III sites in the Escalante drainage. He describes these figurines as being markedly different from the very elaborate Fremont figurines from Range Creek and from the Old Woman Site (Gunnerson 1959:10). Lipe (1960:144–146) found unfired clay figurines at the Hermitage Site and at Benchmark Cave, twelfth century Kayenta sites with Virgin influence located along the Colorado River. Twelve unfired clay figurines and figurine fragments were recovered from three Pueblo III Anasazi sites in Moqui Canyon (Lipe et al. 1960:168–169). The Moqui Canyon figurines are described as resembling the smaller and cruder "so-called Fremont figurines" of central and northeastern Utah. Because no Fremont pottery or artifacts were present, the Glen Canyon figurines were ascribed to local, Pueblo III manufacture. They are attributed to either a backwash of ideas from the Fremont area or persistence of the Anasazi Basketmaker II figurine-manufacturing tradition (Lipe et al. 1960:169–170). The same conclusion can be applied to the Bighorn Sheep Ruin figurines.

Chipped Stone

The chipped lithic assemblage from the Bighorn Sheep Ruin alcove consists of 916 pieces of chert, chalcedony, quartzite, and siltstone collected from excavated contexts at the site. It is characterized by a high percentage of complete flakes; low numbers of broken flakes, cores, and bifacially retouched artifacts; and moderate amounts of flake fragments and debris. The site occupants were evidently practicing an intensive core reduction technology, whereby flakes were produced for use with little or no modification. Such a technology is characteristic of permanently occupied pueblo sites (Sullivan and Rozen 1985:763). Although some bifacial tools were manufactured at Bighorn Sheep Ruin, most chipped stone "tools" appear to have been of an expedient variety. Large, complete flakes were apparently produced for short-term use as cutting, scraping, and whittling implements.

Six projectile points were recovered from the Bighorn Sheep Ruin excavations. One is a unifacially flaked, corner-notched point or knife

Figure 3. Unfired clay figurine fragment (Catalog Number 192) recovered from Structure 14 at Bighorn Sheep Ruin.

Figure 4. Unfired clay figurine terminus fragment (Catalog Number 418) recovered from the vicinity of Structure 1 at Bighorn Sheep Ruin.

with a basal notch (Figure 5e) that resembles an Elko Eared style point. The other stemmed point or knife is side notched and resembles a Northern Side-notched style point (Figure 5f). Four unstemmed projectile points were recovered from the NW quadrant of Structure 18, in and above the roof fall. The proximity and similar style of these artifacts suggests that they were cached in the structure's roof. These projectile points resemble Bull Creek points (Figure 5a–d), which are found at sites dating between A.D. 1100 and 1250. Sites with Bull Creek points typically have high percentages (80%) of Mesa Verde ceramics, low percentages (20%) of Kayenta ceramics, and no Fremont ceramics (Holmer and Weder 1980:61–63).

The only other prepared tools recovered from the excavations at Bighorn Sheep Ruin were three chert biface fragments. Eight chert cores, three of which were found on the surface, were collected from the alcove. All of the collected cores that retain cortex have tabular cortex, which indicates they were obtained from a primary geologic source. Over 20% of the flakes retain cortex, most of which is also tabular. It is concluded that most of the raw material types were probably obtained locally, from the Cedar Mesa formation.

Ground Stone

One small troughed metate fragment, a two-handed mano, a mano corner fragment, and nine pieces of miscellaneous ground stone were recovered from various proveniences in the site alcove. Twelve bedrock grinding surfaces are also present in the site alcove. Ground stone artifacts are fine-grained sandstone or quartz sandstone, from the Cedar Mesa formation. Two pieces of ground stone were identified as dunite, an olivine-rich intrusive rock that forms in sills and dikes.

Faunal Artifacts

Bone artifacts recovered from excavated structures at Bighorn Sheep Ruin include a bead, a splinter awl, a finely sculpted bighorn sheep head pendant (Figure 6), a mammal rib with three holes punched in the side, and a cut and polished long bone fragment. Several leather fragments, including leather cordage, knots, and hide fragments, were recovered from excavated rooms at the site. Numerous pieces of cordage wrapped with feathers and quills were found. These presumably represent fragments of feather blankets.

Modified Vegetal Artifacts

Modified vegetal artifacts are abundant and typologically diverse. They include such items as basketry, cordage, sandals, cloth, quids, arrowshafts, worked wood, a painted squash rind pendant, and perforated corn shanks. The following parts of 13 taxa of plants were used by the site occupants in the manufacture of modified vegetal artifacts: dogbane (Apocynum), yucca, grass, and cotton fiber; squash pericarp; Dicotyledoneae, cottonwood, and willow wood; Gymnospermae resin; juniper bark; reed (Phragmites) and sedge culm; and various corn parts (Matthews 1988).

Fiber artifacts are the most common type of vegetal artifact. Yucca cordage is ubiquitous, and all stages of manufacture, from leaves to quids to cordage, are represented at the site. Evidence of cotton weaving is also present at Bighorn Sheep Ruin. Cotton seeds were recovered from the fill of rooms, cotton cordage is common, and two pieces of cotton cloth were found. Loom anchors in Structures 18 and 21 and spindle whorls are further indications of on-site textile manufacture.

DATING

Both dendrochronological and radiocarbon samples were collected from Bighorn Sheep Ruin for chronometric dating. The wood (complacent piñon and undatable juniper) was found to be unsuitable for tree-ring dating, however. Four radiocarbon ages were obtained (Figure 7). These were calibrated by the method outlined in Stuiver and Becker (1986; University of Washington's Quaternary Isotope Laboratory 1987).

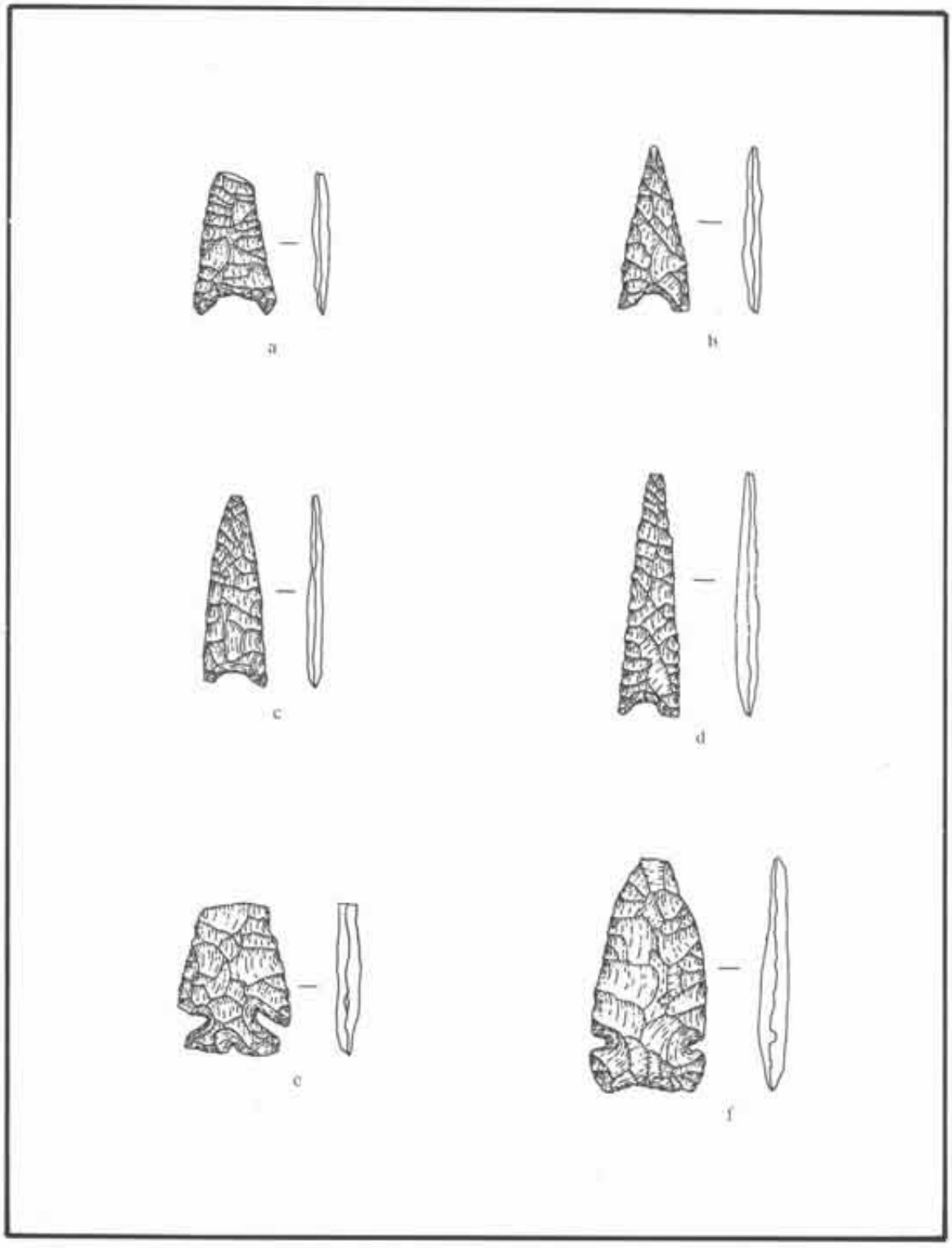

Figure 5. Projectile points: (a)–(d), Bull Creek style points (Catalog Numbers 244–a, b; 247–c, d); (e) Elko Eared style (Catalog Number 185); (f) Northern Side–notched style (Catalog Number 296). Artifacts are actual size.

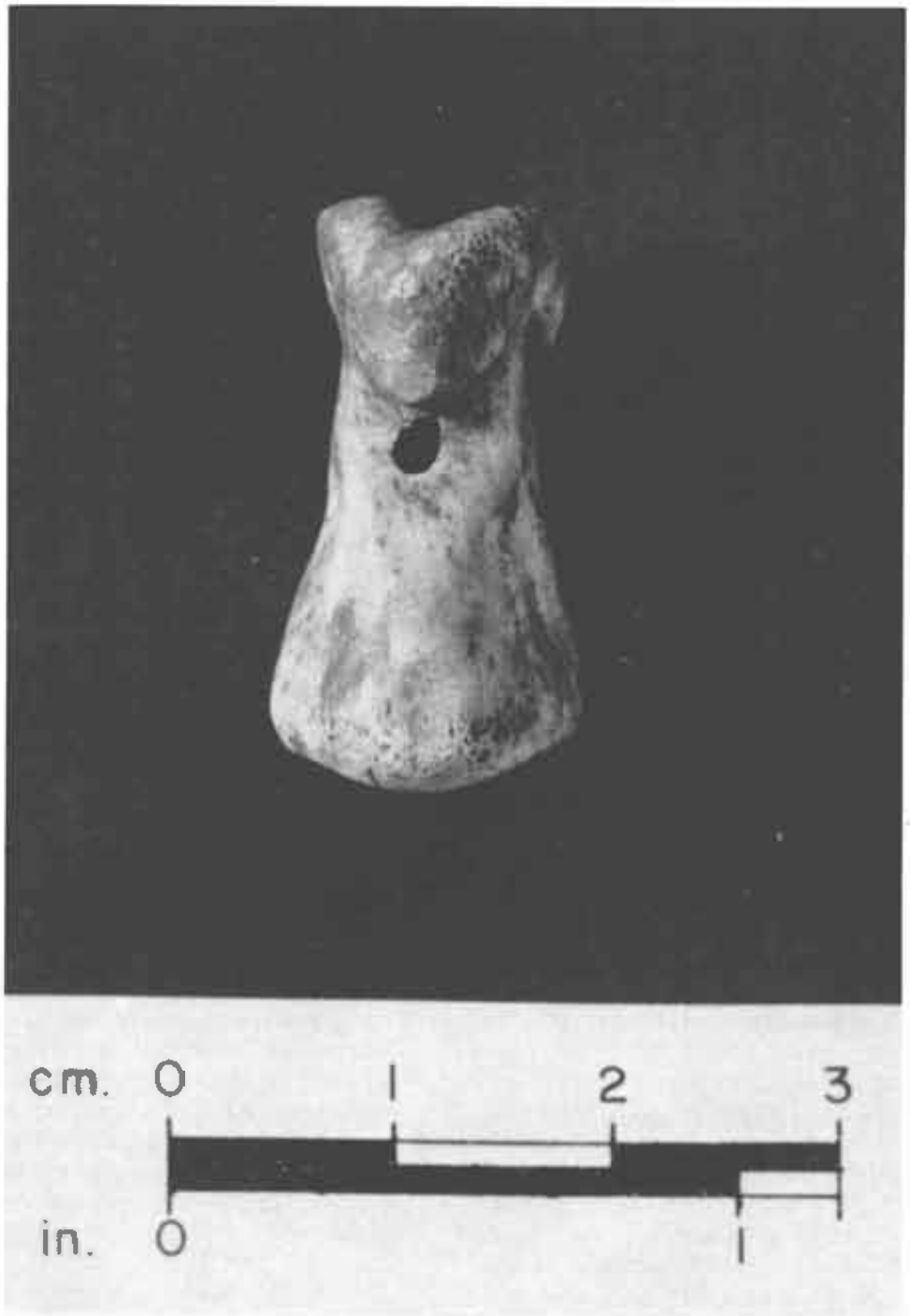

Figure 6. Bighorn sheep head pendant (Catalog Number 386) from Structure 21 at Bighorn Sheep Ruin. This pendant was carved from the second phalange of a bighorn sheep (*Ovis canadensis*).

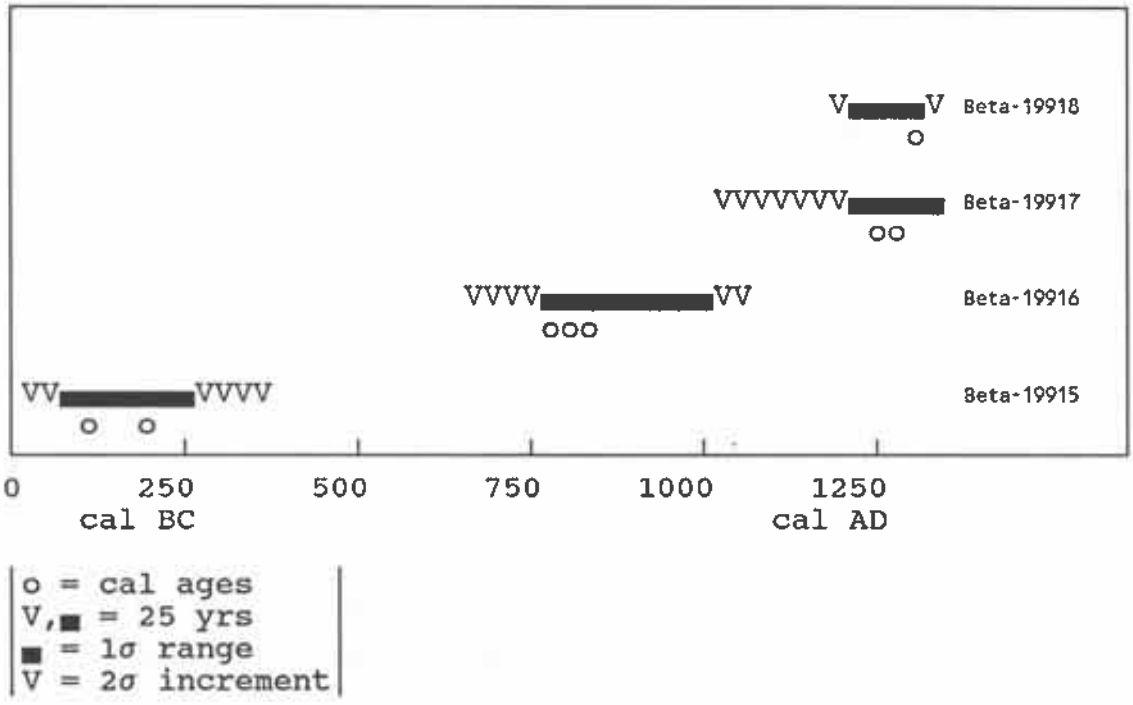

Figure 7. Radiocarbon dates.

The two samples from Structure 18 resulted in what are presumed to be anomalous dates. Beta-19915, charcoal found adhering to a large chunk of roof mortar in the room fill, produced a radiocarbon age of 1840 ± 70 BP (two sigma calibrated range A.D. 3–378). Beta-19916, charcoal from the hearth fill, produced a radiocarbon age of 1180 ± 60 BP (two sigma calibrated range A.D. 680–990). These dates are earlier than either Structure 18's architecture or artifacts.

Beta-19917, charcoal collected from a 5 cm thick stratum of charcoal and ash in the south half of Structure 12's hearth, produced a radiocarbon age of 800 ± 60 BP (calibrated date A.D. 1243; two sigma calibrated range A.D. 1041–1280). Beta-19918, charcoal collected from the fill of Structure 10's hearth, produced a radiocarbon age of 760 ± 50 BP (calibrated date A.D. 1263; two sigma calibrated range A.D. 1163–1300).

The average calibrated age for the two samples from Structures 10 and 12 is A.D. 1260 (two sigma calibrated range A.D. 1164–1282). These dates fall within the late Pueblo II–III period of Anasazi prehistory and correlate well with the late Pueblo II–Pueblo III ceramic types as well as with projectile points dating from A.D. 1100–1250.

ETHNOBOTANICAL ANALYSES

Several ethnobotanical analyses were conducted on remains from Bighorn Sheep Ruin (Clary 1988; Gish 1988; Matthews 1988; Toll 1988). Preservation of botanical remains is excellent because of the site's sheltered location. There is a wide array of taxa and a large quantity of materials, including plant parts that normally are not preserved without carbonization.

Bulk soil samples were collected from various site proveniences for flotation analysis of macrobotanical remains. Pollen samples were also collected during excavation. Vegetal remains and modified vegetal artifacts were recovered from the

surface of unexcavated structures as well as from excavated contexts throughout the alcove. A sample of coprolites found in structures at the site was also submitted for ethnobotanical analysis. Unlike other lines of information about prehistoric diet and plant use, coprolites provide direct evidence of foods actually eaten by the site's inhabitants. According to Toll (1988), an individual coprolite manifests ingestion over about one day, and presumably several eating episodes. It thus reveals the occupant's preferences at one time in the year rather than the general diet over an annual cycle. Conditions of plant specimens in coprolites also indicate food preparation techniques.

The remarkable preservation of perishable remains from Bighorn Sheep Ruin provided the opportunity for a thorough analysis of subsistence patterns. A full range of resource plants was identified at Bighorn Sheep Ruin. Domestic, pioneer, wild, and woody species were represented in the assemblage. Corn, beans, and squash were consumed by the site's inhabitants. These crops, as well as cotton, were probably grown in nearby fields on the floodplain below the alcove. Weedy annuals appear to have been the dominant pioneer plant food consumed at Bighorn Sheep Ruin. Goosefoot, seepweed, purslane, groundcherry, and tansymustard seeds were all found in coprolites. The pollen and macrobotanical analyses also indicate exploitation of pigweed, beeweed, and Indian ricegrass seeds. It is likely that the greens of many of these species, particularly beeweed, were also consumed. Wild plant seeds represented include squawberry, sedge, and prickly pear cactus. The presence of sedge in the macrobotanical and pollen records indicates minor use of riparian species, presumably obtained from Salt Creek.

FAUNAL ANALYSIS

The faunal component of the diet at Bighorn Sheep Ruin appears to have consisted of a variety of small mammals as well as bighorn sheep and, possibly, deer (Matlock 1988). The small mammals were probably snared near the site. Cottontail rabbit bones were abundant in the faunal assemblage, and rabbit hides were also recovered from the site. These rabbits may have been frequenting agricultural fields and so would have been easy prey. The coprolite analysis provides indisputable evidence of human consumption of small rodents, probably prepared in stews (Binford 1988). Few bird bones were recovered, but feathers (presumably turkey) and feather-wrapped cordage were well represented in the artifact assemblage.

ARCHITECTURE

The masonry architecture at Bighorn Sheep Ruin is of uniform style. It consists of single course walls built with unshaped stone laid in copious amounts of unprocessed mortar. The sandstone used as building stone was acquired from the local Cedar Mesa sandstone outcrop, which produces an abundant supply of colluvial debris in sizes appropriate for masonry. Minimal shaping or dressing of the building stones apparently was conducted only when various stone sizes were needed. Mortar for laying stone and for plastering walls was mined from the interbedded siltstone deposit of the Cedar Mesa formation. The abundance of inclusions indicates that little effort was made to modify the sediments before use. Although a fairly consistent, sandy loam mortar was used throughout the site, the variety of mortar types present suggests that there was little concern for color.

The nature of the construction at Bighorn Sheep Ruin has been termed expedient because of (1) the use of locally available building materials that exhibit very little processing or modification before use, (2) the randomness of the overall application of the masonry and mortar, and (3) the lack of patterning with regard to the structure size and shape. There is little or no architectural elaboration in the overall construction, such as quality stone finishing, use of specialized or unique mortars, or application of decorative chinking. The resulting structures do no more than meet basic living requirements. Minimal time investments in the initial construction and subsequent maintenance would have allowed for more time and energy for food procurement. Dry-laid/mudded masonry walls are the most common type of construction. This type of masonry entails laying stones atop one another with no mortar between. Mortar is then

used to fill the voids between stones. It is not uncommon, however, to see both wet-laid and dry-laid/mudded techniques used within one wall. Masonry walls are predominately single course in cross section. Double course walls occur only where a single stone was too small to span the width of the wall. The walls exhibit little or no coursing pattern. Wall construction appears to consist of random stacking rather than masonry laid in even, horizontal rows.

The configuration of the alcove was a factor limiting the types of structures that could be built at Bighorn Sheep Ruin. There is no one distinct structural size or shape. Likewise, there is no standardized pattern of building with the exception of the placement of the smaller granaries along the alcove back and the placement of large habitation and, possibly, ceremonial structures along the alcove edge.

The construction sequence of Bighorn Sheep Ruin is unclear. Rooms appear to have been built one at a time. Each structure is an independent construction unit with little or no sharing of walls or natural features between other structures. The only commonly shared features include the retaining wall, the alcove back, and the natural ledges or shelves within the alcove. Because of this independence, it is not possible to determine the construction sequence based on bonding and abutment patterns.

The presence of mortar outlines on the alcove back that do not correlate with the existing rooms and the presence of construction debris within the fill of the retaining wall beneath the existing structures indicate at least one major renovation episode. Differences in mortar color are evidence of multiple repair episodes ranging from major repairs to miscellaneous patching. The alcove provided excellent protection from the weather. As a result, the site's maintenance requirements were probably greatly reduced.

The retaining wall is the most distinct architectural feature at Bighorn Sheep Ruin. Although retaining walls are common construction features within the Mesa Verde and Kayenta Regions, they may be an anomaly in Canyonlands. Big Ruin is the only other recorded site in Canyonlands known to have such a high-energy investment architectural feature. The retaining wall is significant because it provides a foundation for many structures while also creating greater working and living space within the alcove.

There are many stylistic similarities between Bighorn Sheep Ruin and other sites in the Cedar Mesa and Glen Canyon areas, both of which were expansion areas utilized at different periods by the Mesa Verde and Kayenta Anasazi. This is not to suggest that Canyonlands was inhabited or influenced by Kayenta peoples. It does imply, however, that the expedient style of architecture is a reflection of similar subsistence patterns and a lifestyle oriented more toward food procurement than elaborate architectural refinements.

Room function was determined on the basis of size and interior features. Artifactual assemblages were of limited utility in discerning room function because domestic refuse is present throughout the alcove. Population estimates (see below) were made on the basis of floor area of habitation rooms, employing Clarke's formula of $P = 1/3F$ (population equals one-third the total floor area), derived from the modern Cochiti Pueblo (Clarke 1974). Size of Bighorn Sheep Ruin habitation rooms ranges from 4.0 m^2 to 15.0 m^2, with an average of 8.8 m^2 (Table 1). The total floor area of the seven Bighorn Sheep Ruin dwellings is 61.4 m^2, which equates to a total 20 persons, or an average of 2.9 persons per room. It is interesting to compare this figure to Hill's figure of 2.8 persons per room, derived from population figures at the modern Hopi villages. The habitation rooms at Bighorn Sheep Ruin closely approximate the average Hopi room size (Hill 1970). Structures 18 and 21 are the largest rooms. Both have loom anchors, which are often found in kivas. These rooms may have served dual habitation/ceremonial functions.

SUMMARY

Anasazi horticulturists occupied Bighorn Sheep Ruin in the thirteenth century A.D. The site location was selected on the basis of a large alcove suitable for construction, the presence of arable

land and water in the Salt Creek drainage, and the local availability of raw materials and wild plant and animal resources. The vegetation at the time was similar to the modern environment. The substantial storage, habitation, and possibly ceremonial structures at Bighorn Sheep Ruin suggest that the site was a permanent residence for a small group of people. A population estimate based on floor area of the seven dwelling rooms at the site indicates that as many as 20 persons may have lived at Bighorn Sheep Ruin. During the period of occupation, a major renovation took place. Several storage rooms along the alcove back were dismantled, a labor-intensive retaining wall was constructed and filled with cultural refuse and construction debris to widen and level the alcove ledge, and additional structures were built behind this retaining wall. The major renovation episode at the site appears to have taken place within one main period of occupation. No underlying earlier occupation of the Bighorn Sheep Ruin site alcove was identified by the excavations.

The site occupants cultivated corn, beans, squash, and cotton. Pioneer and wild plant species and wild game were also a major part of their diet. A wide range of domestic activities took place at Bighorn Sheep Ruin, including manufacture of vegetal, lithic, and possibly ceramic artifacts. Hunting of large game is indicated by the presence of arrowshafts, projectile points, and bighorn sheep bones. Ritual activities are represented by pahoes, gaming pieces, and figurines, as well as by structures that may have served dual habitation and ceremonial functions. Except for evidence of borrowing of Fremont design motifs for figurines and rock art and the presence of Kayenta ceramics, there is little to indicate extra-territorial relationships.

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A WICKIUP SITE IN BOX ELDER COUNTY, UTAH

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INTRODUCTION

While conducting an archaeological survey of the Lake Bonneville shoreline (U–88–US–152bsp), a site featuring the remains of four wickiup structures (42Bo555), was discovered. The site is located in the Grouse Creek valley, 14.5 km south southwest of the town of Grouse Creek, Utah (Figure 1).

SITE DESCRIPTION

42Bo555 is located in a protected low–lying small cove of extinct Lake Bonneville, which forms a wind break to the south and west. A rise blocks the view from 42Bo555 to the east. The ground surface slopes slightly to the north northeast. The vegetational life zone could be classified as Upper Sonoran. A grove of juniper trees 3 to 4 m tall surrounds the site covering about 600 square m. Scattered among the junipers are high (up to 1 m) sagebrush, some grasses, and other low vegetation that is sparse in and around the site. Annual precipitation in this location is about 30 cm (Jeppson et al. 1968:31).

The site contains the remains of four wickiup structures or wind breaks and scattered stone flakes (Figure 2). The present appearance of the four structures would indicate they were built by

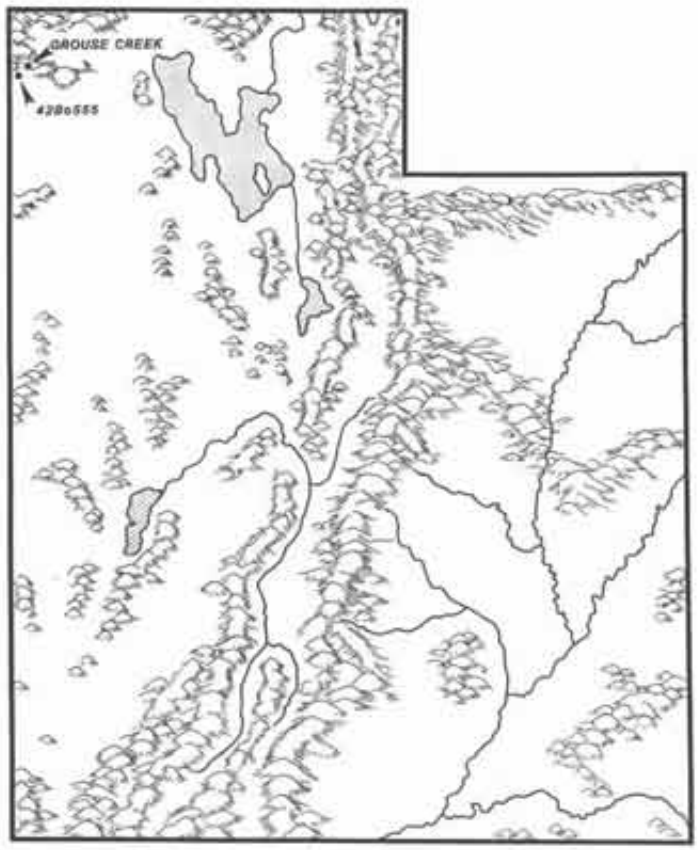

Figure 1. Location of wickiup site (42Bo555) in northwestern Utah.

inserting juniper branches into a living juniper tree. The live trees that were used as supports for the structures were estimated to be 200 to 300 plus years in age. The cut juniper branches are 2 to 3 m long and are currently located 1 to 1 1/2 m above the ground with the thick end of the branches toward the trunk of the tree (Figure 3). The inserted branches suggest tepee-shaped structures that are 2 1/2 to 3 m in diameter at the base. The cuts on the branches are large (up to about 5 cm in length) and smooth indicating a steel ax had been used to remove them from a tree. Two disorganized piles of the same kind of cut branches (a total of 30 to 40) were found between the four structures. The cut branches in the structures and in piles on the ground have few if any of their small branches removed, although the leaves and twigs had weathered away. No flaked lithics or other artifacts were found in or close to the structures. No detectable entrances to the structure were located.

The lithic artifacts on the site included three large utilized flakes, a flake concentration, and assorted isolated flakes. The utilized flakes include a black obsidian, triangular-shaped flake measuring 3 cm at the base and 5 1/2 cm on the longest axis found between the structures, and two other large chalcedony flakes, rectangular in shape and measuring 3 cm by 4 cm and 3 cm by 5 cm found about 7 m to the west of the structures. One flake concentration of over 25 flakes covered an area of about 1 square m and was located about 12 m northwest of the structures. The concentration contained secondary flakes, tertiary flakes, and shatter of white and brown chert and chalcedony. Ten other isolated flakes of the same materials were found 15 to 20 m, north of the structures.

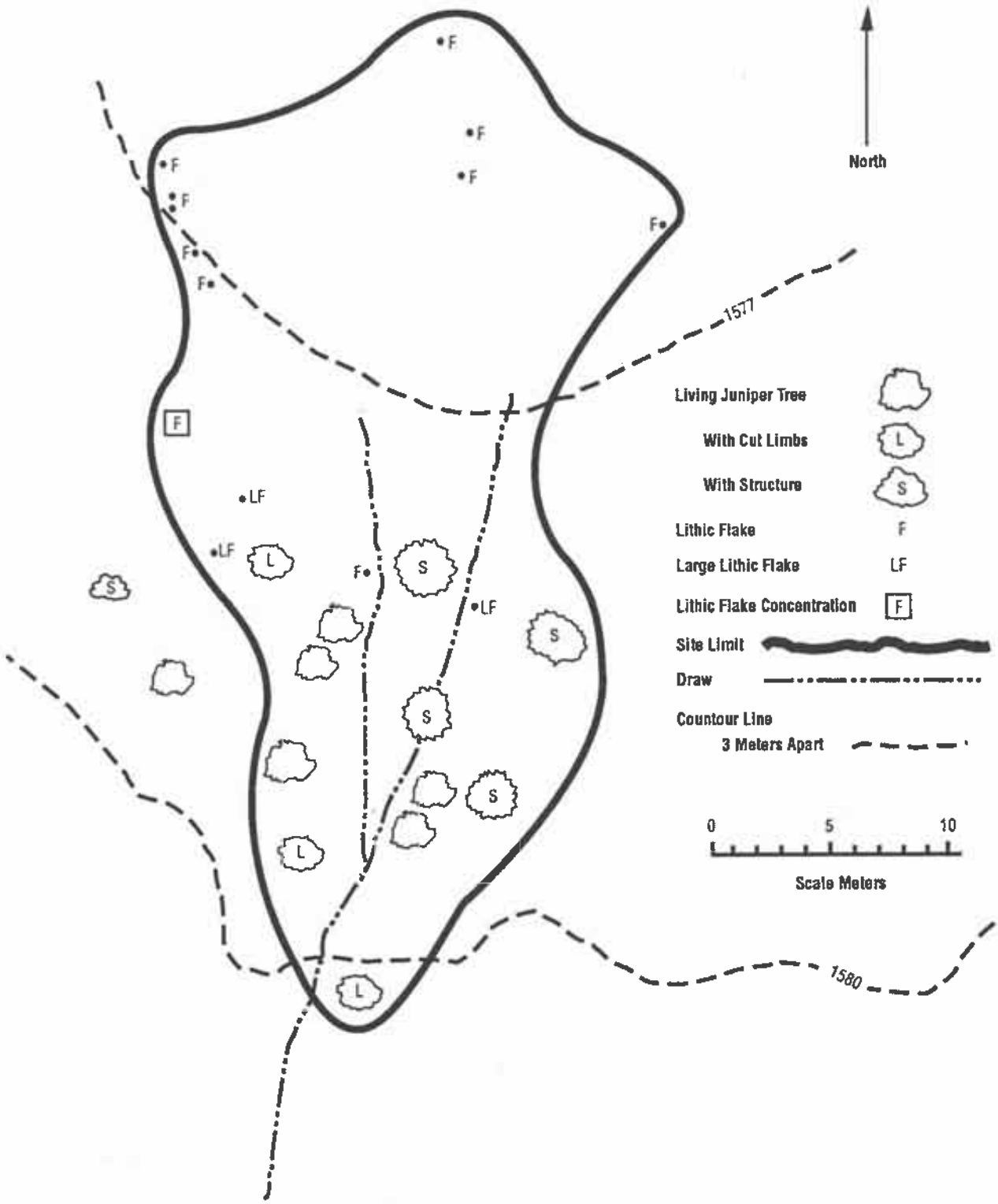

Figure 2. Wickiup site (42Bo555) in northwestern Utah.

Figure 3. The remains of a wickiup at 42Bo555 in Grouse Creek Valley, Utah.

The site does not contain historic trash, grinding stones, or pottery; at least, none of these types of artifacts were found on the surface of the site (no excavating was done).

SIMILAR SITES IN THE AREA

Excavated archaeological sites in the Grouse Creek area have yielded a dearth of information about Numic speaking people (Dalley 1976:161). No other sites yielding structural remains have been reported in Box Elder County, Utah, on IMACS (Intermountain Antiquities Computer System). The closest IMACS recorded sites with structures similar to 42Bo555 are approximately 40 km to the southwest and located northwest of Montello, Nevada (sites CRNV-11-5194 and CRNV-11-5199). CRNV-11-5194 has mostly historic trash along with a few flaked lithics. The historic trash suggests site use between about 1905 and the 1920s. One of the two reported structures is an aligned "ax-hewn" pile of limbs, 2 m in diameter and is more like a wind break or sun shade than the conical-shaped structure found at 42Bo555. The other structure is 4 to 5 m in diameter and has several 1 to 1 1/2 m, "ax-cut" limbs inserted in the ground, butt-end first, suggesting a corral type enclosure. At CRNV-11-5199 there are 400 to 700 lithic flakes, no historic trash, and a structure 5 m in diameter again constructed like a corral.

Eight km farther west and northeast of Toano Well Number 1 in Nevada are two additional wickiup sites (CRNV-11-3613 and CRNV-11-3619). Some of the 7 to 14 structures noted here are circular in form and measure about 2 m in diameter. They incorporate living juniper trees and appear to be more like the structures at 42Bo555. CRNV-11-3619 contained three Elko corner-notched points, two sherds of Late Prehistoric ceramics with a drill hole in each sherd, a mano, and other flaked lithics. No historic trash was noted nor was the type of tool used to cut the limbs for the structures indicated.

One of the closer wickiup sites to 42Bo555 reported in the literature is the Bustos site (26Wp1742) near Ely, Nevada (Simms 1990). The structures at the Bustos site were made with stone tools. The Bustos site structures were more substantial than the structures at 42Bo555 with larger diameter cut logs which in turn are covered with small branches and dirt to make them less permeable. The Bustos site has been dated between A.D. 1700 and 1825.

ETHNOGRAPHY OF THE GROUSE CREEK AREA

The steel ax marks on the cut branches of the structures indicate the site was occupied in the protohistoric or historic times. The occupants would have to acquire axes directly or indirectly from Euro-Americans. At historic contact the Grouse Creek Shoshone inhabited the northeastern Utah region and are described by Steward (Steward 1938:173–177 and 1943).

Before European contact the Grouse Creek Shoshone were one of the groups of the Numic speaking people that may have arrived in the Great Basin some 600 years previous (Jennings 1978:235). Their material possessions were very limited. Their diet was varied but it depended primarily on plant foods, essentially pine nuts (they were called Tuba Duka, pine nut eaters, by the Shoshone, Steward 1943:268), grass seeds, roots, and berries, but also included large and small animals and salmon from the Snake River in southern Idaho (Steward 1943:268). Grasshoppers, ants, and other insects were roasted and eaten (Steward 1943; Madsen and Jones 1990). Because of the desert climate, resources were limited. To survive it was necessary to move from place to place when particular resources came in season. The extended family was the largest social unit although larger groups did get together for antelope and rabbit drives, trading sessions, and social events (Steward 1943:279). Many Great Basin Indians fashioned ceramics, but the employment of this technology is variable. Late Prehistoric ceramics are known from the Grouse Creek area (Dalley 1976). Steward reports that all Shoshones had made pottery but the practice was abandoned a long time ago (Steward 1943:273).

The Grouse Creek Shoshone experienced a radical change in their culture or lifeway from just

before Anglo contact to the time they were placed on the Indian Reservation at Fort Hall in 1876 (Madsen 1986). Initial contact, which occurred between about 1800 and 1825, introduced steel tools such as knives, pots, and axes. The acquisition of the horse in the 1840s (Madsen 1986:25) increased their mobility and their material possessions. With the use of the horse their hunting capability was improved so that they could hunt buffalo in eastern Idaho and Wyoming. With buffalo skins they made increasing use of tepees and moved away from wickiup type domiciles. Large masses of Euro–Americans moved into or through the Grouse Creek Shoshone area after about 1845. The Mormons came into the Salt Lake area starting in 1847 and spread out quickly to cover most of the arable land in Utah. They confiscated some of the best land and springs in the general area, taking from Native Americans a significant portion of the resources that they had been depending upon for survival. In 1849 the California gold rush started and over 10,000 people traveled through Box Elder County. The next year 15,000 traveled the same trail (Madsen 1986:19). These immigrants brought livestock with them that denuded the ground of grass, and these same immigrants shot and ate many of the available game animals. The Grouse Creek Shoshone depended heavily on the U.S. Government and the Mormons for food and other supplies during the 1850s and 1860s. Most of the rest of their supplies came from raids on Anglos or from materials that the Anglos had discarded (Madsen 1986; Madsen and Jones 1990).

By 1876 most of the Grouse Creek Shoshone were pretty well confined to the reservation at Ft. Hall (Madsen 1986:105). The best parts of their land had been taken over by the white man. Without resources it was necessary for them to retreat to the reservation.

SITE DISCUSSION

There are strong indications that 42Bo555 is a Grouse Creek Shoshone site dating to the protohistoric time period. Its location, the wickiup structures with ax cut branches, the lithics found, and the lack of historic trash are the leading indicators.

The four wickiup structures at 42Bo555, which were described earlier, are somewhat temporary in construction. This would indicate the encampment was for a short period of time (days or weeks), but it may have been used more than once based on the quantity of lithics found. The size of the cut limbs at 42Bo555 indicate very frail wind breaks or wickiups were built and the cut limbs may have been leaned against the out branches of the trees that were used as supports. The large smooth cuts on the juniper limbs that are lying on the ground look like they might be trimmings from fence post preparation, but the juniper trees in the area do not show missing "posts" (Steven R. Simms, personal communication 1989).

Although a relatively large number of lithic tools and flakes were found, there were no grinding stones or ceramics. This could be a result of short occupations, an absence of women, or removal of grinding stones by later occupants for reuse (Simms 1983). The absence of ceramics is not unusual since Late Prehistoric ceramics, while known, are uncommon in the Grouse Creek area (Dalley 1976). Flaked lithic tools and the steel ax could have been used at the same time at the site, since they served different functions and stone tool usage persisted into the historic period (Steven R. Simms, personal communication 1989).

The available evidence suggests the site dates between A.D. 1800–1850. The steel ax used to cut the juniper branches could have been introduced to the Grouse Creek Shoshone around 1800 when the first trappers and traders came into the Great Basin. Euro–American goods would be expected to be more available to the Shoshone after 1845 when contact intensified. The wickiup may indicate the Shoshone had not yet obtained the horse (1840s) when they changed to buffalo skinned tepee type structures, although wickiups were used during historic times. Thus the site could date later than 1850, but several lines of evidence suggests a likely span of 1800–1850.

ACKNOWLEDGMENTS

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A CROOKNECK WOODEN STAFF FROM SAN JUAN COUNTY, UTAH

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INTRODUCTION

On 20 December 1980 a crookneck wooden staff was discovered by Fred Blackburn, White Mesa Institute, Blanding, Utah, in a tributary canyon, northeastern drainage of Grand Gulch, San Juan County, Utah (Figure 1). This paper reports the location, collection, and curation of this well-preserved crookneck staff. The prehistory of similar artifacts from the Southwestern archaeological record is reviewed along with a historic account of ceremonial use. Implications concerning the function of the artifact with respect to cultural interaction, trade, and rock art motifs are discussed.

STAFF LOCATION/DESCRIPTION

The crookneck staff was found among pack rat debris in a low, protected space under a large talus sandstone boulder (Figure 2). A decision to document the site and collect the staff was made based on increasing destruction of archaeological resources in the immediate area by artifact hunters.

The gross appearance of the artifact is one of a use-worn, well-made crookneck wooden staff in near-perfect condition, polished from wear along the entire length, especially in midsection. The distal end has been carefully shaped into a blunt

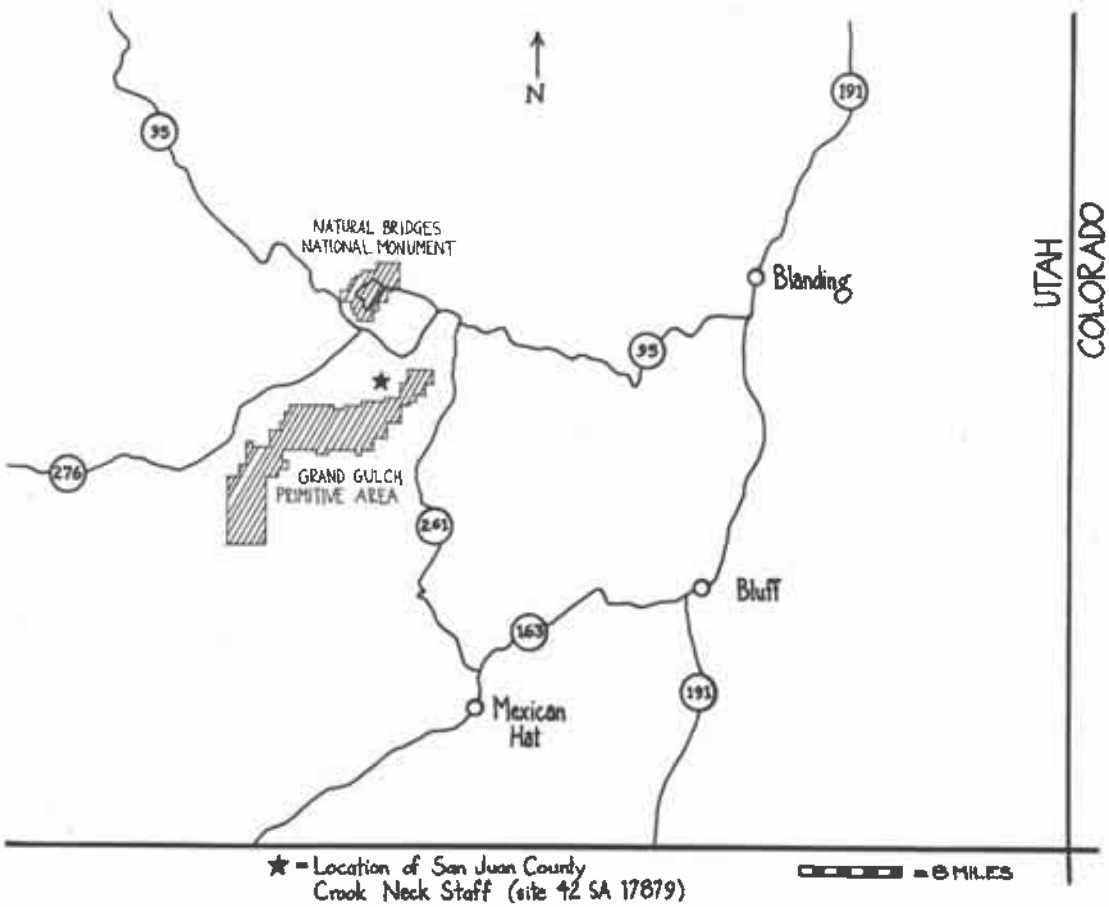

Figure 1. Map of southeastern Utah showing location of wooden crookneck staff site in San Juan County.

wedge form and shows longitudinal abrasion to a distance of about 10 cm from the tip (Figure 3, 4a). The crookneck staff represents an isolated find. No other artifacts or cultural debris were found on the ground surface at the site. The wood has not yet been identified and no radiocarbon dates have been obtained. The staff measures 143 cm from distal tip to top of the crook, 7 cm across the outside of the bow of the crook, and an average thickness of 1.5 cm. The staff has been placed in the Edge of the Cedars Museum's permanent collection, Blanding, Utah (Hurst 1986).

ARCHAEOLOGICAL EVIDENCE FOR CROOKNECK STAFF

Since there are no radiocarbon dates for the San Juan staff, it is not possible to assign a particular time frame for its use, and since there are a range of sites from early Basketmaker to Pueblo III within a three mile radius of the discovery location, any or all of these cultural periods could have played a role in the history. The form and appearance of the staff suggests a strong similarity to the Northern Arizona Basketmaker staffs especially the crooked staff described in the White

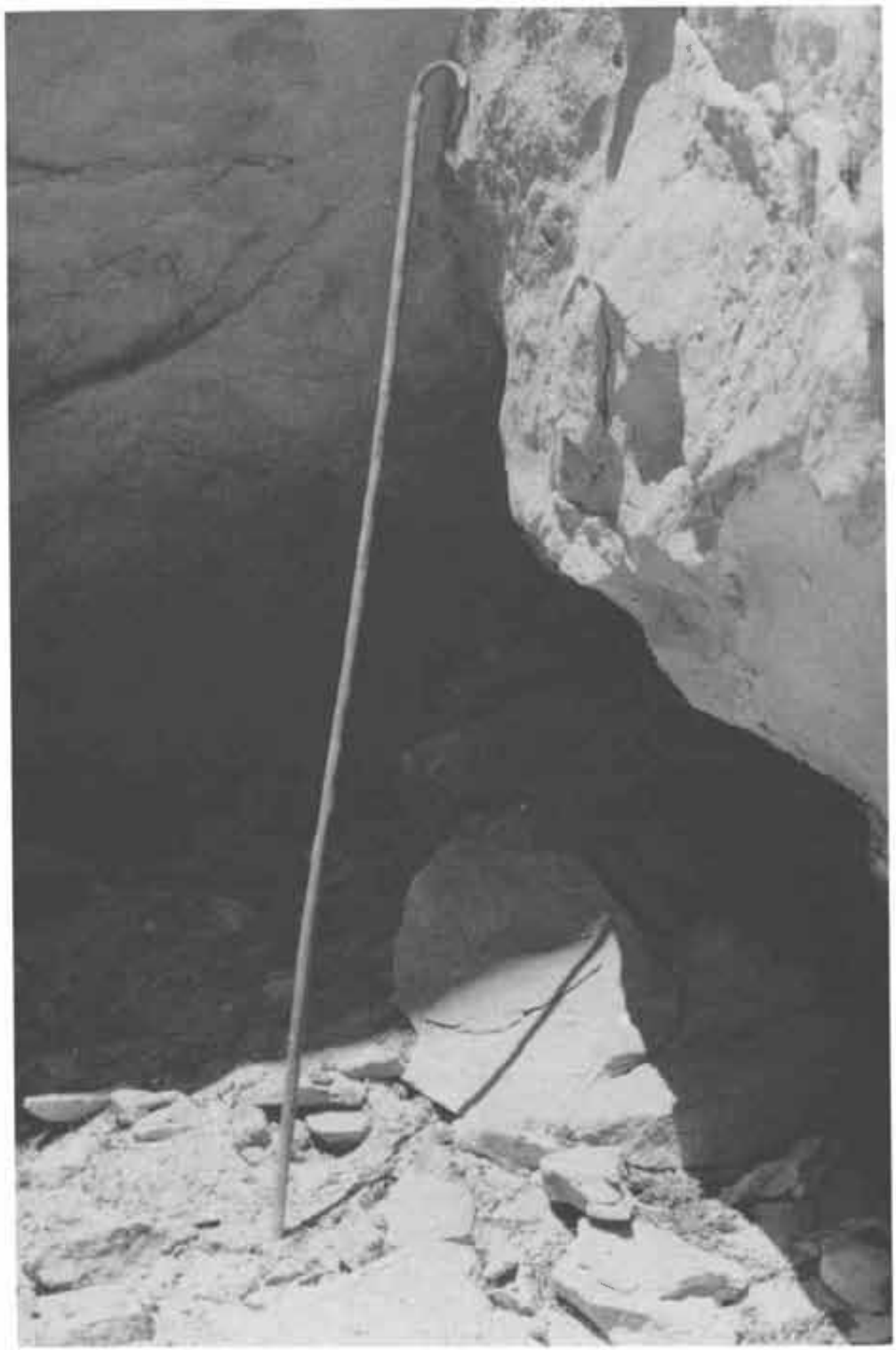

Figure 2. Photograph of crookneck wooden staff at discovery site in Grand Gulch drainage, San Juan County, Utah. The staff measures 143 cm in length and has an average width of 1.5 cm.

Figure 3. Line drawing of San Juan County wooden crookneck staff (not to scale). The drawing shows the knot at the point where the crook begins and the blunt taper at the distal end of the staff.

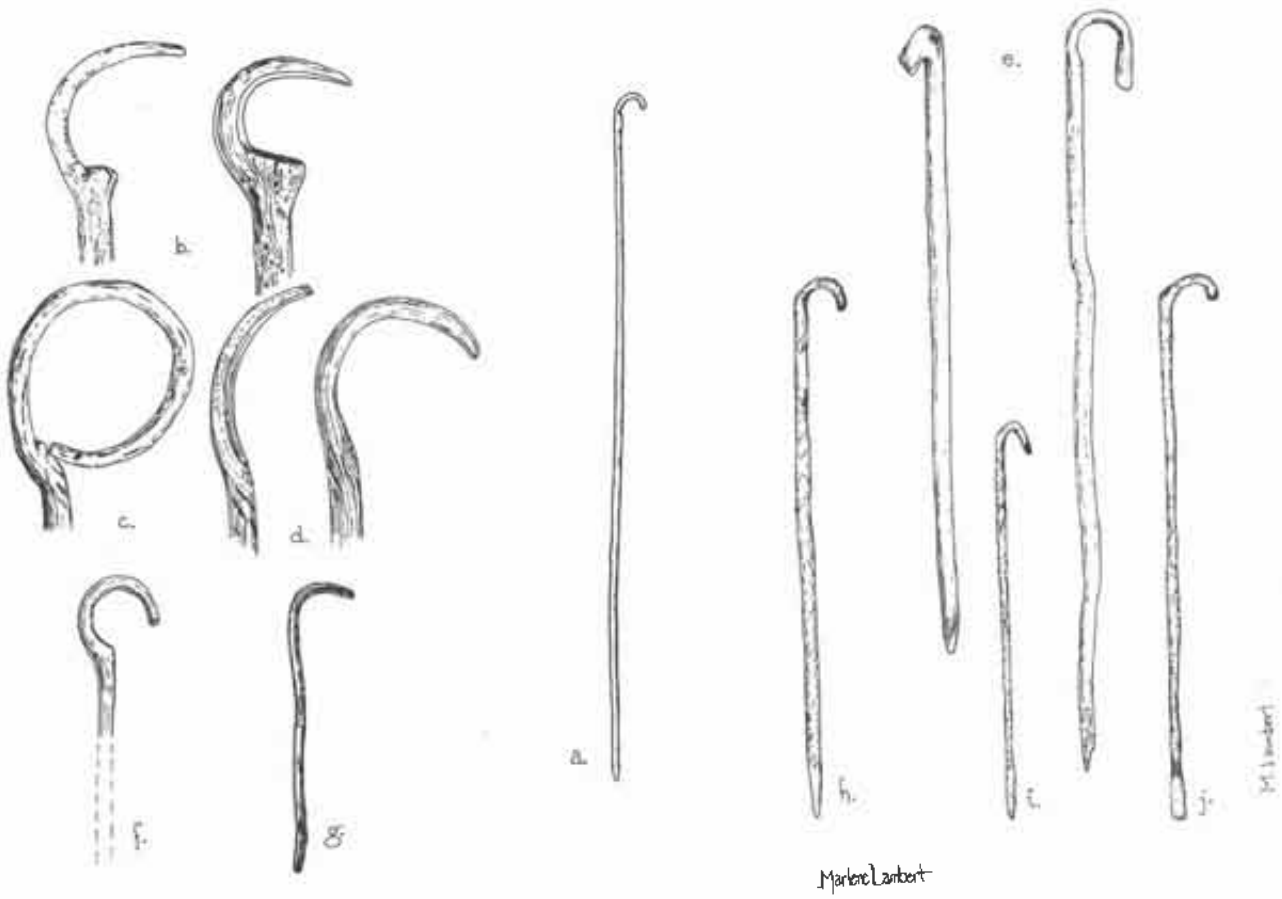

Figure 4. Types of crookneck staffs — (a) staff: San Juan County, Utah (not to scale); (b)–(d) staffs: Room 32, Pueblo Bonito (Pepper 1920); (b) Type II; (c) and (d) other "ceremonial staffs; (e) staffs: Segi Canyon (Kidder and Guernsey 1919); (f) and (g) staffs: Kane County, Utah (Nusbaum 1922); (h) (i) and (j) staffs: Prayer Rock District, northeastern Arizona (Morris 1980).

Dog Cave Basketmaker burial by Guernsey and Kidder (1921).

Wooden staffs of various shapes and sizes have been previously documented in the Southwestern archaeological record. The excavations at Pueblo Bonito, Chaco Canyon, New Mexico, in 1896–99 produced the first description of wooden staffs (Pepper 1920). During the excavation of room 32 in Pueblo Bonito, 375 individual wooden staffs with various types of crooks, bends, and knobs were found standing in the northwest corner (Figure 4b, c, d). Comparative length measurements were not possible on these staffs due to the state of decomposition along the distal end, but, since all the staffs were in an upright position, the upper part was well-preserved and, using end shapes for comparison, Pepper classified them into four classes or types.

The first type had one end with a knoblike element, sometimes perforated; the second type had one end shaped like a bear claw (Figure 4b); the third type had one broad spatulate end, and the fourth type had one end wedge-shaped. Later excavations at Pueblo Bonito produced additional staffs with eight examples of Type II (Judd 1954). The largest (no dimensions published) of the Type

II sticks was recovered from a burial and fragments of Type II sticks were observed in an adjoining room also containing burials. The method of creating the "bear-claw" effect (Figure 4b) on one end of the staff as described by Judd was to cut away one part of a forked branch or shoot and to flatten the inside of the remaining fork so it could be bent.

During the field seasons of 1914–1915, Kidder and Guernsey (1919) excavated several ruins, mounds, and cliff houses in the Kayenta district of northeastern Arizona. Included in their report is a description of artifacts excavated from a burial in Segi Canyon opposite Keet Seel Ruin. The burial is described as being "disturbed" and containing three crooked staffs. The staff that was most carefully made had both ends neatly smoothed, the crook end was blunt, but the opposite end was pointed (Figure 4e). The crook was held down by yucca fibers sunk in grooves and the body of the stick was partly cut away leaving a round opening that Kidder suggests may have been for the reception of a cross stick. The length of the staff was 74 cm. A similar crook was found at a small cliff house in the Monument Valley area by Kidder and Guernsey in 1914, but the shaft of this staff had been burned away and the length could not be determined (Kidder and Guernsey 1919).

Additional excavations by the same group (Guernsey and Kidder 1921) were done in northeastern Arizona during 1916–1917. Artifacts were collected from White Dog Cave and included several "planting sticks" that were excavated from a cist in the cave floor. One stick, the only one with a crook, was associated with a burial (Basketmaker) and was described as being 124 cm long, 1.5 cm diameter with one end worked to a flat point. The other crooked end was blunt. The stick was made from the peeled limb of some unidentified hard wood with knots rubbed smooth and having a dark surface that had been polished the entire length by handling and wear.

In another Basketmaker cave site located in Kane County, Utah (about 100 miles southwest of San Juan County), Nusbaum (1922) excavated "digging sticks" located in the "matted debris" on the cave floor. Six sticks were found with two having a crook at one end. One of these sticks had only a short portion including the crook preserved and it was not possible to determine the original length whereas the other stick, although intact, had a badly misshaped crook end more in a right-angle shape than a true crook (Figure 4f, g).

Morris (1940–1941) describes "prayer sticks" located in the wall of Mummy Cave Tower, Canyon del Muerto, Arizona. From a total of fourteen sticks, all located in wall masonry, three sticks had a crook of some type, six were knobbed at one end, four were curved or slightly bent at the center, and one stick was completely straight. In this collection all of the crooked sticks were made from a limb in which the crook was bent back after having cut away one branch of a fork, similar to the method described by Judd for the Pueblo Bonito Type II crooks.

Elizabeth Ann Morris (1980) has organized and analyzed the notes from 1928–1931 excavations of Earl Morris in the Prayer Rock district of northeastern Arizona. Among the artifacts listed from these Basketmaker Caves are "cane-shaped digging sticks with pointed tips" (Morris 1980:135). Seven whole and five fragments of crooked staffs were collected. The shafts and ends of all the staffs were smoothed and all the tips except one were ground to a rounded point (Figure 4h, i). The one exception had been flattened to a squared edge. The rounded tipped canes had a length of 36–90 cm, a diameter of 0.6—3.2 cm, the square-tipped cane was 146 cm in length and 2 cm in diameter (Figure 4j).

ETHNOGRAPHIC EXAMPLES OF THE USE OF CROOKNECK STAFFS

The use of crooked staffs has been observed and recorded by several ethnographers. In historic times piñon nuts were harvested in the Great Basin with "long hooked harvesting poles" (Fowler 1986). Since there is no wear pattern or scratches around the crook on the San Juan staff, it is doubtful that it was ever used for pine nut collection. Staffs of this type may represent an early planting tool used for placing individual seeds in a small plot close to a water source and thus came to be associated with

spring planting, water, life, growth, and fertility. A petroglyph panel located about three miles from the staff site depicts a crooked staff with fertility symbolism (Figure 5). The association of a crooked staff with the "weeding tool" during the Hopi Powamu ceremony at Oraibi observed by Voth (1901:118:Plate LXXI, Plate LIII) enforces an agricultural basis as the function.

Voth (1901) describes the sand mosaic drawn for the Powamu Kachina initiation as representing the Sipapu or hole in the earth from which the human family emerged. From the center of the Sipapu a yellow cornmeal line is drawn which represents the way of life the Hopi traveled when emerging from the Sipapu and travelling toward the rising sun. This line has four blue marks beside it which are the footprints of the traveler and four crooked sticks of different lengths representing the four stages of life: the longest, youth and the shortest, old age. When impersonating the God of Germination, *Muyingwa*, the Powamu priest carries a crooked stick, a water vessel, and a wooden implement used for weeding crops in his left hand as he descends into the kiva which represents the earth home of *Muyingwa*. Voth also describes events at Oraibi during Powamu when the female kachinas *Cooyok-Wuhti* frighten the village children to ensure their good behavior for another year. The *Cooyok-Wuhti* kachina carries a crooked stick that she uses to reach out, hook, and pull the child towards her.

DISCUSSION

The nature of the site reported here and the location of the staff beneath a protective boulder provides several functional possibilities. The site may represent a water or agricultural shrine with the staff being the remaining element of an altar constructed nearby or the site may represent a depository for a field tool close to a small cultivated area. The staff does not appear to be part of a burial as no human remains were observed on the surface, although this is not proof that the staff was not part of a burial in the vicinity and its location is secondary. Another possibility is that the site represents the ritual burial of the staff and was never associated with human remains.

Parsons (1939) has described the widespread use of prayer sticks and canes among Pueblo societies. These "sticks" are usually about six to eight inches long, tied together in a bundle with specific types of feathers attached. They are measured on finger, hand or arm, the shortest a finger-joint long and the longest the length of the outstretched arms. The standard length at Acoma is from wrist to the tip of the middle finger and at Hopi Mesa from the center of the palm to the tip of the middle finger. At Zuni, Sia, and Acoma the sticks are flat at the base and may be whittled for about one inch above the base, however the Hopi and Laguna round off the base to a point or cut the base in four pieces to form a point. At Acoma a crooked stick or cane is given to travelers to provide strength for the journey and is given to the dead as a letter of introduction to the underground world. Prayer sticks may be planted at shrines, in a cornfield, beside a stream or seep or left at a burial to invoke blessings. Among all the Pueblo societies the most common wood used for prayer sticks of any type is willow and is associated with water or rain. Crooked sticks are common at Zuni, Acoma, Laguna, and Jemez with a string tied bowlike across the crook or with the wood making a complete circle. At Zuni, they are explained as canes of longevity and the crook or closed circle as something for the spirits to come down on "to pull down the rain." At Zuni large crooked sticks belong to the high Rain Priest and are carried by kachina dance announcers in the winter dances. These Zuni crooked sticks are symbolic of authority and power and are a permanent part of the ritual procedures. A crooked stick is carried by the water-corn clan kachina at the Walpi winter solstice; a crooked stick is the office insignia of the Keresan town chief; each member of the clown societies of Cochiti has a crooked stick painted in cardinal colors and the standard of the Singers society of Oraibi is a crook.

If the site where the crooked staff was found represents a burial or a shrine to the dead, then the function may have been one of status. Some of the burials associated with crooked staffs such as those at Pueblo Bonito in Chaco Canyon have been designated as "high status." The term "high status" has been used primarily because of the long-distance trade items of Mexican origin associated with the burial. Lister (1978), for

Figure 5. Rock art, San Juan County, Utah. The petroglyph panel is located at a Pueblo II–Pueblo III ruin about three miles from the crookneck site and depicts fertility symbolism associated with the crookneck staff motif.

Figure 6. Rock art, San Juan County, Utah, about six miles from the site of the crookneck staff. A walking anthropomorph holds a crookneck staff.

example, has included "ceremonial canes" as a cultural item that diffused from the Mesoamerican area into Chaco Canyon about A.D. 1000 and suggests that these canes may have been associated with long-distance traders who moved into the Chaco Canyon area and directly accelerated the development of the Chaco Anasazi. A direct connection between crookneck staffs and Mesoamerica at this period, i.e., A.D. 1000, is not well documented, but at a later time, i.e., the Aztec Period and post-Spanish conquest, good documentation is available for the association of crookneck canes or staffs and the long-distance trade system operated and controlled by the "Pochteca" trade guild (Bittman and Sullivan 1978). Reyman (1978) has taken the association between trader and cane a step further and argues that the burials, especially those in Chaco Canyon that are associated with staffs or canes, are actual *Pochteca* burials and represent an individual who traveled from Northern Chihuahua into the Southwest. The crookneck staffs associated with Basketmaker burials in northern Arizona (Guernsey and Kidder 1921) predate the Chaco expansion period (A.D. 1000 plus) and have been assigned dates of A.D. 1-400 (McGuire 1980). McGuire has used this information as evidence of a flaw in the argument for Mesoamerican influence in the Anasazi developmental sequence.

Since the crookneck staff is used by historic Pueblo cultures as a symbol of both life/fertility and status, this analogue can perhaps be extended into the past suggesting that in early Basketmaker trade networks an individual passed along information, ideas, and seeds among neighboring groups. The planting stick became a trademark of this process and, over time, the crookneck staff became an object symbolizing authority, knowledge, and life. To what extent a trade network existed during the Basketmaker-Pueblo III period in the San Juan region is unknown. However, some type of network must have been operational and agricultural items, horticultural knowledge, and other information exchanged between groups living in close proximity. An interesting petroglyph located about six miles from the staff discovery site profiles a walking human figure holding a crookneck staff (Hurst and Pachak 1989) (Figure 6). This motif is suggestive of the post-Aztec codex drawings of *Pochteca* in which a walking figure is sometimes shown, also in profile, holding a crookneck staff (Dibble 1981).

Whether or not individuals traveled from northern Chihuahua into the Four Corners region remains to be determined. A locally controlled exchange system between neighboring areas could have transported the trade items within the Southwest. The archaeological record may never yield any information that would identify the origin of individuals buried with "ceremonial canes." However, new biochemical information obtainable from the DNA within the bones of these "high-status" burials may answer questions concerning population affiliation for individuals in prehistory and may provide clues as to whether or not actual persons from Mesoamerica or other non-local groups were living with the Basketmaker/Anasazi enclaves (Hagelberg et al. 1989). Some work has already been done (Shearin et al. 1989) on Southwestern prehistoric material but more samples need to be analyzed and the biochemical fingerprints identified before questions of prehistoric association between large geographic areas can be addressed.

CONCLUSION

Major similarities between the San Juan County crooked staff and those excavated in Northern Arizona Basketmaker sites have been identified. Rock art motifs suggest a ritual function of fertility and status for the staff and historic Pueblo use of similar staffs includes both themes.

ACKNOWLEDGMENTS

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THE NINE MILE CANYON SURVEY: AMATEURS DOING ARCHAEOLOGY

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A VOLUNTEER SURVEY IN NINE MILE CANYON

Introduction

In the fall of 1989, fifty-one volunteers worked under the supervision of four professional archaeologists for five weekends to record cultural manifestations in Nine Mile Canyon, Carbon County. The project was conceived and organized by amateurs who obtained funding to hire the professionals. The leaders among the amateurs are graduates of Level III of the Utah Avocational Archaeologist Certification Program (UAACP). Many of the other participants have completed levels I and II of the program. In this article we briefly review the history and goals of the Nine Mile Canyon Survey and the results of the first season's work. The background of the certification program and the use of volunteers and certified amateurs on an archaeological project is discussed. We consider the value of such participation from the point of view of both amateur and professional archaeologists. The Nine Mile Survey 1989 was an interesting test of the certification program and the experience that we gained may be useful to others who are planning similar projects.

HISTORY OF THE PROJECT

In 1986 the Utah State Legislature appropriated one-time funds for the establishment of a training program for amateurs with an interest in archaeology and the preservation and recording of archaeological sites. The need for such a program had been felt for many years and increased with the required use of the Inter-Mountain Archaeological Computer System (IMACS) forms for recording archaeological sites throughout Utah. Professionals and amateurs saw the benefits of a training program that would familiarize interested persons with the basics of archaeological method and theory, Utah prehistory, and IMACS.

This one-time appropriation from the legislature enabled the Division of State History, Utah Professional Archaeological Council (UPAC), and the Utah Statewide Archaeological Society (USAS) to contract with James Wilde of the Office of Public Archaeology at Brigham Young University to write the course materials for the UAACP. These have since been used by professional archaeologists around the state to train interested people in their areas. The program has been a success from the beginning with particular support from David Madsen, State Archaeologist; La Mar Lindsay, former Assistant State Archaeologist; and Kevin Jones, current Assistant State Archaeologist.

The UAACP has been used to certify amateurs from all over Utah to participate in archaeological projects. One of the most ambitious of these projects took place in Carbon County during the fall of 1989.

In early 1989 members of the Castle Valley Chapter of USAS learned that there were historical preservation matching funds available to Certified Local Governments and that some archaeological projects could qualify for the program. They immediately expressed an interest in participating in historic preservation and after short consideration

chose an inventory of the cultural resources of Nine Mile Canyon as their project. Upon learning that Carbon County was not a Certified Local Government, a committee of USAS members prepared a draft of the necessary ordinance which was submitted to the Carbon County Commission and subsequently approved by them. The county commission then appointed a historic preservation committee consisting of several members of the local USAS group and other interested county residents. The committee identified the scope of the project and applied for the funds. After the committee learned that their grant had been approved they contacted professional archaeologists to solicit bids for the project. Ray and Deanne Matheny of Brigham Young University were awarded the contract to supervise USAS members and other volunteers during the survey in Nine-Mile Canyon. Originally the project had been planned as a two-week field school, but there was so little time between the approval of the grant and the end of the field season that the survey was carried out on five consecutive weekends.

To set the scene for discussing the goals of the survey, the manner in which it was carried out, and its results, some basic information about Nine Mile Canyon and the previous archaeological work there is presented.

PREVIOUS WORK IN NINE MILE CANYON

It was Nine Mile Canyon's reputation of being rich in archaeological sites as well as a concern over increasing vandalism in the area that lead USAS amateurs to choose it as the location of their project.

Several archaeological investigations have been carried out in Nine Mile Canyon (Gillin 1938; Gunnerson 1962, 1969; Hurst and Louthan 1979; Morss 1931; Reagan 1931a, 1931b). However, there has been no comprehensive study of the nature and distribution of prehistoric or historic sites in the canyon. Land ownership in the canyon is a complex mosaic of state, federal and private ownership and any archaeological project carried out there requires the cooperation of a number of agencies and individuals. The survey project as conceived by the Carbon County volunteers is to be a long-term, year-by-year effort to inventory the cultural manifestations in Nine Mile Canyon. The 1989 survey was the first portion of work to be completed.

Nine Mile Canyon is easily accessible from Price via a road which runs between Wellington and Myton, traversing the central portion of the canyon (Figure 1). Nine Mile Creek (also known as Minnie Maude Creek) runs through Nine Mile Canyon, flowing east to where it joins the Green River at Desolation Canyon. Currently there is no road into the far eastern portion of the canyon.

Nine Mile Canyon has a long record of human use but its earliest period of occupation has not been established. The oldest remains yet reported come from Rasmussen Cave, located several miles downstream from the area of the present survey, where excavations revealed a burial with Basketmaker II-like artifacts (Gunnerson 1969:101-104). A limited sample of dendrochronological dates suggests that the Fremont occupation of Nine Mile Canyon existed between circa A.D. 950 to 1150 and perhaps as late as A.D. 1200 (Gunnerson 1969:170). Several C-14 dates received during the winter after the survey for sites in the eastern part of the canyon provide a few more dates for Fremont and later occupations. A willow basket found during the 1989 BYU Field School on a ledge in South Frank's Canyon near its confluence with Nine Mile dates to 395 ± 70 B.P. (A.D. 1595 [raw date], Beta 33338) while juniper bark from a small structure on the same ledge dates to 250 ± 60 B.P. (A.D. 1740 [raw date], Beta 33339). These remains likely represent the presence of Numic speakers whose remains are in evidence at sites in other parts of the canyon as well.

In the final years of the nineteenth century and the first years of the twentieth century, Nine Mile Canyon experienced its greatest period of activity since Fremont times as people and goods were transported over the freight road that ran from Price through Gate Canyon to the Uintah Basin.

Little has been written about the historic sites in the canyon (Geary 1981a, 1981b). No inventory of them has been made, although the stage coach

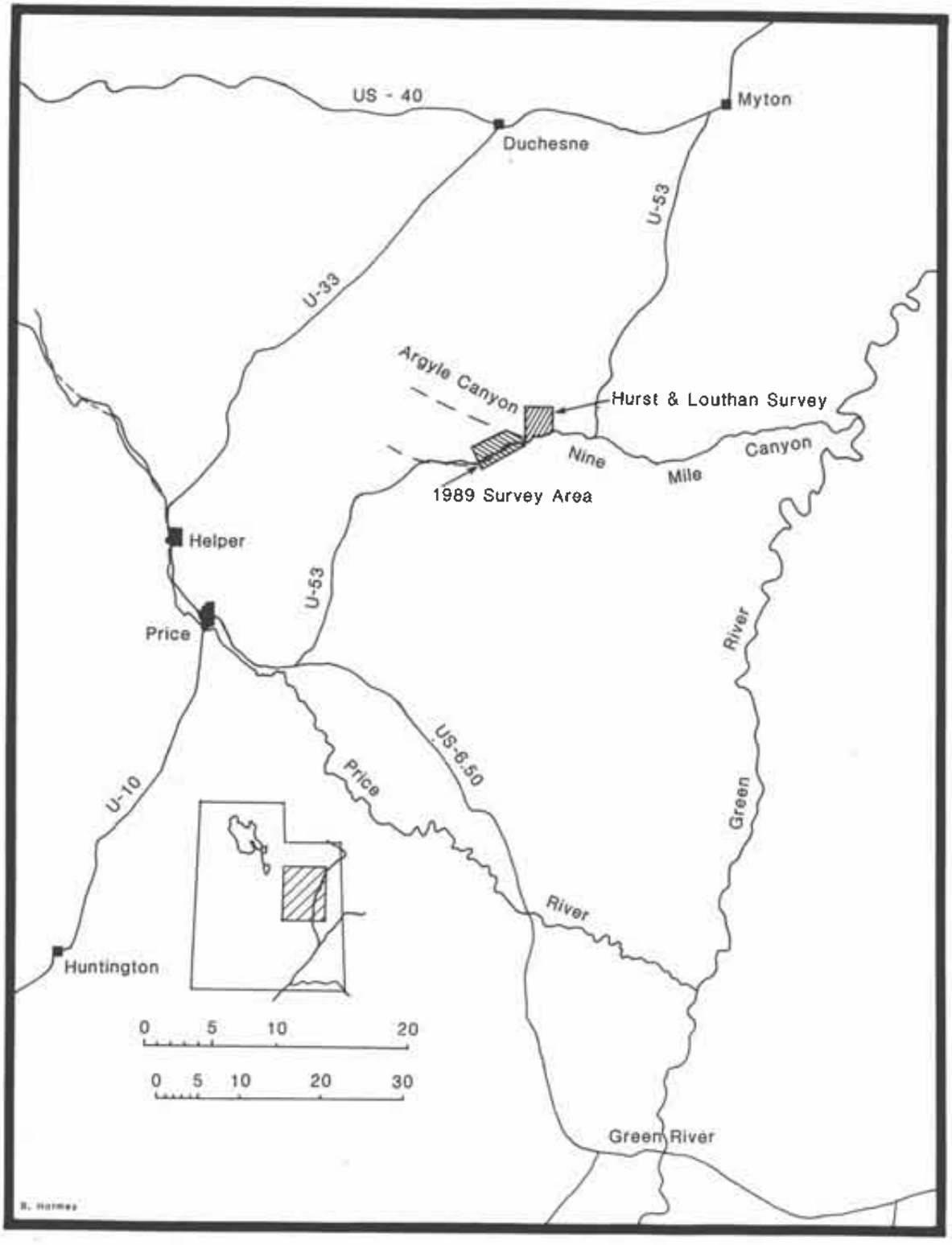

Figure 1. Map showing the location of Nine-Mile Canyon and the survey (adapted from Hurst and Louthan 1979).

stop at Harper, which had a hotel, post office and other amenities, is mentioned in at least one source as is the stop at the mouth of Gate Canyon where a saloon and hotel were located (Zehnder 1984).

The excavation projects carried out in Nine Mile Canyon have concentrated on prehistoric sites (Gillin 1938; Morss 1931; Gunnerson 1969). The most recent excavations were those pursued in the summers of 1989 and 1990 by the Brigham Young University field school of archaeology under the direction of Ray T. Matheny in the eastern portion of the canyon near the former Nordell Ranch. The field school also began a systematic survey that is planned to proceed east from the old Nordell Ranch to the confluence with the Green River. Although the field school survey was initiated prior to the CLG survey, the information collected by BYU will be useful in reaching the goals established by the Carbon County project.

A number of rock art experts, including Schaafsma (1971), have noted the importance of the rock art found in Nine Mile Canyon. Winston Hurst and Bruce Louthan (1979), with a team of fellow students from Brigham Young University, conducted the first systematic rock art survey in Nine Mile Canyon, covering the area from Argyle Canyon downstream to about one-half mile west of the mouth of Current Canyon. They reported 325 panels of rock art, most of which are located on the north side of the canyon. In order to provide continuity with that survey the Carbon County survey in the fall of 1989 began its work at the point where the Hurst and Louthan survey ended.

Before the 1989 survey began, several project goals were outlined by the amateurs. These goals, discussed below, are closely geared to preservation through community planning and participation.

GOALS OF THE SURVEY

Many of the goals of the project relate to long range objectives that will be realized only after a number of years of survey and analysis have been carried out. The first goal of the survey was to provide an opportunity for amateurs to be involved in a worthwhile archaeological project. Nine Mile Canyon, with its steep walls and fertile alluvial bottom lands (Figure 2), was chosen as the location for this project partly because it was known to have enough unrecorded sites to keep the interest of the volunteers and to give them experience in recording a range of site types.

The second goal of the project was to find out specifically what types of archaeological sites were in Nine Mile Canyon and where they were located. The public has long known of the abundance of sites in the canyon but relatively few have been recorded. Jennings (1978:184) noted in relation to the San Raphael subarea, of which Nine Mile Canyon is a part, that "Ironically, the culture [Fremont] was discovered in this subarea with but few sites having been excavated since 1940." During an unsuccessful attempt to nominate Nine Mile Canyon to the National Register of Historic Places several years ago, the qualities and quantity of sites were not addressed. The same is true of the information used to evaluate the effects of several recent federal undertakings in and around Nine Mile Canyon. One reason for the Nine Mile project was to start an archaeological program that would protect the cultural values there. Vandal pressure on the canyon is severe.

Another goal of the Nine Mile Canyon Survey was to locate sites that could be used as points of interest for the increasing numbers of visitors to the canyon. The visitor use of Nine Mile Canyon appears to be increasing greatly. Management of the visitors and mitigation of the effects of their presence in the canyon cannot be accomplished without knowing the location and nature of archaeological sites.

The information from this inventory can be used as justification for nomination of Nine Mile Canyon to the National Register of Historic Places and possibly the World Heritage Site list. This same information is necessary to establish management plans to protect the unique resources of the canyon which are constantly being damaged and destroyed by vandals.

During the early phases of the survey the initial goals of the project were expanded to include the search for information concerning other research

Figure 2. General view of Nine-Mile Canyon in the survey area.

questions. These include the study of site locational patterns relating to topographic features, location of datable samples that could be collected without disturbing significant attributes of the site, i.e., exposed firepits, juniper bark or wood beams in pot hunter's holes, and the possibility of using associated rock art elements to trace movements of people in the canyon. Such information will enable researchers and visitors to understand the lifeways of the different peoples who have occupied Nine Mile Canyon during the course of history. In order to carry out these goals the Carbon County Historic Sites Committee developed an organizational plan for the survey.

THE SURVEY PROCESS

During the original planning of the survey it was anticipated that one professional archaeologist would supervise six certified (Level III) volunteers who would in turn supervise 12 non-Level III certified volunteers. As plans for the survey developed, several archaeologists became involved. The survey was organized and carried out largely by the volunteers who were involved in every stage of the project. They took responsibility for obtaining permission to work on private lands and for contacting others who would be involved. Lists were generated of people who wanted to participate. An orientation meeting was held with the archaeologists before the first day of field work. Plans were made to divide the volunteers into two manageable crews with certified members taking charge of site forms and equipment. The group that arrived in the canyon to participate the first day of survey was not identical, however, to the group that had been oriented, so additional time was spent reviewing procedures.

One archaeologist would have been overwhelmed by the number of volunteers (up to 21

in one day) who participated. Fortunately, the project had three or more professional archaeologists to supervise field work, rather than the one called for in the original plan. Pamela Miller, College of Eastern Utah Prehistoric Museum archaeologist, and Blaine Miller, Bureau of Land Management (BLM) archaeologist, both volunteered their time for the survey. This made it possible for a third crew to be organized and operated on several days.

Working With Volunteers

Fifty-one volunteers participated over the course of five weekends. They ranged from twelve years to over retirement age. Twenty-two volunteers came out for only one day with participation for the others varying from two to ten days. The average number of days worked for those who participated for more than one day was four and one-half days.

Initially volunteers were divided into two groups, each containing certified USAS members and supervised by one of the professionals. Those who had difficulty in walking long distances or climbing were able to help record the numerous rock art sites on the west side of the canyon where the road ran parallel to the cliff face and stone outcroppings.

The survey progressed rather slowly during the first two days as working procedures were developed. Certified members had filled out many site forms during the course of their training but none had been trained in this specific geographical area. As they became more familiar with describing vegetation patterns, land ownership, site locations, and pinpointing sites on maps and aerial photographs, the work began to progress more quickly and efficiently. Site sketches and sketches of rock art commanded a great deal of time throughout the survey, especially at complex sites. Much time also was spent teaching untrained volunteers mapping skills and how to measure aspect and slope of a site. Some showed considerable talent for drawing the rock art.

Sites were located immediately after the survey began. Those engaged in filling out the IMACS "Form A: Administrative Data" found it impossible to keep up with those filling out other forms or doing the measuring and drawing. Crew members who wanted to keep working ahead to locate other sites often located a whole day's worth of sites to record in a short time and then felt impatient with the slow pace of the paperwork, especially at complex sites. It was necessary to keep reintegrating these people into the recording teams.

We soon realized that it took a great deal of time and effort to train those with little or no experience, but it was an important part of the project because one of the purposes of the survey was to give amateurs a legal opportunity to participate in archaeological work. It is hoped that the amateurs learned that the recording of information about sites is a critical part of archaeological work and that such information is often irretrievably lost through the actions of vandals, pot hunters and private collectors. As certified crew members became more familiar with the area and more confident in their abilities to fill out IMACS forms, recording of the sites moved along at a more efficient pace.

An important part of survey work is recording correct and complete information "on site" as crew members do not always have the luxury of returning to the survey area to recheck data or record missed information. In general, the crew members accomplished this with few problems, but in several cases sites were revisited to supply vague or missed information.

We found that particular problems arose in working with amateurs on a project such as this. The composition of crews changed from day to day, the effects of which were only mitigated by the diligent attendance of certain core group of certified volunteers who provided continuity to the project. This core group learned to track the paperwork, making certain that all forms were filled out and accounted for at each site, and that the necessary forms and equipment were available for each weekend's work. These volunteers also made phone calls during the week to those who had expressed an interest in the project but had not yet participated.

On some days when a large number of volunteers were present, crews would be split and core group volunteers in each of the smaller crews took responsibility for making certain all of the forms had been properly filled out for each site or component recorded.

One of the problems with variable crew membership was that each person had his/her own techniques and understandings (or misunderstandings) of the situation at hand. These inconsistencies were worked out as each site form was checked after completion by the core volunteer group. Checking the IMACS forms for completeness and consistency went on for many weeks after field work ended. Slides and photographs were identified, maps and drawings prepared, and forms were typed for submission to the USHPO.

One of the most beneficial aspects of this project for amateurs was the experience of not only planning and organizing a field project, but also realizing the enormous amount of work that goes into a project after the field work has been completed. It is a side of the profession the public does not often see or participate in, but a group of Carbon County volunteers now understands it very well.

Testing the Certification Program

We gained some insight into the adequacies and inadequacies of the certification program in preparing someone to participate in a field project such as this one. Certified crew members agreed that the training course gave them a general awareness of the IMACS forms, including the terminology used, how to fill them out, and an understanding of the importance of recording information accurately. When asked about weaknesses in the training, they responded that they needed more familiarity with the geographical aspects of the forms and an on-the-spot review of the form when in the actual area of the survey. For this project, more instruction about how to record rock art would have been helpful. One of the course instructors suggested that these problems are due to the nature of the IMACS forms rather than to the certification course. IMACS forms are not user-friendly. Also, trained volunteers should become thoroughly familiar with their little black field books and, perhaps, have them indexed to find needed information and definitions quickly in the field.

In general, the amateurs who had passed the certification course were well-prepared to participate on the survey, requiring only some assistance in minor matters and a little time to adjust to the survey area and its variety of sites. As discussed below, the amateur participation can be considered a great success in terms of territory covered and sites recorded.

RESULTS OF THE SURVEY

One hundred sites were recorded during the survey from the mouth of Argyle Canyon to the Duchesne County line, upstream in Nine Mile Canyon to Sheep Canyon, then upstream in that canyon to the southeast fork, and further upstream in Nine Mile Canyon to the old Rich Ranch (Figure 1). The survey covered approximately two miles of Nine Mile Canyon, one-eighth of a mile in Argyle Canyon and about the same in Sheep Canyon. Vertical distance varied according to the difficulty of the terrain reaching the 6700 foot contour (Currant Canyon and Wood Canyon maps) in some areas of the north side of Nine Mile Canyon and to about the 7000 foot contour on a few areas of the south side.

The portion of the canyon surveyed includes a concentration of sites from various periods beginning at least by Fremont times and extending into the historic period. Some of the sites recorded during the survey were known from previous work in the canyon. Both historic and prehistoric sites were recorded during the survey. The major historic sites recorded include the Rich Ranch, Harper (one of the stage stops on the freight road to the Uintah Basin around the turn of the century) (Figure 3), and the Wimmer Ranch at the mouth of Argyle Canyon that includes the remains of a CCC camp. A number of historic rock art sites were recorded, some with both historic and prehistoric elements.

Figure 3. Old post office building at the location currently known as Harper.

The prehistoric sites encountered during the survey usually included either rock art or structural remains. Several sites included both. Among the structural sites, single circular structures were those most frequently found. They generally measured about 3 m in diameter with some stones just visible above ground level. Several more complex sites with multiple structures including two up near the canyon rim were also found, however. A few cists and some structures that may have been granaries were located as well. Few artifacts were in evidence at any of the sites and none were found at most of them which is the typical situation in Nine Mile Canyon. Most of the potsherds encountered were Emery Gray with a smaller number of Uintah Gray, Ivie Creek Black-on-White, and Snake Valley Black-on-Gray sherds present. The effects of vandalism were noted at many sites.

Prehistoric rock art sites are numerous in the survey area, particularly near the mouths of canyons. They are found from near the canyon bottoms almost up to the canyon rims in some localities. Both petroglyphs (Figure 4) and pictographs are found, although pictographs are much rarer. The rock art sites range from those with single panels containing a single element to those with multiple panels containing many and varied elements. The survey area is in a very accessible part of the canyon and survey participants were distressed by the amount of vandalism that has been perpetrated on many of the rock art sites (Figure 5). This includes not only the addition of modern elements (particularly names and dates), but the repecking and defacement of the older ones. In many cases rock art panels are pocked with bullet holes.

The results of the fall 1989 survey in Nine Mile Canyon serve to further demonstrate its importance as a cultural treasure that deserves protection and preservation. One of the major goals of the project,

Figure 4. A panel of one of the rock art sites recorded during the survey.

to involve amateurs in a worthwhile archaeological project, was successfully met. Especially important to the experience was the follow-up work of checking site forms for completion and typing them into the computer. Labeling photographs and cleaning up the drawings and site plans were also time consuming. Many volunteers realized that archaeology work did not end with the completion of field work.

In meeting the other goals of the project, many sites were located that could be developed as points of interest for future visitors in the canyon. The nomination of Nine Mile Canyon to the National Register of Historic Places will proceed as private landowners are contacted for their participation in the process.

CONCLUSIONS

The fall 1989 Nine Mile Canyon survey can be considered a great success not only in terms of the number of sites recorded (100) but also in terms of being a useful training exercise for amateurs and an opportunity for the public to learn more about archaeological resources and their preservation. The amateurs who participated learned more about what is involved in recording various kinds of archaeological sites and that the end of field work is not the end of a project. The certified volunteers who participated are now well trained in recording both historic and prehistoric sites, especially rock art sites, and should have no difficulty in recording sites on their own for submission to USHPO.

The involvement in this project extends beyond those volunteers who actually participated in it. The project is fortunate to have the full support of the Carbon County Commission and especially its

Figure 5. This rock art site recorded during the survey demonstrates the vandalism that has damaged or destroyed many of the rock art sites in Nine-Mile Canyon.

supervisory commissioner, Emma Kuykendall who is a great help to those involved.

The benefits to the local community also have extended beyond the field participants. Several presentations about the organization of the project and its results have been made to community groups and school classes in Price. Through newspaper coverage and the enthusiastic reports of participants, Carbon County residents are experiencing increased exposure to their rich archaeological heritage and a better understanding of the importance of preserving and protecting it. If the future of cultural resources lies in protection through the education of the public, then the fall 1989 Nine Mile Canyon survey can be said to have contributed to this goal.

We have a number of recommendations for future projects of this type. One is to include as many professional archaeologists as possible on a volunteer basis. With a greater number of professionals available the amateurs each receive more attention and instruction. This is particularly important if a large number of untrained volunteers participate. Each crew should have a crew chief and, if possible, an assistant crew chief who are graduates of the certification course and who are responsible for making sure that the proper information is gathered and the proper forms are filled out at each site. Their responsibility would include making sure that all of the necessary forms and equipment are available during each day of field work. It is suggested that crew members meet one evening during the week to review the IMACS forms completed during the previous weekend so that any missing information or inconsistencies can be identified and obtained or resolved during the next day of field work. During the 1989 survey we found that it was convenient to have film shot

during the survey processed and reviewed each week so that if any sites needed to be re-shot it could be done during the next field day. In an ideal situation where the supervising archaeologist(s) live in the same community, they could coordinate the evening sessions. That was not the case for this project, so other professionals volunteered their assistance.

If a group sponsoring a project like this one has available the computer program for generating the final IMACS forms, then the information could be typed in during the week, saving all involved from a marathon event at the end of the project. Carbon County now has this program and less effort should be required in future surveys.

Public interest in the continuing Nine Mile project should generate more students for the certification program. The 1990 Nine Mile survey benefitted from the experience of the amateurs who participated in 1989. A more extended orientation in the canyon was carried out before the project began in 1990 to acquaint participants with the geography of the area.

Volunteers have an important role to play in the future of archaeological research, mitigation, and preservation. Our experience with the fall 1989 Nine Mile survey indicates that projects generated, organized, and carried out largely by certified amateurs with the supervisory assistance of archaeologists can work, but they require a large investment of time and labor both in the field and afterwards by all involved. Also, they must be flexible enough to meet the special needs of some participants and to cope with variable numbers of volunteers with variable levels of training.

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A FLUTED POINT FROM CLEAR CREEK CANYON, CENTRAL UTAH

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INTRODUCTION

A fluted projectile point fragment was found near the juncture of Clear Creek and Single Creek Canyon in central Utah on July 16, 1989. Although fragmented, the point appears morphologically similar to Clovis styles found in Utah (Copeland and Fike 1988, Davis 1989). Sourcing of the artifact was pursued with the approval of the United States Forest Service (USFS) on whose property the point was found. After sourcing and photographing, the point was sent to Bob Leonard to be housed at the Fremont Indian State Park near Richfield.

A few days after the discovery, Bob Leonard, the Fish Lake Forest archaeologist, and Jeri DeYoung, an archaeologist trainee with the United States Forest Service from Weber State University, accompanied me to the site location. Later I was informed that the point was found within the boundaries of a previously recorded site (42Sv1779). Trail Mountain Rockshelter (Janetski et al. 1985) is located 100 m to the south and a number of other sites are in the area (Robert W. Leonard, personal communication 1989).

SITE DESCRIPTION

The fluted fragment was found on a south facing terrace overlooking Clear Creek Canyon in the Fish Lake National Forest (Figure 1). Clear Creek lies 400 m to the south. Vegetation in the area consists of pinyon, juniper, and sage at an elevation of 6,680 feet. Surface soil is a rocky residual created by heavy erosion of Dry Hollow Latites. Several lithic scatters of mostly obsidian and some jasper have been previously recorded throughout this area. Site 42Sv1779 was recorded as an Archaic scatter of lithic debris and tools (IMACS site form on file, USFS offices, Richfield, Utah). Included among the latter are Elko and Northern Side-notched style projectile points. No features or subsurface deposits are known to be present at the site.

The absence of other Paleo-Indian material suggests that the fluted point recovered here was likely removed from another location and dropped by Archaic or other peoples at some time in the distant past. The point is stylistically similar to Clovis or perhaps Folsom, and is made of obsidian from a local source (see below).

POINT DESCRIPTION

The artifact is the base of a fluted projectile point broken transversely at about the midpoint (Figure 2). The point was formed primarily with percussion reduction techniques. The flute is on one side only. Remnants of the nipple or fluting platform are present in the basal concavity. Edge grinding is clearly present on the intact lateral edge (Figure 2a). Numerous scratches and grinding marks in the flute flake scar run in the direction of

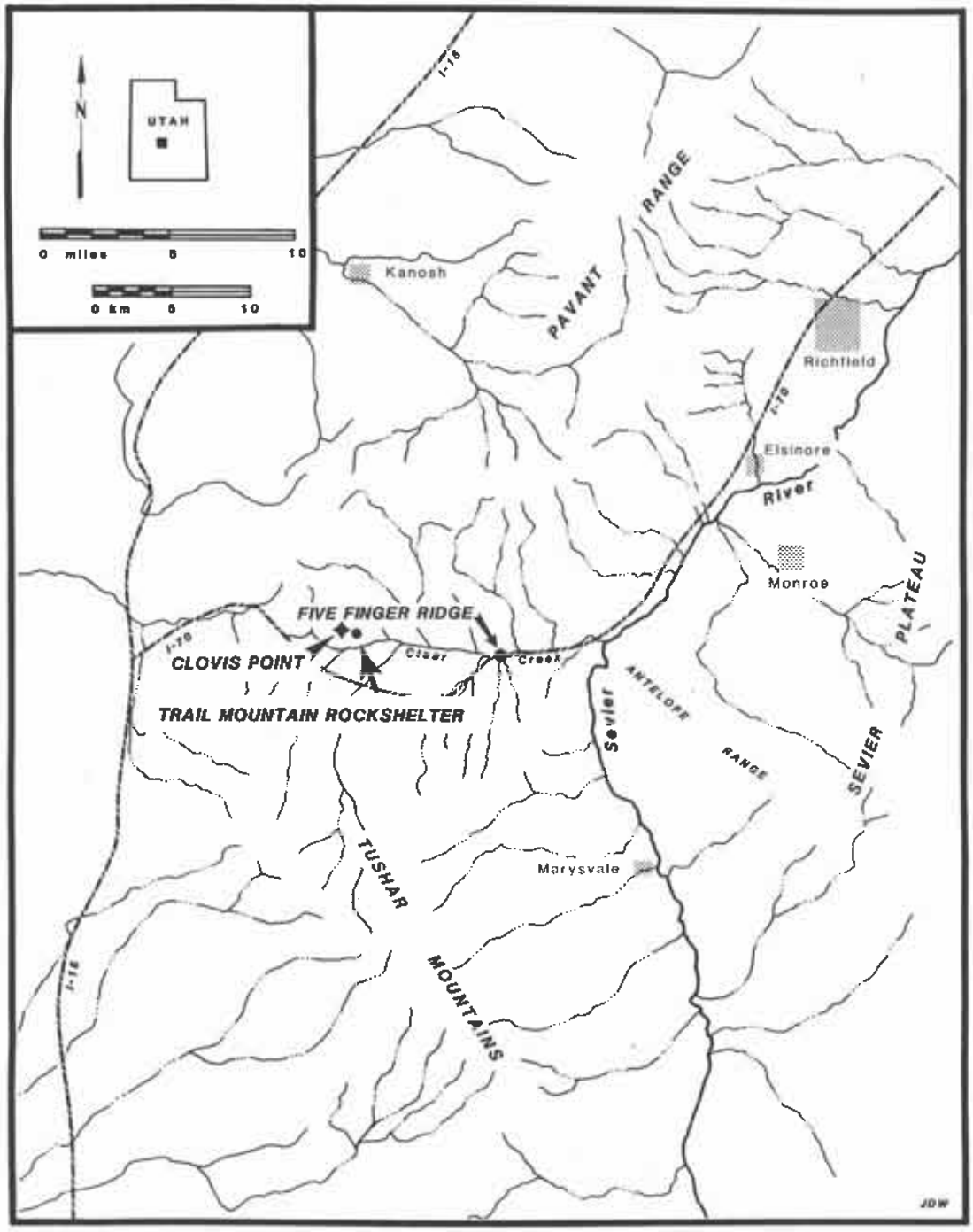

Figure 1. Location of fluted projectile point in Clear Creek Canyon, Utah.

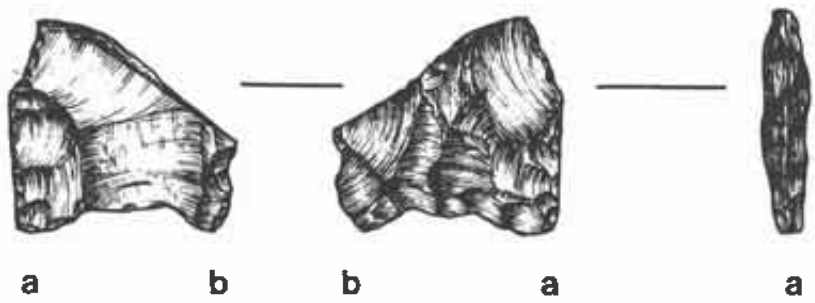

Figure 2. Drawing of fluted point. Actual size.

the flute. Several surface characteristics argue that the transverse point breakage postdates the original use of the tool. Specifically, some minor reworking or use that postdates the break is suggested by the differential weathering of flake scars (e.g., shiny versus dull; especially shiny are the small flakes along the broken transverse edge). The basal width of 2.6 cm, maximum width of 3.0 cm and a thickness of .6 cm fall comfortably in the range for Clovis offered by Copeland and Fike (1988:11).

Sourcing

The artifact was sent to Geochemical Research Laboratory in Rancho Cordova, California, for sourcing analysis utilizing x-ray fluorescence techniques. This is a non-destructive technique appropriate for the analysis of rare artifacts. The results of that analysis are shown in Table 1.

The trace element profile for the obsidian from this specimen matches the Wild Horse Canyon source area in the Mineral Mountains in south central Utah (Richard Hughes, personal communication 1990).

Discussion

Although chert is the predominate material used in Clovis and Folsom point manufacture in Utah, obsidian is the second most common raw material (Copeland and Fike 1988:7). The latter is a fortunate fact as it allows some insight into prehistoric quarrying and trade patterns. This is the second fluted point known to archaeologists to be made of Mineral Mountain obsidian. A complete Clovis specimen sourced to Wild Horse Canyon came from the Blackwater Draw site in eastern New Mexico (Jane Day cited in Janetski et al. 1988:63). These finds although sparse, are important in Great Basin studies as information on early man continues to be elusive (cf. Willing et al. 1988), especially that related to temporal relationships with the well-dated Paleo-Indian strategy on the Great Plains and elsewhere. The Clear Creek Clovis adds another chip to the pile of accumulating evidence for early man in this part of the world.

ACKNOWLEDGMENTS

I would like to thank Joel Janetski for his advice and patience in dealing with me as an amateur. Without his help in having the obsidian sourced, this paper would not have been possible. I appreciate the time Bob Leonard spent with me on the mountain and his consideration in sending me site reference materials.

I very much appreciate the Utah Statewide Archaeological Society organization, for its formation has allowed me to participate with professional archaeologists who have been willing and patient in answering my many questions.

Table 1. Trace Element Concentrations in the Clear Creek Fluted Projectile Point (Richard Hughes, personal communication 1990)

Catalog Number	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	Obisidan Source (Chemical Type)
Clovis-Like	40	13	190	34	24	107	24	170	Wild Horse Canyon
	±4	±3	±5	±3	±2	±4	±3	±11	

All trace element values in parts per million (ppm); ± = pooled expression (in ppm) of x-ray counting uncertainty and regression fitting error at 300 seconds livetime.

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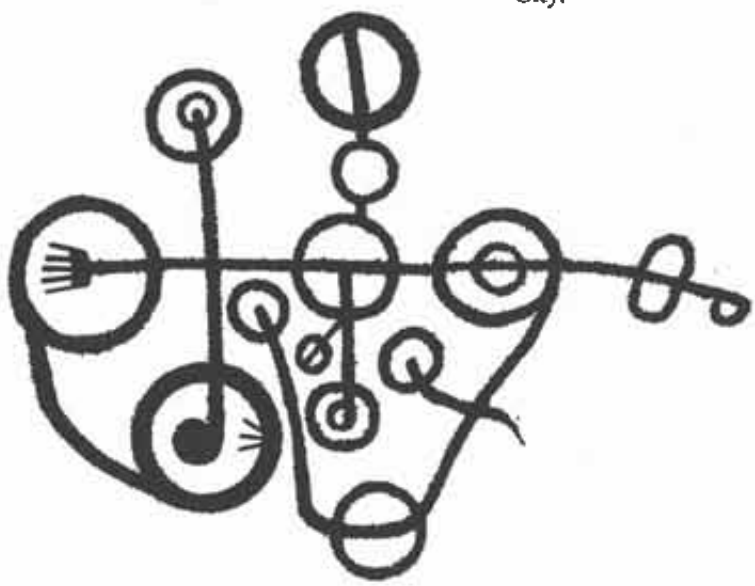
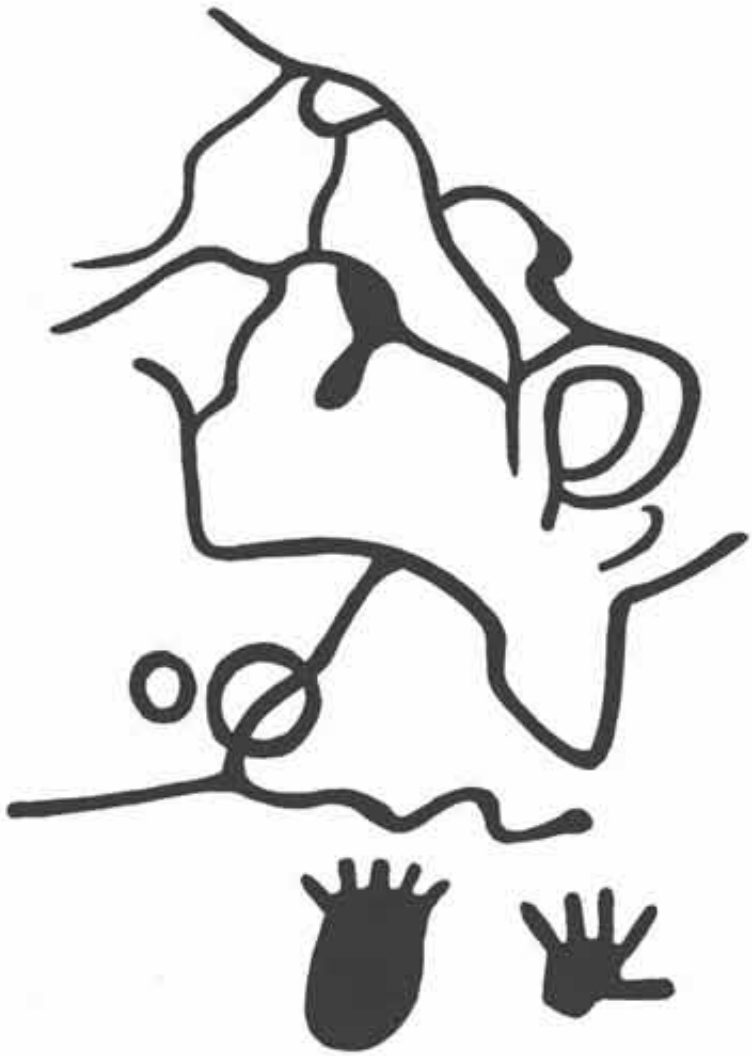


San Juan County

Washington County



Millard County

COMMENTS

EVIDENCE OF ARROW POINTS FROM BASKETMAKER II SITES IN SOUTHWESTERN COLORADO

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Geib and Bungart's article on early bow use published in *UTAH ARCHAEOLOGY 1989* has made an important contribution to our understanding of the terminal Archaic/early Formative transition on the northern Colorado Plateau. From data collected at the Sunny Beaches site (42Ka2751) in the Glen Canyon National Recreation Area and from a re-examination of Unit V strata at Cowboy Cave (42Wn420) in Wayne County, Utah (see Jennings 1980), the authors formulate a convincing case that arrowheads were manufactured north of the Colorado River as early as approximately A.D. 100 (Geib and Bungart 1989:42). Both sites had aceramic components yielding Rose Spring Corner-notched points, which are small and are generally thought to have tipped arrows. The Sandy Beaches component in question was dated by radiocarbon analysis to approximately A.D. 227 (Geib and Bungart 1989:39). No dart points were found. The authors re-analyzed the radiocarbon data from Unit V at Cowboy Cave and concluded that there is a 95% chance that the unit was occupied between A.D. 84 and A.D. 610. These conclusions challenge Holmer's (1986:106) position that the bow and arrow did not appear in the Intermountain West until approximately A.D. 300.

Cowboy Cave and the Sandy Beaches site are both located near what in subsequent centuries constituted the cultural boundary between the Fremont and the Anasazi cultures. According to Jennings's (1978:157) map of the distribution of these two cultures, the Sandy Beaches site occurs within the homeland of the Anasazi, whereas Cowboy Cave occurs within the homeland of the Fremont. Geib and Bungart (1989) argue, however, that components at both sites postdating A.D. 100 were affiliated with a Proto-Fremont culture. The Proto-Fremont concept is used to describe an early Formative stage adaptation that is presumably the precursor of Fremont culture, distinguishable from the Basketmaker II Anasazi culture. They primarily rely upon two alleged differences in material culture to distinguish the two cultural groups.

The Proto-Fremont components are supposedly characterized by one-rod foundation basketry and use of the bow and arrow, whereas the Basketmaker II components are characterized by baskets with two-rod and bundle foundations and an absence of bow and arrows (Geib and Bungart 1989:43). The basketry assemblage recovered from Unit V at Cowboy Cave was dominated by one-rod foundation specimens (Hewitt 1980). No basketry was recovered at the Sandy Beaches site.

Geib and Bungart's (1989) assertion that Proto-Fremont basketry may be technologically different from Basketmaker II basketry may have merit (see Hewitt 1980). Their strongly stated position that Basketmaker II Anasazi people did not use the bow and arrow, however, may be incorrect. Five small corner-notched projectile points, all measuring less than 25 mm in length and thought to represent arrowheads, were recovered at the Tamarron Site (5Lp326) north of Durango, Colorado, in association with typical Basketmaker II architecture (Reed and Kainer 1978). The points can probably be classified as Rose Spring Corner-notched or into Holmer's (1986) Rosegate series. No dart points or ceramics were found at the Tamarron Site. The projectile points were found in association with a cribbed log habitation structure very similar to Basketmaker II habitation structures excavated by Morris and Burgh (1954) at Talus Village. Five slab-lined floor features were discovered, including a large cist containing a human burial. Unfortunately, no chronometric dates were obtained. Based upon architectural similarities with the Talus Village site, Reed and Kainer (1978:45) suggested that the

Tamarron site was occupied between A.D. 250 and 500.

Additional evidence of Basketmaker II use of the bow and arrow in southwestern Colorado emerged during mitigative excavations of site 5DL896 in Dolores County, Colorado. The site had been previously damaged by road construction, and no evidence of architecture was found in the area investigated. Charcoal-stained soils and one hearth were discovered, however; radiocarbon determinations from Level 2, the most recent occupation, yielded calibrated date ranges between A.D. 233 and 394 at one standard deviation and between A.D. 130 and 430 at two standard deviations. These dates fall well within the Basketmaker II period. Nine projectile points were recovered in Level 2, including eight small corner-notched or stemmed points and one Elko Corner-notched point. Application of Thomas's (1978) equation for discriminating arrow points from dart points indicated that all of the eight small points served to tip arrows (Reed and McDonald 1988:71). The small corner-notched specimens resemble Rose Spring points. Basketmaker II Anasazi affiliation was assigned to Level 2 at site 5DL896 because its associated radiocarbon age occurred within the generally accepted temporal range of the Basketmaker II period and because of the similarity between the small corner-notched projectile points and those recovered at the Tamarron site. Site 5DL896 also yielded a crusher, as did the Tamarron Site (Reed and Kainer 1978) and Talus Village (Morris and Burgh 1954), a class of ground stone that may be characteristic of Anasazi sites (see Hayes and Lancaster 1975:154). Additionally, site 5DL896 yielded a large, notched animal bone that was similar to notched scapulas and ribs recovered at Talus Village. Morris and Burgh (1954:61) suggest that such notched bones represent a generalized Basketmaker trait.

Evidence from site 5DL896 and the Tamarron Site indicates that arrow points occur on a small number of Basketmaker II sites in southwestern Colorado. Why other apparently contemporaneous Basketmaker II sites in southwestern Colorado, such as Talus Village, lack evidence of bow and arrow use is unknown. Both the Tamarron Site and site 5DL896 occur at relatively high elevations (2,355 m and 2,353 m respectively) and yielded substantial amounts of artiodactyl bone, so perhaps bow and arrow use was related to a site emphasis on hunting large game. Evidence of Basketmaker II Anasazi use of arrow points has also recently emerged in southeastern Utah. Richens and Talbot (1989) report discovering small arrow points in association with Basketmaker II architecture at the Sandy Ridge site (42Sa18500) south of Moab, Utah. The structure at the Sandy Ridge site was chronometrically dated to about A.D. 200 (Richens and Talbot 1989:77).

It is clear that bow and arrow use cannot be used to differentiate Proto-Fremont sites from Basketmaker II sites. The cultural affiliation of the early Formative stage component at the Sandy Beaches site should therefore be regarded as unknown rather than as Proto-Fremont. Future efforts to distinguish Proto-Fremont from Basketmaker II components should perhaps focus upon basket technology, the distribution of artifact classes such as crushers, and architectural styles.

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PRE-FORMATIVE CULTURAL AFFILIATION IN GLEN CANYON: A RESPONSE TO REED

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PRE-FORMATIVE BOW AND ARROW TECHNOLOGY

Reed (1990) questions the validity of using arrow points in pre-Formative contexts to make cultural (ethnic) assignments, and in so doing casts doubt upon Geib and Bungart's (1989) claim that an ancestral Fremont cultural group occupied the Sunny Beaches site in the central Glen Canyon region. Reed's (1990) critique is based on several recently accumulated archaeological facts: the recovery of arrow points from two aceramic sites in southwestern Colorado (Reed and Kainer 1978; Reed and McDonald 1988), and the finding of arrow points from a pre-Formative period pithouse near Moab, Utah (Richens and Talbot 1989). From these findings, Reed concludes that the bow and arrow cannot be used to distinguish between ancestral Fremont and ancestral Anasazi (i.e., Basketmaker II), and consequently that the cultural affiliation of the Sunny Beaches site should be regarded as unknown.

As Reed observes, the Tamarron Site (Reed and Kainer 1978) is undated. Lacking secure chronological placement, this site does not necessarily support Reed's argument that Basketmaker II people used the bow and arrow, despite the presence of probable arrow points. Granted, there are architectural similarities between the Tamarron pithouse and the well-dated structures of Talus Village and the Falls Creek shelters (Morris and Burgh 1954). Since abundant dart points but no arrow points or remains of bows or arrows came from these sites, however, it could be argued that the Tamarron site postdates Talus Village and the Falls Creek shelters and represents a continuation of house construction technique into Basketmaker III.

Site 5DL896 provides more convincing evidence for bow and arrow use during Basketmaker II, with eight arrow points from a stratum radiocarbon dated between A.D. 130 and 430 (the calibrated date range of two averaged determinations, Reed and McDonald 1988:88–89). A potential point of contention with this evidence is the "old wood problem" since the dating is based on wood charcoal (a hearth sample and loose charcoal from the stratum). Smiley's (1985) investigation of

Basketmaker II chronometrics on Black Mesa reveals that age overestimation is endemic to radiocarbon dates on wood and cannot be easily dismissed.

For discussion purposes, let us assume that all dating problems have been resolved and it is indeed that case that the bow and arrow was in use by Basketmaker II groups in southwestern Colorado during the later part of the pre-Formative period (ca. A.D. 200-500). Matson (n.d.) questions whether the Durango Basketmaker II material (by which he means the remains reported by Morris and Burgh [1954] as well as the Tamarron Site) should be classified as part of the core Basketmaker II culture or as a related variant. Matson argues that the projectile points (dart-sized forms), basketry, sandals, and houseforms distinguish the Durango Basketmaker II from the Basketmaker II of the Cedar Mesa-Marsh Pass-Black Mesa region, which he refers to as the "White Dog" Basketmaker II following Lipe (1970:93-94). In this context, pre-Formative use of the bow and arrow in southwestern Colorado might denote another regional difference within Basketmaker II materials. Thus, the general claim that the Basketmaker II Anasazi did not use the bow and arrow would be incorrect. A more restricted claim, that the White Dog Basketmaker II in particular did not employ the bow and arrow appears valid. If this restricted claim holds true, then bow and arrow technology might still be used to differentiate ancestral Fremont sites from Basketmaker II sites in the Glen Canyon region.

What about the arrow points from the pre-Formative pithouse of Sandy Ridge (Richens and Talbot 1989)? Although favoring a Basketmaker II affiliation, the authors leave this issue open, stating that "the site presents interesting data for future research on contacts between, or development of, early Fremont and Anasazi groups of the northern Colorado Plateau" (Richens and Talbot 1989:87). Setting aside the bow and arrow issue for now, I will examine another aspect of material culture that might be informative of cultural differences during the pre-Formative period.

PRE-FORMATIVE BASKETRY

Assuming for the sake of argument that bow and arrow technology cannot be used to differentiate ancestral Fremont and Basketmaker II groups, then who where the pre-Formative occupants of the Sunny Beaches site? I will examine this question using basketry from sites adjacent to Sunny Beaches and in nearby canyons of the Escalante River basin. Reed (1990) acknowledges that basketry technology should be used in future efforts to distinguish Proto-Fremont from Basketmaker II occupations. Although no basketry was recovered from the open Sunny Beaches site, two protected sites in the same canyon yielded pre-Formative period basketry. One of these sites is Bechan Cave, located about 1.2 km east of Sunny Beaches. Cultural Period III at this site is bracketed by dates of 2640 ± 50 and 2080 ± 140 years B.P. (Agenbroad et al. 1989:343, 350). Based on the calibrated 2 sigma age ranges, this period could extend from B.C. 900 to A.D. 230. Cultural remains attributable to this layer are few, but include a coiled basket fragment with a whole-rod and bundle stacked foundation (Agenbroad et al. 1989:343). The second site, 42Ka2737, is a small alcove located about 1.7 km upstream from Sunny Beaches. A basket fragment with a split-rod and bundle stacked foundation was recovered from the surface of this site. This fragment has a C-13 corrected radiocarbon age of 1720 ± 140 years B.P. (Beta-31974). The possible calibrated midpoints for this sample are A.D. 265, 281, or 333, while the 1 sigma age range is A.D. 130-440 and the 2 sigma age range is A.D. 0-620.

Additional radiocarbon dated pre-Formative basketry assemblages come from two sites in nearby canyons of the Escalante River basin. Triangle Cave in Harris Wash (Fowler 1963:33-38) has an aceramic cultural stratum that yielded two complete bowl-shaped baskets: one with a half-rod foundation and the other with a half-rod and bundle stacked foundation (Fowler 1963:62). A recently submitted sample of corn from this stratum has a calibrated radiocarbon age of A.D. 244, with a 1 sigma range of A.D. 128-382, and a 2 sigma range of A.D. 60-440 (Geib 1990). Level II of the Alvey Site in Coyote Gulch contains both aceramic and ceramic strata from which 13 close coiled

baskets or basketry fragments were recovered (Gunnerson 1959:50–109). The foundations of this collection include: five with half-rod and bundle stacked, three with one-rod and bundle stacked, one with two-rod and bundle, one with two whole rods, and two unidentified. A corn sample from this level has a calibrated radiocarbon age of A.D. 367, with a 1 sigma age range of A.D. 244–425, and a 2 sigma age range of A.D. 130–540 (Geib 1990).

Pre-Formative basketry from sites south and east of the Escalante River basin on the opposite side of the Colorado River is generally distinctive. At these other sites, such as Sand Dune Cave (Lindsay et al. 1968:97), the Moqui Canyon sites of Rehab Center, Bernheimer Alcove, and Honeycomb Alcove (Sharrock et al. 1963:208–209), and sites in Grand Gulch (Morris and Burgh 1941; Weltfish 1932a, 1932b), the basketry technology is dominated by a two-rod and bundle bunched foundation typical of White Dog Basketmaker III technology. These sites also yielded other typical Basketmaker II remains.

Pre-Formative basketry technology of the Glen Canyon region reveals a marked boundary along the Colorado River. Basketry technology of the Escalante River basin is similar to the basketry technology of Unit V at Cowboy Cave that Hewitt (1980:57) concludes may "represent the transition to the Fremont culture." The two rod and bundle bunched foundation basketry that is ubiquitous south and east of the Colorado River in Glen Canyon, is poorly represented north of this river. The Sunny Beaches site occurs in an area with basketry that represents a continuation and elaboration of Archaic basketry technology for Utah (Adovasio 1975, 1980:39). To the extent that basketry provides a useful ethnic indicator (see Adovasio 1980, 1986), then the late pre-Formative occupation of the Escalante River basin, including Sunny Beaches, is believed to have been by people ancestral to the Fremont of south-central Utah.

CONCLUSIONS

Reed's evidence that the bow and arrow was used by Basketmaker II groups of southwestern Colorado during the late pre-Formative period is provocative and could well be verified by future research. If confirmed, this finding could denote another material culture difference between the Durango Basketmaker II and the White Dog Basketmaker II as Matson (n.d.) has argued. Since bow-and-arrow technology is unknown from Basketmaker II sites of this latter region, then arrow points at pre-Formative sites in Glen Canyon might still signify a Proto-Fremont occupation. The pre-Formative basketry technology of the Escalante River basin clearly supports the notion of an ancestral, preceramic Fremont occupation north of the Colorado River in portions of Glen Canyon.

The concern with culture history expressed in Geib and Bungart's 1989 article and in this response stems from trying to understand whether the transition from a hunting-gathering to a horticultural lifeway in south-central Utah involved the adoption of agriculture by local Archaic populations, or the territorial expansion of horticulturalists as argued by Berry and Berry (1986:319). O'Connell et al. (1982:230) maintain that identifying diffusion or migration as processes involved in the sudden appearance of cultigens "begs all the critical questions." Answers to their critical questions, however, such as why hunter-gatherers should adopt agriculture or why exotic agriculturalists should displace resident hunter-gatherers (O'Connell et al. 1982:230), requires an accurate description of past events and, when necessary, an identification of the "cultures" or "ethnic groups" involved in those events. It seems that a considerable amount of basic archaeological research remains to be done before we can move on to "processual" interpretations for the Archaic-Formative transition in Utah.

ACKNOWLEDGMENTS

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COMPREHENSIVE ROCK ART LITERATURE SEARCH THROUGH THE FILES OF THE DIVISION OF STATE HISTORY, A SUMMARY

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INTRODUCTION

One of the first steps in conducting many archaeological research projects is a literature search. The purpose of a literature search is to locate all known information relative to the goals of the research project. This is accomplished so that time and resources will not be unjustifiably expended repeating previous research. Literature searches are also conducted when a defined geographical area is to be surveyed. All known records are examined for previously recorded sites in the area. This not only eliminates duplicate work, but provides surveyors an understanding of the type and density of sites that may be found in the survey area. In Utah, site specific information currently exists in a computerized data set called the Intermountain Antiquities Computer System (IMACS).

The data set that is IMACS grew out of a desire by the Bureau of Land Management, University of Utah, Utah State Historic Preservation Office (SHPO), and the Intermountain Region of the U.S. Forest Service to create a computerized inventory of archaeological sites for cultural resource management and historic preservation purposes (Lichty 1986). The development process began in 1979 and the first IMACS form appeared in 1981.

The bulk of the information from the Utah SHPO was entered into the IMACS data set in 1982 and 1983. The procedure that was used to enter data into IMACS from the SHPO files was

accomplished by filling out an IMACS encoding form for each site form in the files. The data on the encoding forms were then key-punched and the data read onto tape for use by various agencies' computer hardware. All newly discovered sites in Utah, Idaho, and Nevada are recorded using IMACS forms.

IMACS FILES AND RESEARCH POSSIBILITIES

In 1988 a research project was proposed by myself that would study the relationships of prehistoric rock art styles with associated and identified cultural remains. This data could then be used to evaluate currently assigned cultural associations with petroglyph styles. To accomplish this research I proposed to conduct a literature search utilizing the IMACS data set to obtain the required information. IMACS has the potential to provide cultural identification of associated material remains, as well as site locations for rock art.

A printout of all of the recorded archaeological sites that contained rock art was obtained from the division of state history. A brief inspection of the printout immediately determined that there were inconsistencies in the data. Some of the information in the printout was not in agreement with either the site forms in the files at the Division of State History or personal knowledge of some of the pictograph sites.

When it was realized that there were inconsistencies in the data, it became necessary to determine an approximation of the reliability of the data before it could be used. This was accomplished by obtaining an estimate of the percentage of inconsistency. Five pages of the printout were selected at random (this represented about a 10% sample). The records in the state files over the range of site numbers on each page were compared with the printout.

This inspection determined that there was indeed a significant percentage of inconsistency. The inconsistency rate was found to be 29.2%. The inspection also determined that the inconsistency appeared to be nearly uniform throughout the entire IMACS data set. A 29.2% inconsistency rate was felt to be too high to be acceptable in the proposed application. To proceed with the style analysis project, it would be necessary to check and correct all of the data entered into IMACS to insure the desired level of accuracy. This would be no easy task. The state files contain approximately 86,000 site forms, with an average of about four pages each. This would mean examining approximately 350,000 pages. Every page would have to be read and compared with the printout.

The discovery of these inconsistencies in IMACS suggested a second project: the systematic examination of the IMACS data files to identify all rock art data problems. This information could then be given to the Antiquities Section and the problems resolved. Fortunately, prehistoric pictographs are perhaps the easiest archaeological feature to identify and track because of the uniqueness of each panel. Thus data obtained for pictograph sites would be more accurate than for other types of sites, for example, lithic scatters. Also, the author has inspected thousands of pictograph panels throughout the state, so suspicions of duplications were readily formed.

METHODOLOGY

The methodology utilized in the clean-up project was as follows: the information in the state files was compared with the IMACS printout by searching every page of every site form in the files for a reference to rock art, while also checking to see if that specific site number appeared on the printout. Duplication of site numbers was verified by comparing photographs of the sites in question. In a few instances (five or six), when photographs were not available, verification was through personal experience. As stated above, the Division of State Histories files contain approximately 86,000 site forms, most with multiple pages (especially after the introduction of IMACS). So this presented a formidable task. It took slightly over one year to complete the project.

RESULTS

The literature search identified three categories of inconsistencies.

1. There were site numbers on the IMACS print out, but no reference on the site form that the site contained rock art.

2. Site forms were found in the files that indicated rock art was present at the site, but the site number did not appear on the print out.

3. Duplicate site numbers were found, i.e., the same site was surveyed more than once and different site numbers were assigned to the same site. As noted, duplication of site numbers was determined by examining site photographs.

The results of the project are shown in Table 1. A total of 1,756 site numbers appeared on the IMACS rock art printout. There were 97 sites whose numbers appeared on the printout, but the site form in the files contained no reference to rock art. Three hundred and thirty-two site forms were found in the files that indicated rock art was present at the site, but that information was never entered into the IMACS data set. There were sixty sites that had duplicate site numbers, six that had triplicate site numbers, and one that had quadruplicate site numbers. There were 504 inconsistencies in the 1,756 IMACS sites, or 28.7%. However, this is not an accurate assessment in the percentage of inconsistency. During early IMACS encoding, there was no differentiation made between prehistoric rock art and historic inscriptions. All of the inconsistencies found in column 2 are due to historic inscriptions being recorded as pictographs. Re-encoding these entries would eliminate 97 inconsistencies, dropping the percentage of error to 23%. This means that in nearly one out of every four sites with rock art there was a problem with data entry. After as many inconsistencies as possible were clarified, we found that there were 1,916 rock art sites recorded in Utah.

CONCLUSION

The purpose of presenting this information is to suggest the need to consider the rate of inconsistency in data entry when doing research with the IMACS data set. The rate of inconsistency with other types of sites is unknown. Perhaps it would be a greater rate considering the difficulty of identifying sites without distinctive traits. Also, in this study only one category was considered and only one question was asked—does the site contain rock art? If the questions were compounded, the inconsistency rate would also likely be higher. It is hoped that the information presented here will be useful to those working with the IMACS data set.

The problems identified were, as promised, given to personnel at the Antiquities Section and efforts to resolve them are underway. We plead with all those recording sites of any type to do so with care.

ACKNOWLEDGMENTS

This paper was presented at the December 1989 meeting of the Utah Professional Archeological Council in Salt Lake City, Utah.

I wish to thank David Shire of the Utah Division of State History for providing me with the print out. Without his help this project would never have taken place. I also wish to thank La Mar Lindsay for discussing this project with me many times, and for his continued encouragement.

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1986 Intermountain Antiquities Computer System. In *Current Status of Cultural Resource Management Archeology in the Great Basin*, edited by C. Melvin Aikens, pp. 125–130. Report of the Society for American Archeology Regional Conference on Great Basin Cultural Resource Management Research.

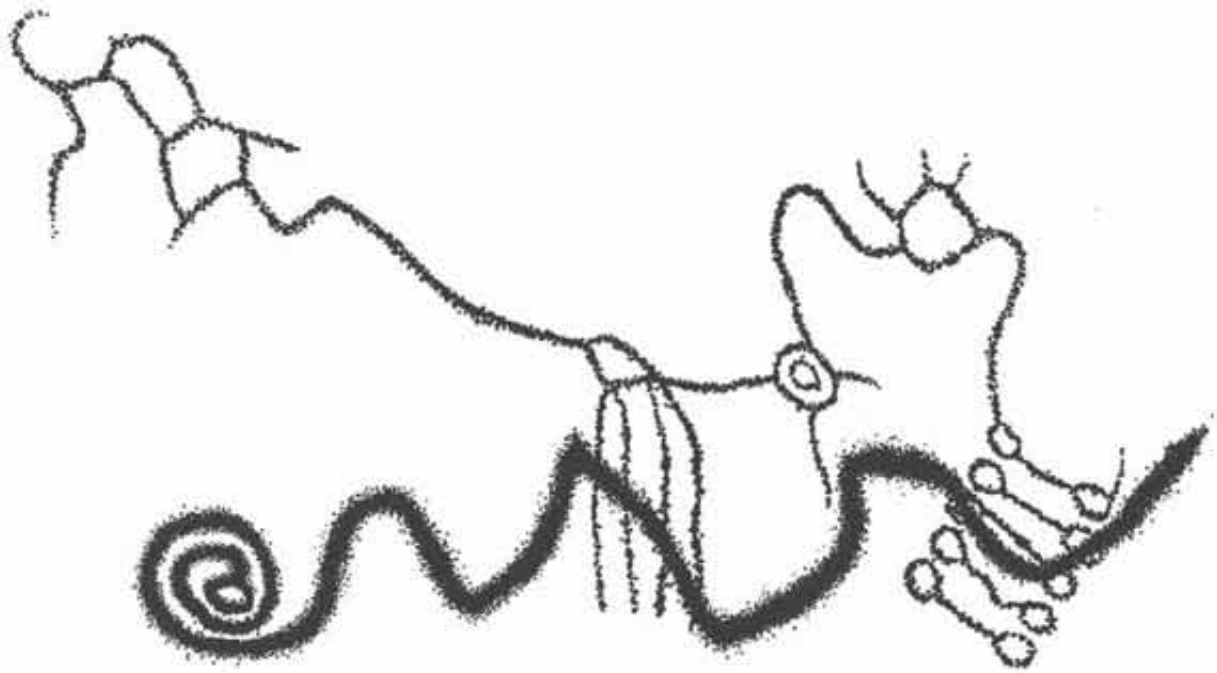
Table 1. Summary Table, Compiled 1988

County	(1)*	(2)*	(3)*	(4)*	(5)*	(6)*	(7)*
Beaver	11	4	11	00	18	0	24
Box Elder	17	0	1	02	16	0	33
Cache	2	1	0	00	1	0	2
Carbon	79	12	37	03	101	23	1,041
Daggett	5	1	0	01	3	0	8
Davis	1	0	0	00	1	0	2
Duchesne	123	1	0	01	121	99	722
Emery	115	11	16	04; 00; 01	113	7	325
Garfield	90	3	12	03; 02	92	3	408
Grand	113	5	24	15; 01	115	0	302
Iron	31	1	2	01	31	0	33
Juab	7	0	0	00	7	0	11
Kane	85	13	31	01	102	0	391
Millard	32	2	0	04	26	0	60
Morgan	1	1	0	00	0	0	14
Piute	15	2	0	01	12	0	15
Rich	1	0	0	00	1	0	1
Salt Lake	2	0	2	00	4	0	4
San Juan	603	24	114	10; 02	679	81	2,904
Sanpete	6	0	0	01	5	1	7
Sevier	53	2	7	02	56	4	64
Summit	1	1	0	00	0	0	0
Tooele	18	0	4	00	22	1	39
Uintah	156	11	45	08	182	3	538
Utah	19	0	4	01	22	0	22
Wasatch	1	0	0	00	1	0	2
Washington	82	2	16	01	95	0	250
Wayne	85	0	4	01; 01	86	0	331
Weber	2	0	2	00	4	0	11
Totals	1,756	97	332	60; 06; 01	1,916	222	7,564

*Key to Table

(1) Number of rock art sites in IMACS data set.
(2) Sites entered as rock art, but no reference to rock art on form.
(3) Sites containing rock art that were not entered as rock art.
(4) Duplicate sites, triplicate sites, quadruplicate sites.
(5) Actual number of recorded rock art sites.
(6) Forms referencing rock art missing from files.
(7) Rock art sites known to exist.

504 inconsistencies in 1,756 sites entered equal 28.7% error rate.



Carbon County

Daggett County

REVIEWS

Cultural Resource Inventory and Testing in the Salt Creek Pocket and Devils Lane Areas, Needles District, Canyonlands National Park, Utah, by Betsy L. Tipps and Nancy J. Hewitt. Selections from the Division of Cultural Resources, Rocky Mountain Region, National Park Service, No. 1, 1989. Available from Canyonlands National Park, Moab, Utah 84532. 158 pages (plus appendices). Free.

Reviewed by: **Owen Severance**
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According to the Forward, this volume is "the first in a series of National Park Service monographs dealing with the historic and prehistoric cultural resources within the Rocky Mountain Region." It is a welcome addition to the cultural resource literature of southeastern Utah. Although the area would appear to be marginal for habitation, Canyonlands National Park, which includes the area around the junction of the Green and Colorado rivers, was a place where cultures from areas north of the Colorado River met and interacted with cultures south of the river. The cultures that might have been present in the park include Paleo-Indian (10,000-6000 B.C.); Archaic (7000 B.C.-A.D. 500) (Desert Archaic, Oshara Tradition, Desha Complex); Late Prehistoric (A.D. 300-1300) (Mesa Verde and Kayenta Anasazi, Fremont); and protohistoric (A.D. 1300-1850) (Ute, Paiute, Navajo). A primary goal of the present research is to determine which of these cultures were present in the Needles District. In addition to sections on Background Information, Research Design, and Methods, this report discusses the results of field work done in 1985, the first year of a multi-year program. Approximately 4,500 acres were surveyed in two areas: Devils Lane, located in the "grabens," and Salt Creek Pocket, located adjacent to, and south of, Highway 211. One hundred forty-two sites and 76 isolated finds were located and documented. The cultural affiliations documented in the first year's work include Archaic, Mesa Verde Anasazi (Basketmaker III, Pueblo I, Pueblo II, and Pueblo III), and one possible Fremont site.

Since much of the earlier archaeological work done in Canyonlands National Park is of questionable value, this new work is an important step in understanding the prehistory of the area. One valuable aspect of this report is that rock art is considered to be a significant part of the archaeological record and an attempt is made to understand the relationship between rock art styles and locations, and the cultural material associated with them. One site with Barrier Canyon Style rock art nearby was tested and yielded a date of 3340 ± 110 B.P. There are many other rock art sites in association with datable cultural material in the Needles District that could provide excellent opportunities to date various rock art styles. I hope that more testing of this type will be done in the future.

While only limited conclusions can be drawn from the relatively small area surveyed, it is a start. Work done in the succeeding years should fill in some of the blanks. However, one of the major problems with this type of study is the lack of an overall perspective; the keys to understanding the prehistory of Canyonlands National Park lie outside of the Park. Until a regional view is used, there will be more questions than answers. The ideal approach would be to implement a multi-agency, multi-disciplinary regional research plan for southeastern Utah.

My major concerns with the work done in the Needles District are the constraints imposed by the Park Service. The most serious of these is the "no collection" policy. Over the last 90 plus years, visitors to the Needles area have carried off artifacts

by the ton. By not using this opportunity to create well-documented surface collections of artifacts, future researchers will have even larger data gaps than now exist as tourists continue to strip the park for souvenirs. In addition, as noted in the report, the accuracy of previous work cannot be checked since no collections are available. Data collected in the field without the benefit of laboratory facilities are often suspect.

Too often the public does not have any way to learn about the results of archaeological work on Federal lands. This publication improves that situation. Now that the Park Service has joined the Bureau of Land Management in publishing a "Cultural Resource Series," it is time for the United States Forest Service to join them and provide the public with information on cultural resources on national forest land in Utah. Who knows, some day we may be able to see the "Big Picture."

Archaeological Data Recovery at Three Prehistoric Sites Located Along State Road 313, Grand County, Utah, by Alan D. Reed. Alpine Archaeological Consultants, Montrose Colorado. 292 pages (plus vii); figures, tables, references, five appendices. No price given.

Reviewed by: **Kevin T. Jones**
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A persistent source of angst for many archaeologists is the often deep rift between the requirements of contract archaeology and the challenge of independent research. The pedestrian and often pedantic recording and reporting procedures demanded by private clients and ponderous bureaucracies rarely reward and frequently preclude taking the extra step to turn salvage into research. Contract reports usually contribute site forms and lists of artifacts sorted into the same old tired cultural-historical categories, but little to an understanding of the most unusual projects usually fade quickly into the "gray" literature, never seen, rarely referenced, soon forgotten. Alan Reed's report on excavations along the Dead Horse Point road is a pleasant departure from the everyday cultural resource management (CRM) report, and is an indication that things can be different.

Prompted by a Request for Proposals from the Utah Division of Transportation specifying that the work be organized around a series of specific hypotheses to be stated beforehand and tested with data recovered during the project, the entire exercise was organized as a research project from the very beginning. The report details the investigation of three prehistoric sites (42Gr2212, 42Gr2232, and 42Gr2236) excavated to mitigate the adverse effect of State Road 313 construction. In most respects the report follows a typical CRM format, reporting the details of the excavations, the stratigraphy, features, artifacts, and dates; and analyses of pollen, floral, faunal, and macrofossils. What sets this report apart is contained in the final two chapters, where the hypotheses posed long before the fieldwork began are evaluated.

The hypotheses, generated prior to the initiation of fieldwork, were based on the kinds of questions excavation of the sites was likely to answer. In posing hypotheses and specifying the data necessary to test them, Reed set up a research program designed to address problems, not just dig up sites. Hypotheses were posed concerning culture history, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, and site formation. For each hypothesis a test was specified, pertinent data identified, and an outcome predicted. Some of the hypotheses turned out to be moot, as relevant data were not recovered, but many were addressed, some with interesting and unexpected results.

One of the more interesting findings involves an apparent need for revision of Reed's own Chipeta-Canalla Phase ordering of Ute culture history. Site 42Gr2236 was found to contain ceramics approximately 100 years earlier than expected, in conflict with expectations of the phase sequence. By testing the hypothesis and carefully

considering the results, Reed was able to gain insight into this aspect of the Ute prehistory to add to his existing synthesis. Another telling analysis that might not have otherwise been attempted was to compare deposits inside and down slope of a rockshelter, to determine if they were discrete activity areas. They were not significantly different except in numbers of artifacts, and the hypothesis that they represented separate activities was discarded. Analysis of the distribution of artifacts around the hearth in 42Gr2236 was prompted by the hypothesis that activities would be segregated into zones, characterized by areas of primary and secondary refuse. The distribution of artifacts indicated that most refuse was likely in its primary context, perhaps due to a short span of occupation. Other hypotheses concerning artifact distribution, structures, artifact material and manufacture, and size sorting are presented, and each discussed. Some of the hypotheses are supported, some refuted, some not addressable due to lack of data, but as a whole, this section provides a look at the results of the excavations that is most unusual and welcome.

By designing the project to answer a series of questions, Reed has produced a CRM report that actually answers some questions. This stands in contrast to the standard procedure of reporting the data recovered as though they were ready-made answers to as yet unspecified questions. Questions which rarely materialize. Designing a project to answer questions means that at the end, some answers, some synthesis, some knowledge is presented that may be of significance to our understanding of prehistoric human cultural behavior. And that is, after all, the reason for contract archaeology—mitigation of adverse effects to sites thought to contain significant information relating to prehistory. We should expect archaeologists to extract and present that significant information, and in my opinion, Alan Reed has done that. The Utah Department of Transportation and Alpine Archaeological Consultants are to be commended for making the excavation of these three small sites result in a contribution to Utah prehistory and the methods by which it is investigated.

Archaeology of the Eastern Ute, edited by Paul R. Nickens. Colorado Council of Professional Archaeologists, Occasional Papers No. 1. Denver, Colorado. 1988. 233 pages, tables, references cited. $10.00

Reviewed by: **David B. Madsen**
State Archaeologist
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Archaeologists have always seemed to me to be the most backwards of people. They seem to be far more fascinated by matters of antiquity than by matters of substance. "Older" always seems to be better. This is, perhaps, the necessary result of archaeology practiced as culture history—the older things are the less remains, in terms of both objects themselves and their contexts, and hence, each item recovered becomes increasingly important. Yet when archaeology is practiced as anthropology, exactly the reverse is true. The younger things are, the more they can contribute to understanding why people do what they do. This is particularly true when they are young enough that physical remains can be directly related to the behaviors which caused them; that is, when it is possible to link the archaeological record to the ethnohistorical record. In short (and at the risk of sounding like a heretic), the archaeology of the Late Prehistoric and protohistoric cultures of Utah has much more to contribute to anthropology than does the investigation of the earliest Paleo-Indian groups. Yet we know virtually nothing about them. This is something that is gradually being realized by archaeologists in the intermountain west. Steven Simms and Joel Janetski, among others, are making extensive efforts to understand the Late Prehistoric record in Utah, while the publication of the *Archaeology of the Eastern Ute: A Symposium*, produced by the Colorado Council of Professional Archaeologists, is an important step in rectifying this problem in the Colorado area.

The volume, dedicated to Omer C. Stewart, consists of twelve papers together with a short introduction by Paul Nickens and a more extended summary discussion by William Buckles. With the

exception of Buckles's piece, virtually all the papers have an essentially cultural-historical perspective and are, for the most part, descriptive. Buckles takes a more argumentative stance, and suggests that it is inappropriate to ascribe many Late Prehistoric archaeological phenomena to the Ute in the absence of data to support that assignment. Since I have always been a proponent of parsimony, it is not an argument to which I pay much heed (can a more likely assignment be made?), but it does point out an important problem when dealing with groups such as the Ute who can be traced from Late Prehistoric to protohistoric to ethnohistoric to ethnographic periods: they often changed so fast in terms of material culture, economic orientation, and even social organization, that it is often impossible to identify a single set of objects and behavior that is truly "Ute."

It is not a problem that is easy to deal with. I recall a rather heated discussion I had with Omer Stewart several years ago after a Plains Anthropology symposium during which he pointedly denied the Ute ever made pottery while I just as vehemently suggested they did. As in most such arguments, we were probably both right. It was simply that we were looking at opposite ends of a chronological continuum. Several papers in this Colorado Council of Professional Archaeologists volume address this issue. Papers by Alan Reed on "Ute Cultural Chronology" and by Steven Baker on "Historic Ute Culture Change in West-Central Colorado" provide some structure to a rapidly changing record. Neither is entirely successful, but that may be more a product of limited information than anything else. They are certainly useful starting points.

The strength of the volume lies in the many descriptive papers which add substantially to the material culture record of the protohistoric and historic Ute. These range from one on the use of pounded bark for food by Marilyn Martorano to one on Ute burial practices by Paul Nickens (several from eastern Utah are described) to another by Jonathon Horn on trade goods found in protohistoric Ute sites (again, a number of Utah sites are listed). Four of these descriptive papers I found to be less than successful for different reasons. Two by Bill Kight and Robert Nykamp deal with the use of site records in the analysis of Ute prehistory—both are a cry for help and illustrate the limited utility of most file data. One concerning the petrographic analysis of Ute ceramics by David Hill and Allen Kane is limited to southwestern Colorado and explores similarities and differences with Anasazi and Navajo wares. It would be more useful if the growing literature on the pottery of Numic-speaking groups were at least referenced. A paper by Sally Cole on Ute rock art suffers from the same problem that plagues many rock art studies—how do you know what is Ute and what is not?

I was especially taken with three papers that described Ute wickiup sites. One by Reed Terry and Cynthia Wood Gilchrist reports a series of photographs of Ute sites along the lower Gunnison River drainage by Harold and Betty Huscher in 1939-1941. Given the rapid destruction of these sites (a new wave of wood stove fanatics seem to find them irresistible), such historic records may be one of the few sources of data on Ute architecture. Another by Donald Scott is a more generic discussion of wickiup sites. Scott stresses the fragile nature of these sites and suggests that the only viable management/preservation strategy is to record everything possible about such sites when they are first encountered—there probably will not be another chance. Finally, the only site report in the volume, by Carl Conner, reports the surface mapping and sub-surface testing of a wickiup site near Eagle, Colorado. Such reports are rare and I was surprised by the amount of artifactual material associated with the structures. Most of the very few excavation reports of similar sites suggest that a limited amount of material remains occur in close proximity to structures.

On the whole, *Archaeology of the Eastern Ute: A Symposium* is a very useful and welcome addition to the extremely limited literature on Late Prehistoric/protohistoric peoples of the intermountain west. There are a number of clear problems with the volume—the editing is marginal, there is very little discussion of the extremely interesting Fremont/Late Prehistoric transition in northwestern Colorado, and, most importantly, there is virtually nothing on the behavioral implications of the work. Despite these limitations,

however, I found the volume to be a valuable addition to my library. At this rate, the Colorado Council of Professional Archaeologists Occasional Papers may prove to be almost as worthwhile as these UPAC/USAS *UTAH ARCHAEOLOGY* journals.

The Great Journey, by Brian M. Fagan. Thames and Hudson, Inc., New York. 1987. 288 pages, 126 illustrations. $19.95 (hardback).

Reviewed by: **Bob Kohl**
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Utah Statewide Archaeological Society members may be roughly divided into three camps. There are the "diggers," those who truly enjoy getting their hands and knees dirty during field surveys, staking and gridding, troweling and screening under professional supervision. There are the "voyeurs," those who enjoy more moderate exercise in viewing petroglyphs and pictographs and sites under excavation. And there are the "armchair archaeologists," those who are eager to learn as much as possible about prehistoric peoples but lack the physical ability or motivation to get beyond the speakers, films, and videos of chapter meeting programs.

Particularly for the latter is *The Great Journey* recommended. It is both enjoyable reading and excellent material for the reference shelf for those who enjoy their exploration at fireside. The book could be called a detective story after the manner in which the author pieces together the evidence for this subtitle, "The Peopling of Ancient America."

After a brief look at some of the outdated theories of origin of American Indians, the author moves on to the archaeological clues which continue to add pieces that fit into what was once a humongous jigsaw puzzle. Then he pursues the whys and why-nots of archaeological theories into the "age of enlightenment"—the coming of professional archaeology. Fagan traces the development of man from Africa, Europe, and Asia, and across the Bering Strait without missing any of the opposing views of man's entry into the New World.

He traces man's cultural advancement from spear to atlatl to bow, from hunter to farmer, from nomad to villager, and from Paleo to Pueblo in easily understandable language. Fagan is a master at using a vast body of evidence from bones and tools and ancient hearths to pollen and climatic data. As a bonus, Fagan adds chapter-by-chapter suggestions for further reading which could well whet the knowledge appetite of the armchair group and send them to the local library or interlibrary loan for additional servings.

Brian Fagan was educated at Cambridge University, England. He then spent seven years in Africa, as Keeper of Prehistory at Livingston Museum in Zambia, then as Director of the Bantu Studies Project at the British Institute in Nairobi. He has been Professor of Anthropology at the University of California, Santa Barbara, since 1967. His many books include four widely used textbooks on prehistory plus the beautifully illustrated *The Adventure of Archaeology* in 1985.

Emery County

MANUSCRIPT GUIDE FOR *UTAH ARCHAEOLOGY*

UTAH ARCHAEOLOGY is a journal focusing on archaeological research within or relevant to Utah. Articles on either prehistoric or historic archaeological research are acceptable and both are encouraged. All articles must be factual technical writing with some archaeological application. The journal is jointly sponsored by the Utah Statewide Archaeological Society (USAS) and the Utah Professional Archaeological Council (UPAC). The journal is published annually.

Authors submitting manuscripts are requested to follow Society for American Archaeology (SAA) style in text references and bibliography (see April 1983 issue of *American Antiquity*). Please **include** authors' first names in your "References Cited" to be consistent with the 1983 style. If you do not have access to a copy, write to Joel Janetski requesting a photocopy. Authors are asked to submit one original and three copies of their manuscripts as all submitted articles will be reviewed by three readers. Reviewers will be selected on the basis of paper topic. Manuscripts should be double spaced with margins adequate to allow for comments and should include a short abstract if the manuscript is intended for an article rather than a report or a comment.

Categories of papers are: (1) Articles (up to 30 pages in length) are more synthetic; review or overview articles are especially encouraged); (2) Reports (shorter, usually less than 10 pages and are more descriptive); (3) Comments (on issues of current interest or previous publications). Comments on published works will be submitted to the author of that work for review and reply; and (4) Book Reviews.

Authors are responsible for figure and photo production. Figures need to be publishable quality and should not exceed 6 1/2 inches by 8 inches in size. Use pressure sensitive transfer letters or KROY lettering for labels. Figure captions should be submitted on a separate sheet and clearly correlated to figures or photos. Please submit figures as computer generated graphics or as positive mechanical transfer prints (PMTs). If such a process is unavailable, submit figures as photo-ready drawing in black ink. Photos should be black and white glossy and 5 inches by 7 inches in size.

Once the manuscript has been reviewed and accepted for publication, usually with revisions, authors will be asked to respond to the reviewer's comments. A hard copy of the revised manuscript should then be submitted to the editor with a computer disk in either WordPerfect or ASCII. The editor will then copy edit and format the article and return a hard copy to the author for final proofreading.

Subscriptions are available through membership in either USAS or UPAC or annual subscriptions (see *Message from the Editors* on page iii). Individual issues are available through selected retail outlets throughout the state. These include the Utah Division of State History Bookstore, the Museum of Peoples and Cultures Publications Department, Fremont Indian State Park, and Edge of the Cedars Museum.

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