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Radiocarbon Dates, Acquired Wisdom, and the Search for Temporal Order in the Uinta Basin

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Some 25 years ago, University of Colorado archaeologists J. Richard Ambler and David Breternitz effectively argued that the Fremont of the Uinta Basin could be temporally defined from about A.D. 1000 to 1200. This popular and critically accepted hypothesis was based more on intuition than actual chronometric data. Since that time, temporal sequences for Fremont adaptations in the Uinta Basin have undergone various revisions that have gradually expanded the Fremont temporal range beyond that proposed by Ambler and Breternitz. With more than 400 radiocarbon dates now reported from northeastern Utah and northwestern Colorado, it can be postulated that hunter-gatherer populations were becoming increasingly sedentary about 500 b.c., that transitions from a hunter-gatherer economy to a mixed farming and foraging economy was occurring by at least A.D. 250, and that elements typically associated with the Fremont (horticulture, sedentism, and ceramics) were all in place by about A.D. 550 and continued until about A.D. 1900, although with considerable spatial and temporal variability. After about A.D. 1900, most human occupations in the region were reflective of hunter-gatherer subsistence strategies typically attributed to Shoshonean-speaking peoples who occupied the region at the time of Euroamerican contact.

A Late Archaic period from 500 B.C. to A.D. 550 is proposed for that period of time when some foraging populations became increasingly sedentary, adapted more efficient bow-and-arrow technology and began to incorporate horticulture into a semisedentary lifestyle. Radiocarbon dates from the region indicate that horticulture, along with a concomitant increase in sedentism, flourished between about A.D. 550 and 1900, herein assigned to the Formative stage. However, the chronometric data suggest at least two distinct adaptations: A Uinta adaptation from A.D. 550 to 1000, characterized by Formative lifeways in the central Uinta Basin, Browns Park, and Yampa River areas, and a Tavaputs adaptation from about A.D. 1000 to 1300 on the adjacent Tavaputs Plateau, including Nine Mile Canyon, Hill Creek, and Douglas Creek, all located in canyon environments immediately to the south of the Uinta Basin. Whether the paucity of Uinta Basin radiocarbon dates after A.D. 1000 and the comparative abundance of dates in the Tavaputs Plateau region after A.D. 1000 represents a withdrawal of Uinta Basin populations into the Tavaputs Plateau cannot be demonstrated by the available data, although it is unlikely the spatial distribution of these dates is coincidental.

INTRODUCTION

In the early 1970s, after a decade of research by the University of Colorado and the University of Utah, scholars of Fremont Culture were embroiled in a fierce debate as to the temporal span of the Uinta Fremont. Some (Jennings 1978; Marvitt 1979a; Shields 1967, 1970) argued for an appearance of a mixed farming and foraging strategy about A.D. 600, and others (Ambler 1969, 1970; Breternitz 1970a, 1970b, 1970c; Gumerston 1982, 1989) argued the Fremont could be more narrowly defined within a temporal range of about A.D. 1000 to 1200. These arguments reached an apex at the Fremont Culture Symposium in Mexico City during the annual meetings of the Society for American Archaeology (Aiken 1970; Ambler 1970; Breternitz 1970a, 1970c; Marvitt 1970a; Shields 1970).

One of the most influential voices in that debate was David Breternitz, an unapologetic proponent of the idea that the Fremont of the Uinta Basin should be temporally defined within a range of about A.D. 1000 to 1150, "with the possibility that the actual dates are 30 years longer at either end." (1970b:7). Breternitz rejected the half-dozen pre-A.D. 1000 radiocarbon dates reported by Shields (1969) from excavations in the central Uinta Basin and by Leach (1970) from Deluge Shelter in the Jones Hole area, arguing these dates were 200 to 300 years too early. Although Breternitz had no quibbles about rejecting early dates that did not conform to his Utah Creek phase, he accepted two radiocarbon dates from Blue Mountain in northwestern Colorado because they "seemingly support my idea" (1970b:10) despite the fact the standard deviation of both dates made them unacceptable to most other researchers.

Breternitz's temporal hypothesis (1970b), which has remained unjustifiably resilient over the years, was, as he stated, based on "archaeological evidence, not radiocarbon dates," along with a healthy dose of "intuition and comparative analysis." Now 25 years later, with a data base of more than 400 radiocarbon dates from sites in northeastern Utah and northwestern Colorado, it is possible to move beyond intuition and comparative analyses of artifact types. Given
the fact this session coincides with the 25th anniversary of the Fremont Culture Symposium, it is appropriate to examine the chronologic data now available from the Uinta basin region, and to offer a new chronologic perspective based on quantitative stratigraphic data reported since that time.

Two periods of time are herein discussed: an Archaic stage (12,000 B.C. to A.D. 550), with special emphasis on the Late Archaic period (5000 B.C. to A.D. 1500); and the Formative stage (A.D. 550 to 1500), with emphasis on a Uinta adaptation evident in the Uinta Basin from A.D. 550 to 1000, and a Tavaputs adaptation evident in the contiguous canyon ecosystems of the Tavaputs Plateau from about A.D. 1000 to 1300. The term "Fremont" is retained for both adaptations. Based on the chronometric data now available, it is evident that the site populations of Late Archaic hunters and gatherers became increasingly sedentary, erecting semi-permanent residential structures by about 300 B.C., if not earlier (McKibbin 1992: Tucker 1986), adding basketry and arrow technology to hunting strategies perhaps as early as 50 B.C., but certainly by about A.D. 100 (McKibbin 1992), and incorporating maize horticulture into Basketmaker-like subsistence strategies by about A.D. 250 (Talbot and Rieder 1994). Plain gray ceramics appear consistently in the Uinta Basin archaeological record by A.D. 550 (Spannig 1995); at about the same time populations began to aggregate into small villages with evidence of permanent architecture. The Fremont presence in the Uinta Basin appears to have decreased gradually in intensity after about A.D. 700. No radiocarbon dates have yet been reported from Uinta Basin residential sites dating to about A.D. 1000, although a Fremont presence in the Tavaputs Plateau to the south appears to have flourished between about A.D. 1000 and 1350 (Spannig 1995: 1996).

This paper is based on a synthesis of Uinta Basin archaeological data reported by Spannig 1995. The Uinta Basin region herein discussed includes the Green River drainage in northeastern Utah and northwestern Colorado. This region includes the Yampa, Duchesne, and Uintah rivers, and Ashley-Dry Fork and Brush creeks, all located in the northern portion of the study area and Douglas, Hill, Willow, Nine Mile, and Range creeks, all in the
southern portion of the study area (Figure 5.1). All temporal ranges and calendar dates used in this paper are based on calibrated dates as per Stuiver and Reimer (1993). Method A. all singular dates are median calibrated dates. The radiocarbon dates, presented in Appendix 5.1, represent that data reported through 1995.

THE ARCHAIC STAGE

The presence in the Uinta Basin of Paleoindian hunters and Early Archaic hunters and gatherers, is implied by the recovery of temporally diagnostic projectile points, very few of which were recovered in stratigraphically controlled contexts. No cultural deposits have yielded radiocarbon dates consistent with a Paleoindian period (pre-6000 B.C.), and chronometric data in support of an Early Archaic period (6000 to 3000 B.C.) remains scant, making any statements regarding an Early Archaic presence in the region extremely tenuous. In fact, only seven radiocarbon dates attributable to the Early Archaic have been reported from the region, six of which were from sites in the Douglas Creek Arch area of northwestern Colorado. Most of these pre-3000 B.C. radiocarbon dates are from isolated hearth features and were generally not associated with temporally diagnostic artifacts. Given the paucity of chronometric data, archaeological evidence in support of Early Archaic or pre-Archaic temporal sequences remains largely circumstantial and will not be addressed in this paper. See Spangler (1993) for a more detailed discussion of temporally diagnostic evidence in support of the Paleoindian and Early Archaic periods.

The Middle Archaic Period

The first significant exploitation of the Uinta Basin region appears to have occurred during the Middle Archaic period (3000 to 500 B.C.). Several stratified Middle Archaic sites have been excavated throughout the region, and at least 54 radiocarbon dates have been reported from a variety of rockshelters and camp sites throughout the region. Additionally, dozens of sites containing temporally diagnostic Middle Archaic artifacts have also been reported. Nevertheless, the quantity of Middle Archaic radiocarbon dates remains insufficient to identify spatial and temporal patterns.

Typically, the Uinta Basin region has been included within temporal sequences offered for other regions, specifically the northwestern Plains (Frisnon 1991; Metcalfe 1987), the Yampa River (Kalab et al. 1990), and the northern Colorado Plateau (Schroedl 1976) (see Figure 5.2).
Given the fact these temporal sequences were developed from archaeological investigations in areas near or contiguous to the Uinta Basin, it may be theoretically untenable to apply these sequences to Uinta Basin archaeological phenomena that may or may not be similar to those described in contiguous areas. However, the radiocarbon dates attributed to the Middle Archaic in the Uinta Basin are similarly similar to patterns observed in northwestern Plains contexts.

For the purposes of this discussion, the Middle Archaic period is characterized by generalized hunting and gathering subsistence strategies that are differentiated from earlier adaptations primarily by projectile point types recovered from stranded cave and rockshelter contexts. Most researchers have characterized the Middle Archaic in the region on the basis of two factors: 1. An increase in human populations, as suggested by literally dozens of archaeological sites attributed to this period, and 2. The appearance of the distinctive McKeen complex projectile points, which are considered reflective of cultural influence from the northwestern Plains. Given the comparatively large number of sites yielding radiocarbon dates or temporally diagnostic McKeen complex artifacts, it is possible the Uinta Basin region was exploited by greater numbers of hunter-gatherers, and that these foragers may have been utilizing Mesolithic technologies typically assigned to Middle Archaic contexts on the northwestern Plains. However, the continued proliferation of Elko series points may also imply some level of continued influence from the Great Basin.

At least 17 Middle Archaic radiocarbon dates have been reported from the Uinta Basin-Browns Park area, and at least 41 such dates have been reported from the Yampa River and Douglas Creek areas of northwestern Colorado. The spatial distribution of these data while admittedly limited, suggest that environments east of the Green River were exploited to a greater degree than were similar areas west of the Green River. The distribution of these dates imply a sparse, but comparatively continuous occupation of the region. Although the Middle Archaic data reported from the Uinta Basin-Browns Park region remain scant, it appears that beginning about 3000 B.C., increasingly moist climatic conditions resulted in expanded grasslands that, in turn, precipitated an expansion in the herds size of various ungulates.

The increased availability of faunal resources corresponded with a dramatic increase in the number of archaeological sites, suggesting an increase in human populations. These groups of hunter-gatherers utilized different technologies defined in both Plains (McKeen complex) and Great Basin (Elko series) contexts. This dichotomy may be reflective of differential adaptations in which in situ descendants of Early Archaic hunter-gatherers continued to practice Great Basin and northern Colorado Plateau subsistence strategies. At the same time, hunter-gatherers with cultural affinities to the northwestern Plains may have also exploited the Uinta Basin, bringing with them McKeen complex artifacts.

The best evidence for Middle Archaic adaptations in the Uinta Basin comes from Deluge Shelter (Leach 1970), Thorny Cave (Day 1961), and 42DA61 and 42DA43, in the Browns Park area (McKibbin 1952). The collective data suggest Middle Archaic foragers may have selectively reduced the spatial range of their hunting and gathering activities. Lengthy occupations at Deluge Shelter (Leach 1970) and Thorny Cave (Day 1961) suggest foragers were staying longer at optimal locations, relying on a greater extent on floral resources and engaging in domestic activities such as the construction of basketry, ground stone tools, and specialized seed processing tools. Where sites yielding Early Archaic evidence reflect highly transient occupations by small groups, Middle Archaic sites reflect comparably less mobility. It is possible that increased availability of floral and faunal resources precipitated a modified adaptive strategy in which long-term base camps were also utilized during spring, summer, and fall. Populations may have aggregated in the late fall and winter in the sheltered peaks along the Green River.

The size of foraging groups may have increased slightly. Increased availability of faunal resources may have reduced dietary stress, decreasing infant mortality and increasing life spans. In general, the demographics of forager populations continued to reflect family or extended family groups. Given the increased number of foraging groups in the Uinta Basin, these population aggregations may have been greater than during the Early Archaic.

A seasonal pattern of plant and animal exploitation continued to be practiced during Middle Archaic times, but this pattern typically involved exploitation of more spatially restricted areas. If the proposed model is correct, rockshelter sites like Deluge Shelter and Thorny Cave could be interpreted as base camps, each focused on the seasonal procurement of different resources. Smaller, temporary camps, i.e., hunting camps, quarry sites should be logically located within an optimal foraging range around the base camps.

The reduced mobility may have enabled the emergence of food storage structures subsurface storage pits of suspected Middle Archaic age have been described at rockshelter sites in the Yampa River Basin. The types of resources being exploited by Middle Archaic hunter-gatherers remained the same as in Early Archaic times. However, the pattern of exploitation shifted to reflect greater resource availability, reduced mobility, and increased competition for those resources. It may be possible that environments east of the Green River were better suited than those west of the Green River for this kind of adaptive strategy, but that increased human populations probably precipitated an expansion into Uinta Basin areas that were not extensively exploited during earlier times. Some areas appear to have been sparsely exploited; no
Middle Archaic radiocarbon dates have yet been reported from the West Tavaputs Plateau or the western Uinta Basin.

As in Early Archaic times, Middle Archaic winter occupations should be found in sheltered parks along the Green and Yampa rivers where foragers reoccupied sites offering an optimal combination of permanent water, fuel resources, and access to raw lithic sources and winter ranges of deer and elk. Given the larger number of foraging groups in the area, these winter occupations may have precipitated competition for optimal site locations, or they may have resulted in larger population aggregations at those sites.

Rockshelters were utilized, as were open encampments that may have featured semisubterranean pithouses and subsurface storage pits. Middle Archaic residential architecture has not yet been described in the Uinta Basin; however, Early or Middle Archaic residential architecture has been reported in northwestern Colorado (Metcalfe and Black 1988a, 1988b), in south-central Wyoming (McGuire 1984), and in the Clay Basin on the Utah-Wyoming border (Harrell and McKern 1986). Evidence of longer-term foraging activities in the Uinta Basin would likely be found in Brown’s Park where the archaeological evidence suggests favorable base camps were repeatedly occupied throughout the Archaic, Formative, and Shoshonean stages.

The Late Archaic Period

The pattern of seasonal mobility evident in the Middle Archaic appears to have changed little through the early part of the Late Archaic period (500 B.C. to A.D. 550). Sites with radiocarbon dates after about 300 B.C. no longer contain McKean complex artifacts, perhaps implying a withdrawal of Plains influences. The continuation of Elko series projectile points early in the Late Archaic sequence, as well as the appearance of bow-and-arrow technology perhaps as early as 50 B.C. (McKibbin 1992), suggest a resurgence in influence from the eastern Great Basin. The appearance of maize horticulture by A.D. 250 also suggests influence from the northern Colorado Plateau (Talbot and Richens 1994).

In general, the Late Archaic was characterized by the appearance of radically new technologies, in particular the introduction of the bow and arrow, the incorporation of maize horticulture into a foraging subsistence strategy and an increase in sedentism, both at hunter-gatherer encampments and at farmsteads focused on maize cultivation. Also evident was an increase in the complexity of storage strategies, including the appearance of bell-shaped storage pits and masonry-and-adobe structures. The various Late Archaic temporal sequences proposed for the Uinta Basin region are summarized in Figure 5.2.

At least 57 Late Archaic radiocarbon dates have been reported from the Uinta Basin, Browns Park, and Dinosaur National Monument areas. Another 55 Late Archaic radiocarbon dates have been reported from the Yampa River and Douglas Creek areas (all dates summarized in Spangler 1995; see also Appendix 5.1). If the distribution of radiocarbon dates can be considered an accurate measure of Late Archaic occupations in the region (Figure 5.3), several conclusions can be postulated: (1) Hunter-gatherer lifeways persisted uninterrupted throughout the Late Archaic; (2) Late Archaic encampments in the region reflect procurement of faunal resources by mobile bands of hunters and longer-term encampments where exploitation of floral resources was also a common activity (McKibbin 1992; Tucker 1980); (3) The earliest Late Archaic radiocarbon dates are generally associated with exploitation of wild floral and faunal resources along the Green River, in particular the Dinosaur National Monument, Browns Park and Clay Basin areas (McKibbin 1992; Tucker 1980); (4) Bow-and-arrow technology may appear in the artifact assemblage as early as 50 B.C. (McKibbin 1992), but it does not replace the atlatl until several hundred years later (Talbot and Richens 1994); (5) Horticulture was firmly established in the archaeological record by A.D. 250, if not earlier (Coltrain 1994a, 1994b, 1994c; Talbot and Richens 1994); (6) Temporarily or poorly delineated architecture appears in the Uinta Basin as early as 300 B.C. (McKibbin 1992; Tucker 1980); and (7) Permanent architecture featuring floors of compacted soils and internal firepits, postholes and storage pits appears about A.D. 50 (Trueblood 1986), becoming increasingly complex over the subsequent centuries with the addition of stone and adobe masonry construction (Tucker 1986).

The most convincing evidence of a Late Archaic to Formative transition comes from the Steinaker Gap site (42UN 2004) in the central Uinta Basin (Talbot and Richens 1994). In a summary of the archaeological data, researchers concluded the site was occupied between about A.D. 250 to 400 by individuals who constructed temporary habitations without interior fire hearths, implying a warm-season occupation reflective of “agricultural farmsteads.” No evidence of cool-season occupations was observed. Storage pits were constructed, possibly for the storage of maize, chino-ams, cat-tail, and other food resources. A ditch system was constructed, implying that irrigation was a critical aspect of maize horticulture.

Based on stable carbon isotope studies of osteological remains, an inferred dependency on maize of about 50 percent was postulated (Coltrain 1994). Because three of four burials were infants of approximately the same age and closely contemporaneous as to time of burial, occupation by more than a single family was inferred. The presence of shells possibly originating from coastal California or the Pacific Northwest implied that a complex trade network was present. The co-occurrence of Rose Springs arrow points and unidentified atlatl darts indicated that the transition from the latter to the former was taking place between A.D. 250 and 400 and that occupants were comfortable with both technologies (Talbot and Richens 1994:231–232).
Evidence of early maize horticulture appears to be confined to the central Uinta Basin and Browns Park areas; to date, there is no convincing radiocarbon evidence of maize horticulture east of the Green River (e.g., Yampa River, Douglas Creek). There is also minimal evidence of maize horticulture in the canyon drainages south of the Uinta Basin. One exception may be maize samples from a large stone and adobe storage facility in Nine Mile Canyon that yielded a calibrated radiocarbon date of A.D. 350 (Spangler 1993). This site is more reflective of Basketmaker II sites on the northern Colorado Plateau than they are of the hunter-gatherer encampments of the Browns Park-Clay Basin area (cf. McKee 1992; Tucker 1986).

Masonry storage structures have not been described in Late Archaic contexts in Browns Park or Clay Basin; however, they are common in the Yampa River area of Dinosaur National Monument (Burgh and Stogin 1946), although none have yet produced Late Archaic radiocarbon dates. The Nine Mile Canyon site could imply the movement of Basketmaker II-like peoples or horticultural technology into the southern periphery of the Uinta Basin about A.D. 350. It would be speculative to suggest a relationship between maize horticultural activities in Nine Mile Canyon and concurrent activities in the Uinta Basin. However, the burial data from Steenaker Reservoir from this same period also feature Basketmaker II-like characteristics. Such influences suggest a strong northern Colorado Plateau influence on Late Archaic peoples in this region (Talbot and Richens 1964).

As effectively summarized by Janetski (1993), maize horticulture, storage facilities, and pit house architecture had all become well established in the centuries prior to A.D. 350 at numerous sites north of the Colorado River. Whether this represents a migration of Basketmaker II peoples into the northern Colorado Plateau (M. Berry 1982; Coltrain 1994a, 1994b, 1994c) or the accretion of Basketmaker-like traits by indigenous Late Archaic peoples (Wilde et al. 1986) remains a matter of considerable debate and little consensus.

It can be stated with some confidence that the Late Archaic was a period of dramatic change in areas north of the Colorado River and that this change included the appearance of new technologies and lifeways, some with generalized Basketmaker-like similarities. An actual migration of Basketmaker II peoples into the Uinta Basin region is not supported by the existing data, although it is possible that small migratory groups of people with Basketmaker-like traits may have occupied sites like Rasmussen Cave and Big Wash Cave on the Tavaputs Plateau, and Steenaker Gap in the central Uinta Basin. These groups may have been responsible for the introduction of maize horticulture into the Uinta Basin region, but such conclusions are conjectural given the data currently available.

In contrast to the possible northern Colorado Plateau influences, copious data from Browns Park and Clay Basin
prompted McKibbin (1992) to suggest a temporal sequence corresponding to that defined for the Wyoming Basin and northwestern Colorado. McKibbin's investigations demonstrated a continuity of occupations, subsistence, and social structures that began between 200 B.C. and A.D. 130 and persisted through the Late Prehistoric. The core of the Fremont culture was not observed in the Brown's Park region, although maize may have been grown or processed in Brown's Park by about A.D. 250 (1992:418-419), a date corresponding with horticultural activities at Steinaker Gap (Talbot and Richards 1994). McKibbin interpreted the data as reflecting a transition from the Archaic to Late Prehistoric in about 1700-1800 B.C. This transition is marked by notable increases in dated components that cannot be accounted for solely on the basis of site preservation, the introduction of bow-and-arrow (which is manifested in both regions by the presence of Rose Springs points), and by a general diversification in resource utilization (McKibbin 1992:417).

McKibbin's assignment of a Plains temporal sequence to sites in the Brown's Park area is extremely tenacious given the evidence for possible expansion of Colorado Plateau influences into the contiguous Uinta Basin at the same time, and the fact that radiocarbon date frequency patterns are similar for both the Uinta Basin and Brown's Park areas (Spangler 1995; see also Figure 5.3). Unlike the Uinta Basin to the south, the northwestern Plains people appear to have been slower to adopt transitional technologies and lifeways (Frisvold 1991).

Semipermanent architecture is evident at some southwestern Wyoming sites, but does not become common in the archaeological record until after A.D. 500. Bow-and-arrow technology may have appeared as early as A.D. 250 in the northwestern Plains, but an A.D. 500 date is generally accepted by Plains archaeologists. Maize horticulture appears never to have been adopted in the northwestern Plains, probably due to environmental conditions unfavorable for horticulture. Conversely, Plains influence on Uinta Basin peoples from 500 B.C. to A.D. 500 cannot be adequately demonstrated. Given the presence of bow-and-arrow technology and maize, the Brown's Park data could be interpreted as evidence of seasonal hunting and gathering camps associated with Late Archaic horticultural farmsteads in the Uinta Basin.

It should also be noted that hunter-gatherer encampments in the northwestern Plains are considerably more complex than anything yet described in the Uinta Basin. Communal hunting activities, a characteristic subsistence strategy on the Plains, may have occurred in the Uinta Basin but cannot yet be demonstrated archaeologically. Likewise, the procurement and processing of significant quantities of large mammals (antelope, bison) at a single site was a common feature of Late Archaic adaptations in southwestern Wyoming, but no significant kill or processing sites have been identified in the Uinta Basin.

Several sites in the Brown's Park area show affinities with procurement-processing sites in the Wyoming Basin to the north, but the Brown's Park sites are considerably less complex. The differences in size and complexity of hunter-gatherer encampments may be a function of different topographies. The open plains of Wyoming allowed aggregations of large herds of ungulates; this herd behavior was subsequently conducive to exploitation by larger human populations. On the other hand, human populations in the more topographically varied Uinta Basin were forced to exploit smaller herds of deer, elk, bison, and antelope; these smaller herds may have afforded fewer opportunities for population aggregations.

Influences from the eastern Great Basin also remain a possibility. In the eastern Great Basin, the Late Archaic was characterized by a decrease in population, based on the decrease in the number of sites yielding radiocarbon dates (Madsen 1978, 1982). This depopulation apparently coincided with an increase in Late Archaic populations in the Uinta Basin (based on an increase in number of sites yielding radiocarbon dates). The appearance of Great Basin-influenced Rose Springs projectile points in preceramic Uinta Basin contexts could be additional evidence of an eastward expansion of Great Basin hunters and gatherers into the previously sparsely populated Uinta Basin. This possibility has not been tested, and no formal hypotheses have been offered for the Uinta Basin, although Gordon et al. (1983) suggested this possibility in their discussion of Archaic settlement patterns in northwestern Colorado.

When taken collectively, the Uinta Basin data suggest that two distinct settlement patterns or subsistence strategies had emerged by the end of the Late Archaic, one focused on mobility and the procurement of wild plants and animal resources, and the other reflected a mixed farming and foraging strategy that resulted in a marked increase in sedentism. The co-occurrence of hunter-gatherer sites (e.g., McKibbin 1994) and semisedentary farmsteads (e.g., Talbot and Richards 1994; Tucker 1986) may reflect dynamic subsistence strategies employed by the same groups of people, some who remained at horticultural sites and others who engaged in procurement of wild floral and faunal resources.

A population aggregation may have occurred in the fall when cultivated resources were harvested or in winter months when sedentary populations became mobile to exploit the winter ranges of deer, elk, and bighorn sheep. Based on the distribution of radiocarbon dates, the hunter-gatherer strategy appears to have been geographically restricted to the Green River drainage in the Brown's Park, Clay Basin, and Dinosaur National Monument areas. The farmer-forager strategy appears to have been focused along Green River tributaries of Nine Mile Canyon, Cliff Creek, and Ashley Creek, and perhaps the Yampa River.
Late Archaic sites in the Douglas Creek Arch region of northwestern Colorado appear more reflective of hunting and gathering subsistence strategies with Great Basin influences, dependence on horticulture and increased sedentism has not been convincingly demonstrated in this region. Despite the abundance of Late Archaic radiocarbon dates, temporally diagnostic artifacts in stratigraphically controlled contexts are surprisingly rare in northwestern Colorado. For example, Rose Spring arrow points are not abundant in northwestern Colorado, and none have been reported from well-controlled deposits radiocarbon dated to about A.D. 500 (Grady 1984). And only one site in the region has yielded evidence of Late Archaic horticulture (Baker 1992b), but these data are not convincing. No hypotheses have been offered as to why peoples in the Uinta Basin would quickly embrace new lifeways and technologies at the same time contemporaneous peoples in northwestern Colorado retained basic Archaic hunter-gatherer lifeways.

The increase in sedentism and increasing reliance on maize horticulture has prompted recent researchers to extend the Fremont culture in the Uinta Basin as early as A.D. 200. These subsistence strategies and settlement patterns are admittedly similar to Basketmaker II strategies in the Southwest, which have traditionally been assigned to the Formative stage. Talbot and Richens (1994:234) have argued that these peoples "are unquestionably early Fremont." Gordon Tucker (1986) has also argued for an early Fremont Cliff Creek phase from A.D. 390 to 600 in the Uinta Basin, based on the presence of Fremont-like artifacts at the Cocklebur Wash site.

The assignment of the Steinaker Gap (Talbot and Richens 1994) and Cocklebur Wash (Tucker 1986) to the Fremont temporal sequence is problematic given the fact that both sites lack important traits considered characteristic of Formative stage adaptations. Although the Steinaker Gap site yielded convincing evidence of heavy reliance on maize, no evidence of ceramics or permanent architecture was reported. Although the Cocklebur Wash site contained evidence of permanent architecture, no evidence of ceramics or horticulture was reported. Rather than engage in an esoteric and perhaps irrelevant debate over what constitutes "Fremont" or Formative cultures, both sites are herein considered Late Archaic sites offering evidence of in situ transition from a hunting and gathering lifeway to increasing dependence on maize and a concomitant increase in sedentism.

Summary

Human adaptations during the Archaic Stage were characterized by a sparse—but relatively consistent—hunter-gatherer subsistence strategy and settlement pattern featuring seasonal mobility focused on the procurement of plant and animal resources. This strategy was likely characterized by mobility within reduced spatial ranges during periods of increased effective moisture, and longer-distance forays during periods of climatic deterioration. The Late Archaic was characterized by a gradual increase in sedentism, the eventual incorporation of horticulture into local economic strategies, and the utilization of bow-and-arrow technologies.

How and when these changes in local lifeways appeared in the Uinta Basin cannot be clearly seen from the few sites investigated. Temporary architecture appears to have become a part of the Late Archaic settlement pattern by about 300 B.C. in the Brown Park area (McKibbin 1992; Tucker 1986) and the Cocklebur Wash site (Tucker 1986). Bow-and-arrow technologies may have appeared in the Uinta Basin region as early as 50 B.C. (McKibbin 1992), but an A.D. 200 date is a more conservative estimate (Spangler 1995).

Maize horticulture appears to have a long history in the Uinta Basin region, perhaps as early as A.D. 50. Based on evidence from the Steinaker Reservoir area (42Un2004), a well-developed subsistence strategy based on maize horticulture was in place by A.D. 250 (Coltrain 1994a, 1994c). These data are consistent with the presence of maize in Nine Mile Canyon (42Ch66) dated to about A.D. 960 (Spangler 1993a), but evidence of a mixed farming-foraging subsistence strategy is lacking outside the central Uinta Basin and Brown Park areas. Permanent architecture reflective of increased sedentism appears in the archaeological record perhaps as early as A.D. 84 at Burnt House Village (Triesdale 1990), but certainly by about A.D. 400 at Cocklebur Wash (Tucker 1986).

These data suggest that two distinct lifeways had begun to emerge perhaps as early as A.D. 1, but certainly by A.D. 200. One strategy, evident in the Brown Park and Clag Basin areas, was focused predominately on the procurement of wild plant and animal resources. These groups may have been practicing foraging strategies reflective of both the northwestern Plains and the eastern Great Basin. The second strategy appears to have involved some level of sedentism, perhaps seasonal sedentism, that precipitated the construction of increasingly complex residential structures. These structures may have been associated with incipient maize horticulture, but also could have functioned as relatively permanent base camps for the exploitation of wild plants and animals in a more geographically restricted area. This strategy is more reflective of influence from the northern Colorado Plateau. A dramatic displacement of Archaic hunter-gatherers is not evident in the archaeological data reported.

Based on the comparative abundance of radiocarbon dates attributed to Late Archaic occupations, it is suggested that the Uinta Basin experienced a steady population increase after about 300 B.C., and that populations increased very rapidly after A.D. 1. This population increase apparently occurred at the same time the eastern Great Basin
experienced a decrease in population, presumably due to rising lake levels that flooded shoreline environments previously rich in floral and avian resources. It is suggested that a population increase in the Uinta Basin region can be attributed, in part, to a movement of eastern Great Basin foragers into the region already occupied by Uinta Basin foragers who may have been ethnically related to the immigrants.

The paucity of Plains projectile points may imply a withdrawal of Plains influence during this period due to increased competition with foraging populations having Great Basin cultural affinities. The appearance of bow-and-arrow technology in the Uinta Basin by A.D. 200 or earlier may be attributed to continued cultural association between Uinta Basin and eastern Great Basin kin groups.

The appearance of semi-subterranean brush residential structures in the Browns Park area (McKibbin 1992; Tuckee 1986) also may be evidence of influence from the eastern Great Basin. Great Basin peoples adapted to sedentary foraging in areas around the Great Salt Lake, now have foraged in spatially reduced ecotones that permitted the construction of semi-permanent residential structures. As human populations increased throughout the Late Archaic period, competition for food resources increased. During periods of climatic instability, the unpredictability of floral and faunal resources would have intensified this competition.

Beginning about A.D. 200, some groups added horticulture to their hunting and gathering subsistence strategies. Horticultural technologies may have been introduced to the area by small groups of farmers who were practicing a Basketmaker II-like strategy. Horticulturists may have experimented with maize cultivation in Tavaputs Plateau drainages, but this region was not extensively exploited at this time. As horticulture became increasingly successful in the Uinta Basin, Late Archaic populations became more sedentary, expanding greater energy in the construction and maintenance of residential structures. Temporary brush structures were eventually replaced by formal semi-subterranean pit-house architecture featuring floors of compacted soils and occasionally masonry wall construction. This settlement pattern may have had its origin on the northern Colorado Plateau.

Although horticulture mandated significant commitment of time and energy, horticultural populations appear to have made seasonal forays into the Browns Park, Dinosaur National Monument, Blue Mountain, and Douglas Creek areas to procure faunal resources. Faunal resources may also have been procured, but these resources became increasingly subordinate to domesticated maize in the cen-
natural Uinta Basin. It is suggested that many hunting and gathering encampments in the Browns Park area are actually indicative of an emerging farming-foraging strategy.

Maize recovered at such sites is probably reflective of stored food resources carried into the area by farmers engaged in seasonal foraging activities. However, it is emphasized that not all Uinta Basin populations were engaged in horticultural activities. In the Yampa River and Douglas Creek areas, in particular, a continuation of different Archaic hunting and gathering strategies is evident. Farmers in this region were much slower to incorporate horticulture into local subsistence strategies; consequently, settlement patterns reflect considerably less sedentism.

Based on the significant increase in the number of radiocarbon dates during the latter half of the Late Archaic period, it is possible the area experienced an increase in population. This may be attributed to an influx of northern Colorado Plateau peoples practicing a Basketmaker II-like strategy, or perhaps eastern Great Basin peoples displaced by rising lake levels. It is also plausible that horticulture and the consequent increase in sedentism improved fertility rates, decreased infant mortality, and generally increased the biologically viability of local populations. It is also possible that the radiocarbon frequency curve is statistically biased by intensive investigations at Steinaker Gap and in Brown's Park that have produced the most quantitative Late Archaic radiocarbon dates from the Uinta Basin.

THE FORMATIVE STAGE

Defining the spatial and temporal range of the Fremont culture in the Uinta Basin and Tavaputs Plateau is problematic and perhaps futile given the lack of consensus as to what constitutes the Fremont culture elsewhere. Although there is considerable disagreement as to the spatial and temporal nature of Formative stage archaeological phenomena in the Uinta Basin and Tavaputs Plateau, Figures 3.4 and 3.5, a comparison of these data to concurrent manifestations in surrounding areas of the northern Colorado Plateau, eastern Great Basin, and northwestern Plains would suggest that peoples in these areas were engaged in variable subsistence and settlement patterns that included both farming and foraging. As suggested by Madsen (1989), the term Fremont is retained as an "umbrella" to describe a multitude of adaptations in the eastern Great Basin and northern Colorado; however, it is not intended to imply that Formative groups were homogenous or even ethically related.

The term Fremont as used in this paper is intended to describe a variety of different adaptations from about A.D. 1200.
550 to 1300, a period generally referred to as the Formative stage. These adaptations were characterized by a lack of cultural homogeneity as human populations adapted to different environments in decidedly different ways at different times. Variable subsistence strategies (predominantly horticulture, mixed horticulture and foraging, and exclusive foraging) consequently mandated different settlement patterns both in time and space. The Formative stage temporal span of about 750 years should not be interpreted to imply that all areas of the Uinta Basin and Tavaputs Plateau were occupied continuously or concurrently.

A somewhat continuous occupation of the Uinta Basin by Fremont-like peoples can be demonstrated from about A.D. 250 to 1000; however, this occupation gradually decreased in intensity after about A.D. 700, and cannot be convincingly demonstrated after about A.D. 1000 (Figure 5.6). A Fremont-like occupation in the Tavaputs Plateau area can be demonstrated perhaps as early as A.D. 800, but a florescence of horticulture, sedentary lifeways, and complex storage strategies did not occur until about A.D. 1000, disappearing from the archaeological record by about A.D. 1900. The appearance of surface masonry architecture in northwestern Colorado after about A.D. 1000 (Creesman 1981) would appear to correspond with adaptive strategies described for the Tavaputs Plateau (Spangler 1993a, 1993b; also see Spangler, Chapter 3).

A rather continuous occupation of the Dinosaur National Monument and Browns Park areas by foragers, presumably Fremont peoples with access to maize and ceramics, has been demonstrated by a wealth of radiocarbon dates representative of the entire Formative stage sequence (McKibbin 1992; Tucker 1986). The frequency of radiocarbon dates associated with these forager occupations appear to have increased and decreased in direct proportion to an increase or decrease in horticultural occupations in the central Uinta Basin.

It would seem logical that Fremont peoples in the Uinta Basin and Tavaputs Plateau would have been influenced to a greater or lesser degree by people in surrounding areas. For example, architectural styles in the Uinta Basin share numerous affinities with the Willard and Grantsville sites in the eastern Great Basin (Steward 1933a) and with Snake Rock Village in the San Rafael Swell (Aikens 1957). The dry-laid masonry architectural styles common to the Tavaputs Plateau are virtually absent elsewhere in the Fremont culture area (Spangler 1993b), but are somewhat similar to architectural manifestations in the Yellowstone area of southwestern Colorado (Fawkes 1917a, 1917b). However, three important sites—Valley Village and Sky House in Nine Mile Canyon (Gillis 1938) and the Turner-Look site on the southern escarpment of the Book Cliffs (Wormington 1955)—featured adobe-rimmed firepits or prepared clay floors that are strikingly characteristic of Uinta Basin architectural features. Similar variability is observed with
settlement patterns, storage strategies, and artifact assemblages.

Differences in settlement patterns may have reflected differences in local topographies. In the Uinta Basin, residential sites were generally located in broad alluvial areas and Pleistocene river terraces in the Uinta Mountain foothills with easy access to permanent streams (Ambler 1966; Shields 1967). In the Tavaputs Plateau area, residential sites were narrowly distributed along stream terraces and on outcrops in deeply dissected canyons, primarily Nine Mile, Hill Creek, and Willow Creek canyons. Access to permanent water was a critical factor in site location in both regions; access to pinyon-juniper resources and arable lands were also critical factors for site location in the Tavaputs Plateau (Spangler 1999b; see also Spangler, Chapter 3).

There are also significant differences in storage strategies between the two regions (Spangler 1999b; 1995) that may reflect different subsistence strategies, as well as differences in local topography. In the central Uinta Basin, Fremont horticulturalists employed a variety of subsurface storage cists and surface storage structures, usually in close proximity to residential structures. In contrast, horticulturists in the Tavaputs Plateau region employed a complex storage strategy that included large and energy-expensive storage structures on cliff ledges and crevices, as well as camouflaged caches in protective overhangs. Whereas the Uinta Basin storage structures imply expedient access by resident populations, the pattern observed in the Tavaputs Plateau implies periodic abandonment of the region, either seasonally or for longer periods of time.

Another significant difference between the two regions was the utilization of ceramics. In the Uinta Basin, calcite- or limestone-tempered Uinta Gray pottery is abundant at residential sites after about A.D. 550. In the Tavaputs Plateau area, the ceramic assemblage is dominated by Emery Gray types believed to have been tempered with basalt. Unlike the Uinta Basin, where ceramics appear to have been a moderately significant part of the Fremont lifestyle, pottery sherd are extremely rare at Tavaputs Plateau sites; in fact, many sites of suspected Fremont cultural affiliation are aceramic.

Consequently, two distinct adaptations are herein discussed. The Uinta adaptation (A.D. 550 to 1000) includes various foraging and horticultural strategies evident in the
archaeological record of the Uinta Basin, Browns Park, and Dinosaur National Monument areas from about A.D. 550 to 1000 (calibrated). This adaptation is characterized by permanent architecture, substantial reliance on maize, the utilization of ceramics, and the aggregation of some populations into small villages. This period was also characterized by a continuation of hunting and gathering in the Dinosaur-Browns Park area where some foraging camps during this period also yielded evidence of ceramics or maize subsistence. The adaptation may extend beyond A.D. 1000 (calibrated), but that cannot yet be supported by chronometric data.

No Uinta Basin Fremont residential sites have yet yielded radiocarbon dates after about A.D. 1000 (Figure 57), and the chronometric data, although limited, would suggest that sedentary lifeways and horticultural strategies may have been abandoned about that time. The continuation of maize and ceramics at foraging sites in the Dinosaur-Browns Park region, and the florescence of maize and sedentism in the Taupo Plateau area after that time, imply that Fremont peoples did not abandon the region. Rather, they shifted subsistence strategies and settlement patterns, perhaps in response to climatic factors or competition with foragers.

The Taupo adaptation (A.D. 1000 to 1900) includes various foraging and horticultural strategies evident in the archaeological record of the Taupo Plateau. This region is dissected by deep canyons with limited natural resources necessary for maize horticulture; however, maize horticulture appears to have been a dominant activity at most Taupi sites investigated thus far. Human occupations appear to have been limited to portions of these drainages (e.g., Nine Mile Canyon, Hill Creek, Willow Creek) that offered an optimal combination of permanent water, arable lands, and piñon-juniper resources. Residential structures were characterized by abundant dry-laid masonry construction and settlement patterns featuring clusters of semi-underground pithouses on stream terraces and surface masonry architecture on rock outcrops, pinnacles and cliff ledges, many of which are defensive postures some 180 to 200 m above permanent water sources.

Any proposed reconstruction of Fremont lifeways is complicated by the variety of subsistence strategies and settlement patterns evident in the region after A.D. 550. The delineation of a Formative stage, as used in this report, is based on several factors: (1) Horticulture appears to have assumed an even greater, perhaps dominant, importance in prehistoric subsistence (Coltrain 1944b, 1945b, 1949c); (2) Storage structures, typically associated with the production of food surpluses, became increasingly large and reflected a variety of storage and caching strategies (Spangler 1950b); (3) Residential architecture became increasingly complex with the addition of prepared clay floors, adobe-rimmed firepits, and coursed masonry architecture (Bretz 1970a; Shields 1967; Spangler 1950b); (4) Enhanced social complexity was reflected by population aggregations into small villages and farmsteads (Bretz 1970a; Jennings and Sammons-Lobst 1981; Marvitti 1970a), and perhaps by the construction of ceremonial architecture (Spangler 1950b); (5) An elaborate rock art and figurine complex with broad regional implications appeared in the archaeological record (Mors 1954); and (6) Ceramics were added, to a greater or lesser degree, to local lifeways (Spangler 1950b).

It is recognized that different types of human adaptations to a varied environmental landscape likely occurred throughout the Formative stage, but these manifestations may not yet be identified or have not been subjected to chronometric analyses. Various phase sequences proposed for the Uinta Basin are rejected as inadequately supported by radiocarbon data. The continued utilization of phase nomenclature based on limited and noncorroborating investigations constitutes little more than phase-stacking (Berry and Berry 1986), a practice that is not only theoretically untenable but one that creates illusions of temporal continuity that may, in fact, be nothing more than different and not necessarily sequential adaptations in time and space. Various temporal sequences proposed by various researchers are summarized in Figures 5.4 and 5.5.

The Fremont Adaptation

As previously discussed, the Fremont adaptation ranges from about A.D. 550 to 1000, and includes a variety of horticultural and foraging subsistence strategies. Beginning about A.D. 250, horticultural strategies were implemented by some groups in the Uinta Basin, but hunting and gathering remained the dominant subsistence strategy. As agriculture proved successful, horticultural sites became increasingly large and architecture exhibited greater permanence. Farmsteads with permanent architecture are evident at least A.D. 550 when ceramics appeared in significant quantities in the archaeological record. Populations appear to have increased dramatically between A.D. 550 and 700 (see Figures 5.6 and 5.7), perhaps bringing Fremont farmers-foragers into increasing competition with full-time foragers, who maintained a competitive advantage over part-time foragers.

The Farmers. Based only on those sites yielding radiocarbon dates, residential architecture between about A.D. 550 and 700 was relatively uniform, consisting of circular or semi-circular structures with concealed, slightly semisubterranean floors of compacted soils. These structures featured centrally located, adobe-rimmed fire hearths and postholes, typically four, around the hearths, which implied the presence of central roof supports. Subsurface pits, including bell-shaped pits, are typically located inside the dwelling features. Wall construction often featured a base of vertical
slabstones, above which was erected a brush superstructure dished with adobe. Coursed adobe structures and prepared clay floors are absent during this period. Radiocarbon dated sites attributed to the first half of the period include the Dan site, Caldwell Village, Wagon Run, and Wholeplace Village (Auble 1966; Buttermitz 1978; Shields 1978), among others. See Appendix 5.1.

After about A.D. 700, the larger Uinta Basin populations began to focus. Small groups of horticulturalists began to occupy canyon drainages and other environmental niches that were previously peripheral to Fremont horticultural strategies. Fremont horticulturalists may have occupied Douglas Creek in increasing numbers, and other groups may have begun exploiting Nine Mile and Hill Creek canyons. Yet other groups remained in the Uinta Basin, employing a variety of settlement patterns, including the occupation of bastis in possible defensive postures and aggregating at village sites like Whiterocks and Caldwell Village. Residential architecture became increasingly complex from A.D. 700 to 900 with the addition of prepared clay floors, adobe-rimmed hearths, anechoambers, and overhead storage structures. Not enough is known of Tavaputs Plateau adaptations during this period to offer valid comparisons, but Valley Village and Beeson Ridge (Gill 1957) in Nine Mile Canyon and the Turner-Lock site (Wormington 1975) in the southern Tavaputs Plateau may offer evidence of similar adaptations in those regions.

The increased variability in architectural styles and settlement patterns was evident at several sites dating after A.D. 700. For example, the Gilbert site, located on a butte above Lake Fork and Zinmanov Wash without immediate access to permanent water on arable lands, yielded a radiocarbon date of 1280 ± 80 years B.P. (A.D. 700 calibrated) in association with a structure 12 ft sq and constructed of horizontally-laid sandstone slabs separated by 2 to 3 inches of mortar. Two floors of prepared clay were present, indicating at least two occupations. In the center of the structure was a basin-shaped, adobe-rimmed fire hearth. At the Goodrich site, located along a narrow ridge above Deep Creek, three residential structures were identified, all of which were circular with centrally located, adobe-rimmed fire hearths, subsurface pits, internal postholes and prepared floors of puddled clay. Structure 2, which may have been a surface structure, yielded a radiocarbon date of 1240 ± 85 years B.P. (A.D. 700 calibrated) (Shields 1977: 146).

About A.D. 900, a depopulation of the Uinta Basin may have begun, based on a significant reduction in the number of radiocarbon dates after this time (see Figure 5.7). These few Uinta Basin horticultural sites that have been investigated suggest that populations may have been aggregating into larger village settings, perhaps with defensive orientations. These settlement patterns were certainly evident at Whiterocks Village, located in the Uinta Mountains foothills near the Uinta River, where Structure 2 yielded radiocarbon dates of 1150 ± 80 years B.P. (A.D. 900 calibrated) and 1070 ± 60 years B.P. (A.D. 900 calibrated). This structure was circular, measuring 17 ft in diameter and featuring a floor of prepared clay. Two superimposed, centrally located fire pits were located, both of which featured adobe rims (Shields 1977: 146).

The significant decline in Uinta Basin radiocarbon dates after A.D. 1000 appears to have coincided with an increase in the intensity of Fremont occupations in the Nine Mile Canyon area where a dual settlement pattern of stream terrace pithouses and dry-laid masonry architecture on pinnacles and butte tops may have been an elaboration of the less-complex defensive architecture evident at some Uinta Basin sites occupied after about A.D. 700. The remarkable complexity and considerable energy expended in the construction of the Tavaputs Plateau architectural sites dated after A.D. 1000 imply that defensive strategies may have evolved into a significant part of local settlement patterns.

The appearance of defensively oriented architecture in Nine Mile Canyon about A.D. 1000 also coincides with the appearance of Desert Side-Notched projectile points in Level 3 deposits at Deluge Shelter (A.D. 1004 calibrated). The appearance of these points, considered by many to be evidence of Shoshonean expansion, also coincided with a significant de-emphasis on horticultural resources. It is suggested that the appearance of Desert Side-Notched points at the same time Fremont horticulturalists of the Tavaputs Plateau were constructing defensive architecture is not coincidental. Rather, this phenomenon may be evidence of cultural conflict between hunter-gatherers and horticulturalists (not necessarily between Shoshoneans and non-Shoshoneans). Not only did the deeply dissected canyons of the Tavaputs Plateau offer a topography conducive to defensive strategies, but higher elevations of the Tavaputs Plateau may have offered an acceptable combination of biotic resources that had been subjected to only sporadic foraging activities in earlier times. The presence of Fremontlike ceramics and mace at some foraging encampments in the Brown Park-Dinosaur National Monument area after A.D. 1000 suggest this region continued to be exploited by Fremont foragers, but the intensity of this exploitation was significantly reduced.

The Forbes. Most discussions of Fremont adaptations in the Uinta Basin have emphasized horticulture and sedentary lifeways. But as demonstrated by the wealth of radiocarbon data reported from the Brown Park-Dinosaur National Monument, Yampa Canyon, and Douglas Creek areas, foraging activities were a significant part of subsistence strategies throughout the Formative stage. In fact, more radiocarbon dates have been reported from horticultural sites than from any other cultural group in the Uinta Basin.
These data are strongly suggestive of Fremont seasonal foraging strategies that may have included horticulture at certain times of the year and procurement of faunal resources at other times of the year. It is probable that these foragers were Fremont peoples or were groups with socioeconomic association with Fremont peoples.

Six of the seven Dinosaur-Browns Park sites containing Rose Springs projectile points (admittedly a poor measure of Fremont cultural affiliation) also yielded maize or ceramics. Furthermore, 13 of the 15 sites in this area yielding radiocarbon dates also contained evidence of maize or ceramics. The small sample size of radiocarbon-dated sites makes any statistical conclusions speculative, but it would appear that foragers in the Browns Park-Dinosaur area at least had access to maize and ceramics.

Within this context, maize and ceramics recovered at foraging sites could be evidence of a late fall-winter migration by Fremont farmers into the Green River drainage to exploit deer and elk winter ranges. These foragers could have brought with them processed maize as a supplemental food resource. Ceramics found at forager encampments could have been manufactured at the winter base camps or carried in small quantities to the camps from farmsteads or villages in the Uinta Basin. Another possibility (discussed in greater detail later in this paper) is that hunter-gatherers developed a symbiotic socioeconomic relationship with sedentary horticulturalists. Under this model, foragers could have exchanged faunal resources for maize and ceramics.

It should also be noted that Formative stage peoples of northwestern Colorado appear to have also incorporated a variety of subsistence strategies, dominated by hunting and gathering of wild resources, but also utilizing maize to some degree. Data indicate that the Fremont of Douglas Creek did not become reliant on maize horticulture as much as other Fremont peoples and may have remained "very much entrenched in lifestyles developed during earlier Archaic times" (Cressman 1981:17). The nature of the farming-foraging subsistence strategy is poorly understood in this region.

Summary: Fremont occupations of the Uinta Basin appear to have been relatively continuous from about A.D. 550 to about 1000, although the intensity of these occupations...
may have varied considerably. However, an occupation of the region by Fremont horticulturists after that period cannot be adequately demonstrated given the paucity of radiocarbon dates. Whether this represents an abandonment of the Uinta Basin by sedentary Fremont peoples or a bias in the sites selected for radiocarbon analysis cannot be determined from the available data.

The rapid decline in Fremont occupations in the Uinta Basin after A.D. 900 is intriguing in light of chronometric data reported elsewhere in Utah that demonstrate an expansion of Fremont horticultural strategies from about A.D. 550 to 1150 (Talbot and Wilde 1988). It has been hypothesized that greater effective moisture during this period permitted greater reliance on domesticated resources. This hypothesis may be supported by data from the Tavaputs Plateau, which show an expansion of horticultural activities after A.D. 1000. But the central Uinta Basin appears to have been sparsely populated during this time. If climatic conditions were indeed favorable during this period, the population of the Uinta Basin may have been precipitated, at least in part, by nonenvironmental factors, perhaps increased competition with hunter-gatherers for limited resources.

The relationship between farmers and foragers in the Uinta Basin is unresolved. A wealth of radiocarbon dates from forager camps in the Dinosaur National Monument and Browns Park areas and corresponding chronometric data from the Uinta Basin offer considerable research potential. Interestingly, the frequency of Uinta Basin radiocarbon dates, generally associated with sedentary horticultural activities, is virtually identical to the frequency of Browns Park-Dinosaur National Monument radiocarbon dates generally associated with hunting and gathering activities (Figures 5.7 and 5.8).

A continued occupation of the central Uinta Basin by sedentary horticulturists is implied by circumstantial evidence. This includes the presence at some Uinta Basin sites of Anasazi trade wares that have been dated in Southwestern contexts after A.D. 1000, and concurrent and complex Fremont occupation in the environmentally inferior Tavaputs Plateau region adjacent to the Uinta Basin. Additionally, the presence of ceramics and mace encampments dating as late as A.D. 1300 in Dinosaur National Monument and Browns Park, as well as a Fremont-like presence in northwestern Colorado that persisted well after A.D. 1000, exhibit features similar to those observed in the Uinta Basin.

Three possible explanations are offered as to the paucity of Uinta Basin radiocarbon dates after A.D. 1000: (1) No abandonment occurred and the paucity of post-A.D. 1000 radiocarbon dates is a function of sampling bias, (2) Uinta Basin horticulturists shifted settlement patterns to locations not yet identified or subjected to chronometric analysis, or (3) An expansion of foraging activities in the Uinta Basin beginning about A.D. 900 may have forced sedentary populations to adjust settlement patterns to include defensible site locations in the Uinta Basin, and later to migrate to more defensible environments in the deeply incised canyons of the Tavaputs Plateau.

The Tavaputs Adaptation

Researchers have long recognized that horticultural adaptations in the Nine Mile Canyon, Hill Creek, and Willow Creek areas of the Tavaputs Plateau were substantially different than those in the Uinta Basin to the north or the San Rafael Swell to the south. Among the distinct adaptations evident in the Tavaputs Plateau area are: (1) dry-laid masonry structures, some of massive size, (2) masonry towers and other architectural features situated on ridge tops and buttes hundreds of meters above any arable land, (3) the absence of a local ceramic tradition, and (4) a complex storage strategy unparalleled elsewhere in the northern Colorado Plateau. (The Tavaputs adaptation is discussed in detail in Chapter 3.)

Given spatial distribution of chronometric data, it is likely not a coincidence that horticulturists practicing Fremont-like strategies appeared in Tavaputs Plateau drainages at about the same time that horticultural strategies appear to have been decreasing in intensity in the central Uinta Basin. However, there is limited archaeological evidence to support the hypothesis of an actual population shift from the Uinta Basin to the Tavaputs Plateau. In fact, there are significant differences in settlement patterns, subsistence strategies, and artifact assemblages.

There are also significant temporal differences between the two areas (Figure 5.7). The florescence of Fremont residential sites in the Uinta Basin occurred between about A.D. 550 and 700 (19 radiocarbon dates), but continued for another 20 years (10 radiocarbon dates between A.D. 700 and 900). In the Tavaputs Plateau region, the Fremont presence appears to have been sparse prior to about A.D. 1000. Between A.D. 1000 and 1300, eight radiocarbon dates have been reported, as well as some 40 tree-ring dates from four different Tavaputs Plateau sites that reflect construction dates between A.D. 1000 and 1300.

The frequency curves for residential sites in the region (Figure 5.7) seem to support the hypothesis that a migration of horticulturists from the Uinta Basin to the Tavaputs Plateau may have occurred during the late A.D. 900s and early A.D. 1000s. However, there is surprisingly little archaeological evidence to support such a hypothesis. Among the evidence mitigating such a hypothesis: (1) The paucity of Tavaputs Plateau sites dated prior to A.D. 800 is likely a function of statistical bias due to the small number of sites subjected to chronometric analyses; (2) A continued Fremont-like foraging subsistence strategy is evident in the archaeological record of Dinosaur National Monument and
Brown's Park to the north of the Uinta Basin during this same time period. There is little direct evidence of social conflict at sites in the Uinta Basin or Taypauts Plateau. (4) Architectural styles and settlement patterns are decidedly different between the two regions. (5) Storage strategies are extremely complex in the Taypauts Plateau area and appear to reflect periodic or seasonal abandonment, but this strategy is virtually absent in the Uinta Basin. (6) Taypauts Plateau gray wares are dominated by what appears to be basalt temper, an exotic material derived from the San Rafael Swell area, instead of limestone or other tempering agents preferred by Uinta Basin peoples and which are readily available throughout the Taypauts Plateau. (7) Ceramics appear to have been a moderate part of Fremont adaptations in the Uinta Basin, but are an inconsequential part of the artifact assemblage at most Taypauts Plateau sites. (8) The Taypauts Plateau exhibits a Fremont rock art style distinctly different from that in the Uinta Basin and (9) Characteristic traits (e.g., Utah type pecates, figurines, applique pottery) are extremely rare in the Uinta Basin but are relatively common in the Taypauts Plateau area (Spangler 1955).

Taken collectively, these traits argue for a separate Fremont adaptation uniquely suited to the deeply incised canyons of the Taypauts Plateau. This adaptation was likely present prior to A.D. 1500, but becomes conspicuous in the archaeological record after that time with the addition of large masonry architectural structures—a phenomenon unprecedented anywhere else in the Fremont culture area north of the Colorado River. The florescence of the Fremont culture in this region was likely influenced by concurrent adaptations in the Uinta Basin and San Rafael Swell, but is spatially, temporally, and architecturally distinct.

An abandonment of horticultural lifeways on the Taypauts Plateau area may have occurred by about A.D. 1500, although evidence at some sites in northwestern Colorado imply the Fremont may have persisted as a recognizable entity in isolated areas until about A.D. 1600. For example, 3R8091 yielded evidence of maize and a radiocarbon date of A.D. 1287.arda 6366 yielded evidence of maize and a radiocarbon date of A.D. 1284, and from site 5R8282 and 5R8282, which yielded radiocarbon dates of A.D. 1284 and A.D. 1287, respectively. A seedling ball, typically considered a Fremont material culture trait, was recovered at 3R8273 in association with Desert Side-Notched points. This site yielded a radiocarbon date of A.D. 1285.

Two sites in particular may be reflective of post-A.D. 1300 Fremont occupations. The Edge site (5R8245) yielded Fremont artifacts and a radiocarbon date of A.D. 1241, and the Texas Creek Overlook site (5R8245) yielded Fremont ceramics and a radiocarbon date of A.D. 1448 (Cranehan 1986; Cremaschi and Scott 1987; LaPoint et al. 1981). Both sites exhibit architectural traits similar to those described for the Taypauts adaptation, while artifacts recovered from both sites may share cultural affinities with the Uinta Basin. Collectively, these data imply the persistence of adaptive strategies similar to those found in isolated areas throughout the late Formative and early Shoshonean stages, even though climatic conditions were deteriorating.

It should be emphasized that post-A.D. 1000 Fremont populations in the Taypauts Plateau and Douglas Creek areas were never numerous; the susceptibility of small populations to predation may have mandated the defensive strategies evident in the archaeological record. These defensive sites were not refuges from invading Shoshoneans; rather, they offer circumstantial evidence of temporary refuge by horticulturalists subjected to increased competition from hunters and gatherers. It should also be noted that there is little chernometric data from the Taypauts Plateau area to support a hypothesis that farmers were also engaged in hunting and gathering activities.

Summary: The relative paucity of Taypauts Plateau sites yielding radiocarbon dates prior to A.D. 1500 is likely a perceptual problem perpetuated by a small sample of radiocarbon dates: this region has not been subjected to the intensive diachronic development and pipeline construction as has the Uinta Basin and Brown's Park areas. As discussed earlier, a robust Fremont presence prior to A.D. 1500 has been documented in the Uinta Basin to the north in canyon environments in the San Rafael Swell in the south. A significant pre-A.D. 1000 Fremont presence may yet be demonstrated in the Taypauts Plateau.

However, current chernometric data suggest that horticulture flourished in the region after about A.D. 1000, although human populations were never large given the environmental constraints of limited arable lands and water. The frequency of chernometric data between about A.D. 1000 and 1300 suggest human populations were increasing during this period. This expansion could reflect a) improved climatic conditions throughout the Colorado Plateau that facilitated expansion of horticultural activities, or b) a migration of horticulturalists from the Uinta Basin into the environmentally inferior Taypauts Plateau. It could also be a function of stratigraphic bias in which sites occupied prior to A.D. 900-1000 have not yet been subjected to chernometric analyses.

Regardless of the temporal range of horticultural adaptations in the Taypauts Plateau, it is emphasized that unique geographical and environmental variables precipitated human adaptations unique to the northern Colorado Plateau. Consequently, the various "phases" and "varieties" hypothesized by various researchers (Jennings 1978; Marvino 1978; Schaedler 1974; Schaefer and Hogan 1975) are rejected. These designations are theoretically flawed attempts to explain cultural variability in the Taypauts Plateau through diffusion of material culture traits from the
Uinta Basin or San Rafael Swell. These labels inherently militate against an independent adaptation to unique environmental variables characteristic of the Tavaputs Plateau region, ignoring explanations as to how or why prehistoric peoples adapted to their Tavaputs Plateau environment in such a distinct manner.

THE SHOSHONEAN STAGE

The hypothesized Numic expansion into the eastern Great Basin and contiguous territories remains a popular explanation for abandonment of Fremont lifeways. It is widely accepted that the period from about A.D. 1000 to 1500 was characterized by widespread cultural migrations that precipitated tremendous social interaction. As described by Lindsay (1986) and others, it was also a time of significant climatic change that disrupted agricultural lifeways throughout the Southwest (see also Gunnerman 1989). The predominance of a hunter-gatherer lifeway after A.D. 1300, therefore, is likely dynamic, reflecting human adaptation to changing environments through population migration and shifting subsistence strategies in which agriculture was no longer viable.

The relationship of Fremont peoples to historic Numic-speaking peoples is wholly unresolved. While acknowledging a Numic expansion at different points in time, Grayson (1994a), Gunnerman (1962, 1989) and Holmer (1994) see the Fremont as ancestors of the Utah Shoshoneans. However, others see the disappearance of horticulture and sedentism as evidence for a displacement of non-Numic peoples by Shoshonean newcomers (Bettinger and Baumhoff 1982; Sutton 1986, 1987). The problem is aggravated by the fact that non-persishable material culture of the prehistoric Shoshoneans “is so scanty and nondistinctive that almost no archaeological evidence of the tribes or their lifeway can be gathered except through ethnographic and linguistic sources” (Jennings 1978:233).

Abandonment of horticultural subsistence strategies in the Uinta Basin region and the subsequent appearance of Shoshonean foragers in the archaeological record remains a perplexing and inadequately studied problem. None of the recent models (Aikens and Witherspoon 1986; Bettinger and Baumhoff 1982; Sutton 1986, 1987) specifically addressed archaeological phenomena in the Uinta Basin region, although each appears to have some merit to a discussion of post-A.D. 1300 manifestations in the study area.

It is probable that a variety of climatic and social factors led to a discontinuation of sedentary, horticulture-based lifeways about the same time Anasazi agricultural-based societies were collapsing in the Southwest. This culturally-induced abandonment may have been accelerated by increasing populations of Shoshonean foragers. With the exception of recently obtained radiocarbon dates for certain Numic artifacts, no research is being conducted related to the Shoshonean presence in the Uinta Basin or Tavaputs Plateau region. The coexistence of sedentary Fremont peoples and Numic foragers cannot be conclusively demonstrated at the current time, but should not be rejected given the paucity of research.

Researchers in the Uinta Basin region have emphasized that the hunting and gathering strategies employed after A.D. 1300 did not differ markedly from those in preceding Archaic and Formative stages. As noted by several researchers (Bright and Sims 1994; Grady 1986; Sims 1986; Ugan and Sims 1994), the Fremont-Shoshonean interface may not reflect a cultural displacement as much as it does an abandonment of horticulture and greater emphasis on hunting and gathering subsistence strategies. The material culture record associated with this strategy was distinguished from that of earlier Fremont peoples primarily on the basis of Desert Side-Notched projectile points and Shoshonean pottery sherds, and rarely, basketry and Shoshonean knives. Rock art styles attributed to post-A.D. 1300 occupations are also in decided contrast to earlier Fremont styles.

As discussed earlier, these artifacts were utilized by historic Shoshonean populations in the same region. It is not unreasonable, therefore, to postulate that these same artifact types, when recovered in prehistoric contexts, were manufactured by ancestral Shoshonean peoples (cf. A. Reed 1944). The theoretical problems of assigning ethnicity to material culture are acknowledged.

The paucity of Shoshonean stage chronometric data from the region is perplexing and may well be a function of statistical bias. Researchers throughout the Uinta Basin have described sparse evidence suggesting the region was exploited by Shoshonean hunter-gatherers. Numic activities may be represented by rockshelter habitations, dune encampments and rock art sites in the Natural Buttes, Bonanza, and Riverbend areas, all of which appear to have been sparsely exploited during the Formative stage; however, there is no chronometric data to support the concept of expanded foraging ranges. In fact, Shoshonean stage manifestations are not particularly common anywhere in the central Uinta Basin.

With the possible exception of the rock art in the Nine Mile and Hill Creek Canyon areas, there is also little evidence for an extensive Shoshonean occupation of the Tavaputs Plateau; however, the lack of recorded sites may be reflective of the mobile lifeway of Shoshonean foragers and the inability of archaeologists to recognize these ephemeral settlement patterns and subsistence strategies. It should be noted that Shoshonean pottery has not been recovered from chronometrically controlled contexts in the Tavaputs Plateau region, and only one Desert Side-Notched point has been recovered from a context yielding a Shoshonean stage radiocarbon date.

An occupation of the Tavaputs Plateau region by Sho-
shoshonean hunter-gatherers is implied by the recovery of sev-
ral temporally diagnostic artifacts and the abundance of
post-Fremont rock art. However, interpretations of prehis-
toric Shoshonean lifeways is hampered by the fact that no
radiocarbon dates have been reported from stratified de-
positions. Given the limited data from the Tavaputs Plateau
region, it could be reasonably postulated that this region was
exploited by small, highly mobile groups of hunters, per-
haps individual hunters, who periodically cached bundles
of food, clothing, and raw materials throughout their foraging
range. There is no evidence to suggest social organiza-
tion on the band level during prehistoric times. Some areas
(e.g., Nine Mile Canyon) may have been exploited by fami-
lies who also gathered floral resources, as evidenced by the
large Numic basket recovered in that region (Spangler
1993b), but such evidence is rare.

Data related to the Shoshonean stage present intriguing
archaeological and ethnographical questions that, unlike
earlier periods of culture history, allow direct comparisons
between the ethnographically observed behavior and the
archaeologically described past. Unfortunately, little re-
search has been conducted in the Uinta Basin or the Tav-
aputs Plateau related to prehistoric Shoshonean adapta-
tions. This region is frequently included in various models for Fre-
mond abandonment and Shoshonean expansion, but with
few exceptions these regional hypotheses are not cite actual
data from the study area.

The paucity of prehistoric Shoshonean sites yielding
stratified deposits is frustrating. The only stratified sites to
date are found in the Browns Park area (McKibbin 1992),
but the value of those data to an explanation of Shoshon-
ean lifeways is marginal, at best. Other radiocarbon dates
have been derived from isolated components and individu-
al artifacts that offer little in the way of explanation of
shifting subsistence strategies or settlement patterns. The
entire prehistoric Shoshonean occupation of the Uinta Basin
and Tavaputs Plateau must be considered a significant
gap in the corpus of archaeological data, and any hypo-
theses, conclusions, and interpretations must be consid-
ered extremely tenuous.

As emphasized in the previous discussion of the Forma-
tive stage, the appearance of Desert Side-Notched points in
hunter-gatherer contexts in the Uinta Basin at the same
time horticulturalists were constructing defensively orien-
ted architecture in the Tavaputs Plateau is probably not
coincidental. Whether this represents an expansion of Sho-
shonean hunters and gatherers into the Uinta Basin region
about A.D. 1000 cannot be stated. Rather, this phenomenon
should be viewed within the context of increased competi-
tion between horticulturalists who also foraged and those
who relied exclusively on hunting and gathering. It is cer-
tainly possible that practitioners of both adaptive strategies
were Shoshonean-speakers. It does appear, that hunting
and gathering had become the dominant subsistence strat-
 egy by at least A.D. 1300, and that this strategy included the
utilization of local lithic sources, ceramics, and basketry
considered characteristic of historic Shoshonean peoples.

The coexistence of horticulturalists and hunter-gather-
er is not only considered possible but probable during the
latter part of the Formative stage and early in the Shoshon-
ean stage. The ethnographic observations of William
Henry Jackson are considered relevant to the hypothesis
proposed here. In his interviews with Puebloan peoples,
Jackson observed that prehistoric farmers were

...living by agriculture rather than by chase. About a
thousand years ago, however, they were visited by savage
strangers from the North, whom they treated hospitably.
Soon these visits became more frequent and annoying.
Then their troublesome neighbors—ancestors of the present Utes—began to forage among them, and, at
last, to massacre them and devastate their farms so, to
save their lives at least, they built houses high on cliffs,
where they could store food and hide away the raiders left. But one summer the invaders did not go
back to their mountains as the people expected, but
brought their families with them and settled down. So,
driven from their homes and lands, starving in their little
niches on the high cliffs, they could only steal away dur-
ing the night... [Jackson 1876:380].

The ethnographic record also indicates that Ute hunters
frequently visited Puebloan settlements in New Mexico and
Arizona in the 1500s, 1600s, and 1700s, trading furred
resources for maize and textiles and exchanging captives. At
other times of the year, Ute peoples were in almost con-
stant conflict with Puebloan peoples (Tyler 1951). It is
possible, therefore, that hunters and gatherers developed a
symbiotic relationship with sedentary farmers, raiding
sedentary groups during certain seasons and engaging in
socioeconomic intercourse during other seasons.

Based on the archaeological evidence currently re-
ported, the number of Shoshonean hunters and gatherers
does not appear to have been significant, certainly not
enough to displace larger numbers of horticulturalists.
However, if the raiding activities of hunters and gatherers
eventually displaced horticulturalists, the foragers may have
responded by relocating to areas where a symbiotic socio-
economic relationship with horticulturalists (e.g., Puebloan
and Apachean peoples) could be resumed.

Of possible significance, 18 of the 25 Shoshonean stage
radiocarbon dates from northwestern Colorado sites occur
between A.D. 1300 and 1500; this period coincides with a
posulaged late Fremont presence at sites like the Edge site
and Texas Creek Overlook. By comparison, only 6 Sho-
shonean stage radiocarbon dates have been reported from
Uinta Basin contexts during that same time period; no post-
A.D. 1300 Fremont occupation has been unequivocally
demonstrated in either the Uinta Basin or Tavaputs Pla-
teau. The comparative paucity of Shoshonean Stage radio-
[66] AP 122
carbon dates after A.D. 1500 (10 in the Uinta Basin, 7 in northwestern Colorado) may represent a movement of many, but not all, early Shoshonean peoples southward into southwestern Colorado and northern New Mexico. The ethnohistoric record indicates that Ute populations were increasing rapidly in that area after A.D. 1600, and that these hunter-gatherers were engaged in regular economic intercourse with sedentary populations in that region (Tyler 1951).

It is emphasized that small groups of ancestral Utes probably remained in the Uinta Basin and northwestern Colorado, but the number was comparatively small. Although the numbers of Shoshonean stage radiocarbon dates (25 in northwestern Colorado, 16 in the Uinta Basin and Tavaputs Plateau) is insufficient to demonstrate spatial and temporal changes, it is postulated that the Uinta Basin region was occupied by small numbers of hunters and gatherers with Shoshonean technologies. The pre-equestrian adaptations during the Shoshonean stage were characterized by mobile hunting and gathering strategies reminiscent of Archaic stage strategies.

It is also probable that Shoshonean hunter-gatherers coexisted with horticulturalists. For example, at the Moss Shelter site in Yampa Canyon, researchers described about 60 box elder poles averaging 12 ft in length, grouped about lodges or house floors. The floors were indicated by circles of rock 8 to 15 ft in diameter, "which would seem to indicate their use as tepee poles." Artifacts in association with the structures included notched wooden shafts, corn ears, scrapers, triangular projectile points, rubbing stones, and pottery sherds (Baldwin et al. 1947:8-9). The association of Shoshonean domestic structures, maize, and ceramics cannot be readily explained, although Baldwin suggested "this shelter represents a late prehistoric Ute site" (1947:33). It is also possible this site represents a concurrent exploitation of the region by Shoshonean and Fremont peoples.

The combination of deteriorating climatic conditions and sparse populations precipitated a resumption of long-distance transhumance. Consequently, sites after A.D. 1300 should reflect mobile subsistence strategies and settlement patterns similar to those described above for the Early Archaic and Middle Archaic periods. Population aggregations in sheltered parks along the Green River were probably part of this foraging strategy, but this cannot yet be demonstrated in the Uinta Basin archaeological record. The procurement of floral and faunal resources during predetermined seasonal rounds was reminiscent of Great Basin adaptive strategies; influence from the northwestern Plains cannot be demonstrated during this period, although Plains Shoshoneans may have exploited the Browns Park and Dinosaur National Monument areas as evidenced by the presence of steatite vessels in Uinta Basin contexts.

Given the fact that Utes at the time of historic contact utilized Desert Side-Notched points, brown ware ceramics, and Numic-style basketry, and practiced a mobile hunting and gathering subsistence strategy, it is postulated that Shoshonean peoples who occupied the region after A.D. 1300 were ancestral Utes. The model presented here is clearly based on ethnohistoric evidence inasmuch as little archaeological research into Shoshonean lifeways has been reported from the Uinta Basin area.

**SUMMARY**

Despite the abundance of chronometric data now available to researchers in the Uinta Basin region, significant gaps in the data base complicate any comprehensive interpretations of the local chronology. No radiocarbon dates have been reported from the western Uinta Basin, nor have any dates been reported from the White River drainage in the southeast Uinta Basin. The abundant Formative stage manifestations in Hill and Willow Creek have produced numerous tree-ring dates, but no radiocarbon studies have been initiated. Sites in Nine Mile Canyon, arguably the most intensively investigated drainage in northeastern Utah, have only recently been subjected to radiocarbon analyses, and the small number of dates reported from the Tavaputs Plateau may have created a statistical illusion of a late Fremont adaptation to the near exclusion of earlier Fremont or Late Archaic occupations.

Since early temporal classification schemes were proposed by Breternitz (1970a), Ambler (1969), Shields (1970) and Marett (1970a), the temporal range of human adaptations in the Uinta Basin region has been gradually expanded to include Archaic hunters and gatherers, Late Archaic and Formative horticulturalists and foragers, and Shoshonean hunters and gatherers. Despite the more than 400 radiocarbon dates now available to researchers, the significant gaps in the chronometric data base make it difficult to propose anything but broad temporal sequences. Labels like Coh Creek phase and Cliff Creek phase (see Figure 5-3), based in large part on limited archaeological investigations, remain theoretically untenable (see Berry and Berry 1956) and should probably be discarded.

It is suggested the collective radiocarbon data be used as a broad framework for cultural change in northeastern Utah. Given the data available, it can be speculated that small groups of hunters and gatherers exploited the region by about 3000 B.C., but these occupations were sparse until about 500 B.C. when a steady increase in the number of radiocarbon dates may coincide with increased human populations. The appearance of maize horticulture about A.D. 250 coincides with a dramatic increase in the number of radiocarbon dates; the number of sites yielding radiocarbon dates continues to increase, peaking about A.D. 700 and gradually declining thereafter. The paucity of Uinta Basin radiocarbon dates after A.D. 1000 and the comparative abundance of dates in the Tavaputs Plateau between A.D. 1000 and 1500 may imply a spatial shift. With the possible exception of isolated sites in the Douglas Creek area,
horticultural lifeways appear to have disappeared by about A.D. 1300. Shoshonean peoples, who may or may not have been ethnically or linguistically related to Fremont horticulturalists, continued to occupy the region after A.D. 1300, practicing hunting and gathering strategies similar to those described for the Archaic stage.

NOTE ON METHODOLOGY

The chronometric database was created using a Quatro Pro V spreadsheet program. All radiocarbon dates were first calibrated as per Suwa and Reimer (1993). The two-sigma range of each date was then plotted on a horizontal axis (calendar dates). A value of 1 was assigned to each 25-year interval represented within the two-sigma range. Tree-ring dates were also added to the database in the same manner. The outer ring date was assigned a corresponding value of 1 on the horizontal axis. Details samples with bark present (B) were assigned 50-year ranges; samples with variable rings (V) were assigned 100-year ranges; samples without rings were assigned 500-year ranges. The spreadsheet program then calculated the total number of intervals within each 25-year period. All radiocarbon and tree-ring dates were added to the database; no attempts were made to subjectively eliminate those samples deemed to be erroneous (an exception was radiocarbon samples that returned “modern” dates).
## Appendix 5.1.

### Radiocarbon Dates from the Uinta Basin

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Lab. No.</th>
<th>Site Type</th>
<th>C-14 Date BP</th>
<th>2 Sigma Range</th>
<th>Calen. Date</th>
<th>Calib. Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5Rb726</td>
<td>W-4264</td>
<td>Foraging</td>
<td>9120 ±130</td>
<td>8420–7936 B.C.</td>
<td>7170 B.C.</td>
<td>8588 B.C.</td>
<td>Site: Campsite with hearth, lithic debitage, no diagnostic artifacts. Location: Douglas Creek, DCA (Grady 1984).</td>
</tr>
<tr>
<td>5Mf176</td>
<td></td>
<td>Foraging</td>
<td>4185 ±2</td>
<td></td>
<td>2235 B.C.</td>
<td>2773 B.C.</td>
<td>Site: McKeen complex artifacts with hearths. Location: Lay Creek, Vampa Basin (in LaPoint 1967).</td>
</tr>
</tbody>
</table>

* The Office of Public Archaeology at Brigham Young University conducted excavations at Steinaker Reservoir in 1995. Data from those investigations were not available for this overview, but the radiocarbon dates were graciously provided by Rich Talbot. Radiocarbon dates from the Sandhollow site in northwestern Colorado were not formally reported at the time the database was created, but were graciously provided by Steven G. Baker and are herein calibrated as per Stuiver and Reimer (1995).

Abbreviations in the appendix are as follows: DCA, Douglas Creek Arch; DNM, Dinosaur National Monument; ETP, East Tavaputs Plateau; WTP, West Tavaputs Plateau.
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<tr>
<th>Site No.</th>
<th>Lab. No.</th>
<th>Site Type</th>
<th>C-14 Date BP</th>
<th>2 Sigma Range</th>
<th>Calen. Date</th>
<th>Calib. Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5MH76</td>
<td>—</td>
<td>Foraging</td>
<td>1163 ± 39</td>
<td></td>
<td>2215 B.C.</td>
<td>2748 B.C.</td>
<td>Lay Site: McKean complex artifacts with hearths. Location: Lay Creek, Yampa Basin (in LeaPoint 1987).</td>
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<tr>
<td>5MH76</td>
<td>—</td>
<td>Foraging</td>
<td>4150 ± 100</td>
<td></td>
<td>2200 B.C.</td>
<td>2683 B.C.</td>
<td>Lay Site: McKean complex artifacts with hearths. Location: Lay Creek, Yampa Basin (in LeaPoint 1987).</td>
</tr>
<tr>
<td>5RB512</td>
<td>RL-726</td>
<td>Foraging</td>
<td>3690 ± 130</td>
<td>2462-1690 B.C.</td>
<td>1740 B.C.</td>
<td>2539 B.C.</td>
<td>Site: Data not available. Location: Douglas Creek Arch (in Grady 1984).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
<td>C-14 Date BP</td>
<td>2 Sigma Range</td>
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<tr>
<td>42Un1</td>
<td>GX-0897</td>
<td>Foraging</td>
<td>3260 ± 129</td>
<td>1869-1262 B.C.</td>
<td>1310 B.C.</td>
<td>1518 B.C.</td>
<td>Deluge Shelter, Multioccupation shelter with floral/floral processing, Sample: Charcoal from Level 8 hearth. Location: Jones Hole, DNMM (Letch 1970).</td>
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<tr>
<td>5Rb554</td>
<td>B-12961</td>
<td>Foraging</td>
<td>3250 ± 80</td>
<td>1731-1324 B.C.</td>
<td>1380 B.C.</td>
<td>1516 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pithouse features. Sample: Charcoal from Feature 1, hearth. Location: Four Mile Wash, DCA (Hauck 1993).</td>
</tr>
<tr>
<td>5Rb548</td>
<td>R1-6</td>
<td>Foraging</td>
<td>3150 ± 150</td>
<td>1743-909 B.C.</td>
<td>1200 B.C.</td>
<td>1414 B.C.</td>
<td>Site: McKean point. Other data not available. Location: Douglas Creek Arch (in Grady 1964).</td>
</tr>
<tr>
<td>5Rb554</td>
<td>B-12353</td>
<td>Foraging</td>
<td>3110 ± 60</td>
<td>1512-1211 B.C.</td>
<td>1160 B.C.</td>
<td>1396 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pithouse features. Sample: Charcoal from hearth 1. Location: Four Mile Wash, DCA (Hauck 1993).</td>
</tr>
<tr>
<td>5Rb554</td>
<td>B-36592</td>
<td>Foraging</td>
<td>3060 ± 60</td>
<td>1430-1123 B.C.</td>
<td>1110 B.C.</td>
<td>1312 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pithouse features. Sample: Charcoal from hearth AC. Location: Four Mile Wash, DCA (Hauck 1993).</td>
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<tr>
<td>42Un1476</td>
<td>B-14419</td>
<td>Foraging</td>
<td>3030 ± 90</td>
<td>1496-998 B.C.</td>
<td>1080 B.C.</td>
<td>1255 B.C.</td>
<td>Site: Hearths in association with features belonging to Late Archaic. Sample: Charcoal from Feature 12, hearth. Location: Clifton Creek, Uinta Basin (Tucker 1986).</td>
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<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
<td>C-14 Date BP</td>
<td>2 Sigma Range</td>
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<tr>
<td>5M976</td>
<td></td>
<td>Foraging</td>
<td>2950 ± 75</td>
<td>1371-932 B.C.</td>
<td>490 B.C.</td>
<td>1125 B.C.</td>
<td>Lay Site: McKiver complex artifacts, but other data not available. Location: Yampa Basin (in LaPoint 1987).</td>
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<tr>
<td>5Rh454</td>
<td>B-56334</td>
<td>Foraging</td>
<td>2500 ± 60</td>
<td>1263-399 B.C.</td>
<td>950 B.C.</td>
<td>1045 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pit-house features. Sample: Charcoal from Hearth AE. Location: Four Mile Wash, DCA (Haack 1993).</td>
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<tr>
<td>5Rh454</td>
<td>B-42352</td>
<td>Foraging</td>
<td>2800 ± 60</td>
<td>1237-904 B.C.</td>
<td>950 B.C.</td>
<td>1022 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pit-house features. Sample: Charcoal from Hearth C. Location: Four Mile Wash, DCA (Haack 1999).</td>
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<tr>
<td>42Un176</td>
<td>B-14969</td>
<td>Foraging</td>
<td>2550 ± 75</td>
<td>1237-926 B.C.</td>
<td>980 B.C.</td>
<td>990 B.C.</td>
<td>Site: Multioccupation open site with hearths. Sample: Charcoal samples from feature 3 hearth. Location: CBH Creek, Usam Basin (Haack 1986).</td>
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<tr>
<td>5Rh434</td>
<td>B-51342</td>
<td>Foraging</td>
<td>2620 ± 60</td>
<td>1126-826 B.C.</td>
<td>870 B.C.</td>
<td>955 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pit-house features. Sample: Charcoal from Hearth J. Location: Four Mile Wash, DCA (Haack 1999).</td>
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<td>5Rh454</td>
<td>B-50583</td>
<td>Foraging</td>
<td>2640 ± 60</td>
<td>844-546 B.C.</td>
<td>790 B.C.</td>
<td>790 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with pit-house features. Sample: Charcoal from Structure B. Location: Four Mile Wash, DCA (Haack 1999).</td>
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<td>5M1510</td>
<td>UGa-1355</td>
<td>Foraging</td>
<td>2595 ± 100</td>
<td>920-405 B.C.</td>
<td>645 B.C.</td>
<td>796 B.C.</td>
<td>Site: Rockshelter site; other data not available. Location: Yampa Basin (in LaPoint 1987).</td>
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<tr>
<td>5M176</td>
<td></td>
<td>Foraging</td>
<td>2590 ± 10</td>
<td>840-625 B.C.</td>
<td>725 B.C.</td>
<td>725 B.C.</td>
<td>Lay Site: Data not available. Location: Lay Creek, Yampa Basin (in Grady 1984; LaPoint 1987).</td>
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<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
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<tr>
<td>5Rb595</td>
<td>UGa-1496</td>
<td>Foraging</td>
<td>2570 ± 30</td>
<td>844-109 B.C.</td>
<td>620 B.C.</td>
<td>790 B.C.</td>
<td>Site: Rockshelter site; other data not available. Location: Douglas Creek Arch (in Grady 1984).</td>
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<tr>
<td>5Rb2084</td>
<td>B-33122</td>
<td>Foraging</td>
<td>2570 ± 70</td>
<td>833-419 B.C.</td>
<td>620 B.C.</td>
<td>790 B.C.</td>
<td>Site: Data not available. Location: Douglas Creek Arch (in Hanke 1983).</td>
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<tr>
<td>5M3151</td>
<td>UGa-1356</td>
<td>Foraging</td>
<td>2560 ± 65</td>
<td>823-419 B.C.</td>
<td>610 B.C.</td>
<td>785 B.C.</td>
<td>Site: Rockshelter site; other data not available. Location: Slater Creek, Yampa Basin (in LaPoint 1987).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
<td>C-14 Date BP</td>
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<tr>
<td>42Un1476</td>
<td>B-14467</td>
<td>Foraging</td>
<td>2210 ± 120</td>
<td>B.C. 519 - 60 A.D.</td>
<td>260 B.C.</td>
<td>316 B.C.</td>
<td>Hanging Hearth: Multioccupation shelter with architectural features. Sample: Charcoal from Feature 12. Location: Cliff Creek, Umta Basin (Fukker 1983).</td>
</tr>
<tr>
<td>5M1433</td>
<td>UGa-2725</td>
<td>Foraging</td>
<td>2175 ± 95</td>
<td>B.C. 400 - 84 A.D.</td>
<td>225 B.C.</td>
<td>194 B.C.</td>
<td>Duffy Shelter: Multioccupation rockshelter. Sample: Data not available. Location: Milk Creek, Umta Basin (in LaPoint 1987).</td>
</tr>
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<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
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<td>42Da693</td>
<td>B-136289</td>
<td>Foraging</td>
<td>2140 ± 50</td>
<td>150 B.C.</td>
<td>143 B.C.</td>
<td>Site: Composite with hearths, architectural features. Sample: Charcoal from interior of Feature C. Location: Green River, Browns Park (Tucker 1986).</td>
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<tr>
<td>5Mi077</td>
<td>UG-10575</td>
<td>Foraging</td>
<td>1280 ± 80</td>
<td>137 B.C.</td>
<td>134 B.C.</td>
<td>Site: Rockshelter site; additional data not available. Location: White River (in Grady 1994).</td>
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<tr>
<td>5Mi135</td>
<td>UG-2734</td>
<td>Foraging</td>
<td>2110 ± 60</td>
<td>120 B.C.</td>
<td>114 B.C.</td>
<td>Duffy Shelter; Multicoropation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (in LePoint 1987).</td>
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<tr>
<td>42Da185</td>
<td>B-32923</td>
<td>Foraging</td>
<td>2070 ± 60</td>
<td>90 B.C.</td>
<td>87 B.C.</td>
<td>Site: Multicoropation camp with architectural features. Sample: Charcoal from F13 hearth. Location: Green River, Browns Park (McKibbin 1992).</td>
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<tr>
<td>5Mi155</td>
<td>UG-2736</td>
<td>Foraging</td>
<td>2045 ± 65</td>
<td>80 B.C.</td>
<td>76 B.C.</td>
<td>Duffy Shelter: Multicoropation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (in LePoint 1987).</td>
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<tr>
<td>4Rb1672</td>
<td>DHC-2263</td>
<td>Foraging</td>
<td>2010 ± 75</td>
<td>90 B.C.</td>
<td>85 B.C.</td>
<td>Site: Data not available. Location: Douglas Creek Arch (in Grady 1994).</td>
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<tr>
<td>5Rb1465</td>
<td>B-30407</td>
<td>Foraging</td>
<td>2000 ± 60</td>
<td>60 B.C.</td>
<td>60 B.C.</td>
<td>Hummingbird Rockshelter; Multicoropation shelter. Sample: Charcoal from Unit 2. Location: Little Bull Basin, OCA (Conner and Laughead 1986).</td>
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<tr>
<td>4Bk1461</td>
<td>B-12909</td>
<td>Foraging</td>
<td>1960 ± 60</td>
<td>40 B.C.</td>
<td>40 B.C.</td>
<td>Site: Composite surface composite with hearths, lithics. Sample: Charcoal from T22 Feature 2. Location: Dripping Rock Creek, ETP (Tucker 1986).</td>
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<tr>
<td>5Mi135</td>
<td>UG-2736</td>
<td>Foraging</td>
<td>1935 ± 60</td>
<td>50 B.C.</td>
<td>50 B.C.</td>
<td>Duffy Shelter: Multicoropation shelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (in LePoint 1987).</td>
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<td>Site No.</td>
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<td>5RB2212</td>
<td>—</td>
<td>Foraging</td>
<td>1950 ± 70</td>
<td>B.C. 92 - 236 A.D.</td>
<td>1 A.D.</td>
<td>72 A.D.</td>
<td>Site: Campsite, Sample: Data not available. Location: Douglas Creek Arch (in Grady 1984).</td>
</tr>
<tr>
<td>42U1118</td>
<td>B-33967</td>
<td>Sedentary</td>
<td>1950 ± 70</td>
<td>B.C. 92 - 236 A.D.</td>
<td>1 A.D.</td>
<td>72 A.D.</td>
<td>Site: Burn House Village, Multicorrelation village, Sample: Charred wood from pithouse, Location: Chib Creek, DNM (Frenz 1993a; Truesdale 1990).</td>
</tr>
<tr>
<td>5RB384</td>
<td>UGA-4195</td>
<td>Foraging</td>
<td>1875 ± 75</td>
<td>B.C. 6 - 329 A.D.</td>
<td>70 A.D.</td>
<td>132 A.D.</td>
<td>Site: Rockshelter site, additional data not available, Location: Douglas Creek Arch (in Grady 1984).</td>
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<tr>
<td>42Da193</td>
<td>UGA-3712</td>
<td>Foraging</td>
<td>1880 ± 70</td>
<td>B.C. 6 - 329 A.D.</td>
<td>90 A.D.</td>
<td>141 A.D.</td>
<td>Site: Base camp with maize, Archaic-Formative points, Sample: Charcoal from hearth, Location: Rye Creek Draw, Browns Park (Davenport et al. 1981).</td>
</tr>
<tr>
<td>5RB609</td>
<td>UGA-2425</td>
<td>Foraging</td>
<td>1845 ± 90</td>
<td>B.C. 6 - 410 A.D.</td>
<td>105 A.D.</td>
<td>137 A.D.</td>
<td>Dipping Bowl: Multicorrelation shelter with hearths and maize, Sample: Charcoal from Level H, Unit L, Location: Douglas Creek, DCA (Greassman 1981).</td>
</tr>
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<td>Site No.</td>
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<tr>
<td>3Rb258</td>
<td>B-7021</td>
<td>Foraging</td>
<td>1790 ± 130</td>
<td>B.C. 1-318 A.D.</td>
<td>160 A.D.</td>
<td>244 A.D.</td>
<td>Site: Campsite. Sample: Data not available. Location: Vermillion Creek, Wyoming Basin (in LaPoint 1987).</td>
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<tr>
<td>5Rb2982</td>
<td>B-53121</td>
<td>Foraging</td>
<td>1620 ± 100</td>
<td>229-647 A.D.</td>
<td>330 A.D.</td>
<td>427 A.D.</td>
<td>Site: Rockshelter site with ground stone. Sample: Data not available. Location: Douglas Creek, DCA (in Grady 1984).</td>
</tr>
<tr>
<td>5Rb234</td>
<td>B-32591</td>
<td>Foraging</td>
<td>1610 ± 70</td>
<td>344-593 A.D.</td>
<td>346 A.D.</td>
<td>432 A.D.</td>
<td>Site: Rockshelter site with ground stone. Sample: Data not available. Location: Douglas Creek, DCA (in Grady 1984).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
<td>C-14 Date BP</td>
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<tr>
<td>42Un1773</td>
<td>B-38588</td>
<td>Sedentary</td>
<td>1550 ± 60</td>
<td>403 - 642 A.D.</td>
<td>400 A.D.</td>
<td>341 A.D.</td>
<td>Site: Semi-subterranean residence with prepared clay floor, ceramics. Sample: Charcoal from pit house. Location: Cub Creek, DNM (Truesdale 1990).</td>
</tr>
<tr>
<td>5Rh2449</td>
<td>B-35115</td>
<td>Foraging</td>
<td>1510 ± 60</td>
<td>410 - 648 A.D.</td>
<td>410 A.D.</td>
<td>344 A.D.</td>
<td>Site: Campsite with hearths, wild flora. Sample: Charcoal from roasting pit with evidence of charcoal. Location: Texas Creek, ITP (Haack 1993).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
<td>C-14 Date BP</td>
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<tr>
<td>5M9568</td>
<td>B-70209</td>
<td>Foraging</td>
<td>1500 ± 80</td>
<td>596 - 682 A.D.</td>
<td>450 A.D.</td>
<td>596 A.D.</td>
<td>Site: Campsite. Sample: Data not available. Location: Vermillion Creek, Wyoming Basin (E. LaPoint 1987).</td>
</tr>
<tr>
<td>42Un1475</td>
<td>B-13681</td>
<td>Foraging</td>
<td>1470 ± 70</td>
<td>430 - 677 A.D.</td>
<td>480 A.D.</td>
<td>610 A.D.</td>
<td>Site: Campsite with hearths, pine pollen. Sample: Charcoal from Feature 2 hearth. Location: Calf Creek, Uinta Basin (Jakob 1986).</td>
</tr>
<tr>
<td>5Rb999</td>
<td>UGa-2982</td>
<td>Foraging</td>
<td>1170 ± 70</td>
<td>430 - 477 A.D.</td>
<td>480 A.D.</td>
<td>610 A.D.</td>
<td>Dripping Bowl: Multi-occupation shelter with hearths, maize. Sample: Charcoal from Feature 2. Location: Douglas Creek, DCA (LaPoint et al. 1984).</td>
</tr>
<tr>
<td>5Rr773</td>
<td>UGa-9793</td>
<td>Foraging</td>
<td>1450 ± 60</td>
<td>534 - 677 A.D.</td>
<td>500 A.D.</td>
<td>620 A.D.</td>
<td>Site: Campsite with lithics, hearths. Sample: Charcoal from Feature 2. Location: Douglas Creek, DCA (Cranmer 1981).</td>
</tr>
<tr>
<td>5M435</td>
<td>UGa-2727</td>
<td>Foraging</td>
<td>1425 ± 60</td>
<td>412 - 689 A.D.</td>
<td>525 A.D.</td>
<td>641 A.D.</td>
<td>Duff Shelter: Rockshelter with ceramics. Sample: Data not available. Location: Milk Creek, Yampa Basin (in LaPoint 1987).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
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<td>5Rh797</td>
<td>UGa-1924</td>
<td>Foraging</td>
<td>1375 ± 60</td>
<td>596-778 A.D.</td>
<td>375 A.D.</td>
<td>684 A.D.</td>
<td>Site: Campsite with hearths, Late Archaic artifacts. Sample: Charcoal from Feature 1 hearth. Location: Douglas Creek, DCA (Greubman 1984).</td>
</tr>
<tr>
<td>42Da488</td>
<td>B-34595</td>
<td>Foraging</td>
<td>1350 ± 60</td>
<td>600-786 A.D.</td>
<td>600 A.D.</td>
<td>668 A.D.</td>
<td>Site: Complex base camp with ephemeral structures, maiz. Sample: Charcoal from FB hearth. Location: Green River, Browns Park (McKibbin 1992).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
<td>Site Type</td>
<td>G-14 Date BP</td>
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<td>5Mf436</td>
<td>UGa-2740</td>
<td>Foraging</td>
<td>1330 ± 80</td>
<td>599-886 A.D.</td>
<td>620 A.D.</td>
<td>676 A.D.</td>
<td>Empire Site; Rockshelter site. Sample: Data not available. Location: Williams Fork, Yampa Basin (Honey 1987).</td>
</tr>
<tr>
<td>5Rb3449</td>
<td>B-56501</td>
<td>Foraging</td>
<td>1300 ± 50</td>
<td>653-874 A.D.</td>
<td>650 A.D.</td>
<td>690 A.D.</td>
<td>Harding Hearth II; Concentration of hearths with wild flora. Sample: Charcoal from Feature 1 hearth. Location: West Douglas Creek, DCA (Hauke 1993).</td>
</tr>
<tr>
<td>5Rb3499</td>
<td>B-56388</td>
<td>Foraging</td>
<td>1290 ± 50</td>
<td>565-881 A.D.</td>
<td>660 A.D.</td>
<td>746 A.D.</td>
<td>Harding Hearth II; Concentration of hearths with wild flora. Sample: Charcoal from Feature 1 hearth. Location: West Douglas Creek, DCA (Hauke 1993).</td>
</tr>
<tr>
<td>Site No.</td>
<td>Lab. No.</td>
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<td>5Rb699</td>
<td>UGa-2580</td>
<td>Foraging</td>
<td>1290±70</td>
<td>545 944 A.D.</td>
<td>670 A.D.</td>
<td>739 A.D.</td>
<td>Dripping Brow: Multioccupancy shelter with maize. Sample: Charcoal from Feature 16 firepit. Location: Douglas Creek, DCA (LaPoint et al., 1981).</td>
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<tr>
<td>5Mh58</td>
<td>B-7013</td>
<td>Foraging</td>
<td>1280±60</td>
<td>659 884 A.D.</td>
<td>670 A.D.</td>
<td>739 A.D.</td>
<td>Site: Campsite. Sample: Data not available. Location: Vermillion Creek, Wyoming Basin (LaPoint 1987).</td>
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<tr>
<td>Site No.</td>
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<td>Site Type</td>
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<td>5Rb2829</td>
<td>B-13041</td>
<td>Foraging</td>
<td>1240 ± 70</td>
<td>651 950 A.D.</td>
<td>710 A.D.</td>
<td>782 A.D.</td>
<td>Site: An exposed hearth located during survey. Sample: Charcoal, Location: Dunton, Umatilla Basin, ETP (Gordon et al. 1995).</td>
</tr>
<tr>
<td>3MF135</td>
<td>UG-2735</td>
<td>Foraging</td>
<td>1240 ± 70</td>
<td>659 974 A.D.</td>
<td>710 A.D.</td>
<td>782 A.D.</td>
<td>Dully Shelter: Multi-occupation shelter with ceramics. Sample: Data not available, Location: Milk Creek, Yampa Basin (in LaPoint 1987).</td>
</tr>
<tr>
<td>42Da61</td>
<td>B-12557</td>
<td>Foraging</td>
<td>1240 ± 70</td>
<td>659 974 A.D.</td>
<td>710 A.D.</td>
<td>782 A.D.</td>
<td>Site: Multi-occupation camp with hearths. Sample: Charcoal from Feature 4, Location: Green River, Browns Park (Trout 1993).</td>
</tr>
<tr>
<td>42Da199</td>
<td>B-41379</td>
<td>Foraging</td>
<td>1240 ± 70</td>
<td>670 946 A.D.</td>
<td>710 A.D.</td>
<td>782 A.D.</td>
<td>Site: Base camp, food processing, maize. Sample: Charcoal from Feature 1, Location: Whiskey Springs, Browns Park (McKibbin 1992).</td>
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<td>Site No.</td>
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<td>42Un1</td>
<td>Gx-18895</td>
<td>Foraging</td>
<td>1215 ± 85</td>
<td>638-1010 A.D.</td>
<td>735 A.D.</td>
<td>848 A.D.</td>
<td>Deluge Shelter: Multioccupation shelter with ceramics, maize. Sample: Charcoal from hearth. Level 1. Location: Jones Hole, DMN (Leach 1979).</td>
</tr>
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<td>Site No.</td>
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<td>5Rh2449</td>
<td>——</td>
<td>Foraging</td>
<td>1190 ± 50</td>
<td>708-973 A.D.</td>
<td>760 A.D.</td>
<td>881 A.D.</td>
<td>Site: Campsite with hearths, wild floral processing. Sample: Charcoal from hearth. Location: Texas Creek, FTP (Haeck 1994).</td>
</tr>
<tr>
<td>42Da455</td>
<td>B-32569</td>
<td>Semi-sedentary</td>
<td>1170 ± 60</td>
<td>709-1096 A.D.</td>
<td>780 A.D.</td>
<td>886 A.D.</td>
<td>Site: Campsite with hearth features, wild floral processing. Sample: Charcoal from hearth. Location: Texas Creek, FTP (Haeck 1995).</td>
</tr>
<tr>
<td>5Rh2329</td>
<td>B-39737</td>
<td>Foraging</td>
<td>1170 ± 50</td>
<td>667-1026 A.D.</td>
<td>780 A.D.</td>
<td>886 A.D.</td>
<td>Site: Multioccupation camp with epiphenomenal structure. Sample: Charcoal from Feature 1 pit house. Location: Texas Creek, FTP (Haeck 1995).</td>
</tr>
<tr>
<td>42D4188</td>
<td>B-34692</td>
<td>Foraging</td>
<td>1140 ± 60</td>
<td>775-1017 A.D.</td>
<td>810 A.D.</td>
<td>891 A.D.</td>
<td>Site: Base camp with epiphenomenal pithouse. Sample: Charcoal from F5 hearth with maize. Location: Green River, Browns Park (McKibbin 1992).</td>
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<td>Lab. No.</td>
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<td>42Da488</td>
<td>B-34694</td>
<td>Semi-sedimentary</td>
<td>1080 ± 60</td>
<td>870-1037 A.D.</td>
<td>870 A.D.</td>
<td>984 A.D.</td>
<td>Site: Base camp with ephemeral structure. Sample: Charcoal from Feature 3 pithouse. Location: Green River, Browns Park (McKimlin 1992).</td>
</tr>
<tr>
<td>5MI2060</td>
<td>—</td>
<td>Foraging</td>
<td>1080 ± 50</td>
<td>823-1929 A.D.</td>
<td>870 A.D.</td>
<td>984 A.D.</td>
<td>Site: Composite. Sample: Data not available. Location: Milk Creek, Yampa Basin (Ad A. Reed 1984).</td>
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<td>5MI435</td>
<td>UGa-2723</td>
<td>Foraging</td>
<td>1055 ± 60</td>
<td>801-1152 A.D.</td>
<td>895 A.D.</td>
<td>993 A.D.</td>
<td>Duffy Shelter: Multioccupation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (in LaPoint 1987).</td>
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<tr>
<td>5MI335</td>
<td>UGa-2733</td>
<td>Foraging</td>
<td>1045 ± 60</td>
<td>886-1150 A.D.</td>
<td>905 A.D.</td>
<td>1004 A.D.</td>
<td>Duffy Shelter: Multioccupation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (in LaPoint 1987).</td>
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<tr>
<td>42Un1</td>
<td>GX-0894</td>
<td>Foraging</td>
<td>1030 ± 95</td>
<td>870-1215 A.D.</td>
<td>920 A.D.</td>
<td>1014 A.D.</td>
<td>Deluge Shelter; Multi-occupation shelter, ceramics. Sample: Charcoal from Level 3 hearths. Location: Jones Hole, DNM (Leach 1978).</td>
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<tr>
<td>5Mf1355</td>
<td>UGa-2739</td>
<td>Foraging</td>
<td>1030 ± 95</td>
<td>870-1215 A.D.</td>
<td>920 A.D.</td>
<td>1014 A.D.</td>
<td>Dally Shelter; Multi-occupation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa River in LaPoint 1987; A. Reed 1994.</td>
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<tr>
<td>5Mf3355</td>
<td>UGa-2734</td>
<td>Foraging</td>
<td>1010 ± 95</td>
<td>890-1203 A.D.</td>
<td>940 A.D.</td>
<td>1020 A.D.</td>
<td>Dally Shelter; Multi-occupation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa River in LaPoint 1987; A. Reed 1994.</td>
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<td>5Rb3025</td>
<td></td>
<td>Foraging</td>
<td>950 ± 55</td>
<td>996 – 1222 A.D.</td>
<td>1000 A.D.</td>
<td>1046 A.D.</td>
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<tr>
<td>5Mh475</td>
<td>UGa-3775</td>
<td>Foraging</td>
<td>945 ± 145</td>
<td>984 – 1299 A.D.</td>
<td>1005 A.D.</td>
<td>1142 A.D.</td>
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<td>Site No.</td>
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<tr>
<td>5MI433</td>
<td>UGa-2737</td>
<td>Foraging</td>
<td>805 ± 75</td>
<td>1007–1204 A.D.</td>
<td>1055 A.D.</td>
<td>1106 A.D.</td>
<td>Duffly Shelter: Multi-Occupation shelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (LaPoint 1987).</td>
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<tr>
<td>5Rb2210</td>
<td></td>
<td>Foraging</td>
<td>880 ± 70</td>
<td>1016–1285 A.D.</td>
<td>1070 A.D.</td>
<td>1176 A.D.</td>
<td>Site: Campsite. Sample: Data not available. Location: Douglas Creek Arch (Grady 1984).</td>
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<td>42Un103</td>
<td>B-8539</td>
<td>Storage</td>
<td>800 ± 140</td>
<td>984 - 1421 A.D.</td>
<td>1150 A.D.</td>
<td>1253 A.D.</td>
<td>Site: Jocas storage structure in small rockshelter, maize. Sample: Charcoal from Level 1. Location: Jones Hole, DNM (Lewin 1985).</td>
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<tr>
<td>3M5335</td>
<td>UGa-3135</td>
<td>Foraging</td>
<td>785 ± 95</td>
<td>1029 - 1397 A.D.</td>
<td>1165 A.D.</td>
<td>1271 A.D.</td>
<td>Duffy Shelter: Multicomponent shelter. Sample: Data not available. Location: Milk Creek, Yampa Basin (A. Reed 1994).</td>
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<tr>
<td>5R5817</td>
<td>UGa-2496</td>
<td>Foraging</td>
<td>705 ± 60</td>
<td>1227 - 1409 A.D.</td>
<td>1245 A.D.</td>
<td>1291 A.D.</td>
<td>Site: Campsite. Sample: Data not available. Location: Excavation Creek, ETP (in Grady 1984 and A. Reed 1994).</td>
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<tr>
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<td>42Un1177</td>
<td>B-13092</td>
<td>Foraging</td>
<td>680 ± 50</td>
<td>1247-1490 A.D.</td>
<td>1270 A.D.</td>
<td>1288 A.D.</td>
<td>Site: Campsite with hearth, obsidian from Mount Priest; Sample: Charcoal from Feature 23; Location: Old Creek, Canyon Basin (Baker 1966).</td>
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<tr>
<td>5M245</td>
<td>UGa-2749</td>
<td>Foraging</td>
<td>675 ± 50</td>
<td>1223-1424 A.D.</td>
<td>1275 A.D.</td>
<td>1299 A.D.</td>
<td>Site: Campsite; Sample: Data not available; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>42Un1102</td>
<td>B-4566</td>
<td>Storage</td>
<td>670 ± 50</td>
<td>1275-1403 A.D.</td>
<td>1280 A.D.</td>
<td>1300 A.D.</td>
<td>Site: Semi-sedentary structure; Location: Iris Creek, D.C. (Lettenmaier et al. 1984).</td>
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<td>5M245+4</td>
<td>B-32354</td>
<td>Foraging</td>
<td>600 ± 80</td>
<td>1275-1447 A.D.</td>
<td>1250 A.D.</td>
<td>1335 A.D.</td>
<td>Site: Multi-occupation base camp with bedrock hearths; Sample: Charcoal from Feature 2; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>5M245+4</td>
<td>B-32350</td>
<td>Foraging</td>
<td>600 ± 50</td>
<td>1292-1431 A.D.</td>
<td>1350 A.D.</td>
<td>1333 A.D.</td>
<td>Site: Multi-occupation base camp with bedrock hearths; Sample: Charcoal from Feature 8; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>5Rb3180</td>
<td>B-60053</td>
<td>Storage</td>
<td>590 ± 80</td>
<td>1281-1459 A.D.</td>
<td>1360 A.D.</td>
<td>1398 A.D.</td>
<td>Site: Multi-occupation base camp with bedrock hearths; Sample: Charcoal from Feature 6; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<td>5M2031</td>
<td>B-19293</td>
<td>Semi-sedentary</td>
<td>590 ± 60</td>
<td>1290-1430 A.D.</td>
<td>1360 A.D.</td>
<td>1398 A.D.</td>
<td>Site: Semi-sedentary structure; Sample: Data not available; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>5Rb2958</td>
<td>CAMS-9062</td>
<td>Semi-sedentary</td>
<td>590 ± 80</td>
<td>1283-1455 A.D.</td>
<td>1370 A.D.</td>
<td>1400 A.D.</td>
<td>Site: Semi-sedentary structure; Sample: Data not available; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>5Rb3454</td>
<td>B-68156</td>
<td>Foraging</td>
<td>570 ± 60</td>
<td>1295-1444 A.D.</td>
<td>1360 A.D.</td>
<td>1403 A.D.</td>
<td>Site: Semi-sedentary structure; Sample: Data not available; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>5M2039</td>
<td>B-23346</td>
<td>Foraging</td>
<td>540 ± 40</td>
<td>1302-1455 A.D.</td>
<td>1410 A.D.</td>
<td>1410 A.D.</td>
<td>Site: Multi-occupation base camp with bedrock hearths; Sample: Charcoal from Feature 7; Location: Ailk Creek, Yamuna Basin (in A. Reed 1994).</td>
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<tr>
<td>5Rb748</td>
<td>UGa-3377</td>
<td>Sedentary</td>
<td>520 ± 75</td>
<td>1300-1611 A.D.</td>
<td>1430 A.D.</td>
<td>1421 A.D.</td>
<td>Edge Site: Wet-laid masonry residential structure. Sample: Charcoal from structure posthole. Location: Douglas Creek, DCA (LaPoint et al. 1981).</td>
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<tr>
<td>5Rb2435</td>
<td>B-7199</td>
<td>Sedentary</td>
<td>430 ± 50</td>
<td>1414-1631 A.D.</td>
<td>1520 A.D.</td>
<td>1449 A.D.</td>
<td>Texas Creek Overlook: Masonry structure. Sample: Charcoal from floor of residential structure. Location: Texas Creek, EPT (Greisman and L. Scott 1987).</td>
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<tr>
<td>5MH335</td>
<td>UGa-2722</td>
<td>Foraging</td>
<td>325 ± 65</td>
<td>1439-1553 A.D.</td>
<td>1615 A.D.</td>
<td>1595 A.D.</td>
<td>Dilly Shelter: Multioccupation rockshelter. Sample: Data not available. Location: Milk Creek, Yampa River (in A. Reed 1994).</td>
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<td>42C61476</td>
<td>B-14464</td>
<td>Foraging</td>
<td>320 ± 120</td>
<td>1405-1553 A.D.</td>
<td>1630 A.D.</td>
<td>1537 A.D.</td>
<td>Site: Hearth feature in association with Late Archaic residential structures. Sample: Charcoal from Feature 3, Location: Cliff Creek, Uinta Basin (Tucker 1986).</td>
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<td>42Da485</td>
<td>B-34681</td>
<td>Foraging</td>
<td>230 ± 100</td>
<td>1443-1955 A.D.</td>
<td>1720 A.D.</td>
<td>1663 A.D.</td>
<td>Site: Multioccupation camp with floral/faunal processing. Sample; Charcoal from P4 hearth. Location; Green River, Browns Park (McKillop 1992).</td>
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<td>Patterson</td>
<td>B-54299</td>
<td>Storage</td>
<td>120 ± 100</td>
<td>1529-1955 A.D.</td>
<td>1830 A.D.</td>
<td>1840 A.D.</td>
<td>Site: Cache leather pouches, clothing. Desert sidepatched point. Sample; Sinew. Location; Book Cliffs, ETP (Bruce Lothrop, pers. comm. 1999).</td>
</tr>
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</table>
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