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THE EARLY AND MIDDLE ARCHAIC PROJECTILE POINT TECHNOLOGIES IN THE CLOSED BASIN AREA OF THE SAN LUIS VALLEY, COLORADO

by

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The Early and Middle Archaic Projectile Point Technologies in the Closed Basin Area of the San Luis Valley, Colorado

Thesis Committee Chair: John Douglas, Ph.D.

Early and Middle Archaic projectile point types from the High Plains, southern Rocky Mountains, Great Basin and Desert Southwest regions are outlined in this research in order to establish what lithic technologies are present in the Closed Basin area of the San Luis Valley, Colorado. Three-hundred forty-eight projectile points recovered as surface finds in the Closed Basin area are documented, analyzed (statistically and morphologically) and, in many cases, illustrated to provide a comprehensive guide of the variability present in accepted point type technologies. The lithic raw material types used in the production of these various projectile point types from the Closed Basin area are recorded and compared to known quarries in and adjacent to the San Luis Valley. Statistical t-tests are computed and utilized to compare morphological data and lithic technologies from the projectile points of the Closed Basin area with corresponding morphological data and lithic technologies from adjacent regions, when published data are available. These comparisons provide quantifiable evidence as to whether the points from the Closed Basin area are a part of the same projectile point technologies found in the High Plains, southern Rocky Mountains, Great Basin and Desert Southwest regions.
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Chapter 1: Introduction and Overview

The focus of the research presented here is to identify the Early and Middle Archaic projectile point technologies that existed in southern Colorado and the adjacent regions -- the Great Basin, the southern Rocky Mountains and the desert Southwest. The San Luis Valley, in southern Colorado, is in close proximity to these regions, and it seems logical that groups of Archaic people from these surrounding regions could have made their way into the San Luis Valley at different times throughout the Archaic Period.

The Archaic Period was defined by Frison as (a) the Early Plains Archaic, which dates between 5,000 and 8,000 B.P.; (b) the Middle Plains Archaic, which dates between 3,000 to 5,000 B.P.; and (c) the Late Plains Archaic, which dates between 1,800 to 3,000 B.P. (Frison 1991, 20). Frison's proposed three-segment division was intended for defining the Plains Archaic, but has been used by a number of researchers studying this time period in different regions (Cassells 1997; Gunnerson 1987; and Holmer 1986). The Early and Middle Archaic projectile point technologies will be reviewed in this study.

Studying projectile point collections, both privately and publicly owned, provided insights into problems such as:

1. what projectile points were present in the San Luis Valley during the Early and Middle Archaic Periods;
2. how the San Luis Valley projectile points compare by metric measurement with those from surrounding regions;
3. what lithic material types were associated with these various projectile point technologies;
4. whether these differences in lithic materials tell us anything about the lifeways of the people who used them;
5. whether we can learn anything from studying the technologies used by certain groups to create their projectile points;
6. whether the various projectile point technologies of the Early and Middle Archaic were really more diverse in form than the projectile points of the Paleoindian Period; and
7. where these different projectile point technologies originated.

All of these questions will be addressed throughout this research.

Chapter Two is the main literary review segment of this thesis. To identify the different projectile point technologies in the San Luis Valley, in-depth research was needed to establish what Early and Middle Archaic point types have been identified and radiocarbon dated in the
surrounding regions. Early and Middle Archaic projectile point types will be discussed and outlined in the following manner:

- providing an in-depth description, both morphological and metric, when possible;
- naming the region or area where the various projectile point technologies have been recovered;
- identifying radiocarbon dates associated with these different projectile point types;
- furnishing illustrations of the various projectile point types; and
- describing the various flintknapping stages involved in the manufacture of these projectile points, when published material could be found on this subject.

The discussion of the different projectile point types in Chapter Two is chronologically ordered. The study begins by providing a description of the atlatl weapon system. Describing the atlatl is important in that all the projectile points in this study are believed to have been tips for atlatl darts as opposed to arrow points or spear points. Next the diagnostic, morphological attributes of the projectile points used in this study are discussed.

The rest of Chapter Two is dedicated to providing a background of the Early and Middle Archaic projectile point technologies, ordered chronologically within their regions; for example, the Early Archaic Side-Notched projectile point continuum begins with the Northern Side-Notched point type, then covers the Albion Boardinghouse type, and forward to the San Rafael. Projectile points from the Early Archaic on the High Plains, Mountain Traditions, and the Oshara Traditions (Jay and Bajada Phases) will be discussed.

The last section of Chapter Two covers the Middle Archaic Period in the same regions researched for the Early Archaic. The various point types associated with the Middle Archaic Period include the Pinto Basin projectile point types, the Oshara Tradition (San Jose Phase), Gypsum Cave/Contracting-Stem type and Humboldt Types from the Great Basin, and the McKean point types from the High Plains and Rocky Mountains. Chapter Two concludes with inferences as to what types of projectile points are likely to be found in the San Luis Valley, based on the data obtained from the surrounding regions.

Chapter Three begins by describing the location and physiographic setting of the San Luis Valley in southern Colorado. The main mountain passes connecting the San Luis Valley to the other physiographic regions are noted, as well as a general environmental description of the Valley.
The history of archaeological investigations, although limited, is reviewed. This section provides some insight into just how limited archaeological investigations of the Early and Middle Archaic have been in the San Luis Valley. It is evident that the Early and Middle Archaic Periods have been overlooked by archaeologists researching the area in favor of the Paleoindian Period and the Late Prehistoric pottery-producing cultures of south/southwestern Colorado.

The study area, the Closed Basin area of the San Luis Valley, is also discussed in Chapter Three. The environment and setting are thoroughly described, as well as the reasoning for focusing on the Closed Basin area. This chapter closes with a methodology section which summarizes (1) whose collections were reviewed for this study, (2) why these collections were chosen for analysis, (3) what measurements were taken from the projectile points, (4) how these measurements were obtained, and (5) who influenced the direction and scope of this research.

Chapter Four provides analysis and illustrations of the Early and Middle Archaic projectile points recovered in the Closed Basin area of the San Luis Valley. The data from measurements, chiefly length, width, thickness, and, in some cases, base width, base length, blade length and basal concavity depth were also recorded, when applicable. These data were compared to published data on projectile points from the Great Basin: Gatecliff and Elko Contracting-Stem types, the Humboldt Type and the Pinto Basin projectile point types. Unfortunately, no published data could be found on the other projectile point types researched for this study. In the cases where comparative study is possible, the data were statistically compared using t-tests run with Microsoft Excel 97. The means and P-values are provided, along with interpretation of their possible meaning and significance. The projectile point types that had no comparative sample were statistically analyzed and the means and standard deviations of their measurements are provided and interpreted.

The sample size is small in most cases, so the data recovered, analyzed and recorded in this study should be considered a suggestive, but not definitive guideline to the Early and Middle Archaic projectile points from the San Luis Valley. The range of these morphological measurements will become more meaningful as more projectile point specimens are measured and added to this data base in future studies.
Perhaps one of the most significant contributions of this work is to provide illustrations of the various point types found in the Closed Basin area. These illustrations offer insight into the range of variations of a given projectile point type, from the complete, unbroken points to the points which exhibit multiple reworkings and breakage.

Very little information has been published on the Early and Middle Archaic in the San Luis Valley. It is hoped that this research will provide a valuable contribution to the knowledge of the prehistory of the San Luis Valley.
Chapter 2: The Diagnostic Archaic Period Projectile Point Types In and Adjacent to Colorado

Introduction

The main goal of this chapter is to create a concise, yet comprehensive guide to the diagnostic projectile point types associated with the Archaic projectile point technologies in the San Luis Valley of south central Colorado. I will discuss the diagnostic characteristics (when possible) as well as the spatial and temporal distributions of these Archaic projectile point types. The projectile point types will be discussed chronologically, beginning with the Early Archaic and on through the Middle Archaic, and spatially, by geoclimatic zones, (e.g. Mountain Traditions and Desert Traditions). The Late Archaic will not be discussed in this study. The amount of research involved in exploring the Early and Middle Archaic alone has been daunting, and due to both financial and time constraints, the focus of this study is limited to the Early and Middle Archaic. When possible, I will include both quantitative and qualitative data in the presentation of the diagnostic characteristics of each of these projectile point types, focusing on both morphological and technological attributes.
The Atlatl Weapon System

The Archaic projectile points researched in this study are all believed to be atlatl dart tips.

The atlatl dart shaft differs from an arrow in that the atlatl dart shafts were commonly compound in their construction. Harrington describes the compound dart’s components,

The largest of these [compound dart components], normally, is the main-shaft, usually made of arrowbrush, cane, or willow, with a maximum diameter of about half an inch and a length of between four and five feet. The distal end of the main-shaft is drilled lengthwise, forming a socket to receive the pointed end of the fore-shaft. The fore-shaft is made of harder, heavier wood than the main-shaft, sometimes made of greasewood, mesquite, catclaw, or screwbean. It [the fore-shaft] measures, as a rule, four to five inches long and the diameter is slightly less than the main-shaft. Its [the fore-shaft’s] distal end is provided with a deep slot or notch to receive the flint point; the proximal end is tapered down to fit into the socket in the distal end of the main-shaft (1933:92-93).

Harrington bases this description on atlati components recovered from the Gypsum Cave excavations. The compound shaft (including both the main-shaft and fore-shaft) commonly had a fletching of feathers at the distal end. The dart is hurled with a wooden handheld device called an atlatl, which is also described by Harrington as,

...a stick about twenty inches long, with a handle at one end and a spur in the other. This spur engages a little pit drilled in the butt of the dart shaft [the proximal end of the main-shaft]. The object of the whole device is to lengthen the user’s arm by the length of the atlatl and consequently to give more leverage providing greater force in casting the dart (1933: 92).

The projectile points that tipped these darts were commonly made of knappable stone, usually chert, basalt, quartzite, or obsidian (Harrington1933).

Stanford conducted a replicative experiment aimed at discerning the differences in energy delivered by a hand-thrown spear and that of an atlatl-hurled dart. The atlatl, compound dart and stone projectile tip used in this experiment were all hand made by Stanford based on studies of this weapon type. This experiment was undertaken with the aid of the Physics Department at Colorado College in Colorado Springs, Colorado. Stanford's first throw with an atlatl surprised everyone present. He recalled that,

The target was made of about 2-inch thick foam covering 3/4 inch plywood with a metal sensor [to detect the foot pounds in energy delivered] on the back of the target behind the bull's-eye. The first dart throne hit the center of the target and pierced the foam, plywood and the sensor! It really shocked us all. We had to put the experiment on hold while the University of Colorado crew scrambled to obtain another sensor (2000 personal communication).
Allen reports that, "The results surprised even Stanford – the atlatl increased the velocity of the missile fifteenfold and generated energy 200 times greater at the point of impact than that of a hand-thrown spear" (1989:94).

**Projectile Point Morphology**

 Projectile point types are defined by their various morphological attributes, such as the shape of the base or stem, notches (or lack thereof), position of the notches, and size (see Figure 1.1 and 1.2). Thomas defines projectile point types as, "Types are not artifacts but are composite descriptions of many similar artifacts. Accordingly every morphological type must encompass a certain range of variability; the quality of manufacture might vary; absolute size usually fluctuates; and so forth" (1989: 316). The morphological attributes unidentified projectile point types from regions adjacent to the San Luis Valley are presented in this chapter.

![Diagram of projectile point types](image)

**Figure 1.1:** Some of the diagnostic morphological attributes pertinent to this study: (a) blade length; (b) stem length; (c) base length; (d) notch; (e) basal concavity depth (Ahler 1971; Jodry 1999; and Pitblado 1999). For more on the morphological attributes used in this study, see the Methodology section.
Figure 1.2: The different hafting element morphologies of the Early and Middle Archaic projectile points in this study: (a) side-notched straight-base (Frison 1991); (b) side-notched concave-base (Jennings 1978); (c) side-notched convex-base (Cassells 1997); (d) corner-notched convex-base; (e) corner-notched straight-base; (f) corner-notched concave-base (e-f) Thomas and Bierwirth (1983); (g) expanding-stem indented-base or bifurcated base (Frison 1991); (h) lanceolate (Frison 1991); (i) leaf-shaped (Amsden 1935); (j) contracting-stem (Harrington 1933); (k) stemmed point with convex base; (l) stemmed point with concave base; and (m) stemmed point with straight base (k-m) Gunnerson (1987).
The Early Archaic Periods

The Early Archaic Side-Notched

On the Plains, the transition from the late Paleoindian projectile point technologies to those of the Early Archaic is readily apparent. The Late Paleoindian projectile points were typically lanceolate, stemmed types, whereas the Early Plains Archaic points, although typically lanceolate in form also, were either side-notched or corner-notched (see Figure 2) (Frison 1991). Frison outlines the area where these Early Plains Archaic side-notched points have been found, "... an area that begins in the South at the latitude of the Colorado-Wyoming border and extends to about 52 degrees north latitude in Alberta and Saskatchewan. The eastern boundary extends northward into Western Nebraska, South Dakota, North Dakota and Southwestern Manitoba. The Western boundary is more difficult to define" (1998:140).

Figure 2: Early Plains Archaic Side-notched projectile points; (a-c) Early Plains Archaic, from the Hawken site; (d) Early Plains Archaic, from the Bighorn Basin; (f) Early Plains Archaic, from the Lookingbill site (illustrations from Frison 1991: 84, Fig. 2.45 and 87, Fig. 2.47).
It is difficult to believe that these point types cease to occur at the northern Colorado border as Frison claims. In fact, Early Archaic side-notched points were recovered in the North Park area of Colorado (Lischka et al.1983: Fig. 8). The Ptarmigan site, located in the Continental Divide region to the west of Boulder, has yielded a specimen that appears to be an Early Archaic side-notched point base (Cassells 1997: Fig. 7,16). The Carter Gulch site near Runberg, Colorado, produced two side-notched point with collateral flaking and straight bases. The dates associated with these points are in the range of 5,230 to 5,000 B.P. (Black 1991: 9). The boundaries proposed by Frison for the distribution of Archaic side-notched point types undoubtedly need to be moved further south.

The Early Plains Archaic side-notched projectile points are generally lanceolate, bi-convex in outline with side-notches beginning about 5 mm above the base. The average width is two centimeters, and the average length is between 3 and 5 cm (Frison 1991; Figures 2.45, 2.46, and 2.47). The cross-section is not shown, but judging from the flaking patterns, it is lenticular or bi-convex. Frison did not offer a quantitative description of the various technological aspects of this point, such as average thickness, widths, and lengths, so the characteristics listed above are only estimates and should not be considered wholly diagnostic.

Husted, however, offers a good description that includes quantitative information for the eighteen (18) Early Plains Archaic side-notched projectile points that he recovered from occupation level IV at the Sorensen site:

Small to medium-sized points with straight or weakly-convex edges. The bases are straight or very slightly concave. Side-notches are placed immediately above the base and slightly oblique toward the tip. Notching forms wide, sharply expanding stems, and a majority of the specimens are widest at the base. Chipping quality ranges from fair to good. All cross-sections are bi-convex (lenticular), basal edges are slightly smooth. Lengths: 24 to 40 mm; widths 16 to 21 mm.; thickness 4 to 6 mm. (1991: 16).

The projectile points from level IV at the Sorensen site seem to be smaller than many other side-notched points of the Early Archaic. The radiocarbon date associated with this occupation level is 5,525 ± 190 B.P. Husted suggests that the smaller size of these points could represent a shift in projectile point technology, a downsizing if you will, that may be tied to the post-Pleistocene reduction in the physical size of bison (Frison 1991). It has been proposed that the post-
Pleistocene climatic changes reduced the effective moisture and subsequent nitrogen levels within the environment. This environmental change caused the regional reduction of long grass prairies and their subsequent replacement by short grass prairies. The bison that lived in this depleted environment experienced a reduction in body size, and by about 6,500 B.P. reached the size of today's animals (Frison 1991; Jodry 1999 personal communication). Many other factors could contribute to the smaller size of the side-notched projectile points recovered from Sorensen shelter, such as reworking or retooling, personal or band preference, changes in hafting technology, or regional variation.

The dates proposed for the Early Archaic side-notched points include the following date ranges:

- 7,630 to 5,255 B.P. at Mummy Cave;
- 7,560 to 5,420 B.P. at Southsider Cave;
- 6,830 to 5,700 B.P. at Laddie Creek;
- 5,475 B.P. at the Sorensen site;
- 6,840 to 6,000 B.P. at the Deadman, Washington site;
- 6,470 to 6,270 B.P. at the Hawken Bison kill site;
- 7,140 B.P. at the Lookingbill site;
- 6,180 to 5,030 B.P. at the Split Rock Ranch site (Frison 1991: 28-32); and
- 6,450 to 6,205 B.P. at the Ptarmigan site (Cassells 1997: Figure 7-16).

Other Early Archaic Plains Side-Notched Projectile Points Reviewed in this Study

On the southern Plains in western Kansas, the Early Archaic side-notched projectile points are considered representative of the Logan Creek Complex. This Complex has dates compatible with the side-notched points described above, and has a date range of 8,600 to 6,000 B.P. (Kay 1998). Kay describes the Logan Creek points as being "lanceolate points, concave-based, generally with the haft ground on its lateral margins" (1998: 176). However, Kay does not provide a drawing or photograph of this point type, so it can only be inferred that it is similar to the Early Archaic side-notched point types referred to by Frison (1991). Similar side-notched point types occur throughout the western high Plains.

In Western Nebraska, at the Springcreek site, yet another type of these early side-notched projectile point has been reported. In this case, the points are classified as belonging to the Frontier Complex, which appears to date to approximately 5,700 B.P. The Frontier Complex projectile points are similar to the Logan Creek Complex points both technologically and
The early Archaic Large Side-Notched Projectile Point Types

Throughout the intermontane West during the Archaic time period (ca. 8,000 to 3,500 B.P.) a large side-notched projectile point technology was being developed and used by some hunter-gatherer populations. Archeologists throughout this area have uncovered examples of the side-notched technology and, unfortunately, assigned it a number of different names; for example, Elko, Bitterroot, Cochise Tradition Chiricahua phase, Blue Dome, Madeline Dunes, Sudden, San Rafael, Albion Boardinghouse, and Rocker Side-Notched (Holmer 1986). These projectile point types are all large side-notched points that technologically vary only slightly over time. The study will focus on the Northern Side-Notched, Sudden Side-Notched, San Rafael type, Cochise Chiricahua stage, and finally the Albion Boardinghouse, and their slight morphological changes over time. The Northern Side-Notched type will be covered first, because, chronologically, it appears to be the oldest side-notched point type in the Rocky Mountain area.

The Northern Side-Notched Projectile Point Type

The Northern Side-Notched type (see Figure 3: j-l) is among the earliest in the large side-notched continuum in the intermontane west. Northern Side-Notched projectile points have been recovered from sites in the Great Basin, the Colorado Plateau, and into the Rocky Mountains, from Montana to New Mexico. This type of projectile point was recovered from the Weston Canyon rockshelter in southeastern Idaho. Chronologically, radiocarbon dates extracted from the same stratigraphic level as the points date the level from 7,370 to 7,266 B.P. At the Dirty Shame Rockshelter in eastern Nevada, five Northern Side-Notched projectile points were recovered stratigraphically between levels that were radiocarbon dated between 6,200 B.P., and 7,975 B.P. (Holmer 1986). Hogup Cave is located in Utah, on an ancient Lake Bonneville shoreline just below the Provo terrace, at about 4,700 feet above sea level (Jennings 1973, 1978).
Northern Side-Notched projectile points from Hogup Cave were found to occur before 7,800 B.P.; however, no ending date was determined at Hogup Cave (Holmer 1986). Danger Cave is also located along the ancient Lake Bonneville shore and sits about 4,312 feet above sea level (Jennings 1973,1978). The Northern Side-Notched projectiles came from mostly undatable stratigraphic levels; however, the last level containing this projectile type provided date of 6,950 B.P. as a termination date for this type at Danger Cave (Holmer 1986).

At Cowboy Cave in southeastern Utah, on the Colorado Plateau (Berry and Berry 1986), dates preceding 6,880 B.P. are ascribed to the Northern Side-Notched type; Jennings claims a range of dates from 6,000 to 8,000 B.P. for this point type (1973). Sudden Shelter is also on the Colorado Plateau in Utah, a little over 40 miles northwest of Cowboy Cave (Berry and Berry 1986). There, the Northern Side-Notched point type was recovered with the beginning date of 7,140 B.P. to 6,720 B.P. (Holmer 1986).

Berry and Berry note that,

> The Northern Side-Notched, also known as a Bitterroot side-notched; this point is the dominant type in the Northern Rocky Mountains where it dates as early as 8,200 B. P. ... The occurrence of Northern Side-Notched on the central Colorado Plateau by 7,200 B. P. is consistent with the dispersion of this type. It may represent the southward expansion of the hunting-oriented northern groups during the warm-wet conditions that prevailed on the Plateau at that time (1986: 316).

As evidenced from the various areas where these point types have been recovered, the Northern Side-Notched point type has a wide area of distribution. Holmer notes that, "Northern Side-Notched occur everywhere in the Intermontane west except in the Southwestern portion" (1986: 105).
Figure 3: Large Archaic Side-Notched projectile point types: (a) Sudden Side-Notched (5AA1407), from the San Juan/Rio Grande National Forests (Charles 1995); (b-d) Sudden Side-Notched from the Cibola National Forest, Mt. Taylor Ranger District (site no. LA130740, 2000); (e) Chiricahua - Cochise artifact number (A1) from the Cibola National Forest, Magdalena Ranger District (site no. LA130740, 2000); Chiricahua - Cochise (5AA1470) from the San Juan/Rio Grande National Forests (Charles 1995); (g-l) Sudden Side-Notched projectile points from Hogup cave, (Jennings 1978: 63); (j-l) Northern Side-notched, from Hogup cave (Jennings 1978: 63); (m-n) Albion Boardinghouse, from the Albion Boardinghouse site (Benedict 1979: 7, Fig. 3).
The Northern Side-Notched projectile point type is not described well, either morphologically or technologically, in the articles available for this study. From the illustration provided by Holmer (1986: 104, Figure 14; see Figure 3: j-l), the point pictured is an elongated triangular shape, with slightly biconvex edges, and a pronounced concavity at the base, and side-notches well up the edges from the base. These high side-notches are a significant diagnostic attribute. Holmer notes that,

If we separate the points notched high enough on the side to leave a straight edge below the notch, from those notched so low that the portion below forms a point with the base, the pattern becomes clear. The chronologies of the (low) side-notched points are identical to those of the Elko Comer-Notched; the (high) side-notched points, conversely all occur between 7,500 and 3,500 B.P. (1986: 104).

Other Archaic concave-based, high side-notched projectile points, such as the Albion Boarding-house, may be a part of the technological continuum that was started with the Northern Side-Notched projectile point type.

The Sudden Side-Notched Projectile Point Type

The Sudden Shelter site is on the Colorado Plateau and is the type site for the Sudden Side-Notched projectile point type. Jennings describes Sudden Shelter as, “... an extensive habitation site under an overhanging ledge alongside a stream east of Selena, Utah. The location was about 7,200 feet above sea level in a typical Juniper-Pinon-Fir ecotone” (1978:92). Holmer, who excavated Sudden Shelter along with Jennings, (1986: 104) named the Sudden Side-Notched point type. The Sudden Side-Notched type is typically a high side-notched projectile point; unfortunately, few articles referenced for this study illustrate Sudden Side-Notched points (see Figure 3: a–d and g–i). Other examples of this point type were found during surveys near Grants, New Mexico in the Mount Taylor Ranger District of the Cibola National Forest at Sites No. AR-03-03-02-2383/LA130776 and AR-03-03-02-2386/LA130779.

The Sudden Side-Notched point types were originally recovered from the Sudden Shelter. This point type was bracketed by stratigraphic levels that dated from 7,150 to 3,550 B.P. These point types were also recovered from the Veratic Rock Shelter where they dated to approximately 4,000 B.P., although it should be noted that a number of these points were found below this datable level, in undated strata older than 4,000 B.P. (Holmer 1986). These points
were also found in the Monitor Valley in Southeastern Idaho by Thomas, who referred to this type as "variants 4 and 9" (1981: 19). Radiocarbon dates from the O'Malley Shelter in eastern Nevada, as well as from Danger Cave (Jennings 1973), both came up with dates that fell within the 6,500 to 5,000 B.P. range. At Hogup Cave, Jennings refers to the Sudden Side-Notched points as Elko Side-Notched (1979). Holmer notes that, "... the Sudden Side-Notched occur only in the southern one-half of the study area" (1986: 105); Berry and Berry state that the Sudden Side-Notched types are, "...widely distributed on the southern Colorado Plateau" (1986: 316). Holmer also claims that, "by 4,400 B.P., the Sudden Side-Notched points at Sudden Shelter were replaced by what I have called the San Rafael Side-Notched..." (1986: 104). Holmer notes that, "If the Sudden Side-Notched point proves to date to this period [approximately 4,000 to 7,000 B.P.] wherever it is found, it may greatly assist in analyzing settlement pattern shifts, which probably correlate with the Altithermal climactic episode" (1986: 105).

The San Rafael Side-Notched Projectile Point Type

The San Rafael Side-Notched projectile point type is seen as the descendent of the Sudden Side-Notched. Holmer made this distinction after studying the assemblage recovered from Sudden Shelter in Central Utah. In the articles reviewed for this study, no illustrations of the San Rafael Side-Notched could be found. Both Holmer (1986), and Berry and Berry (1986) claim that this projectile type is found throughout the Colorado Plateau, Rocky Mountains (from Montana to New Mexico), and well out onto the Great Plains. To the north, this type of point is called the Mallory Side-Notched, and is considered to belong to the McKeen Complex. The McKeen Complex and the Mallory Side-Notched projectile points are discussed in greater detail and illustrated in the McKean section of this chapter.

The Chiricahua Stage of the Cochise Culture

Sayles and Antevs, based on work in the southern Arizona deserts in the early 1940s, named the Chiricahua stage of the Cochise Culture (Sayles 1983). The type site for this projectile point is in the San Simon Valley, in southeastern Arizona. The type site is located in the foothills of the Chiricahua Mountains at the mouth of Cave Creek Canyon and consists of a deep midden of cultural debris (Sayles 1983). The site at Cave Creek did not yield any datable
material, but Antevs determined a date based on the geology of the area and decided on the 
figure of 5,000 to 9,000 B.P. (Sayles 1983; Cordell 1984). However, since that time, radiocarbon 
dates have been obtained from within sound stratigraphic context with point types belonging the 
Chiricahua stage at several sites; dates of 5,500 to 3,500 B.P. are generally accepted today 
(Cordell 1984; Sayles 1983; Wills 1988). The original dates assigned by Antevs should no longer 
be considered accurate.

Sites assigned to the Chiricahua stage are found throughout southern New Mexico and 
Arizona, sites such as the Wet Leggett site in the Pine Lawn Valley in southern New Mexico, and 
the Cienega Creek site, on the San Carlos Indian Reservation near the Point of Pines, in the 
Mountains of east central Arizona (Berry and Berry 1986; Cordell 1984; Sayles 1983; Wills 1988). 
Artifacts associated with the Chiricahua stage were also found in Ventana Cave, located in the 
San Pedro River Valley in the western deserts of southern Arizona, and found in Bat Cave in 
southwestern New Mexico, located in the foothills bordering the Plains of San Augustine (Berry 
and Berry 1986; Cordell 1984). A Chiricahua stage side-notched projectile point was found 
during a surface survey in the Magdalena Ranger District of the Cibola National Forest, near Lion 
Mountain; this point was made of red chert and had an impact-damaged tip (Cibola N.F. Report 
No.2000-03-058, see Figure 3:e). A Chiricahua stage side-notched point was also recorded in 
the San Juan/Rio Grande National Forest (see Figure 3:f, Charles 1995).

The projectile point technology associated with the Chiricahua stage is varied. The 
illustrations supplied by Sayles are small, and lack a scale, so few illustrations can be provided 
for this study. However, Sayles does describe the various projectile point types. One type has 
an "expanded base, stem frequently wider than blade, edges of blade usually serrated" (1983: 
121); a second type is described as having a "straight stem, edges parallel, indented base, 
rounded base, and straight base, edges of blade in frequently serrated" (1983: 121); a third type 
is, 
"... diamond-shaped, slightly shouldered with the straight base, or diamond-shaped, pointed at 
both ends" (1983: 121); a fourth type is, 
"... pointed at both ends, and toward the points, convex edges, and lastly is the leaf-shaped with an indented base" (1983: 121). This bewildering number 
of point styles assigned to one cultural stage causes real problems in identifying sites from
surface finds. Many of these projectile point types could easily be mistakenly assigned to other cultures, unless they are uncovered in a datable context. It is also questionable that these point types, or at least those attributed to the Chiricahua stage, made it all the way to the San Luis Valley from the southern areas of New Mexico and Arizona. In the San Luis, there are similar types of points, but it is unclear as to whether they date to the same age as the Chiricahua stage.

The Albion Boardinghouse Complex

The Albion Boardinghouse Complex is one of the Archaic Mountain Traditions (Black 1991), but since it is a large Archaic side-notched point it has been placed in this section. The Albion Boardinghouse site is located in the Green in Range west of Denver, Colorado. This site is situated at an elevation of 10,690 ft. above sea level. Tom Platt, who was the caretaker of the Boulder City Watershed, undertook excavations at the site. The data from this excavation was reviewed and published by Benedict (1975; 1979). Benedict thought the projectile points recovered were unique enough to represent a new Archaic culture, and so named the Albion Boardinghouse Complex. The projectile points belonging to this complex are described by Benedict:

The blade edges of the points are uniformly ovate and unserrated. The points are bi-convex in transverse and longitudinal section and are generally fully flaked on both faces. Shoulders are abrupt, rarely abruptly sloping or oblique. The stem is very greatly expanding, forming deep and narrow side-notches that are parallel-sided or expand inward. Notches are very lightly ground or unground.

The stem is wider than the base and is disproportionately long, accounting for 40 to 45 percent of the total length of the point. Stem edges are straight and lightly ground. Perhaps the most distinctive part of the projectile point is its base: an initially concave, straight, or slightly convex base was lightly ground and broadly notched. Basal notches are concave to very concave in outline and are 2 to 7 mm deep; they are unground, and commonly are coarsely serrated, perhaps to keep the points from shifting laterally when hafted (1975: 6).

These projectile points (see Figure 3, m – n) are similar to the Mallory points that belong to the McKeans Complex. The Mallory points of the McKeans Complex, as well as the Northern Side-Notched, Sudden Side-Notched, and the San Rafael will all be discussed later in this chapter. The radiocarbon date assigned to the Albion Boardinghouse Complex is questionable at best; the two dates of 2,420 ± 220 B.P. and 5,730 ± 145 B.P. were obtained from charcoal samples that had been redeposited by slope wash. Benedict acknowledges that these dates are
questionable, but adds, "the hypothesis that seems most consistent with available information is that Archaic occupation of the site occurred 5,730 radiocarbon years ago, during an interval in which the local mountain environment was used intensively" (1975: 6). Radiocarbon dates associated with other large Archaic side-notched projectile point types help bolster Benedict's hypothesis. However, until a radiocarbon date is associated with the Albion Boardinghouse projectile point type, we should hold in abeyance any assumptions about the temporal placement of this particular technology and the Archaic hunter-gather culture it represents.

Benedict uses his earlier date of 5,730 B.P. (1,000 years earlier than the McKean Complex's Mallory side-notched points) to propose that the Albion Boardinghouse side-notched projectile point type originated in the intermontane area and gradually defused out onto the Colorado Plateau, northward into Wyoming and east out onto the Plains (1975; 1979). In the intermontane west, the Northern Side-Notched appear to be the technological precursor to many of the high side-notched Traditions. The Albion Boardinghouse type represents only one of these Traditions; the Sudden Side-Notched is seen as another one of the technological descendents of the Northern Side-Notched Traditions (Holmer 1986).

Summary of Early Archaic Side-Notched Point Types

The projectile points discussed above all exhibit technologically similar high side-notching that, when viewed through time, seemed to form a technological continuum throughout the western Great Basin, Colorado Plateau and the Intermontane area of the Rocky Mountain region. The high side-notches seem to originate in the western Great Basin and in the Colorado Plateau area with the introduction of the Northern Side-notched type; the Sudden Side-Notched, the Albion Boardinghouse, the Cochise-Chiricahua and the San Rafael projectile point types chronologically follow this type, covering a time span from approximately 3,500 to 8,000 B. P. Slight differences in this high side-notching technology may represent thousands of years in cultural prehistory and technology. Hopefully, by grouping point types by diagnostic characteristics, this study and the illustrations provided will help eliminate some of the confusion between the slight differences in technology and morphology and the multiple names assigned to morphologically similar point types.
The Early Archaic Mountain Traditions

The Rocky Mountains were home to the Early Archaic Tradition of large side-notched projectile points. The high mountains and valleys offered the Early to Middle Archaic people unique environments to exploit; juniper and pinion dominate in the foothills, with forests of lodgepole pine, ponderosa pine, and aspen generally dominating the mountain slopes and high mountain valley parklands. The high mountain environment offered refuge to a variety of wildlife, including white-tailed deer, mule deer, pronghorn antelope, elk, mountain goat, bighorn sheep and bison. This environment also offered abundant edible plant resources that could have been utilized as well (Pitblado 1999). Higher up in this mountain environment, above tree line, was a sub-alpine to alpine zone that offered forage for many of the game animals listed above. This mountain environment was rich enough in resources that it was inhabited year-round by many Archaic people who developed unique technologies that helped them to survive in these environments (Pitblado 1999; Black 1991). A map showing the spatial distribution of known Archaic Mountain Traditions sites is provided in Figure 4.
Figure 4: A map of the Archaic Mountain Tradition sites located in the state of Colorado.

a. Cherry Gulch site, north of Morrison, Colorado;
b. Hungry Whistler site, and the Fourth of July Valley site;
c. Wilbert Thomas Shelter, near Carr, Colorado;
d. Helmer Ranch site, near Roxborough State Park;
e. Ptarmigan site, north of Dillon Reservoir;
f. Rocky Mountain National Park;
g. Mount Albion site, in the Indian Peaks Wilderness Area;
h. Albion Boardinghouse, in the Green Lakes Valley;
i. Split Rock Ranch site;
j. Magic Mountain site, near Morrison, Colorado;
k. Willowbrook site, near Morrison, Colorado;
l. (5GN344) Site, southwest of Crested Butte, Colorado;
m. Sites (5ML45) and (5ML46), are both south of Creede, Colorado;
n. The Closed Basin area of the San Luis Valley, Colorado.
The Mountain Tradition projectile point technologies share basic technological and morphological characteristics. Black provides a general description of the Mountain Tradition lithic technology, in addition to the common shallow side-notches and convex bases,

Technologically, Mountain Tradition projectile points tend to be relatively thick with biconvex longitudinal cross-sections and collateral flaking patterns. The flaking quality is moderately- to well-executed, and a reworking of broken specimens is extremely common. Serrated blade edges are common features that crosscut all styles in the post-7,000 B. P. era;... haft element edges and notches are not usually ground, but there are important exceptions such as the Mount Albion type (1991: 11).

The various Mountain Traditions technologies did differ in reduction sequences. Black also notes that "manufacturing techniques include the common use of the ubiquitous bifacial reduction sequences, but importantly, many Mountain Tradition points are made on flakes-including larger dart points" (1991: 11). It is also important to note that local lithic materials were commonly used; this penchant for local lithics is most likely due to the abundance of raw materials found in mountain settings (Black 1991).

Archeologists investigating these Early Archaic Mountain Traditions have often confused regional synthesis by assigning a variety of names to artifacts—specifically projectile points—that are seen as diagnostic markers to cultures that, in many cases, inhabited the same spatial area and utilized the same resource base during the same time period. Examples of this are the Mount Albion Complex, the Cherry Gulch Types 1 and 2, and the Magic Mountain Type 3 (Black 1991). The similarities and differences in the technologies will be discussed below.

The Mount Albion Complex

The Mount Albion Complex was named by Benedict (1975; 1979), and the type site is the Hungry Whistler site (5BL67) that is located in the mountains west of Denver, Colorado. The elevation at (5BL67) is approximately 11,500 (FSL), above today's timberline. The site was a kill/butchering area with an adjacent game drive. The radiocarbon date that Benedict assigns to the Mount Albion Complex is 5,730 ± 145 B.P. (Benedict 1975; Gunnerson 1987; Black 1991).

Other sites that are known to contain Mount Albion Complex projectile points include the Wilbur Thomas Shelter (5WL45) near Carr, Colorado, although no radiocarbon dates were available from this site (Breternitz 1971). The Cherry Gulch site (5JF63), also in the mountains
west of Denver, yielded a radiocarbon date of 5,730 ± 220 B.P. for this projectile point type (Nelsen 1981). Another site in the mountains west of Denver is the Helmer Ranch site, which provided radiocarbon a date of (5,780 ± 160 B.P.) Finally, but not inclusively, the Ptarmigan site (5BL170) in the mountains west of Denver yielded questionable radiocarbon dates of to 4,620 ± 95 to 4,745 ± 95 B.P. (see Figure 4) (Gunnerson 1987; Cassells 1997).

The diagnostic projectile points associated with the Mount Albion Complex (see Figure 5) are generally of a broad leaf-shape with shallow, low side-notches. Benedict claims that, "the Mount Albion Corner-Notched projectile point style has no known predecessors in the western United States" (1979: 9). Overall, this projectile point stylistically looks like it could have developed from the lanceolate foothill/mountain Tradition, as a part of the mountain Tradition continuum (Black 1991; Pitblado 1999) because this form, minus the notching, is reminiscent of the earlier lanceolate points. There are other points that are technologically as well as morphologically similar to those in the Mount Albion complex that are found in the same area; slight differences have led some archeologist to bestow a number of different names on these side-notched projectile points. These include the Cherry Gulch Types 1 and 2, as well as the Magic Mountain sequences Type 3 projectile points (Black 1991, see Figure 5).

**Cherry Gulch Types 1 and 2 / Magic Mountain Sequences Type 3**

The Cherry Gulch site (5JF63) is located near Denver north of Red Rocks Park, and is situated at approximately 6,200 feet above sea level. The Cherry Gulch site was first excavated by Nelson in the spring of 1973 and was revisited by crews through the next two summers (1981). The Cherry Gulch Types 1 and 2 (see Figure 5), were recovered from the lowest levels of the site, and Type 2 points were directly related to a radiocarbon date of 5,780 ± 220 B.P. (Nelsen 1981: 6). There were very similar projectile point types recovered from the Mount Albion site (5BL73), located in western Boulder County, Colorado. The Mount Albion site is located in a valley at an elevation of 10,600 feet above sea level. The Mount Albion site yielded radiocarbon dates of 5,350 ± 130 B.P. to 5,800 ± 125 B.P. Another nearby site that contains Cherry Gulch projectile point Types 1 and 2 is the previously-mentioned Helmer Ranch site, which also contained projectile points from the Mount Albion Complex.
Figure 5: Early Archaic Mountain Tradition projectile points: (a) Magic Mountain Complex Type 3, from the Magic Mountain site; (b-c) Mount Albion Complex, from the Hungry Whistler site; (d) Mount Albion Complex, from the Ptarmigan site (borrowed from Cassells 1997:126); (e) Cherry Gulch Complex Type 1, from the Cherry Gulch site. [It should be noted that the flaking pattern is approximated due to the poor quality of illustration]; (f) Cherry Gulch Complex Type 2 serrated, the flaking pattern could not be discerned in the illustration in Nelson 1981 (from Nelson 1981:7, fig. 5). Archaic Mountain Tradition projectile points representing the Fourth of July Complex, from the Fourth of July Valley in Colorado (a-f) Bottom row (from Cassells 1997:126, Fig.7-16).

The Helmer Ranch site, as stated above, had radiocarbon dates of 5,780 ± 130 B.P. associated with similar point types. The only noticeable difference between the Cherry Gulch Type 1 and 2 is that the Type 2 is serrated. The Helmer Ranch site also contained projectile points associated with the Magic Mountain Type 3 point; however, there are no radiocarbon dates
associated with the Magic Mountain Type 3 projectile points at the Helmer Ranch site (Nelson 1981; Black 1991).

The Magic Mountain Type 3 projectile points average 5.0 cm in length, by 2.25 cm in width, with the widest part at the shoulders (Cassells 1997: Figure7-16). The Magic Mountain Type 3 points, are morphologically and technologically synonymous with the Cherry Gulch Types 1 and 2, except they are not serrated. The most notable difference between the projectile points discussed here—Cherry Gulch Types 1 and 2, Magic Mountain Type 3, and the Mount Albion Type—is that the Mount Albion points are generally basally ground (Black 1991). It is possible that these cultures existed contemporaneously, perhaps interacting. If not, at least they were using some of the same sites, and utilizing many of the same resources as well. There are other Mountain Tradition Archaic technologies that do differ from the above technologies, one of which is known as the Fourth of July complex.

The Fourth of July Complex

Benedict and Olson named the Fourth of July Complex in 1975. The type site is located in the Fourth of July Valley near Santana Peak, west of Denver, Colorado, at an elevation of 11,200 (FSL) (Benedict 1979). The projectile points associated with the Fourth of July Complex (see Figure 5, bottom row a-f), are technologically similar to, and may be part of, the Foothills/Mountain Paleo Tradition (Frison 1991; Pitblado 1999). This is also noted by Benedict when he states, "Both lanceolate and stemmed varieties, some of which show parallel-oblique flaking and alternate edge retouch. The points are intermediate in size, shape and technique of manufacture between certain Late Paleoindian forms (cf. James Allen/Pryor stemmed points) and other Middle Plains Archaic forms (McKean Lanceolate/Duncan points)" (1979: 8).

The average width of these points is 2.0 cm; the lengths are unknown because five out of the six points pictured (Benedict 1979: 7, Fig. 3) are broken. All specimens pictured exhibit a concave base, but it is not mentioned whether the basal edges are ground or not. Radiocarbon dates from the Fourth of July Valley site range from 5,880 + 120 to 6,045 + 120 B.P. (Benedict 1979; Gunnerson 1987; and Cassells 1997). Judging from the illustrations of Fourth of July Valley point types, these point types will undoubtedly be confused with the James Allen and the
Pryor stemmed points as well as the Humboldt types found in the Great Basin. Unless they are stratigraphically associated with radiocarbon dates, the Fourth of July projectile point type will be very hard to place chronologically, solely on a basis of morphological attributes.

Summary of Early Archaic Mountain Traditions

This list of Early Archaic Mountain Traditions is by no means all-inclusive; it does, however, provide a picture of what types of technologies were present in the Colorado Rocky Mountains during the Early to Middle Archaic (4,000 to 8,000 B.P.). The technologies represented seem to be limited to the intermontane area and are rarely found elsewhere. The radiocarbon dates associated with these Archaic Mountain Tradition technologies seem to chronologically place these cultures together in time; the cultures represented by the Magic Mountain Type 3, Cherry Gulch Types 1 and 2, and the Mount Albion Complex projectile points have all been recovered within an area spatially related in both elevation and location. The Mountain Tradition technologies discussed here, with the exception of the Fourth of July Valley Complex, are very similar, with shallow, low side-notches, lenticular blades, and thick lenticular cross-sections; the main difference seems to be in the basal characteristics, with the Mount Albion generally having a ground base, and the Magic Mountain Type 3 and the Cherry Gulch Types 1 and 2 generally exhibiting unground bases. Another technological commonality between these point types is that they are often made from local materials, a trait that seems to have been carried on in the mountains from the late Foothill/Mountain Paleo Tradition (Pitblado 1999).

The Early Archaic Oshara Tradition and the Rio Grande Complex

The projectile points typically associated with the Early Archaic in New Mexico, southern Colorado, northeastern Arizona and southeastern Utah are stemmed varieties termed either as the Rio Grande Complex or the Oshara Tradition's Jay Phase and Bajada Phase. The projectile point technology associated with these hunter-gatherer cultures is believed to have evolved out of the Great Basin stemmed Traditions, such as the Haskett and Lake Mojave Paleoindian projectile point types (Irwin-Williams 1994; Pitblado 1999; Huckell 1996). The Rio Grande Complex will be discussed first.
The Rio Grande Complex, Quemado Phase

The Rio Grande Complex was named by Honea (1969) after his work at the La Bolsa site in north-central New Mexico. The earliest component at the La Bolsa site belongs to the Quemado Phase of the Rio Grande Complex (Honea 1969). The diagnostic projectile point type associated with the Quemado Phase is the Rio Grande point, defined by Honea as:

The characteristic dart point of the component and phase is of the type (Rio Grande). Basically lanceolate in shape, the upper lateral edges (the point body) are straight to gently-rounded. They are broadest above mid-section. Lower lateral or stem edges are set off from the body by very small shoulders. Stem edges are consistently long, usually quite straight, and taper somewhat to the base, which is narrower than the shoulders. The base may be either shallowly concave, slightly rounded, or straight. Stem edges are always ground smooth. The base rarely so. Facial retouch of Rio Grande points is by a cylinder-hammer percussion. Shallow, irregular flaked scars are typical (Honea 1969: 57, 59).

These points seem to average approximately 2 cm at the widest point (the shoulders), 1.5 cm at the base, and length of 5.6 cm are common; of course, reworked versions are shorter (see Figure 6) (Honea 1969). Honea did not include a quantitative analysis of the Rio Grande point style, so the averages above are estimates.

Rio Grande points have also been found at Bat Cave in west-central New Mexico near the Plains of San Augustine, as well as in the upper Rio Grande Valley, and the San Luis Valley in southern Colorado. Dates associated with the Quemado Phase of the Rio Grande Complex have been estimated at 7,000 to 6,000 B. P. (Honea 1969). In a personal communication between Honea and Agogino, Agogino claims that, "a 'J' point, our Rio Grande type-horizon associated with a hearth at one locality near Grants, New Mexico, has been radiocarbon dated at 6,880 ± 400 years B. P." (Honea 1969). This seems to imply that the Quemado Phase of the Rio Grande Complex is synonymous to the Jay Phase of the Oshara Tradition. To support this observation, Honea adds, "the spotty data now indicates that the Quemado evolved into the San Jose phase [belonging to the Oshara Tradition] in at least part of north-central New Mexico" (1969: 68). However, Irwin-Williams never cleared up the naming issues when she developed her synopsis of the Oshara Tradition. To avoid further confusion, these points will be called Jay for purposes of this study.
The Oshara Tradition (Jay Phase)

The Oshara Tradition was named by Irwin-Williams (1973, 1979, 1994) after carrying out extensive fieldwork in the Arroyo Cuervo Valley in northwestern New Mexico. The earliest component of this proposed Archaic continuum is the Jay Phase, with radiocarbon dates between 6,800 to 7,500 B.P. Wills claims the Jay Phase has a date range of 6,700 to 7,900 B.P. and Huckell proposes the Jay type could be dated as early as 8,500 B.P. or older (1996). Pitblado argues that Irwin-Williams only offered one radiocarbon date (ca. 7,200 B.P.) to back up her "Archaic" claim for the Jay Phase (1999). Pitblado notes that this radiocarbon date, "...was obtained at a site that yielded two other hearths in the same stratigraphic level with earlier dates in the 7,500 to 8,000 B.P. time frame" (1999:151). Jay-type artifacts were recovered at Tsosie Shelter located in northeastern Arizona, where they were dated to roughly 8,100 to 8,200 B.P. At the Hastquin site, also in northeastern Arizona, a date range of 8,000 to 8,200 B.P. was also recovered from the same stratigraphic level as both Jay and Bajada points (Huckell 1996).

Huckell states that,

Thirteen Jay Phase sites on Gallegos Mesa in northwestern New Mexico, excavated in the late 1970s and early 1980s, provide an expanding view of the Phase. Data from the sites indicate that they range from approximately 7,000 to 8,000 B.P., are far larger and have greater artifact densities than Jay sites reported by Irwin-Williams, and contained ground stone and milling equipment (1996: 332).

It has been argued that the Jay point is technologically synonymous with projectile points from the Great Basin in the Southwest that date to the 8,000 to 10,000 B.P. time period. The Jay Phase points could represent a Paleoindian age adaptation to an Archaic-like, hunter-gatherer resource procurement strategy. When considering the radiocarbon dates from the Great Basin associated with stemmed points similar to the Jay Phase, it may even be possible that these points date to as early as 11,000 B. P. (Pitblado 1999; Huckell 1996).

Irwin-Williams only provides one Jay projectile point photo and no real definition of this type's attributes, nor has she supplied a scale to judge the size of the artifact; the only description

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Figure 6: Rio Grande/Jay and Bajada projectile points; (a-o) are not to scale; scale is above them; (a) Bajada point (MNM 7009/11); (b) Jay point (MNM 6150/11c); (c) Jay point (MNM6150/11b, (a-b) from Wills 1988: 80, Fig. 17); (d-e are to scale), (d) Jay point (Cibola National Forest, Mt. Taylor R.D. #338); (e) Bajada point (Cibola National Forest, Mt. Taylor R.D. #18); (f-j) Rio Grande/Jay points, scale unknown, (from Gunnerson 1987: Appendix I, plate 39).
she provides is, "... large, slightly-shouldered projectile points (reminiscent of those termed Lake Mojave in California and Arizona)..." (1979: 36, see Figure 6). It would have been helpful if she had included a more detailed description of the only truly diagnostic artifact of the Jay Phase in her synopsis of the Oshara Tradition. This is a problem with Irwin-Williams' descriptions of the projectile points belonging to the Oshara Tradition's various phases, as noted by Wills, "The primary data upon which the Oshara Tradition is constructed has not been published, making it difficult to assess differences between the temporal phases which constituted it" (1988:8). The problem of Irwin-Williams' unpublished data concerning the Oshara Tradition has also been noted by others (Cordell 1979; Judge 1981; Berry and Berry 1986; Huckell 1996).

If the Jay Phase and the Rio Grande-type projectile points represent the same cultural technologies, then, referring to Honea's point characteristics above, I think he is describing one point type that has been erroneously assigned two names. The Jay Phase/Rio Grande point types are most commonly found made from dark lithic materials and/or black basalts. Honea believes this may be because basalt was a very durable stone (1969; Wills 1988). The Jay Phase is also known as the Concho Complex, the Aneth Complex and the Moab Complex in various early archaeological studies of this region (Irwin-Williams 1979: 35).

The Oshara Tradition (Bajada Phase)

Irwin-Williams' next proposed phase in the Oshara Tradition is called the Bajada Phase. This phase has been dated at 5,300 to 6,800 radiocarbon years B. P. The Bajada Phase projectile points are found in the same area as the Jay Phase points. In her article, Irwin-Williams notes "considerable continuity from the preceding Jay Phase. The possible increased population and the shifts in tool kit apparently reflect increasingly effective adaptation to a broad-spectrum, localized resource base" (1979: 37).

The main difference in the projectile point types is outlined by Irwin Williams as, "Within the tool kit, the projectile point form shifted from an early variety distinguished from the Jay principally by the presence of the basal indentation and basal thinning to a later variety with increasingly well-defined shoulders and decreased overall length" (1979: 36, see Figure 6). Wills notes that the, "Early Archaic specimens appear to represent a single type, almost always made
of basalt (83.0 percent) and with no edge modification" (1988: 79). The Jay and Bajada point types display many similarities in form.

**Summary of Early Archaic Oshara Tradition and Rio Grande Complex**

The technology involved in the Rio Grande Complex, Quemado Phase, and in the Oshara Tradition (Jay Phase) projectile points is so similar that it probably represents one point type with two names. It seems that the name "Oshara Tradition (Jay Phase)" became commonplace in contemporary publications on this point type, and "Rio Grande, Quemado Phase" is rarely used anymore.

The technological relationship between the Oshara Tradition's, Jay and Bajada Phases, is evident. The basal concavity is more common and prominent on the Bajada point types than on the Jay points. The Oshara people may have been experimenting with a new hafting technique and found the basal concavity more favorable.

The Jay Phase projectile points are typically larger than their Bajada counterparts. This size reduction could reflect the preference for smaller projectile point forms in the post-Pleistocene/early-Holocene time period. It was during this time that the larger Pleistocene bison were evolving into the more compact bison we see today (Frison 1991), and the larger points may no longer have been necessary. If the new dates proposed by Pitblado (1999) and Huckell (1996) of 8,000 to 10,000 B.P. for the Jay Phase are proven accurate, the reduction in the size of bison would correlate nicely with the reduction in size witnessed from the Jay to Bajada Phase projectile point technology.

Wills claims that these two point types "... are so consistent in average values variance that they appear to reflect manufacture by strictly standardized criteria" (1988: 78). Wills also notes that, "the great consistency [between Jay and Bajada types] in point form dimensions from Early Archaic sites corresponds to limit variation in qualitative aspects of morphology. Early Archaic specimens appear to represent a single type"... (1988: 79). As with the Jay Phase, Irwin-Williams includes a figure with a photo of this projectile point in question without supplying a scale to judge the size of the points (1979). It is difficult to conceive how anyone could define a cultural marker without giving a clue as to what dimensions the diagnostic artifacts exhibit. In many
cases, ages of pre-ceramic cultures can only be defined by the diagnostic artifacts associated with those cultures. Like the Jay Phase points, Bajada Phase is also known as the Concho Complex, the Aneth Complex and the Moab Complex, in various early archaeological studies of this region (Irwin-Williams 1979: 35). The next point type in the Oshara Tradition is the San Jose type. These points are smaller than the Jay and Bajada Phase points and represent the Middle Archaic Period in the Oshara Tradition continuum.

The Middle Archaic

The Pinto Basin Projectile Point Type

The Pinto Basin site is located in a desert valley in Riverside County, California, called the Pinto Basin (see Figure 7). The Pinto Basin is surrounded by mountains on all sides: to the north, the Pinto Mountains; to the east, the Coxcomb Mountains; to the south, the Eagle Mountains; and to the west, the Little San Bernardino Mountains. The elevation of these mountain ranges varies from 4,000 to 6,000 feet above sea level.

The Pinto Basin site is located on a terrace overlooking an area that was a shallow lake bed by a river when the site was occupied (Scharf 1935). The age of the site occupation was unknown at the time of the initial excavations in the early 1930s, but Scharf estimated that "... 15,000 or 20,000 years have elapsed since the last glacial stage (the Wisconsin). The age of human occupation would therefore follow a certain amount, difficult to determine, below that given for the Wisconsin glaciation" (1935: 20).

The Pinto Basin site was discovered by Jack Meek and Samuel Baily, who were prospecting in the area in the 1930s. They contacted archaeologists William and Elizabeth
Figure 7: Archaeological sites with Archaic components that are located in the Great Basin and throughout the Greater Southwest: (a) Pinto Basin Site (Campbell and Campbell 1935; (b) Gatecliff Shelter (Thomas 1983); (c) O'Malley Shelter (Hattori 1982); (d) Danger Cave (Holmer 1986; Jennings 1979); (e) Hogup Cave (Jennings 1973); (f) Gypsum Cave (Harrington 1933); (g) Sudden Shelter (Holmer 1986); (h) Cowboy Cave (Jennings 1980); (i) Black Mesa (Berry and Berry 1986:282-288); (j) Hastquin Site (Huckell 1977); (k) Grants sites; (l) Bat Cave; (m) Wet Leggett site; (n) Fresnal Shelter; (o) Arroyo Cuervo Area; (p) Ventana Cave; (q) Tularosa Cave (Berry and Berry 1986:282-283); (r) Yarmomy Pit House site (Metcalff and Black 1991); (s) Closed Basin Area of the San Luis Valley; and (t) Deluge Shelter (Holmer 1986).

Campbell and told them about the site and the artifacts they found on the surface. Meek and Baily also told the Campbells of finding fossilized bone around the site area. Campbell and Campbell recalled the "hope of finding association between fossil bones and human artifacts led
to the formation of the combined expedition of the California Institute of Technology and the desert branch of the Southwest Museum" (1935: 23, 24). Unfortunately, direct association of the fossil bones—predominantly camel and horse—with the artifacts could not be proven. To the contrary, it was believed that the bones were eroding out of a clay level stratigraphically below the artifact-bearing level (Campbell and Campbell 1935).

As for the excavations, all the Campbells mention is "several small trenches" (1935: 24); it seems the rest of their work was "mapping the district in detail" (1935: 24, 25). The Campbells reported finding a number of sites along the ancient watercourse of the Pinto Basin drainage that was thought to be a shallow, sluggish river at the time the site was occupied. Because of the climatic changes through time that have left this area a desert, the sites had remained untouched by collectors. The Campbells noted this bit of good fortune; "Because of its isolation and great distance from any watering place, as well as difficulties of crossing such rough and sandy country, this district has escaped the ravages of pot hunters. That a virgin site of great importance has been spared us down the centuries, is one of those things for which the good archeologist searches long and hopefully" (1935: 26). Sixty-five years later, the thought of finding a virgin archaeological site is still a dream shared by virtually all archaeologists.

The sites along the Pinto Basin wash produced similar assemblages. As the Campbells state, "with few exceptions, very much the same amount of material was obtained from each site," with the exception that "Metates and manos, both fragmentary and whole too, were found west and a great many more snub-nosed or (keeled) scrapers came from the south shore than from the north" (1935: 29). The distribution of projectile points remained rather constant as well, as noted by the Campbells, "dart-points were found on both shores along the entire line of occupation, and their forms denote both leaf-shaped and stemmed, large and small, being found everywhere" (1935: 29).

There was one site that really stood out among the others. The Campbells recall, "... on one camp area on the north shore, more whole dart-points were found in one small space than in any other given area. Here, on a camp only one hundred yards across, we found in an hour's time forty-eight perfect points and a few fragmentary ones " (1935: 29).
The diagnostic characteristics of the Pinto Basin projectile points recovered in the initial Pinto Basin survey (see Figure 8) are best described by Amsden.

Pinto-type points, of which 160 whole specimens and identifiable fragments were recovered, are decidedly the type projectile points of the locality. For that reason, we have called them the Pinto type, [even though the Pinto Basin type site is considered to be the Stahl site (Harrington 1957)]. Poor material and hasty workmanship have caused the group to vary somewhat in detail of form, but through them all, one sees the intent of the artisan to produce a projectile points with a definite, although narrow, shoulder and then usually an in-curving base. Frequently, there are single nocks just below the shoulder, producing most often three serrations at each edge. The points are thickish, well-rounded on each face, as if made from a thick flake by trimming down its core. Proportionately expressed, maximum thickness often equals 30 percent of total length and probably averages 20 to 25 percent. Many specimens show pressure retouch, although bone percussion is still the rule. The shoulder and base nocks were usually made by a single, deft blow, producing a characteristic curved effect. Several specimens show an attempt at thinning the fat central zone by striking a long flat flake from the base down the central ridge. Generally, the flake has carried less than halfway up to the tip (1935: 43, 44).

The size of the Pinto Basin type points varies. The smallest was 2.5 cm in length by 1.25 cm in width, and .5 cm thick; the largest point recovered was 5.5 cm in length by 2.5 cm in width, and was 1.25 cm thick. Overall, the Pinto Basin type points average 4.0 cm in length, 1.88 cm in width, and .88 cm in thickness (Amsden 1935: 44).

The leaf-shaped projectile points (see Figure 8) recovered in the Pinto Basin were described by Amsden as, "the form is leaf-shaped, remarkably thin and shapely in the best examples" (1935: 42). Amsden also notes that except for a pressure flaked example, that "... the others show only bone percussion work" (1935: 42). The size of the Leaf-shaped Pinto Basin points varies from the smallest measuring 2.0 cm in length, by 1.25 cm wide to the largest point which measured 5.5 cm in length by 2.5 cm wide. Thickness varied from .5 cm, to 2.0 cm. The average size for the leaf-shaped Pinto points was a length of 4.0 cm, a width of 1.88 cm; an average thickness cannot be ascertained from Amsden's article (1935).
Figure 8: Pinto Basin projectile point types: (a-j) from Hogup cave, courtesy of Jennings (1978: 65, Fig. 51); (a, b) Pinto Square-Shouldered; (c, d) Pinto Barbed; (e, f) Pinto Sloping-Shouldered; (g, h) Pinto Leaf-shaped; (i, j) Pinto Shoulderless. (k-r) Projectile Points from the Pinto Basin site courtesy of Amsden (1935); (k-n) Pinto Leaf-shaped; (n r) Pinto-type points; (s-t) Pinto-type points from the San Luis Valley. The flake scar patterns are close approximations drawn from the photos. The blank areas exhibiting a (?), are due to the inability of the illustrator to discern any flaking pattern there on the illustrations.
Amsden does not mention basal grinding; and it is unclear whether it might be present. It is unknown if recycling or resharpening attempts led to this high thickness-to-length ratio, but I think that it could be a contributing factor. These Leaf-shaped points need to be studied with contemporary techniques to examine use wear to determine if they're projectile points, small knives, or just bifacial pre-forms.

Although the Leaf-shaped point types have been placed in the Pinto Basin Complex (Campbell and Campbell 1935; Amsden 1935; and Rogers 1939) there has been little evidence published as to how old they really are. Leaf-shaped points have, however, been recovered in datable contexts at some excavations. Holmer notes that at the O'Malley Shelter, "... Leaf-shaped lanceolate points recovered from strata dating to approximately 3,500 to 4,800 B. P. Their bases are convex and they are morphologically quite different from the concave-base forms" (1986: 100). At the Weston Canyon Rockshelter, Leaf-shaped points were dated to 3,790 B. P., and at the Birch Creek sites Holmer reports, "Numerous Leaf-shaped points were also recovered... over 90% came from strata dated between 3,000 to 6,000 B. P." (1986:101). At this point, it is uncertain as to what the beginning dates for the Pinto Basin Leaf-shaped point types are—6,000 B. P., or did they occur later than that? If so, how much later? At present, it appears that this point type is a Middle Archaic technology dating to approximately 3,000-5,000 B.P., possibly older. However, as it stands, the leaf shape of this projectile point type is not a very sound diagnostic indicator, and more of the Pinto Basin Leaf-shaped points will have to be recovered in a datable context in order to firmly establish a chronology for the type.

The lithic raw materials used by the Pinto Basin flintknappers were "milky quartz, obsidian, chalcedony, various forms of rhyolites (principally vitrophyre, and siliceous), jasper, chert, quartzite, rock crystal, and slate (silicified), in about the order named" (Campbell and Campbell 1935: 44). The obsidian is believed to have been transported from Little Lake in Inyo County, California. The chalcedony apparently also comes from sources outside the Pinto Basin, nearly 100 miles to the Northwest. The jasper originates from an area approximately 40 miles from the Pinto Basin (Amsden 1935: 47-49). Most of the lithic material used by the Pinto Basin area flintknappers was collected to the north of the Pinto Basin. Of course a combination of both
trade and seasonal rounds is quite likely. Pitblado has identified north-south travel by late
Paleoindian groups in the Great Basin for lithic resource procurement purposes (1999), so it is
possible that groups in the Great Basin and southern California Desert could have undertaken
similar north-south lithic procurement rounds during the Archaic period.

The type site for the Pinto Basin culture is the Stahl site in the Mojave Desert. From
Harrington's (1957) research at the Stahl site in the mid-1950s and later analysis of his finds, he
identifies five types of projectile points which have been defined as representing the Pinto Basin
technology (see Figure 8). These five different Pinto Basin point types were described earlier by
Rogers:

Type 1 has a concave base and a faintly shouldered effect. In typing the
specimens, difficulty arises in distinguishing them from weakly notched Type 3
points. In the group, a small percentage of the points are equipped with serrated
margins. It is difficult to determine the exact number as Pinto technique is of so
poor an order. The marginal flaking of the average point is very irregular, and
because of this, points have not been classed as serrated unless the notches
were so orderly spaced that no doubt of its being purposeful could be entertained.

Type 2 is broad stemmed with weakly developed shoulders. The stem is usually
thick, except at the base where a desperate effort to thin the edge is generally in
evidence.

Type 3 has both the base as well as the sides notched. This group contains the
highest percentage of serrated points, if the requisite classification is based on
continuous and evenly spaced notching. This point type is consistently thinner
and better flaked to than the members of the other groups, when done in the
same material.

Type 4 numbers are so few that is quite possible that the type is merely a sub-
type of Type 3, or unfinished members of that group which have not been
equipped with a basal notch.

Type 5 is a small, slender, leaf-shaped point and is more consistent with regard
to size than any other type. Most of them are made of obsidian or chert, and
dacite ones are extremely scarce. Many of the chert and obsidian ones have a
weakly developed basal notch. The leaf type is the rarest of all and constitutes
only 6 percent of the total Pinto points (Rogers 1939: 54, 55).

Some of Rogers' and Harrington's classifications were seen as flawed by later
researchers. Holmer thinks the five types proposed by Rogers, and later by Harrington, should
be reduced to three types: shoulderless, shouldered, and single-shouldered. Recycling could be
the cause of some of this variation, as Harrington notes, "the shoulderless all appear to have
been shouldered, but have been resharpened to the extent that the shoulder no longer remains"
(1986: 97). If this is the case, Harrington's three types should be lumped back into the one type that changes in form throughout its use life. Harrington omits the leaf-shaped type of projectile point that is generally associated with Pinto Basin assemblages, yet he does not provide a clear reason why he no longer considers this type to be a part of these assemblages.

Jennings also divides the Pinto Basin projectile points into five separate categories. He uses the term "Pinto square-shoudered, Pinto barbed, Pinto sloping shoulder, Pinto leaf-shaped, and Pinto shoulderless" (1978: 65, Fig.51). I have used Jennings categories in Figure 8 to display the variation within the Pinto Basin assemblages. As you can see, these different types seemed close enough, both in morphology and in technological attributes, that the variations seen between Types 1 through 4 can be explained as an effect of the reworking or recycling process.

Other possible explanations of the variability seen in the Pinto Basin point types could be that form varied slightly—either temporally, spatially, or a combination of both factors. After all we are looking at a span of up to 3,000 years use of this technology and a geographical distribution covering virtually all of the Great Basin and Southern Desert and intermontane areas in the southwestern United States. A lot of diverse, yet minimal changes should be expected in a technology over that length of time covering such a vast geographical area.

Variation could be expected among different bands of contemporaneous hunter/gatherer flintknappers. Some of the Pinto Basin culture sites that have been analyzed may very well have been occupied by different bands at different times, yet have been close enough chronologically, to be virtually indistinguishable in the archaeological record. By splitting the Pinto Basin assemblages into multiple types, researchers could be clouding the archaeological record when what we could be seeing is simply just recycling or slight variation occurring within the same technology. Rather than assign multiple names to these Pinto Basin point types, we should concentrate more on publishing both quantitative and qualitative data on these projectile points.

In the original Pinto Basin site report by Campbell and Campbell (1935), the only way to date a site was through geoarchaeological means. The dates proposed by Scharf were sometime after the glaciation, 15,000 to 20,000 years ago. Since this estimate was made,
archaeology has acquired the radiocarbon (C-14) dating technique. The C-14 technique has allowed researchers to establish credible dates for the Pinto Basin culture. Using C-14 dating, Pinto Basin types were dated as follows:

- in the pre-4,000 B.C. range at Danger Cave (Jennings 1978);
- pre-4,000 B.C. dates were also obtained at Hogup Cave (Jennings 1978) and Sudden Shelter (Holmer 1986);
- Wilson Butte Cave provided a date of 4,940 B.C. for the Pinto Basin occupation there (Holmer 1986);
- The Western Canyon Rockshelter in southeastern Idaho provided dates of around 5,300 B.C. (Holmer 1986);
- the date of 4,100 B.C. was acquired at the Silent Snake Springs site (Layton and Thomas 1979);
- Kramer Cave in Nevada was dated at 2,400 B.C. (Layton and Thomas 1979); and
- Gatecliff Shelter in Nevada yielded dates from 4,000 to 1,600 B.C. that were associated with Pinto Basin occupations (Layton and Thomas 1979).

As noted from the above, the Pinto Basin culture can be chronologically placed with some certainty into a time frame of approximately 4,000 to 7,000 B.P.

Those who have researched the distribution of the Pinto Basin culture seem to be at odds as to the spatial extent of its distribution. Holmer places the Pinto Basin culture as southwestern Oregon, southern Idaho, eastern California, most of Nevada and extreme northwestern Utah (1986: 99, Fig. 9). Metcalf and Black claim to have found Pinto Basin-like points in their excavations at the Yarmony Pit House site in Eagle County, Colorado (1991: 94-98). As shown in Figure 7, there are five sites throughout Utah that have reported Pinto Basin projectile point types included in their assemblages: Hogup Cave (Jennings 1973); various sites in the Four Corners area (Botelho1955; Wormington 1964); Danger Cave (Jennings 1978; Holmer 1986); Sudden Shelter (Holmer 1986) and Deluge Shelter (Holmer 1986). It is puzzling that Holmer would provide information on Pinto Basin point types found at Sudden Shelter and Deluge Shelter and not include them in his map of Pinto Basin distributions. I have found no evidence of Pinto Basin culture sites in Arizona or New Mexico, although one of the point types in the Chiricahua Phase that is found in these states appears to represent the same technology (Wills 1988). The only reference to Pinto Basin projectile point types in Colorado is the aforementioned Yarmony Pit House site. The lack of references to Pinto Basin points in these areas could be because variations of the point type in question are considered to belong to the San Jose Phase of the Oshara Tradition by researchers in these areas (Irwin-Williams 1978), a further indication that it is
imperative to consider these point types collectively, by diagnostic features, rather than to use previously-identified point type names which change with each new site or archaeologist who studies them.

The Pinto Basin culture seems to be limited to the Great Basin of the United States by the archeologists who have studied this area; however, the Pinto Basin projectile point technology can be found as far east as the San Luis Valley of Colorado. As to whether this is the result of technological diffusion or population movements remains an unanswered question. More work is needed to better to define this cultural area.

The ages associated with the Pinto Basin culture range from 5,000 to 2,000 B.C., or 7,000 to 4,000 B.P. These dates put the Pinto Basin culture well into the Altithermal Period as proposed by Antevs (1955). The adaptations toward changing climates, such as higher usage of seeds, nuts and other plant resources can be seen by the occurrence of manos and metates which were used to process these foods in the Pinto Basin assemblages.

The variations within the Pinto Basin projectile point types can be explained as differences in flintknapping techniques used by contemporaneous groups who use the same sites or the recycling of artifacts. These variations could also be seen as the result of changes in technological preference throughout the time-span (approximately 3,000 years) recognized for the Pinto Basin culture. Splitting up the Pinto Basin assemblages into five point types seems entirely unnecessary when the variations seen within these assemblages can be logically explained as being the effect of spatial or temporal factors, a combination of both, or simply as a result of the use and recycling of projectile points.

The Oshara Tradition (San Jose Phase)

Yet another Oshara Tradition phase that Irwin-Williams identified is the San Jose Phase (1979). This phase represents the Middle Archaic in southern Colorado, southeastern Utah, northeastern Arizona, and throughout most of New Mexico. The San Jose Phase projectile points are similar in appearance to those of the McKean Complex to the north in that the basal characteristics are a short expanding stem with a concave base (see Figure 9); that should not come as a surprise, because, not only are the San Jose Phase and the McKean Complex closely
related technologically, but both of them occurred during much of the same time frame—3,000 to 5,800 B. P. for the San Jose Phase, although the earliest dates for the McKean Complex are approximately 5,000 B. P. (Irwin-Williams 1979; Frison 1991). Unfortunately, there is little published on San Jose Phase dates other than Irwin-Williams' work.

The diagnostic attributes of the San Jose Phase projectile point technology are presented by Irwin-Williams as "projectile point forms differ from those of the preceding phases principally in the use of serration of the projectile point blade and decreased stem length; there is a trend in time toward decreasing overall length and toward expanding stems" (1979: 40). As with the preceding Oshara Tradition phases, Irwin-Williams has neglected to provide any quantitative description of this diagnostic projectile point type; she includes a photograph of four projectile points along with some other tools to aid in the identification of the San Jose Phase, but again, without a scale, one can merely speculate as to the dimensions of these projectile points (1979: 40). Bryan and Toulouse named the San Jose non-ceramic culture (1943) then, subsequently, Irwin-Williams changed the name to the San Jose Phase (1979). The projectile points are better described by Bryan and Toulouse as, "... the points are strongly serrated and range in length from one and a half to two inches. They have a broad tang with an indented base. The edges of the tang are smoothed by grinding" (1943: 272). Wills refers to the San Jose base as "an expanding stemmed indented base form" (1988). This description will be used throughout the rest of this study when referring to the basal morphology of the San Jose Phase point. The San Jose Phase point type, like the point types of the previous Oshara Tradition phases, is most commonly found made from black or dark colored basalt, although chert, quartzite, chalcedony and obsidian were also used (Irwin-Williams 1979; Wills 1988).

The San Jose Phase of the Oshara Tradition is also known as the Apex Complex, the Gallegos Complex, The Rio Grande Complex, the Concho Complex and the Moab Complex (Irwin-Williams 1979), and Type 8a (Lister 1951); it is also named Elko indented-base corner-notched by Jennings (1978). This plethora of names has caused a great deal of confusion among scholars trying to make sense of the Archaic materials in this region.
Gypsum Cave/Contracting Stem Projectile Point Types

The Contracting Stem projectile point types were first recovered by Harrington in his excavations at Gypsum Cave, in Nevada (1933). Harrington named the Contracting Stem types Gypsum Cave points. The Gypsum Cave points are described by Harrington as having a symmetrical blade and, "the stem slopes abruptly back from the shoulders to a rounded forming the butt"... (1933, see Figure 10). Subsequent archaeological excavations have revealed that this point type is widespread throughout the Great Basin and greater Southwest. This Contracting Stem projectile point type is associated with a wide variety of dates and names.
Figure 10: Gypsum Cave/Contracting Stem-type projectile points: (a-b) Gypsum Cave-type points recovered from site (5ML45) in Mineral County, Colorado (Reed 1984: 13); (c-d) Park points from Ruby Mtn., Colorado, and a Park point from the Wilmot Springs site (Stewart 1970: 21-22); (f-h) Gypsum Cave points from Gypsum Cave (Harrington 1933: 44, 91); (l-k) Gatecliff Contracting Stem points from Hidden Cave (Pendleton 1985: 190,191).
Originally, Harrington reported that the Contracting Stem points from Gypsum Cave dated to at least 10,000 years ago and probably older (1933). These dates are no longer accepted by archaeologists studying prehistory in these regions for the following reasons:

- At Cowboy Cave, the Gypsum Cave-types were dated from $3,560 \pm 75$ B. P. to $3,635 \pm 55$ B. P. (Berry and Berry 1986: 285);
- At Pint-Size Shelter, a date of $3,390 \pm 170$ B. P. was recovered at the top of stratum containing Gypsum Cave-type points (Berry and Berry 1986: 292);
- At Sudden Shelter, these points were recovered from a level radiocarbon date to $3,535 \pm 95$ B. P. (Berry and Berry 1986: 293);
- At Keystone Dam, a date of $3,300 \pm 140$ B. P. was reported (Berry and Berry 1986: 299);
- At Gatecliff shelter, Thomas (1983) named the Gypsum Cave-type points Gatecliff Contracting Stem points, where they dated to 3,300 to 1,400 B. P.;
- Warren and Crabtree claim the Gypsum Cave point type dates from 1,500 to 4,000 B. P. (1986: 187);
- Holmer concludes of the Gypsum Cave type, "wherever they occurred their temporal placement is remarkably consistent - always between 4,500 to 1,500 B. P." (1986: 105).

It should be noted, however, that some of these earlier as well as some of the later dates have been questioned and may be inaccurate.

Two researchers, Berry and Berry (1986) have concluded that the later dates for the Gypsum Cave point type are suspect due to the presence of storage pits cutting down through stratigraphic levels mixing up the chronological sequences. Aboriginal surface collecting may also contribute to the confusion in the archaeological record. Berry and Berry specifically mentioned, "...the widespread practice of aboriginal surface collection" (1986: 310). The possibility of aboriginal surface collection has also been acknowledged by Bruce Huckell (2000 personal communication); Dennis Stanford (2000 personal communication) and Pegi Jodry (2000 personal communication).

Because of the above-listed disturbance factors, as well as researching the validity of the radiocarbon dates associated with the Gypsum Cave point types at numerous sites, Berry and Berry have proposed this point type dates to 3,600 to 4,700 B. P. (1986: 307, Fig. 14, 309-310).

The Gypsum Cave/Contracting Stem projectile point type is most likely the end product of a five-stage lithic manufacturing process, based on Thomas' replicative experiments (1985: 192-193). These five stages defined by Thomas are as follows,

Stage I: A primary flake line was struck from the core by direct percussion using a semihard hammerstone (e.g., limestone or sandstone).
Stage II: The knapper switched to an antler billet and began random bifacial percussion, creating a thin, even surface that was prepared for pressure flaking. The resultant fine percussion blank was an elongated oval in plan view.

Stage III: This stage consisted of heavy pressure retrench with a large pressure flaker (an antler tine with tip ground to a flat bevel). The objective was to orient the pressure ridges for stylized light pressure retouch.

Stage IV: A narrow pressure flaker (a sharply pointed antler tine) was used for final retouch. Once again, the [flake] scars were initiated at the tip on the dorsal face, and proceeded toward the base. The ventral face was similarly flaked. Irregular and unflaked surfaces were quickly retouched, producing a triangular pressure flaked blank.

Stage V: The final stage required another tool change to an extremely narrow antler flaker (the width of a small nail) to produce the shoulders and base. Rows of bifacial oblique pressure flakes were removed from the biface approximately 10 mm from the basal ends running towards the opposite tip margin, resulting in curved shoulders and a contracting base (1985: 192, 193).

It should be noted that replicative experiments like Thomas' are not exclusive; Archaic flintknappers may have used different techniques to arrive at the same final form.

The Gypsum Cave/Contracting Stem projectile point technology is thought to have originated in Mexico. Marmaduke (1978) suggests that sites in the Tehuacan Valley contain contracting stemmed points that date to 7,000 B. P.; these points belong to the early Coxcatlan Phase. The Coxcatlan Phase projectile point technology terminates, chronologically, between 6,000-7,000 B. P. in Mexico and occurs 500 to 1,000 years later in the Great Basin. Marmaduke believes that this technology could have defused north during this period (1978).

The Gypsum Cave/Contracting Stem-type projectile points has been assigned a number of names throughout the Southwest and Great Basin areas. It seems that, in general, the greater Southwest Archaic projectile points types suffer from an overabundance of names. This problem is noted by Warren and Crabtree, "Archaeology in the Mojave Desert has suffered from flora of names and renamed ' Cultures', ' Industries', ' Phases' and ' Periods'. There has been striking lack of agreement on taxonomic systems and terminology" (1986: 183). The same problem plagues the Archaic archaeology of the Great Basin and entire Southwest. For example, the Gypsum Cave type is also known as Gatecliff Contracting Stem (Thomas 1983); Park point (Stewart 1970: 21-23); the Oshara Traditions late San Jose Phase (Irwin-Williams 1967); Augustin points (Wills 1988); and other names including Pelona, Almagre, Val Verde, Shuma, and Lobo (Berry and
Berry 1986: 218). Warren and Crabtree list a number of other complexes that Contracting Stem projectile points belong to, including "the Newberry period, Pinto Gypsum Complex, Early and Middle Rose Spring, Armagosa I and III, Death Valley II excluding the Pinto material, early levels of the Stuart rockshelter, the Ray Phase of the Coso Mountains, and Newberry Cave on the Mojave River. The terminology involved in these reports is complex, inconsistent, and extremely confusing" (1986; 187-188). With regard to the Contracting Stem type, Holmer notes that, "since the chronological placement of all large contracting stem points in the study area is so consistent, it is apparent that wherever they are found, they should be considered the same type. The problem, therefore, is to settle on the name" (1986:105-106). A simple solution would be to refer to the points as the Gypsum or Gypsum Cave type, named after the cave where they were first excavated by Harrington back in 1933, or simply by the morphological name of Contracting Stem points.

The accepted dates for the Gypsum Cave projectile point types vary a great deal depending on which article you read. It would seem this point type has been recovered from enough sites that a common consensus on the dates associated with this technology would be set and accepted by the archaeological community. Unfortunately, this is not the case. The discrepancies in the published literature concerning the dating of this point type cover more than 3,500 years, from approximately 1,500 to 5,000 B. P. This seems like an extraordinarily long time span for any lithic technology. The dates proposed by Berry and Berry of 3,600 to 4,700 B. P. are probably the most accurate date span for this point type.

**The Humboldt Projectile Point Type**

The Humboldt projectile point type is fairly common in the Great Basin and desert regions of the Southwest. The Humboldt series (see Figure 11) includes the Humboldt Type, the Humboldt Basal-Notched and the Triple "T" points (Thomas 1985; Thomas and Bettinger 1976; Hattori 1982; Layton and Thomas 1979; Warren and Crabtree 1986). The Humboldt Basal-Notched has a wider-flaring base that is deeply concave, whereas the Humboldt Type has a contracting base with a small basal notch. Point types similar to the Humboldt types are also known as Pinto shoulderless and McKean Lanceolate. Hattori has noted morphological
Figure 11: Humboldt Series of projectile points: Humboldt Type points (a-i); (a-d) are from Hidden Cave (Pendleton 1985: 200, 202); (e-f) are from Kramer Cave, (e) could be a Humboldt Basal-Notched (Hattori 1982: 131,132); (g) is from Mateo’s Ridge site (Thomas and Bettinger 1976: 301); (h, i) are from Silent Snake Springs (Layton and Thomas 1979: 262). Humboldt Basal-Notched points: (j, k) are from Hidden Cave (Pendleton 1985:197); (l) is from Silent Snake Springs (Layton and Thomas 1979:262); (m) is from Mateo’s Ridge site (Thomas and Bettinger 1976: 300). Triple "T" points: (n, o) are from Hidden Cave (Pendleton 1985:202).
differences between the Humboldt types and the McKean Lanceolate type, "In the Great Basin, parallel-oblique flake scar patterning has been used as an analytic attribute to distinguish the collaterally-flaked McKean type from the parallel-oblique flaked Pinto and Humboldt types of the Little Lake series" (1982: 121). However, flake scar patterning may be of limited value as an analytic attribute in this case, because the parallel-oblique pattern does not appear to be consistent on the Humboldt types, as is pointed out by Hattori in his assessment of the lithic reduction sequence used in the production of the Humboldt type.

Although all of these points were probably made from flakes, remnants of the primary flake scars are retained on only one basalt point and one obsidian point. Secondary and tertiary flake removals are usually characterized by a lateral or down-and-to-the-left orientation. The flaking pattern for these later stages ranges from random-collateral to irregular parallel-oblique. The U-shaped basal region of several specimens is shaped and thinned by removing part of the midline ridge with flakes [basal thinning flakes] oriented toward the tip. In other points, however, this procedure was not followed, and the U-shaped base was formed by steep-angle flaking (Hattori 1982: 132, 136).

If the flaking pattern, "grades from random-collateral to parallel-oblique" it would be of questionable value as the diagnostic indicator. The Triple "T" is a wider, lanceolate point with a concave base (see Figure 11). Triple "T" points are similar to those found at the Fourth of July site and the James Allen site and appear to represent the oldest technology associated with the Humboldt point types (Thomas 1983; Thomas 1985).

The chronology associated with the Humboldt point types is a hotly-contested issue among researchers in the Great Basin and Colorado Plateau regions. These point types have been recovered in the following archaeological excavations:

- At Gatecliff Shelter, where the two Humboldt types date between 1,300 to 5,000 B. P. and the Triple "T" type occurs earlier than 5,000 B. P. (Thomas 1983);
- At Hidden Cave, where the Humboldt types were dated between 3,000 and 5,000 B. P. (Holmer 1986);
- At the O' Malley Shelter assemblage which included Humboldt types which were recovered from a level dated at 3,000 to 5,000 B. P. (Holmer 1986: 100);
- At Weston Canyon Rockshelter, where the Humboldt points were dated at 3,790 B. P. (Holmer 1986: 100);
- At the Meadow Valley Wash site, where the Humboldt type points were radiocarbon dated between 2,920± 250 B. P. to 4,100± 300 B. P. (Warren and Crabtree 1986: 188); and
- At other sites throughout the Great Basin which have provided average dates of between 3,000 and 5,000 B. P. for the Humboldt type projectile points (Holmer 1986:100-101; Jennings 1973:61).
However, Berry and Berry contradict the later dates by stating that, Humboldt lanceolate points are a relatively short duration and infrequent occurrence on the Plateau. They appear at ca. 6,700 B.C. and terminate prior to 6,000 B.C. The type occurs much earlier and is far more prevalent in the eastern Great Basin. They may date as early as 7,250 B. P. at Hogup Cave and perhaps even earlier at Danger Cave (1986: 316).

Further, the Birch Creek site contained Humboldt types that were recovered beneath the Mazama volcanic ash layer that has been dated at 6,700 B. P., as well as at levels above the ash that were dated to 3,000 B. P. (Holmer 1986:101). The Humboldt points recovered at Sudden Shelter were bracketed by dates of 5,000-6,670 B.P. (Holmer 1986:100; Berry and Berry 1986: 294). Humboldt points were also recovered from the Dirty Shame Shelter where Holmer claims, "... all but two occur earlier than 5,600 B. P." (1986: 100).

There is an ongoing debate about the dates associated with the Humboldt types. Berry and Berry claimed a short duration, between 6,000-6,700 B. P. and possibly as early as 7,200 B. P. (1986); however, Holmer assigns a date of 3,000-5,000 B. P. to the Humboldt types (1986). The Fourth of July Complex, which is morphologically very similar to the Humboldt point types, has been dated at 5,880-6,045 B.P. (Benedict 1979) and compares nicely with the dates proposed by Berry and Berry. Likewise, the McKean Lanceolate points, which are also very similar, match the dates proposed by Holmer. Because of the disparity in the dates assigned to the Humboldt point types, it is obvious that more of these types of points need to be recovered in a datable context in order establish this point type as an accurate diagnostic artifact. As it stands, it can only be approximated that these point types date to somewhere between 3,000-7,000 B.P. and possibly as late as 1,500 B.P.

The McKean Complex

The McKean Complex is one of the most well-documented cultures of the Plains Middle Archaic period. Projectile points belonging to the McKean Complex have been observed in archaeological site assemblages from Alberta, Manitoba and Saskatchewan in southern Canada south to Utah, Colorado and Nebraska and in all states in between. These point types have been recovered from sites from the Plains into the foothills and mountains in a wide variety of ecological zones (Frison 1978; Frison 1991; Lobdell 1974; and Kay 1998). McKean Duncan-
Hanna points have been reported as far south as the San Luis Valley in southern Colorado (Hoefer 1999: 121).

The projectile point technology belonging to the McKean Complex includes four types of points: McKean Lanceolate, Duncan, Hanna and Mallory (Frison 1978; see Figure 12); however, Davis and Keyser's recent work on the McKean Complex projectile point technology analysis on these four point types has provided a interesting new insight. Davis and Keyser make an observation that seems obvious, yet one which went unpublished until their 1999 Plains Anthropologist article, in which they note,

Hanna points have barbed shoulders and expanding stems, while Duncan points have no barbs and straight to slightly-expanding stems... Our lithic analysis an examination of numerous collections illustrated in various site reports show that Duncan and Hanna are not separable types with any cultural meaning. Instead, they represent a true continuum of stem and based forms at ranges from parallel-sided to expanding. The presence or absence of barbed shoulders merely reflects resharpening and rejuvenation. We recognize this continuum here by referring to these points as Duncan-Hanna (Davis and Keyser 1999: 261).

Davis and Keyser go on to provide a list of diagnostic characteristics of the Duncan-Hanna projectile points, noting that "the Duncan type is based on the following techno-morphological attributes:

1. Symmetrically bi-convex in cross- and long-section;
2. Collateral expanding flakes terminating irregularly near blade center, forming a distinct, sinuous dorsal ridge;
3. Flaked scars perpendicular to the points long axis except on obviously resharpened specimens [Hanna points];
4. Pressure retouch forming a needle-sharp point in very regular, sharp, even edges;
5. Well-formed, but not pronounced, stems and shoulders;
6. Straight to deeply-notched bases;
7. Stems and basal notches formed by steep bifacial retouch, producing the characteristic notch without markedly thinning the haft element;
8. Stem and blade juncture is the thickest part of the point; and
9. Rejuvenated points exhibit diagonally-oriented flaked scars indicating they were resharpened while in haft "(1999: 252).
Figure 12: Projectile points of the McKean Complex: (a-c) McKean Lanceolate points; (d-e) Mallory points; (f-j) Duncan/Hanna points; (f, g, h) are from the Medicine Lodge Creek site (Frison 1991: 85); (c, i, j) are from Dead Indian Creek site (Frison 1991: 99); (a, b, d, e) are from the Scoggin site (Frison 1991: 94).

The next projectile point from the McKean Complex is the McKean Lanceolate, which was named by Wheeler in 1952 (Frison 1991). Perhaps the best technical description of this point type was published by Green (1975), in which he identifies the following diagnostic features:

1. Bi-convex in cross- and long-section;
2. Excurvate to parallel ovate blades in plan view;
3. Collateral expanding flaking pattern with deep prominent bulbs and flake scars produced by the removal of broad expanding percussion flakes initiated at the lateral blade edges; 
4. The flake scars at right angles to the long axis of the point, extending to blade midline and terminating in a continuous dorsal ridge; 
5. Sinuous blade edges formed by a prominent negative bulb scars alternating from face to face; 
6. Edge retouch trims pronounced ridges to form a more even margin on finished specimens; and 

The last projectile point type related to the McKean Complex is the Mallory point type. Davis and Keyser describe this type as follows:

First, Mallory points have deep, narrow side-notches, sometimes expanding so that they are wider in the blade than at their mouth. The Mallory points' bases range from concave to deeply notched. Often, a concave base has an added notch. Second, unlike the McKean Lanceolate points from the site, the proximal blade on most Mallory points does not taper markedly toward the point base. In fact, four Mallory points in our sample exhibit nearly straight, parallel sides below the notches. Some specimens have expanding bases, indicating that the points were made on triangular-shaped bifaces (1999: 256).

The Mallory type is quite different from the McKean Lanceolate and Duncan-Hanna in morphological appearance. Davis and Keyser present an intriguing hypothesis as to why these three different point types occur in one cultural complex; they propose that the Duncan-Hanna points were used as atlatl dart tips, whereas the McKean Lanceolate and Mallory point types were used to tip thrusting spears or lances (1999).

It should be noted that not all McKean points exhibit the collateral expanding flake pattern. Lischka, et al., note that, "Both parallel oblique and collateral expanding flake patterns have been recognized on the McKean lanceolates from the Scoggin site" (1983: 172). Parallel oblique flaking on indented base lanceolate points is also a diagnostic characteristic of the Humboldt point types as well as the Pinto Basin variants. Likewise, it should also be noted that there are Humboldt and Pinto Basin points that exhibit collateral expanding flaking patterns. There is an undeniable similarity in these point forms—McKean Lanceolate, Humboldt and some Pinto Basin types—as well as similarities between other related forms such as Duncan-Hanna and Oshara Tradition, San Jose Phase. Could these technologies that range from the Rocky Mountains of southern Canada all the way to the American Southwest and throughout the Great Basin have derived in one area and defused out across this vast region? Gunnerson notes that,
... stemmed indented-base points might be a time marker in the western United States. In addition to points from the McKean site he [Lister 1953: 264-265] includes in this category such named types as Pinto points, Rio Grande points [Oshara San Jose], Pedernales Indented and Brazos River types and adds to their area of distribution California, Arizona, Utah, Montana, Nevada, Colorado, New Mexico, and Texas (1987: 32).

The main problem with the spatial distribution is the various dates involved. The cultures of the Southwest, primarily Pinto Basin, seem to date between 4,000-7,000 B. P., nearly 2,000 years earlier than the McKean materials in the north. It is quite possible that stemmed, indented-base points originated in the desert Southwest around 7,000 B. P. These point types may have been used primarily throughout the Southwest as well as the southern Great Basin for 1,500 years or more before possibly defusing to the north and east.

The McKean Complex has a number of radiocarbon dates from sites throughout the High Plains and Rocky Mountains. The type site for the McKean Complex, the McKean site, provided date of 4,600 B. P. Other sites and dates which have been identified for McKean Complex point types include:

- The Kolterman site, dated to between 3,600-4,200 B. P.,
- The Sorensen site, located along the Bighorn River in southern Montana, dated to 4,900 B. P.;
- The Granite Creek Rockshelter located in Shell Canyon, also in southern Montana, yielded a date of 4,700 B. P.;
- The Myers-Hindman site in southwestern Montana, dated to between 3,100-3,500 B. P.,
- Dead Indian Creek in northern Wyoming, dated to between 3,800-4,400 B. P.;
- Leigh Cave also in northern Wyoming, dated to 4,200 B. P.
- Three sites in the Bighorn Mountains, also in northern Wyoming: the Medicine Lodge Creek site which provided date of 4,000 B.P.; the Paint Rock V site, dated at 4,300 B. P. and Southsider Cave which yielded dates between 3,900-4,200 B. P.;
- The Scooggin site in central Wyoming, which provided date of 4,500 B. P.;
- The Gant site in western South Dakota, which provided a date of 4,100 B. P.;
- The Dipper Gap Site in northwestern Colorado, dated to between 3,200-3,500 B. P.; and

Other dates for the McKean Complex in northeastern Colorado came from:

- The Spring Gulch site (5LR288) which yielded radiocarbon dates between 3,700 ± 105 B. P. to 3,855± 350 B. P.;
- The Kinney Spring site (5LR144), which provided dates of 3,110 ± 130 B. P. to 3,950 ± 150 B. P.;
- The Phoebe Rockshelter (5LR161), which was dated to 3,570 ± 60 B. P. to 3,890 ± 60 B. P.;
- Lunch Cave (5LR288), which had a single date of 3,085 ± 60 B. P.; and
- The Lo Daiska site (5JF 142), which provided dates of 3,150 ± 200 B. P. to 3,400 ± 200 B. P.

And finally, Site (5WL 48) in northwestern Colorado yielded a date of 3,230 ± 80 B. P. (Tate 1999: 121-128). This impressive number of dates and sites associated with the McKean...
Complex allows us to solidly date this technology in the northern Rocky Mountain States to between 3,000 and 5,000 B. P. (Frison 1991, Tate 1999).

**Corner-Notched Projectile Points**

Corner-Notched projectile points are one of the more widespread lithic technologies of the Archaic Period, both spatially and chronologically. These Corner-Notched projectile points (see Figure 13) begin appearing in the archaeological record during the Paleo/Archaic interface, approximately 8,000 B. P. (Frison 1991). Throughout the High Plains, Rocky Mountain region, and eastern Great Basin, these Corner-Notched projectile point technologies occur throughout the Archaic time period (Frison 1991; Holmer 1986; and Benedict 1987).

![Figure 13: Archaic Corner-Notched projectile points: (a,b) are from the Wilber Thomas Shelter; (c) is from the La Daiska site; (d) is from the Magic Mountain site (Greiser 1985:87); (e,f) are Elko Corner-Notched points from Gatecliff Shelter (Thomas and Bierwirth 1983: 185-186).](image)

Unfortunately, throughout this vast expanse of time (2,000-8,000 B. P.) the technology involved in the production of these Corner-Notched projectile points varied little, limiting their diagnostic capabilities. Holmer tested Corner-Notched points from the eastern Great Basin to see if there were any morphologically diagnostic characteristics that could distinguish between the Early, Middle and Late Archaic technologies. He concluded, "No differences can be detected
that would aid in identifying to which fluorescents [period] the point is related" (1986: 102). The Corner-Notched point type is equally ambiguous on the Front Range, as noted by Benedict, "Holmer’s (1986) conclusion [above] ... seems to apply equally well to Corner-Notched dart points used during the Middle and Late Archaic Periods in the Colorado Front Range" (1987: 13). Reed and Metcalf noted yet another difficulty in identifying Corner-Notched point types, "Corner-Notched points show an even greater range of size and basal diversity than do Side-Notched points... Assigning a temporal range to a Corner-Notched, dart-sized hafted biface on the basis of typology is complicated because hafted knives most often appear to be of this style and occur outside the Archaic era (1999: 86). To further confound Reed’s and Metcalf’s classification, many sites produce Corner-Notched points with both ground and unground bases (Nelson 1981; Lyons 1994). Some of the older points having underground bases, are likely to be considered simply larger examples of later types. Zier also comments on the Corner-Notched classification problem, "Corner-Notched projectile points that bear discouraging similarities to certain Late Archaic types also occur in Early Archaic context" (1999: 105-106).

It has been fairly well established that the Corner-Notched projectile point technology offers very limited, if any, diagnostic attributes. The morphology of the Corner-Notched technology is described by Zier as, "They are most likely to exhibit relatively short, broad blades, convex blade edges, and deep corner notches with pronounced expanding stems. However, the full morphological range of Early Archaic corner-notched projectile points has not been described"... (1999: 105-106).

The Corner-Notched points have been assigned a plethora of names including:

- Fremont, Gatecliff series, Elko Corner-Notched, Elko Eared and Pelican Lake (Holmer 1986);
- the Oshara Tradition Enmedio Phase, Ironstone Phase of the Uncompahgre sequence (Hoefer 1999: 121);
- Basketmaker II, Oshara Tradition Armijo Phase, Cienega, and San Pedro (Huckell 1996);
- Magic Mountain Apex complex (Cassells 1997: 123); and
- the Mount Albion Complex (Benedict 1987: 13).

Undoubtedly there are names associated with this projectile point type that were missed in this research. Although not all-inclusive, this list should provide the reader with a good idea of where to look for more information on the Corner-Notched point type.
It has been generally accepted by the archaeological community that the Archaic Period projectile points differ from the Paleoindian projectile points in that (1) Archaic Period points show greater variability of form, and (2) the Archaic Period point forms were restricted to smaller areas across the landscape (Reed and Metcalf 1999). The literary research conducted for this study raises questions about both of these accepted conclusions. It appears that the reason for concluding that more variability was taking place within a small area may be the names given to Archaic projectile points. Different names are given to what is virtually the same projectile point technology. Granted, over distances of several hundred miles, slight variations may occur, but the overall form remains the same. An example of this is evidenced by the Gypsum Cave points, the Elko points and the Gatecliff Shelter Contracting-Stem points—points which represent virtually the same technology, and which occurred during the same time-span in the Great Basin—being given three separate and distinct names.

The Paleoindian Period in the region studied for this research identified 10-12 generally accepted groupings of point types as shown below:

<table>
<thead>
<tr>
<th>Paleoindian Point Types</th>
<th>Approximate Date Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clovis</td>
<td>11,000 -11,500 B.P.</td>
</tr>
<tr>
<td>Goshen/Plainview/Belen</td>
<td>10,500 -11,300 B.P.</td>
</tr>
<tr>
<td>Folsom/Midland</td>
<td>10,000 -10,500 B.P.</td>
</tr>
<tr>
<td>Agate Basin</td>
<td>10,000 - 10,250 B.P.</td>
</tr>
<tr>
<td>Great Basin Stemmed</td>
<td>7,550 - 10,700 B.P.</td>
</tr>
<tr>
<td>Hell Gap</td>
<td>9,500 - 10,000 B.P.</td>
</tr>
<tr>
<td>Alberta</td>
<td>9,000 - 9,500 B.P.</td>
</tr>
<tr>
<td>Cody Complex</td>
<td>8,000 - 9,000 B.P.</td>
</tr>
<tr>
<td>Foothills/Mountain Paleo Traditions</td>
<td>8,000 - 10,000 B.P.</td>
</tr>
</tbody>
</table>

(Frison 1991; Pitblado 1999).

While some of these general classifications have recognized sub-types, nearly all Paleoindian points can be placed with relative ease within one of these classifications.

By contrast, the Early and Middle Archaic had more than 30 distinct projectile point types, only a few of which have been readily grouped together (e.g. Oshara Tradition, Archaic Large Side-Notched Continuum). Some of these point types include:

- Oshara Tradition (Jay Phase) 8,000 - 10,000 B.P.
- Rio Grade Quemado Phase 8,000 - 10,000 B.P.
- Oshara Tradition (Bajada Phase) 6,000 - 8,000 B.P.
- Northern Side-Notched 6,000 - 8,000 B.P.
- Early Plains Archaic Side-Notched 5,500 - 8,000 B.P.
- Sudden Side-Notched 5,000 - 6,500 B.P.
Mountain Traditions 5,000 - 6,500 B.P.
Leaf-Shaped Points 4,500 - 7,000 B.P.
Pinto Basin Points 3,500 - 7,000 B.P.
Chiricahua Stage- Cochise Culture 3,500 - 5,500 B.P.
Albion Boardinghouse 2,500 - 5,700 B.P.
Oshara Tradition (San José Phase) 3,000 - 5,800 B.P.
San Rafael Side-Notched 3,000 - 5,500 B.P.
Gypsum Cave 3,500 - 5,000 B.P.
Elko Contracting-Stem 3,500 - 5,000 B.P.
Gatecliff Contracting-Stem 3,500 - 5,000 B.P.
Augustin 3,500 - 5,000 B.P.
McKean 3,000 - 5,000 B.P.
Elko Corner-Notched 2,000 - 8,000 B.P.
Gatecliff Corner-Notched 2,000 - 8,000 B.P.

This list is not all inclusive; many point type names have been left out that were previously listed in throughout Chapter Two. Unlike the Paleoindian point types which can be placed with relative ease within a limited number of classifications, it seems few Archaic researchers have thus-far attempted to group similar point types together by virtue of their morphological features or projectile point technology.

Current archaeological thought holds that the Paleoindian period was comprised of relatively stable technology and limited variability, and that the Archaic Period was more dynamic and had a greater variability of technology. Using the dates shown above, it appears many of the Paleoindian projectile point technologies were only utilized for periods of 500 to 1,000 years. By contrast, the Archaic Period point technologies were utilized for much longer periods of time—from 2,000 to 3,000 years. Could this mean that the Archaic lifeway was more stable than the Paleoindian lifeway? Or do these dates reflect inconsistencies in the amount of research devoted between the Paleoindian and Archaic Periods?

Having observed these inconsistencies between current archaeological thought and the material researched, it seems that some previous researchers may have done a disservice to archaeologists currently attempting to analyze projectile point technologies of the Archaic Period. For example, a Clovis point found from Maine to Washington state is still considered a Clovis; the same cannot be said of comparison of similar Archaic Period technology (Morrow and Morrow 1999). It seems each new location or area of study produces a new label for what may be virtually the same projectile point technology, even within a 200-mile (or smaller) radius. For example, Gypsum Cave, Elko Contracting Stem and Gatecliff Shelter Contracting Stem points are
all found in Nevada in relatively close proximity and represent virtually the same technology, but have been assigned different names. Through tediously researching the Early and Middle Archaic throughout the regions surrounding the San Luis Valley, it has become apparent that, in many cases, a single projectile point technology has been given numerous names.
Chapter 3: The San Luis Valley, Colorado

Location and Physiographic Setting of the San Luis Valley

The San Luis Valley is located in south central Colorado and extends southward into northern New Mexico (see Figure 14). The San Luis Valley is more than one hundred (100) miles long (north to south) and more than forty (40) miles wide at its widest area. The San Luis Valley is bordered by the Sangre de Cristo (Blood of Christ) mountain range to the east and by the San Juan mountain range to the west. The main drainage through the San Luis Valley is the upper Rio Grande River. The greater portion of the San Luis Valley lies within Colorado in five counties:

- Costilla county lies in the south east section of the valley;
- Conejos county is in the south central section of the valley;
- Alamosa county is in the central section of the valley;
- Rio Grande county is in the western edge of the valley; and
- Saguache county is in the northern part of the valley (Attheam 1996; National Atlas of the United States 2000).

The San Luis Valley was formed between the upthrusting of the Sangre de Cristo range and the volcanic San Juans. The Rio Grande River flows between these two ranges and has created a broad, flat basin. Attheam notes that, “other streams that feed into the Rio Grande include the Conejos and Alamosa rivers, along with numerous smaller tributary creeks. In addition to the natural watercourses, thousands of artesian wells provide water” (1996: 19).

Although the San Luis Valley is technically a desert, the artesian wells that flow throughout the area would have provided water even through the driest part of the Altithermal Period (Jodry 2000 personal communication). The water provided by these artesian wells created marshy areas as well the formation of ponds and lakes in this arid environment. The marshes and lakes undoubtedly supplied rich forage for animals of all types, as well as fertile areas for a variety of edible plant life. The people of the Early and Middle Archaic Periods appear to have found these lush areas productive for both hunting and gathering. The combination of the water resources in the Valley and the proximity of the mountains and foothills provided an excellent resource base in a relatively small geographic area.

The San Luis Valley is geographically located at a conjunction of different physiographic zones. The eastern part of the state of Colorado is dominated by Plains, while the central and western sections are predominantly Mountain/Foothill and Park, and the southern part of the state
Figure 14: Map showing the location of the San Luis Valley (SLV) in southern Colorado and its spatial relationship to the different physiographic zones: Great Basin, Plains, Rocky Mountain region and the Greater Southwest (National Atlas of the United States 2000).
contains areas that are desert- or near-desert-like. These different geographic areas—Plains, Mountain/Foothill, Park and Desert—all contain their own blend of terrain, climate, flora and fauna. The Archaic people inhabiting these environments had to adapt to different types of resource procurement strategies in order to survive in these areas; these various adaptive strategies led to the development of different technologies. Evidence of these distinctive technologies that were developed in these divergent areas can be found in the archaeological record (Irwin-Williams 1967; Black 1991; Husted 1991; Frison 1991; Frison 1998; Kay 1998; Metcalf and Black 1991; and Pitblado 1999). The San Luis Valley contains archaeological evidence, in the form of stone and bone tools, from all of the physiographic zones that surround it.

The average elevation of the valley is 7,800 feet above sea level. The Sangre de Cristo range contains a number of mountains in the 14,000+ foot above sea level range. The San Luis Valley was quite accessible to the Archaic people due to numerous passes in and out of the Valley. At Mosca Pass, the elevation is approximately 9,000 feet above sea level (FSL), a fairly easy trek through the Sangre de Cristos, and was most likely used in prehistoric times as an eastern route into the San Luis Valley. Poncha Pass in the far northern reaches of the valley is also at 9,000 (FSL) and a likely place prehistoric people would use to access the valley from the north. To the south, the Valley goes on into New Mexico with a broad, flat expanse offering the easiest route to and from the Valley to the south. There is another pass near San Francisco Peak in the southeastern part of the Valley (east of the town of present-day Manassa) that would allow access to the High Plains of southeastern Colorado (Athearn 1996; National Atlas of the United States 2000).

To the northwest of the San Luis Valley lies the Gunnison Basin, which was most likely used as a route over the Continental Divide on to the Great Basin. The Gunnison Basin is connected to the Rio Grande River Valley to the south by tributaries of the Gunnison River. In turn, the Rio Grande River Valley is connected to the San Juan Basin further to the south by other tributaries (Jodry 1999). Trails along these watercourses are still in use and have been used in historic times, and these same trails are believed to have been used by prehistoric peoples as well. Jodry states that,
The geographic position of the Rio Grande headwaters, nestled in a great southwestward arc of the Continental Divide, places a great deal of physiographic diversity within striking distance of highly mobile nomadic peoples. More than a dozen named trails currently connect the San Juan Basin with the upper Rio Grande via the tributaries of the Animas, Los Pinos, and Piedra Rivers (Jodry 1999:55).

The Rio Grande River Valley elevation is 8,500 to 9,000 (FSL) (National Atlas of the United States 2000). The occurrence of projectile points that are very similar to those in the Great Basin in the San Luis Valley lends credibility to the thought that these westward passes were used by Archaic people.

The San Luis Valley could best be described as a basin of sorts; it is nearly 30 miles across from east to west, and is about 80 miles from north to south. The Valley is surprisingly flat across this expanse with the tallest geographic feature being either the Great Sand Dunes (in the area of Mosca Pass), or the sand hills dispersed to the east of the Rio Grande River. The Valley is technically a desert with few inches of rainfall per year; yet, surprisingly, enough springs feed a number of wetland environments that are interspersed throughout the valley. This combination of environments in close proximity to the physiographic diversity creates a number of vegetation zones along the edges of the valley (Jodry 1999).

The foothills are covered with pinion pines and a number of small streams with fertile riparian zones. The wetlands are also covered with vegetation of various types. Elk, deer, bison and antelope used these wetland areas. In the Dune fields, these wetlands offered hunters a unique advantage of stealth in the sand, behind the Dunes, that would allow them to approach wild game that may have been feeding in the wetlands that were often within atlatl range from the Dunes. I experienced this personally in my fall 1999 visit to the San Luis Valley when out on the Dunes; my footfalls were so quiet that a herd of elk did not sense my presence until they came around the Dune and saw me.

With its geographic location within the southern Rocky Mountains, and the numerous passes providing access to it, the San Luis Valley is a natural corridor between the Great Basin and the Plains; this, as well as the rich ecological resource zones within the Valley would make it a very desirable place to the hunter-gatherers of the Early and Middle Archaic Periods.
The History of Archaeological Investigations in the San Luis Valley

The San Luis Valley has a limited history of archaeological investigations. The earliest archaeological surveys and excavations in this area began in the late 1930s and were carried out into the mid-1940s. Spero and Hoefer (1999: 31) list the early archeologist involved as "E. B. Renaud, Director of the University of Denver's archaeological survey of the High Plains area from 1930 to 1947..." and "C.T. Hurst, of the Western State College Museum in the Gunnison." The next archaeological investigations in the San Luis Valley were by the University of Colorado Museum, led by Joe Ben Wheat, in the 1950s. Honea (1969) researched the Rio Grande Complex in the Valley in the late 1960s and the Smithsonian Institution's Museum of Natural History began investigating the Paleoindian presence in the San Luis as early as 1974, and has continued to study the Valley during numerous field seasons since then. Drs. Dennis Stanford and Pegi Jodry have been overseeing the Smithsonian's research efforts in the Valley for the last 20 years. Most of the other archaeological work in the Valley has been done through Cultural Resource Management (CRM) surveys (Spero and Hoefer 1999).

The majority of archaeological investigations in the San Luis Valley have focused on the Paleoindian period. This is probably because the Valley has a high density of Paleoindian sites. Stanford, who has studied archaeology in the Valley since the 1970s, has claimed that, "The San Luis Valley has the richest concentrations of Paleoindian sites I have ever seen" (1997 personal communication). It is because of the abundance of Paleoindian material that most archeologists have overlooked the less-impressive Archaic material and concentrated on studying the older cultures and their associated technologies. As a result, the Archaic period in the Valley remains somewhat of a mystery. This problem has not gone unnoticed by Stanford, who has acknowledged that, "A serious study of the Archaic is needed in the San Luis. Some rockshelters in the area need to be excavated to provide both a good stratigraphic sequence and radiocarbon dates of these Archaic materials so we can better understand what was going on in the Valley during this time period" (1998 personal communication).
In the summer of 2000, Jodry conducted surveys and test excavations on The Nature Conservancy’s land [the Zapata and Medano ranch properties] just west of the Great Sand Dunes National Monument. The surveys located several house pits that are believed to be Archaic in age. Jodry has excavated one of these house pits located near Indian Springs. Unfortunately, no diagnostic artifacts were recovered, but there were enough burned wood fragments recovered to obtain a radiocarbon date. Unfortunately, the results of the analysis were not available as of the time of this writing (Jodry 2001 personal communication).

The Closed Basin Area of the San Luis Valley

The Closed Basin area of the San Luis Valley (see Figure 15) is situated in the northeastern section of the Valley. The water entering this area, in the form of intermittent streams and artesian springs, forms the San Luis Lakes and numerous marshes, but does not flow out of the Valley. This lacustrine environment in the Closed Basin area is rich in natural resources. Hoefer comments on the Closed Basin,

The environmental conditions of the Rio Grande Basin may have led to greater subsistence and settlement variability is commonly assumed for the Archaic. For example, subsistence and settlement in the Closed Basin probably vary greatly as the marshes and lakes were reduced to size or eliminated during dryer periods. Archaic adaptive strategies in lacustrine environments are probably quite different in terms of mobility, group size, foraging areas, and storage than in grassland or desert environments. Evidence from the Great Basin indicates that a lacustrine environment may support greater group size and corresponding reduction in residential mobility" (1999: 118).

Some consider the San Luis Valley generally and the Closed Basin area in particular to be the easternmost extension of the Great Basin lacustrine type environment (Jodry 1999 personal communication; and Stanford 1999 personal communication). Because the environment in the Closed Basin area was able to support larger groups with less residential mobility, the area is rich in archaeological sites dating from the Paleoindian period through the late Prehistoric. Judging from the privately-owned “arrowhead” collections studied in this research, the Closed Basin is equally rich in Early and Middle Archaic sites as well.
For nearly 100 years, local collectors have been going out onto the Closed Basin area and picking up artifacts. During this time, some of these collectors have assembled very impressive collections from this area. I have the great honor and fortune of knowing and befriending some of these collectors. They have allowed me access to their collections for the
purposes of researching and documenting them, and have explained where the artifacts were
found. These collectors, with their irreplaceable knowledge of archaeological sites in the Closed
Basin Area of the San Luis Valley, have been an invaluable resource in discerning what lithic
technologies are represented in these areas. Without the help of these people, we would only
have a limited view of the Early and Middle Archaic Periods.

Early and Middle Archaic in the Closed Basin Area of the San Luis Valley

Until now, archaeological researchers have concluded that the Early Archaic in the San
Luis Valley is represented by "Rio Grande points" (Honea 1969), and the Oshara Tradition's Jay
and Bajada Phases (Hoefer 1999). However, Hoefer does mention the Archaic Mountain
Tradition points associated with the Magic Mountain Complex, as well as Elko side-notched
projectile points (1999: 121, 122). My research shows that the Early Archaic in the Valley is
represented by the presence of lithic technologies other than just the Rio Grande and the Jay and
Bajada Phases of the Oshara Tradition. The Rio Grande and Jay points represent the oldest of
the Early Archaic manifestations in the San Luis Valley, beginning as early as 8,200 B. P., but
they were not alone. The Plains Early Archaic side-notched projectile points, although very rare,
have been found in the Valley to the north; this technology dates back to nearly 8,000 B. P. Further,
projectile points belonging to the Large Side-Notched continuum from the Colorado
Plateau have been found to be fairly common; these points, such as the Northern Side-Notched,
date back to at least 7,900 years B. P. The people represented by the Rio Grande and Jay Phase
projectile point technologies may have been the first Early Archaic occupants of the San Luis
Valley, but within a few hundred years, other groups had moved into the Valley from the Plains as
well as from the western Colorado Plateau. At this point, we can only speculate as to why these
groups moved into the Valley; possibly small groups seeking more productive environments, or
the movement of these peoples could have been caused by drastic environmental factors such as
the Altithermal Period's effects [drought] on the surrounding regions.
The Study Areas of This Research

The majority of the artifacts studied in this research were from the Closed Basin area; most of them were found just west of the Great Sand Dunes National Monument (GSDNM) on the Zapata and Medano ranches. These ranches are located on the sand sheet that extends west of the GSDNM approximately ten (10) miles. This sand sheet is comprised of aeolian sediments deposited by the strong west/southwest winds that are prevalent in the spring. The area is dotted with parabolic dunes, artesian springs and playas (dried lakes). The rest of the artifacts studied this research came from Washington Springs, a large peat bog that is approximately seven (7) miles east of the town of Alamosa, Colorado, and only about two (2) miles south of the southern boundary of the Closed Basin area. This peat bog covers approximately a square mile, although areas have been covered with sand and are currently buried.

There are several reasons I wanted to include this peat bog in my study area. The first reason is that this area is environmentally very similar to the Closed Basin area. The second reason is that this peat bog is one of the most heavily collected areas in the San Luis Valley; all of the collections studied for this research had a number of Archaic projectile points from this area. Unfortunately, however, this area has been collected so thoroughly that it is no longer very productive. My final reason for including the Washington Springs area is that most of the points recovered from the peat bog are complete and have been preserved in near-perfect condition by the peat. In order to avoid confusion, the study area will simply be referred to as the “Closed Basin” area because the artifacts researched in this study came from the Closed Basin area.

Methodology

Having lived in Alamosa, Colorado, in the mid-1980s, I made contact with some old acquaintances who still live in the San Luis Valley in order to inform them of my proposed research and to request access to their collections. I also contacted the Great Sand Dunes National Monument east of Mosca, Colorado. Arrangements were made for lodging at the Dunes, and I was introduced to Fred Bunch, the head of the Heritage Program at the Monument. Fred graciously granted me access to the archaeological collection at the Monument. I had also made arrangements in advance with Nancy Werner of The Nature Conservancy, who provided me with
permission and access to the Zapata and Medano ranch properties in order to obtain GPS data for some of the Archaic site locations.

When I arrived in the Valley, I contacted my acquaintances, many of whom have been living in the Valley and collecting artifacts for decades. It was through these friends that I developed my initial interest in archaeology and the San Luis Valley; without their willingness to allow me to record and analyze the Archaic points in their collections, the meaningful data obtained would not have been available to me.

I decided to contact these local collectors, "avocational archaeologists," for several reasons. First, I personally know and trust these people. Second, these people and their collections represent twenty to thirty years worth of survey activity in the Closed Basin area of the San Luis Valley—an invaluable resource of acquired knowledge. Third, these collectors can generally remember if the point came from certain areas within the Closed Basin area; for example, Mishak Lakes area, near the town of Saguache, the Zapata ranch, the Medano ranch, or "The Pits" (Washington Springs). Although provenience information this imprecise has limited usefulness, it is the most specific locality information currently available in the San Luis Valley. The Museum at the Adams State College library has some donated collections, but the provenience in generally vague, at best (for example, "this collection came from the San Luis Valley"), and the individual who collected the artifacts is most often deceased, so no additional information or details can be obtained. The avocational archaeologists in the Valley can provide better provenience for their artifacts than is available in most of the collections that have been donated to the local museums.

The local avocational archaeologists who allowed me access to their collections represent a cross-section of the population in the San Luis Valley. One of these avocationals is a prominent businessman in Alamosa, Colorado, who is known and respected in the community. The second avocational is retired and now devotes his time to researching and writing about the history of the San Luis Valley, as well as being an active member of the Colorado Archaeological Society. The third person is a rancher who owns a business that does heavy equipment work. The fourth avocational is my brother, who collected artifacts from the San Luis Valley throughout
the 1980s when he lived in the Valley. Of all of these avocationals, only one is still collecting. Most are getting to the point in their lives where they truly wish to share their knowledge and passion for archaeology and the history of the San Luis Valley; they are accepting the fact that they are mortal and do not want their acquired knowledge of the Valley’s archaeology to die with them. Having known all but one of these individuals for nearly 20 years (or more), I trust their sincerity and credibility when they share their knowledge of the Valley. The only one of these avocationals I have known for only a few years was recommended to me by Dr. Pegi Jodry who had met him and reviewed his Paleoindian collection (personal communication 1999).

While at the Clovis and Beyond conference in the fall of 1999, I had discussed my proposed research with Drs. Dennis Stanford and Pegi Jodry of the National Museum of Natural History at the Smithsonian. I had worked with them in the past, and have shown them a number of Paleoindian sites in the San Luis Valley over the past few years. They have been studying the Paleoindian period in the Valley for a number of years. Dr Stanford had actually suggested the need for a comprehensive study of the Archaic Period in the San Luis Valley as a possible topic for this thesis in the spring of 1999. Dr. Jodry supplied me with information on the lithic types and their sources around the San Luis Valley; she also provided me with forms for recording artifact data in the hope that by recording the same type of data on the Archaic projectile points as she had done for the Paleoindian projectile points in the area, the two works collectively would provide a continuum of similar, meaningful data and provide some continuity in the analysis of the early prehistory data of the area.

It has been proposed that through studying the technological attributes of projectile points, one can discern whether the group who utilized that point type was a forager or a gatherer based on Binford’s (1980) hunter-gatherer settlement systems and land use strategies, and the analysis of the economic correlations to technology by Bleed (1986) and Bousman (1994). Pitblado has listed a number of projectile point attributes which she believes signify whether the people who used a particular technology were either foragers or collectors. Following is a copy of those technical attribute lists:
Foraging Systems: Technological Correlates  Collector Systems: Technological Correlates

| Lighter/smaller                       | Heavier/bigger                        |
| Low craftsmanship                    | High craftsmanship                    |
| Reworked in haft                      | Discarded; not repaired               |
| Any raw material                     | Tough raw material                    |
| Less energy investment                | More energy investment                |
| Informal technology, e.g., flake blank, irregular flaking | Formal technology, e.g., bifacial blank, formal [flake scar] patterning |
| Expedient repair                     | Discarded; not repaired               |
| Fewer broken points                  | More broken points                    |
| Extensive reworking                  | Less rework                           |
| High stem: length ratio              | Low stem: length ratio                |
| Low investment in haft element       | High investment in haft element       |
| No-light [basal] grinding             | Heavy [basal] grinding                |
| Less standardization                 | Standardization                       |

Table 1: Foraging-vs-Collector Technological Correlates (Pitblado 1999:100, Table 3.3).

Pitblado notes that:

These technological correlates are based on the premise that: (a) “Collectors gear up in sessions specifically designed for the production and maintenance of tools [whereas] foragers are more likely to have reliable, maintainable points that can be easily brought to a functional state after minor breakage” (Pitblado 1999:97-98); and (b) “collectors, fearing failure, replace points prior to exhaustion with specimens in better condition [whereas] foragers...utilize points that are time minimizers and use tools to the point of exhaustion” (Pitblado 1999:98-99).

As to whether these traits that were used to analyze the late Paleoindian technologies in the Colorado Plateau, Great Basin, Great Basin Mountains and the Southern Rocky Mountains are applicable to the Early and Middle Archaic Periods in the same areas is untested. The use of technological correlates to determine land use strategies could become a much more complicated issue when considering the use of harder lithic materials (e.g., basalt and quartzite) over lithic materials such as obsidian and chert. Obsidian is quite easy to flintknap, but quartzite and basalt, being both harder and grainier, are more difficult to control in flintknapping. Foragers using obsidian may produce finer projectile points than gatherers using the harder basalt or quartzite materials (Prentiss 2001 personal communications). I will only use these guidelines to interpret the point types from the Closed Basin which have sample sizes of 15 or more complete points. I have chosen the benchmark of 15 points somewhat arbitrarily; the sample sizes for the other point types in the study were simply too small to draw any reasonable or meaningful conclusions using Pitblado’s technical correlates of land use strategies.
The sample size for the different projectile point types that were statistically analyzed using a t-Test are as follows:

The Humboldt type, San Luis Lanceolate t-Test sample sizes in each attribute measurement are:

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<tr>
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<th></th>
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<tbody>
<tr>
<td>Length</td>
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<tr>
<td>Width</td>
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<td>8</td>
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<tr>
<td>Basal Concavity Depth</td>
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<td>7</td>
<td>-</td>
</tr>
</tbody>
</table>

The San Jose, Pinto Basin t-Test sample sizes in each attribute measurement are:

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</thead>
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<tr>
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<td>6</td>
</tr>
<tr>
<td>Thickness</td>
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<td>6</td>
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<tr>
<td>Basal Concavity Depth</td>
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<td>9</td>
<td>6</td>
</tr>
</tbody>
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The Contracting Stem points from the Closed Basin area, Gatecliff (Thomas and Bierwith 1983), and Elko (Thomas and Bettinger 1976) t-Test sample size in each attribute measurement are:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Closed Basin</th>
<th>Gatecliff</th>
<th>Elko</th>
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<td>Length</td>
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<td>9</td>
<td>-</td>
</tr>
<tr>
<td>Width</td>
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<tr>
<td>Thickness</td>
<td>18</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 2.1: Sample sizes used in metric study.

The sample size for the different projectile point types used in this research are listed below.

<table>
<thead>
<tr>
<th>Projectile Point Type</th>
<th>Complete Specimens</th>
<th>Incomplete Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jay Phase</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>Bajada Phase</td>
<td>18</td>
<td>55</td>
</tr>
<tr>
<td>Northern Side-Notched</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Sudden Side-Notched</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>San Luis Lanceolates</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>San Jose Phase</td>
<td>23</td>
<td>154</td>
</tr>
<tr>
<td>Contracting Stem</td>
<td>19</td>
<td>50</td>
</tr>
<tr>
<td>Leaf-Shaped</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2.2: Sample sizes used in metric study.

Complete specimens can be defined as projectile points that are complete or near-complete, e.g., missing a tip or corner of base. Measurements involving an incomplete attribute, such as length of a point with a broken tip, were excluded from the statistical analysis portion of this paper, and only complete attribute measurements are used.

Incomplete specimens are basal sections of projectile points that retain enough diagnostic characteristic to identify the projectile point type. The only information used in this study from the incomplete specimens is the type of lithic material they were made from; this data is included with lithic type data to compute Figures 18 and 23.
The measurements in this study were all taken with digital calipers. Measurements were recorded to .01 mm increments. The measurement data used for the analysis sections of this study are shown in Figure 16:

Figure 16: Morphological attributes of projectile points measured in this study:
(a) Length = Maximum length of projectile point from tip to base;
(b) Width = Maximum width of projectile at the widest point;
(c) Width of Base = Taken at the bottom of the stem or base;
(d) Length of Base = Measured either basal grinding (when present) or to the top of the notch on the Side-Notched specimens;
(e) Blade Length = Calculated by subtracting the base length from the maximum length; and
(f) Axial Length = Measurement from deepest portion of basal concavity to the tip of the point along the point's axis;
(g) Basal Concavity Depth = The axial measurement was subtracted from the maximum length and the resulting sum = the basal concavity depth; and
(h) Thickness = Maximum thickness of projectile point at the thickest part.

It should be noted that no radiocarbon dates have been obtained from the Closed Basin area or the San Luis Valley in general. Accordingly, I have provided radiocarbon dates from areas surrounding the San Luis Valley which are associated with the different diagnostic points that are studied in this research. Any dates suggested in this study need to be confirmed through radiocarbon dating of the diagnostic projectile points recovered in context at future excavations.
Chapter 4: San Luis Valley Artifacts and Analysis

Early Archaic Point Types Found in the San Luis Valley

Oshara Tradition (Jay Phase) Points Found in the Closed Basin

The Oshara Tradition (Jay Phase) points were found in a number of collections from the Closed Basin area of the San Luis Valley (Figure 17). The Jay points are thought to date to between approximately 7,500-10,000 B.P., but it should be noted that they have not been dated in the San Luis Valley. Unfortunately, most of the specimens were so badly broken that little, if any, usable metric data could be obtained from them; within the sample size of 31 Jay points, only two of these points were complete enough to be measured for this study. With a sample size this small, statistical analysis would be pointless.

The flintknappers who created the Jay points in the Closed Basin area clearly favored San Antonio basalt (Figure 18), using this material in the production of 64.5% of the specimens studied. San Antonio Mountain is in the San Luis Valley near the Colorado/New Mexico border. A number of prehistoric basalt quarrying sites have been located on its slopes (Spero and Hoefer 1999:188). Chert was the next most commonly used lithic material, with 19.4% of the sample made from it; 12% of the Jay points were made from quartzites and only 3.2% were crafted from rhyolites. These rhyolites were probably from prehistoric quarries the Pole Mountain area near the headwaters of the Rio Grande River (Spero and Hoefer 1999:188). This study shows that the high percentage (64.5%) use of San Antonio basalt indicates that Jay Phase flintknappers may have like this stone type because of its hardness and durability; or possibly its proximity—San Antonio Mountain is located approximately 40 miles south/southwest of the Closed Basin area.

The Jay points from the Closed Basin area typically exhibit random/unpatterned finishing flakes, and heavily ground stems.
Figure 17: Oshara Tradition, Jay Phase/Rio Grande Quemado Phase projectile points found in the San Luis Valley; (a) Kess-R033, (b) Kess-R086, (c) KD17, (d) Kess-R032, (e) Kess-R034, (f) GRSA 213.
Lithic Types Used by the Early Archaic Inhabitants of the San Luis Valley

- Oshara, Jay
- Oshara, Bajada
- Northern Side Notched
- Sudden Side Notched

Lithic Types: (1) Basalt; (2) Obsidian; (3) Rhyolite; (4) Quartzite; (5) Chert
The Oshara Tradition (Bajada Phase) Points Found in the Closed Basin

The Oshara Tradition (Bajada Phase) projectile points seem to be more common than the points belonging to the earlier Jay Phase. These Bajada points are thought to date to between 5,300-6,800 B.P. and could be much older, but the Bajada points have not been dated in the San Luis Valley. Most of the collections reviewed in this research contained specimens of Bajada points; as a result, data on 55 points were recorded. Of these 55 specimens, there were only 18 that were complete enough to use their measurements for the statistical portion of this study (Figures 19.1 through 19.3). The flintknappers who made the Bajada points found in the Closed Basin area preferred basalt in the manufacture of their points (Figure 18); 65.4% of the specimens were made from San Antonio Mountain basalt. Cherts from unidentified sources comprised 20% of the sample, followed by 5.45% in both obsidian and rhyolite. The obsidian in two of these examples is believed to be traceable to the Polaverda source in northern New Mexico. The rhyolite is believed to be from the Pole Mountain area. The 65% use of basalt for the Bajada points compares closely to the 64.5% basalt use in the Jay Phase points. This high preference for basalt continued in the Closed Basin area throughout the Early Archaic in the Oshara Tradition.

Like the earlier Jay Phase points, the Bajada flintknappers used random/unpatterned flaking to finish most of their projectile points, although a few examples exhibit collateral expanding flaking. A number of these points seem to have been expediently fashioned from large flakes as evidenced by one or both sides of the point exhibiting a large, unfinished flake surface (see Figure 19.1 a, b and e; also Figure 19.3 a-c). All of the specimens reviewed for this study exhibited basal grinding.
Figure 19.1 Oshara Tradition, Bajada Phase Projectile Points from the Closed Basin area of the San Luis Valley: (a) GRSA 513; (b) BH21; (c) SD1; (d) SD9; (e) Kess-R034; and (f) GRSA 213.
Figure 19.2: Oshara Tradition, Bahada Phase Projectile Points from the Closed Basin area of the San Luis Valley; (a) CB1; (b) BH17; (c) BH7; (d) BH19; (e) CB2; NS (F) SD31.
Figure 19.3: Oshara Tradition, Bajada Phase Projectile Points from the Closed Basin of the San Luis Valley: (a) GRSA 103; (b) BH20; (c) BH1; (d) Kess-R066; (e) CB2; (f) SD2. Note (e,f) match well with the San Jose points illustrated by Irwin-Williams (1979) and may not belong to the Bajada Phase.
Data from the Bajada points found in the Closed Basin area was statistically summarized and produced the following information:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>42.24 mm</td>
<td>1.73</td>
</tr>
<tr>
<td>Width</td>
<td>22.85 mm</td>
<td>.73</td>
</tr>
<tr>
<td>Thickness</td>
<td>7.78 mm</td>
<td>.31</td>
</tr>
<tr>
<td>Length of Base</td>
<td>16.66 mm</td>
<td>.83</td>
</tr>
<tr>
<td>Length of Tip</td>
<td>22.37 mm</td>
<td>1.71</td>
</tr>
<tr>
<td>Base Width</td>
<td>17.92 mm</td>
<td>.33</td>
</tr>
<tr>
<td>Basal Concavity Depth</td>
<td>2.21 mm</td>
<td>.23</td>
</tr>
</tbody>
</table>

Table 3: Bajada point data.

The Oshara Traditions seemed to remain very consistent throughout the Early Archaic in the Closed Basin area. The lithic types utilized, as well as the flaking patterns and basal grinding, remained the same. The one major change was the reduction in size of the Bajada points from the larger Jay Phase points. This may have been a result of the post-Pleistocene reduction in the size of the bison as witnessed on the Plains (Frison 1991). This conclusion presupposes that bison were a sought-after food source in the San Luis Valley.

Another noticeable change is the basal concavity of the Bajada point; some Jay Phase points exhibit slight basal concavities, though generally not as pronounced as on the Bajada points. This signifies a change in hafting technologies between the Jay and Bajada phases.

The Bajada Phase projectile points have attributes from both of Pitblado's technological correlates categories listed in the Methodology section of this paper. The Bajada Phase points from the Closed Basin area have the Collector System: Technological Correlates of tough raw material, high investment in haft element, heavy grinding and standardization width (M=17.92 mm with s=.33). The Bajada Phase points also show characteristics of the Foraging System: Technological Correlates of low craftsmanship, flake blank, irregular flaking and expedient repair. Using Pitblado's (1999) outline, these technological correlates of land use strategies may suggest that the Closed Basin Bajada point-using people should be placed at a midway point on the Forager-Collector continuum.

Northern Side-Notched Points Found in the Closed Basin

The Northern Side-Notched points are the oldest of the Archaic large side-notched continuum found on the Colorado Plateau and in the eastern Great Basin. These Northern Side-Notched projectile points are not as common in the Closed Basin area as the Oshara Tradition's
Bajada Phase; however, they seem to occur with greater frequency than the Jay Phase point types. The Northern Side-Notched points date to between 7,000 and 8,000 B.P. on the Colorado Plateau. Until now, it was thought that the Oshara Tradition’s Jay and Bajada Phase populations inhabited the San Luis Valley and that, apart from some of the Early Archaic Mountain Traditions, they dominated the Valley (Hoefer 1999). There has been no information published on the Early Archaic in the San Luis Valley that mentions the Northern Side-Notched, or any of the other large Archaic side-notched types; although Charles (1995) mentions some of these types coming from the San Juan Mountains and the San Juan Basin to the west of the San Luis Valley. This study has identified 19 Northern Side-Notched points from the Closed Basin area, although only six (6) of them were complete enough to measure for statistical analysis (Figures 20.1 and 20.2).

The flintknappers who fashioned the Northern Side-Notched projectile points favored chert (Figure 18), using it on 68.4% of the points in this study. The source of this chert is unknown at this time. Quartzite, probably from the Morrison Formation, was used on 15.8% of the specimens. San Antonio basalt was only used on 10.5% of the artifacts studied, followed by a 5.3% use of rhyolite, probably from the Pole Mountain quarries.

The flaking pattern on these Northern Side-Notched points is generally a collateral expanding pattern, and the bases are typically unground on these specimens.
Figure 20.1: Large Side-Notched Projectile Points from the Closed Basin of the San Luis Valley: (a, b) Sudden Side-Notched; (c, d) unknown (San Luis Side-Notched); (e, g, l, j) Northern Side-Notched; (f, h) Sudden Side-Notched; (a) BH16; (b) BH15; (c) NC6; (d) SD19; (e) BH3; (f) SD34; (g) GRSA79; (h) SD108; (i) SD107; (j) SD109.
Figure 20.2: Large Side-Notched Projectile Points from the Closed Basin of the San Luis Valley: (a,b) unknown (San Luis Side-Notched); (c) possibly a large Northern Side-Notched; (d) either a San Rafael or a Mallory point; (a) CB9; (b) SD109" (c) BH9; (d) SD18.

Data from the Northern Side-Notched points from the Closed Basin area was analyzed and produced the following data:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tbody>
<tr>
<td>Length</td>
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</tr>
<tr>
<td>Width</td>
<td>21.87 mm</td>
<td>1.02</td>
</tr>
<tr>
<td>Thickness</td>
<td>5.59 mm</td>
<td>.10</td>
</tr>
<tr>
<td>Length of Base</td>
<td>12.85 mm</td>
<td>.89</td>
</tr>
<tr>
<td>Length of Tip</td>
<td>20.06 mm</td>
<td>3.79</td>
</tr>
<tr>
<td>Base Width</td>
<td>22.22 mm</td>
<td>.87</td>
</tr>
<tr>
<td>Basal Concavity Depth</td>
<td>2.30 mm</td>
<td>.78</td>
</tr>
</tbody>
</table>

Table 4: Northern Side-Notch data.
Sudden Side-Notched Points Found in the Closed Basin

The Sudden Side-Notched points occur chronologically after the Northern Side-Notched type in the Archaic large side-notched continuum (Figure 20.2 f and h). These Sudden Side-Notched point types are not as common as the Oshara Tradition Bajada Phase types in the Closed Basin area. This study has identified 12 Sudden Side-Notched points from the Closed Basin area. The Sudden Side-Notched points date to approximately 4,000 to 7,000 B.P. No known published studies mention Sudden Side-Notched in the San Luis Valley; although they were mentioned by Charles (1995) in her work in the San Juan National Forest. The Sudden Side-Notched point’s occurrence from 4,000 to 7,000 B.P. means they were very likely in the Closed Basin area during the same time period as the Bajada Phase.

The flintknappers who crafted the Sudden Side-Notched projectile points in the Closed Basin favored basalt (Figure 18); 41.7% of these points were made from San Antonio basalt. Various cherts, source unknown, made up 33.3% of the sample size, and 25% of the sample size was made of obsidian, most likely from the Polaverda source. There were no examples of this point type made from either quartzite or rhyolite in the samples analyzed for this study.

The flaking pattern on the Sudden Side-Notched point types from the Closed Basin area appear to be somewhat of a cross between random/unpatterned and collateral expanding; the bases are typically unground.

Data from the Sudden Side-Notched points from the Closed Basin area was analyzed and produced the following summaries:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>43.59 mm</td>
<td>2.88</td>
</tr>
<tr>
<td>Width</td>
<td>26.66 mm</td>
<td>1.51</td>
</tr>
<tr>
<td>Thickness</td>
<td>5.10 mm</td>
<td>.21</td>
</tr>
<tr>
<td>Length of Base</td>
<td>21.16 mm</td>
<td>1.34</td>
</tr>
<tr>
<td>Length of Tip</td>
<td>22.43 mm</td>
<td>3.64</td>
</tr>
<tr>
<td>Base Width</td>
<td>26.16 mm</td>
<td>1.93</td>
</tr>
<tr>
<td>Basal Concavity Depth</td>
<td>1.85 mm</td>
<td>.24</td>
</tr>
</tbody>
</table>

Table 5: Sudden Side-Notched data.
Anomalous Side-Notched Projectile Points Found in the Closed Basin

There were two unusual projectile points that most likely fit somewhere into the Early Archaic large side-notched continuum (Figure 20.2 c and d). As shown in Figure 20.1, this point type somewhat resembles some of the Paleoindian variations like the Plainview (in outline only) with the notches half way up the point. Broken specimens with high side notches were also noted in a few of the collections reviewed for this study; however, no reference to this point type could be found in any of the publications reviewed in this research. Bruce Huckell, of the University of New Mexico (personal communication 2000), thought these high side-notched variants were Sudden Side-Notched, but none were illustrated with anywhere near this high of a side-notch. Until more information can be recovered on this point type in the San Luis Valley, I tentatively place this point within the Early Archaic Side-Notched continuum and suggest that this variation is substantial enough to warrant consideration as a named projectile point type, subject to further study. For the purpose of this study, this point type will be referred to the San Luis Side-Notched projectile point type until additional quantitative research substantiates its classification with a previously-identified projectile point type.

Early Archaic Mountain Tradition Points from the Closed Basin Area

The Early Archaic Mountain Tradition Points are rare in the collections observed in this study. These Early Archaic Mountain Tradition point types are (1) either so rare in the San Luis Valley that this study only identified three points, or (2) the collectors did not identify this technology with the Early Archaic and did not show me any.

Only three (3) or possibly four (4) possible specimens were recorded (Figure 21); with so few specimens, no statistical analysis was undertaken on these points. The illustrations were included in this study to verify that Early Archaic Mountain Tradition technologies are present in the Closed Basin Area. More specimens of these Mountain Tradition point types will need to be measured and studied before any meaningful statistical studies can be accomplished. Future studies will be needed in the San Luis Valley to establish whether these Mountain Tradition point types are common there or not.
Summary of Early Archaic Point Types Found in the San Luis Valley

The earliest Archaic inhabitants of the Closed Basin area of the San Luis Valley seem, at present, to belong to the Jay and Bajada Phases of the Oshara Tradition; however, other groups may have used the Closed Basin during this time as well. It is unknown whether this use was seasonal or year-round. The Northern Side-Notched points recovered from the Closed Basin area indicate that influences from the eastern Great Basin/Colorado Plateau moved into the area at some point in time between 7,000-8,000 B.P.

Presently, it is unclear if there was any interaction between the people utilizing these two technologies. The analysis of lithic materials shows that the Jay and Bajada Phase flintknappers used primarily basalt (65%); whereas, their Northern Side-Notched counterparts generally used chert (68.4%) (Figure 18). As shown by the graph, the lithic use of these two groups is very different; this drastic difference in lithic resource utilization could mean (a) Northern Side-Notched groups were just moving into the Valley during this period and were unfamiliar with the lithic resources 40 miles to the south/southwest; (b) these two groups were competing with the Jay
Phase people, who were in the Valley originally, for resources and therefore not interacting or trading lithic material; or (c) they had different cultural preferences in material.

The Archaic people who used the Sudden Side-Notched technology during the Early Archaic side-notched continuum implemented a change in their use of lithic materials. Their use of cherts dropped to 33.3%, nearly half the amount utilized by their predecessors who used the Northern Side-Notched technology. The Sudden Side-Notched flintknappers were now using 41.7% San Antonio basalt, the material favored by their contemporaries in the Closed Basin, the Bajada Phase people. This could indicate that after a great deal of time, the Sudden Side-Notched flintknappers’ preference of raw material shifted and/or their resource procurement rounds shifted and took them towards the south, and to the San Antonio Mountain basalt sources. An alternative hypothesis is that perhaps trade or interaction of some sort between the Bajada people took place.

The Middle Archaic in the Closed Basin Area

Gypsum Cave/Contracting Stem Points Found in the Closed Basin

The Contracting Stem type projectile points found in the Closed Basin area of the San Luis Valley closely resemble the Gypsum Cave point types first described by Harrington (1933), the Elko Contracting Stem type points (Thomas and Bettinger 1983), and the Gatecliff Contracting Stem type points (Thomas and Bierwirth 1985; Figures 22.1 and 22.2). Contracting Stem-style points have been radiocarbon dated elsewhere to approximately 3,600-4,700 B. P. The Closed Basin examples of these Contracting Stem type points have a mean length of M=35.21 mm, a mean width of M=21.89 mm, and a mean thickness of M=5.3 mm.
Figure 22.1: Contracting Stem Types found in the Closed Basin of the San Luis Valley: (a-c) Park Points, (d-m) Gypsum Cave point types; (i-m) are all from the same blowout. (a) BH11; (b) BH13; (c) BH12; (d) Kess-R115, (e) KD27; (f) GRSA84; (g) SD41; (h) SD40; (l) SD26; (j) KD9; (k) SD27; (l) SD28; (m) SD29.
The Middle Archaic flintknappers who fashioned and utilized this Contracting Stem projectile point technology in the Closed Basin area clearly preferred using basalt; 50% of the points analyzed in this study were made of basalt (Figure 23). The basalt used to make these Contracting Stem points most likely came from quarries on San Antonio Mountain, located in the San Luis Valley near the Colorado/New Mexico border (Spero and Hoefer 1999: 188). The second choice of these knappers was Morrison quartzite (quarry site unknown), since 28% of the Contracting Stem points were quartzite. The quartzites used vary in texture from coarse to very fine-grained. The third most common lithic material used was chert, from various unknown sources; 18% of these points were made from chert. Finally, only four percent (4%) of these points were made of rhyolites. The rhyolites used may have come from the Pole Mountain

Figure 22.2: Contracting Stem Types found in the Closed Basin area of the San Luis Valley: (a) SD102; (b) SD103; (c) SD106; (d) SD101; (e) SD104; (f) SD105.
Lithic Types Used by Middle Archaic Inhabitants of the San Luis Valley

Figure 22: Lithic types used by the Middle Archaic inhabitants of the Closed Basin area.
area near the headwaters of the Rio Grande River, where prehistoric quarries have been noted (Spero and Hoefer 1999: 189). No Contracting Stem obsidian points were noted.

The flaking patterns exhibited on the Contracting Stem point specimens from the Closed Basin area reviewed in this study seem to range from collateral expanding to random (unpatterned), and a lack of basal grinding (smoothing of the basal edges) on all specimens. The flaking patterns on the Gypsum Cave, Elko, and Gatecliff Contracting Stem points ranges from collateral expanding to random.

Metric data for Contracting Stem points from the Closed Basin area show similarities and differences to the specimens from the Great Basin. The data collected for this study was statistically compared with data from the Gatecliff Contracting Stem-type points from the Gatecliff Shelter in Monitor Valley, Nevada (Thomas and Bierwirth 1983: 209); and from Elko Contracting Stem types from the Upper Reese River Valley in Central Nevada (Thomas and Bettinger 1976: 339-344). The data was analyzed using the t-Test: two-sample assuming unequal variances. Due to the small sample size, (Closed Basin 19 specimens, Gatecliff Contracting Stem 9 specimens, and Elko Contracting Stem 9 specimens) a critical value of P was set at (.10). Three measurements were analyzed: length, width, and thickness.

The first analysis compared the Contracting Stem points from the Closed Basin and Gatecliff shelter. The mean length of the Closed Basin samples is $M=35.21$ mm and Gatecliff samples is $M=43.34$ mm. The P two-tail in this comparison =.05. The P value .05 fairly clearly shows two separate populations.

Comparing widths of the Contracting Stem points produced a mean width of $M=21.89$ mm for the Closed Basin specimens and $M=22.00$ mm for the Gatecliff samples. The P value of .95 shows that the widths of these two point groups should be considered to be from the same population.

Comparing thicknesses of the Contracting Stem points produced a mean of $M=5.3$ mm for the Closed Basin specimens and $M=5.04$ the Gatecliff samples. The P value of .37 indicates that, in thickness, these two point groups are from the same population.
The second analysis compared the Contracting Stem points from the Closed Basin and the Elko Contracting Stem types. Unfortunately, no complete specimens were recorded in the Reese River article, so only widths and thicknesses will be analyzed in this study.

Comparing the widths of these Contracting Stem points produced a mean of $M=21.89$ mm for the Closed Basin specimens and $M=24.12$ mm for the Elko samples. The $P$ value of .16 which indicates that, in width, these two point groups are likely to be from the same population.

Comparing the thicknesses of the Elko and Closed Basin Contracting Stem point groups produced a mean of $M=5.31$ mm for the Closed Basin samples and $M=5.04$ mm for the Elko specimens. The $P$ value of .37 shows that, in thickness, these two groups could be considered to be from the same population.

This analysis shows that the Contracting Stem points found in the Closed Basin area of the San Luis Valley are very similar to the Gatecliff and Elko Contracting Stem points from the Great Basin. The major difference is in the statistical comparison of length; however, this could be attributed to the fact that the Closed Basin sample contained more points that appeared to have been reworked than the Great Basin sample. Pitblado has noted that during the late Paleoindian period, "In the Rockies, 63% of points show a single episode of reworking, 30% exhibit no reworking at all, and 7% show intensive reworking. In the Great Basin, a much lower 41% of specimens exhibit evidence for one reworking episode, but a greater 35% show no reworking, and 24% multiple reworking" (Pitblado 1999:431-432). Pitblado (1999: 433) believes this can be interpreted as:

The greater intensity of rework in the Great Basin, Great Basin Mountains and the Colorado Plateau vis-à-vis, similarly (and again like differences in complete:broken point Ratios), indicates the operation of forager strategies in the three Far Western regions And a collector strategy in the Southern Rocky Mountains [during the Paleoindian Period.]

It seems reasonable that this reworking pattern could have continued on into the Archaic Period. Potentially bolstering this argument is the fact that of the 24 Gatecliff Contracting Stem points illustrated by Thomas and Bierwirth (1983: 192), 25% of this sample appeared to be broken but could have been reworked; likewise, of the 16 Elko Contracting Stem points illustrated by Thomas and Bettinger (1976: 299), 18.75% were broken but could have been reworked. Unfortunately, no
percentages on broken but reworkable points can be accurately calculated for the Closed Basin sample.

The evidence from the statistical analysis as well as other arguments concerning these three Contracting Stem point groups—the Elko, Gatecliff and Closed Basin examples—suggests that they represent the same lithic technology. When considering the spatial and temporal distributions of these Contracting Stem types, it seems very probable that this technology diffused into the San Luis Valley from the Great Basin.

The Contracting Stem projectile points from the Closed Basin area have attributes which seem to place these points in Pitblado’s (1999) Foraging System: Technological Correlates category. These attributes include:

- Lighter and smaller
- Less energy investment
- Flake blank
- Irregular to patterned flaking
- Expedient repair
- Low investment in haft element
- No basal grinding
- Less standardization

Using Pitblado's (1999) outline, these technological correlates of land use strategies may suggest that the group of Middle Archaic people who utilized this Contracting Stem projectile point technology used a foraging land use strategy.

**Humboldt/San Luis Lanceolate Points**

The lanceolate, concave based points from the Closed Basin area of the San Luis Valley, will be referred to as San Luis Lanceolates in the rest of this study, (Figure 24). The San Luis Lanceolates were statistically compared to Humboldt type points from two the sites in the Great Basin; the Silent Snake Springs site in Humboldt County, Nevada (Layton and Thomas 1979) and the Falcon Hill, Winnemucca Lake area in Washoe County, Nevada (Hattori 1982). The Humboldt point types have been radiocarbon dated to between 3,000-5,000 B. P. (Holmer 1986; and Jennings 1973), or older, 5,000-6,000 B. P. (Holmer 1986). Perhaps future investigations will be able to narrow this time frame.
Figure 24: San Luis Lanceolates found in the Closed Basin area of the San Luis Valley. These points have a mean length of $M=38.92$ mm, a mean width of $M=19.78$ mm, a mean thickness of $M=7.0$ mm, and a mean the basal concavity depth of $M=2.17$ mm; (a) SD 36; (b) CB 12; (c) CB 11; (d) SD 35; (f) SD 38; (g) SD 37; (h) BH 80; (i) BH 81.
The San Luis Lanceolate have a mean length of $M=38.86\, \text{mm}$, a mean width of $M=19.49\, \text{mm}$, a mean thickness of $M=6.62\, \text{mm}$, and a mean basal concavity depth of $M=2.17\, \text{mm}$. The flaking pattern on the San Luis Lanceolate varies from collateral expanding to parallel oblique and the points typically exhibit basal grinding.

The flintknappers who fashioned the San Luis Lanceolates preferred quartzites, using this material in 43.75% of the sample points from the Closed Basin area (Figure 23). San Antonio basalt was used in the production of 25% of the sample, followed by 18.75% made up of miscellaneous cherts. Rhyolite, probably from the Pole Mountain area, was only used in 12.5% of the sample. It should be noted as significant that no obsidian San Luis Lanceolates, whole or broken, were seen any of the collections reviewed in this study. In the Great Basin, however, obsidian was used in approximately 50% of the Humboldt type points reported by Hattori (1982), and by Layton and Thomas (1979).

The data compiled for this research on the San Luis Lanceolate type points was compared with published data on the Humboldt type points using a t-Test: two-sample assuming unequal variances. Due to the small sample size, (San Luis 13 specimens, Layton and Thomas 7 specimens and Hattori 13 specimens), a critical value of $P$ was set at .10.

The first analysis compared the San Luis Lanceolates to the Humboldt Types from Silent Snake Springs. The mean length of the San Luis specimens are $M=38.86\, \text{mm}$ and the Humboldt types are $M=42.71\, \text{mm}$. The $P$ value of .48 shows that these two groups clearly overlap into the same population in length.

In comparing widths, the San Luis Lanceolates produced a mean of $M=19.49\, \text{mm}$, and $M=16.29\, \text{mm}$ for the Humboldt types. The $P$ value of .01 shows the two groups again very clearly are not representative of the same population.

Comparing thicknesses, the San Luis Lanceolates produced a mean of $M=6.62\, \text{mm}$, and $M=4.93\, \text{mm}$ for the Humboldt Types. The $P$ value of .001 shows that in thickness, these two point types clearly represent two separate populations.

The second analysis compared the San Luis Lanceolates with the Humboldt Types from Falcon Hill and Winnemucca Lake (Hattori 1982). Comparisons of the lengths produced a mean
for the San Luis Lanceolates of $M=38.86$ mm and $M=51.32$ mm for the Humboldt types. The $P$ value of $.001$ shows that in length, these two point types clearly represent two separate populations.

In comparing widths the San Luis lanceolates produced a mean of $M=19.49$ mm and $M=18.41$ mm for the Humboldt Types. The $P$ value of $.52$ indicates these two groups are from the same population with regard to width.

Comparing the thicknesses produced a mean for the San Luis Lanceolates of $M=6.62$ mm and $M=6.54$ mm for the Humboldt types. The $P$ value of $.92>.10$ critical value, so in regards to thickness these two point groups are from the same population.

The last analysis dealt with comparison of the basal concavity depths between the San Luis Lanceolate and the Silent Snake Springs Humboldt Types. This comparison provided a mean for the San Luis lanceolates of $M=2.17$ mm and $M=3.11$ mm for the Humboldt Types. The $P$ value of $.16$ indicates that it is likely that these two groups represent the same population in basal concavity depth.

The first analysis above shows that the San Luis Lanceolates are similar to the Humboldt types from Silent Snake Springs in length and basal concavity depth, yet differ substantially in width and thickness; which might be explained as simply a regional variation of these points. The contrast in thickness also could reflect differences in lithic material types utilized in these two areas. The San Luis lanceolate flintknappers preferred quartzite (43.75%) and basalt (25%); the Silent Snake Springs knappers, on the other hand, used obsidian in nearly half (43%) of their Humboldt Type points. Obsidian is a much easier stone to flintknap than either quartzite or basalt (Pitblado 1999) and, in the hands of skilled in knapper, it would be easy to create thinner points. Another possibility may be that the San Luis Valley knappers had preference for a thicker, more robust projectile point. Thicker, more robust points would reduce the chance of breakage and, most likely, the severity of the break if it should occur, leaving a large enough section to rework or retool. However, It is equally likely that the San Luis Lanceolate points are specimens of a Foothill/Mountain Paleoindian technology. The San Luis Lanceolate points closely match Pitblado’s description of Foothill/Mountain Paleoindian points found in alpine settings; robust,
thick, lanceolate points often made of quartzites or other hard lithic materials (Pitblado 1999). Another hypothesis is that they belong to an Early Archaic technology related to the projectile point types found at the Fourth of July site (Cassells 1997).

The second analysis above demonstrates that the San Luis Lanceolates are similar to the Humboldt Types from the Falcon Hill and Winnemucca Lake areas in width and thickness yet differ substantially in length. This could simply be the result of regional variation of this point type or reflect reworking and rejuvenation of the San Luis Valley specimens used in this study. Considering Pitblado’s findings that approximately 65-70% of the late Paleoindian period points in both the Rockies and the Great Basin show some level of reworking (Pitblado 1999: 431-432), it seems reasonable that this reworking pattern could have continued on into the Archaic Period.

The flaking pattern on the San Luis Lanceolate varies from collateral expanding to parallel oblique. The Humboldt Type points from the Great Basin typically exhibit a parallel oblique flaking pattern; however, some use of the collateral expanding flaking pattern was identified there as well. This variation in flaking pattern could possibly be an indicator of different resource procurement strategies between the two areas (San Luis Valley and Great Basin).

**The Oshara Tradition (San Jose Phase) Projectile Points in the San Luis Valley**

The expanding stemmed, indented base points found in the Closed Basin area, as well as throughout the San Luis Valley (Figures 25.1, 25.2, and 25.3), have been referred to as the Oshara Tradition (San Jose Phase) types. The expanding stemmed, indented base points will be referred to as San Jose points throughout the rest of this study simply for ease of name recognition. The San Jose points are believed to date to between 3,000-5,800 B. P.; however, judging from the illustrations published by Irwin-Williams (1973), the expanding stemmed, indented base points found throughout the San Luis Valley may represent some other lithic technology. The San Jose points from the San Luis Valley reviewed for this study actually look more like the McKean technology to the north than they resemble the San Jose technology illustrated by Irwin-Williams (1973: Figure 4; Figure 9 of this paper), although Irwin-Williams’ illustrated points might represent early San Jose and the expanding stem, indented base points possibly occurred later in the San Jose continuum. With the 3,000-5,800 B.P. date span for the
San Jose Phase, it seems reasonable to assume that some slight variations within the technology would occur.

Figure 25.1: Oshara Tradition San Jose Phase projectile points found in the Closed Basin area of the San Luis Valley. The mean length of the Closed Basin San Jose points is $M=45.13$ mm; the mean width is $M=19.85$ mm; the mean thickness is $M=5.91$ mm; and basal concavity depth is $M=2.28$ mm. (a) CB 8; (b) GRSA 101; (c) GRSA 83; (d) KD 26; (e) SD 3; (f) SD 13; (g) CB 6; (h) SD 4; (i) SD 11; (j) BH 5; (k) CB 7; (l) KD 21.
Figure 25.2: Oshara Tradition San Jose Phase projectile points found in the Closed Basin area of the San Luis Valley.
(a) SD 12; (b) Kess-R053; (c) Kess-R040; (d) SD 17; (e) KD 11; (f) KD 7; (g) BH 14; (h) BH 4; (i) BH 2; (j) GRSA 38; (k) GRSA 37.
Figure 25.3: Oshara Tradition San José Phase projectile points found in the Closed Basin area of the San Luis Valley.
(a) GRSA 13; (b) SD 6; (c) SD 8; (d) SD 7; (e) SD 16; (f) KD 25; (g) SD 5; (h) GRSA 17; (i) SD 14; (j) KD 20; (k) KD 22; (l) CB 5; (m) SD 15; (n) SD 39; (o) KD 19; (p) CB 4.
The San Jose flintknappers who fashioned these points in the Closed Basin area of the San Luis Valley preferred basalt, using this material in 43.1% of the points observed in this study (Figure 23). The basalt source for these points was probably the San Antonio Mountain quarries. Other lithic material types used by the San Jose knappers were quartzites, which comprised 23.9% of the sample; most of these were made from Morrison quartzites, although it is uncertain where this material was quarried. Various cherts from unknown sources make up 20% of the sample. Rhyolites, believed to be from the Pole Mountain quarries, represent 6.9% of the sample, and finally, obsidian is represented by only 4.6% of the points observed for this study.

The San Jose flintknappers generally finished their points with random/unpatterned flake removal, although a few specimens show collateral expanding or parallel oblique flaking patterns (Figures 25.1, 25.2, and 25.3). The bases on the San Jose point type typically exhibit basal grinding; however, there are a few exceptions to this.

Local collectors in the San Luis Valley have been calling these points Pinto Basin points, or Pinto points, as well as San Jose points. Although no data has been published on length, width, or thickness for the San Jose points, there have been data published on measurements of the Pinto points. The data on the Pinto point types came from two sources: Thomas and Bettinger (1976:288-294) provide data on Pinto points from the Upper Reese River Valley in Nevada; and Layton and Thomas (1979:258,259) published data on Pinto points from Silent Snake Springs in Nevada.

The first analysis of the San Jose points from the Closed Basin area will compare these points to the Pinto points from Silent Snake Springs. The sample sizes were small, with only 23 San Jose points, and only six Pinto points. Since the sample size is so small, a critical value of .10 will be used in this analysis.

Comparison of the lengths of the San Jose types produced and mean of \( M=37.08 \) mm, and \( M=45.13 \) mm for the Pinto types. The \( P \) value of .11 is not significant enough to imply that the lengths of these two point types belong to the same population.
A comparison of the widths of the San Jose types produced a mean of M=19.85 mm, and M=20.77 mm for the Pinto types. The P value of .51 suggests that with regard to width, these two point types are likely to belong to the same population.

Comparison of the thickness of the San Jose types produced a mean of M=5.91 mm, and M=6.65 mm for the Pinto types. The P value of .19 implies both point types are from the same population with regard to thickness.

Comparison of the basal concavity depths of the San Jose types produced in mean of M=2.28 mm, and M=4.22 mm for the Pinto types. The P value of .07 suggests that these two point types are separate populations regarding basal concavity depth.

The second analysis compares the San Jose points from the Closed Basin area with data from Pinto points from the Upper Reese River Valley in Central Nevada. Again, the sample sizes were small, with 23 San Jose points and only nine Pinto points from Thomas and Bettinger (1976), so the critical value was set at .10.

In the comparison of lengths, the San Jose types produced in mean of M=37.08 mm, and a mean of M=41.35 mm for the Pinto types. The P value of .25 suggests that these point types belong with the same population in the length category.

Comparison of the widths of the San Jose types produced a mean of M=19.85 mm, and a mean of M=25.49 mm for the Pinto types. The P value of 3.82 shows that, with regard to width, these two point types belong in the same population.

The comparison of the thicknesses of the San Jose types produced a mean of M=5.19 mm, and M=5.19 mm for the Pinto types. The P value of .03 suggests that as far as thickness is concerned, these two point types represent two separate populations.

Comparisons of the basal concavity depth of the San Jose types produced a mean of M=2.28 mm, and 4.42 mm for the Pinto types. The P value of .07 suggests that in regard to basal concavity depth, these two point types are not a part of the same population.

The P values of the San Jose and Pinto Basin projectile points show a relationship between the two types in length and width. However, with regard to thickness, the San Jose points exhibited a P value relationship to the Silent Snake Springs Pinto Basin points, but no
relation to the Reese River Valley specimens. In the category of basal concavity depth, the San Jose and Pinto Basin types did not compare closely, a P value of .07 in both tests seems to indicate a difference in hafting technology between the San Jose and Pinto Basin types. This difference in basal concavity depth could possibly be a regional variation between these two projectile point types (Morrow and Morrow 1999). The rounded ears on the San Jose points from the San Luis Valley visually compare nicely with the Pinto Basin points. However, it can not be ruled out that the basal concavity depth P values between the San Jose and Pinto Basin points could be indicating that these two point types represent different lithic technologies.

In the course of this research, 154 San Jose projectile points were studied; most were broken, but still provided useful information on what lithic types were used. The flintknappers who fashioned the San Jose projectile points in the Closed Basin area of the San Luis Valley seemed to favor San Antonio basalt, which was used in 44.8% of the sample. Quartzites were used in 25.3% of the sample. These were probably Morrison quartzites, but the variations of texture and color within these quartzites makes positive identification difficult. Chert from unknown sources comprised 14.9% of the sample. Rhyolite, probably from the Pole Mountain source, made up 7.8% of the sample, and finally, only 5.8% of the sample was made from obsidian. The source of this material is believed to be near the Grants, New Mexico area.

With 70.1% of the sample being comprised of hard, durable lithic materials such as the basalt and quartzite, it is fairly clear that the San Jose flintknappers preferred these robust lithic types in the construction of their projectile points. The flaking pattern on the San Jose projectile points from the Closed Basin area ranges from random/unpatterned to the occasional collateral expanding, and as a general rule, this point type will exhibit basal grinding.

The Oshara Tradition (San Jose Phase) projectile points from the Closed Basin area have attributes which seem to place these points in Pitblado’s (1999) Foraging System: Technological Correlates category. These attributes include:

- Lighter and smaller
- Low craftsmanship
- Reworked in haft
- Less energy investment
- Flake blank
- Irregular to patterned flaking
Expedient repair
Extensive reworking on some specimens

Using Pitblado’s (1999) outline, these technological correlates of land use strategies may suggest that the group of Middle Archaic people who utilized the San Jose Phase projectile point technology used a foraging land use strategy.

Leaf-Shaped Points Found in the Closed Basin Area

A few Leaf-shaped points were noted in the collections from the Closed Basin area of San Luis Valley that were reviewed for this study (Figure 26). Very little information is published about the Leaf-shaped points in the archaeological literature of the Colorado area; the only mention found in this research places the Leaf-shaped points in the Pinto Basin Complex (Campbell and Campbell 1935; Amsden 1935; Rogers 1939; and Holmer 1986). If this Leaf-shaped point technology is, in fact, related to the Pinto Basin point types, these Closed Basin examples would represent the first solid evidence of Pinto Basin technology in the San Luis Valley.

There is no consistent flaking pattern for the Leaf-shaped points from the Closed Basin area; the flaking ranges from unpatterned to collateral-expanding to parallel-oblique. None of the specimens exhibited basal grinding. It would be premature at this time to make any speculations on the cultural implications of these flaking patterns with a sample size comprised of only five projectile points.

The flintknappers responsible for fashioning these Leaf-shaped points preferred using basalt; 80% of the sample points from the Closed Basin area were made from San Antonio basalt. The remaining 20% were made from Morrison quartzites. Again, the sample size is too small to make a meaningful analysis as to what this lithic preference means, other than that the Middle Archaic people who utilized this Leaf-shaped projectile point technology in the Closed Basin area showed a strong preference for the harder, more robust basalts and quartzites over other lithic types.

The statistical analysis on the data from these Leaf-shaped points only examined three attributes—length, width and thickness. It is difficult to determine technological attributes such as
base and blade length and base width on these Leaf-shaped points due to the fact that the bases are unground; it is not really possible to tell where the base ends and blade starts.

<table>
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<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
<td>Width</td>
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<td>1.04 mm</td>
</tr>
<tr>
<td>Thickness</td>
<td>5.77 mm</td>
<td>.52 mm</td>
</tr>
</tbody>
</table>

Table 6: Leaf-shaped point data.

Until future excavations recover Leaf-shaped points in the San Luis Valley in some datable context, it can only be speculated that they date to about the same time period (between 4,000-5,000 B.P.) as the Pinto Basin points that they resemble.

Figure 26: Leaf-shaped points from the Closed Basin area of the San Luis Valley, (a) SD 110; (b) SD 111; (c) SD 112; (d) CB 10; (e) BH 10.
Summary of the Middle Archaic Point Types Found in the San Luis Valley

The Contracting Stem points found in the Closed Basin area are statistically very similar to both the Elko and Gatecliff Contracting Stem types from the Great Basin. The Middle Archaic people who utilized the Contracting Stem projectile point technology showed a preference for basalt and quartzite; it is possible that they chose these material types because the source sites were close and accessible. However, an argument against this would be that there are a number of close chert sources—why not use those? The answer to this could be that the flintknappers preferred the harder, more robust basalts and quartzites.

The Oshara Tradition (San Jose Phase) projectile point technology generally compared favorably with the Pinto Basin points in most attributes, but not in the basal concavity depth. This variation in basal concavity depth signifies a difference in the hafting technique, a critical diagnostic attribute. This stylistic change shows that even if these two point types are related, the Middle Archaic people of the Great Basin were hafting their points differently.

Irwin-Williams made reference to Contracting Stem points belonging to the late San Jose Phase (1979). But with the Contracting Stem technology most likely coming from the Great Basin area and the San Jose Phase point types presumed to evolve from the Oshara Tradition’s Bajada Phase point type in the Upper Rio Grande area, at what time did they make such a drastic change in technologies? A more reasonable conclusion would seem to be that the San Jose and Contracting Stem point types represent very different technologies.

The Oshara Tradition (San Jose Phase) flintknappers appear to have used lithic resources very similar to those used by their contemporary counterparts who used the Contracting Stem projectile point technology in the Closed Basin area (see Figure 23). Does this mean these two point types represent two separate populations of people who both seem to have utilized the same lithic resources and, judging from their proximity, likely used many other common resources in the area? Did these two groups use the Closed Basin area at the same time of the year or during different seasons? It is likely that there was some interaction between the San Jose Phase people and those who used the Contracting Stem technology, but at this
time so little is known of the Closed Basin's Middle Archaic populations that it would be premature to speculate. More work is needed, in the form of excavations, to better clarify what interactions took place between the San Jose Phase and Contracting Stem groups in the Closed Basin area.

San Luis Lanceolate points are statistically similar to the Humboldt Types in the Great Basin; however, it would be premature at this point to suppose that the Humboldt-type technology is represented in the San Luis Valley. No dates have been recovered on the San Luis Lanceolate point types in the Closed Basin area, so until these points are obtained from a datable context, it is unknown whether these two point types even date to the same period.

The flintknappers of the San Luis Lanceolate points seemed to prefer quartzite over other lithic materials (see Figure 23). This contrasts with the other Middle Archaic groups in the Valley who preferred basalts. Did the group of people represented by the San Luis Lanceolate point technology prefer to live at higher altitudes, in the alpine/sub-alpine areas? Pitblado (1999) correlated the higher percentage of quartzite with Mountain Traditions. If the San Luis Lanceolates represent a Middle Archaic Mountain Tradition, it is open to speculation as to how—or if—they interacted with the Middle Archaic populations who favored the flat basin area of the San Luis Valley.
Chapter 5: Conclusion

It has generally been accepted that during the Archaic Period, the landscape filled up with various hunter-gatherer populations, creating smaller boundaries for the Archaic-Period groups, smaller seasonal rounds and limited freedom of movement around the landscape (Reed and Metcalf 1999; Hoefer 1999). This is believed to have created smaller groups of Archaic people across the landscape which developed their own projectile point technologies. The basis for this conclusion was the seemingly vast number of projectile point types identified for the Archaic Period, spawning the belief that there was a wider degree of variation among point types in the Early and Middle Archaic than was seen during the previous Paleoindian period.

I submit that a more likely explanation is that the same technology has been assigned multiple names over time. During the Paleoindian time period, which is generally accepted to extend from 8,000 to approximately 12,000 B.P., the projectile point styles are believed to have last between 500 and 1,000 years; whereas, in the Early and Middle Archaic Periods, which lasted from approximately 3,000 to 8,000 B.P., some point technologies have a utilization span of 1,000 up to 3,000 years. Previous researchers may have done a disservice to archaeologists currently attempting to analyze projectile point technologies of the Archaic Period. Whereas with the Paleoindian Period, regional variation in Clovis projectile point technology is subsumed under a single name, the same cannot be said of comparison of similar Archaic Period technology (Morrow and Morrow 1999). It seems that each new location or area of study produces a new label for what may be virtually the same projectile point technology, even within a 200-mile (or smaller) radius. For example, the Elko Contracting Stem and Gatecliff Shelter Contracting Stem points both found in Nevada in relatively close proximity represent virtually the same technology, but different names have been assigned to the projectile points.

The earliest Archaic inhabitants of the Closed Basin area of the San Luis Valley seem, at present, to belong to the Jay and Bajada Phases of the Oshara Tradition; however, other groups used the Closed Basin during this time as well. The Northern Side-Notched points recovered from the Closed Basin area indicate that influences from the eastern Great Basin/Colorado
Plateau moved into the area at some point in time between 7,000-8,000 B.P. Presently, it is unclear if there was any interaction between these two groups.

The analysis of lithic materials shows that the Jay and Bajada Phase flintknappers used primarily basalt (65%); whereas, their Northern Side-Notched counterparts generally used chert (68.4%). The lithic use of these two groups is drastically different, which could be interpreted in a number of ways: (a) the Northern Side-Notched groups were competing with the Jay and Bajada Phase people for resources and therefore not interacting or trading lithic material; (b) they had different cultural preferences in lithic material; or (c) these two groups inhabited the Valley at different times and may not have had any interaction at all. It is unknown if the people who utilized Oshara Tradition projectile point technologies had equal access to the different types of flake-able lithic materials. Why did these people prefer basalt and quartzite over chert? Was it because basalt and quartzite were harder materials or because they were more accessible?

The Archaic people who used the Sudden Side-Notched technology during the Early Archaic side-notched continuum implemented a change in their use of lithic materials. Their use of cherts dwindled to nearly half the amount utilized by their predecessors. The Sudden Side-Notched flintknappers were now using 41.7% San Antonio basalt; this material was also favored by the people who used Bajada points in the Closed Basin area. This lithic resource change could indicate that, (a) the preference of raw material shifted; (b) their resource procurement rounds shifted and took them towards the south to the San Antonio Mountain basalt sources; or (c) possibly some sort of trade or interaction with the Bajada point using people took place.

The Oshara Tradition (San Jose Phase) projectile point technology generally compared closely with the Pinto Basin points in most attributes, but not in the basal concavity depth. This variation in basal concavity depth signifies a difference in the hafting technique, a critical diagnostic attribute. This stylistic change shows that even if these two point types are related, the Middle Archaic people of the Great Basin were hafting their points somewhat differently.

The Middle Archaic Contracting Stem points found in the Closed Basin area are statistically very similar to both the Elko and Gatecliff Contracting Stem types from the Great Basin. The Middle Archaic people who utilized the Contracting Stem projectile point technology
showed a preference for basalt and quartzite. It is possible the Contracting Stem flintknappers chose these material types because the source sites were close and accessible, or they preferred the harder, more robust basalts and quartzites.

Irwin-Williams made reference to Contracting Stem points belonging to the late San Jose Phase (1979), but the Contracting Stem technology most likely came from the Great Basin area and the San Jose Phase point types are presumed to have evolved from the Oshara Tradition's Bajada Phase point type in the Upper Rio Grande area. A reasonable conclusion would be that the San Jose and Contracting Stem point types represent different technologies.

The Oshara Tradition (San Jose Phase) flintknappers appear to have utilized lithic resources very similar to those used by their contemporary counterparts who used the Contracting Stem projectile point technology in the Closed Basin area. Does this mean that these two point types represent two separate populations of people who both seem to have utilized the same lithic resources and, judging from their proximity, likely used many other common resources in the area? Did these two groups use the Closed Basin area at the same time of the year or during different seasons? It is likely that there was some interaction between the San Jose Phase people and those who used the Contracting Stem technology, but at this time so little is known of the Closed Basin's Middle Archaic populations that it would be premature to speculate. More work is needed, in the form of excavations, to better clarify what interactions took place between the San Jose Phase and Contracting Stem groups in the Closed Basin area.

San Luis Lanceolate points are statistically similar to the Humboldt Types in the Great Basin; however, it would be premature at this point to suppose that the Humboldt-type technology is represented in the San Luis Valley. Until these San Luis Lanceolate points are excavated in a datable context, it is unknown whether they even date to the same period as the Humboldt Types. It is quite possible that either the San Luis Lanceolate points evolved from the earlier Foothill/Mountain Tradition, or are related to the Fourth of July point types.

The flintknappers of the San Luis Lanceolate points seemed to prefer quartzite to other lithic materials. This contrasts with the other Middle Archaic groups in the Valley who favored basalts. The San Luis Lanceolates could represent a Middle Archaic Mountain Tradition; Pitblado
(1999) demonstrates that the Paleoindians who spent much of the time in alpine/sub-alpine often preferred quartzite for their projectile points because of its durability.

The author hopes that this study will benefit future Archaic Period scholars by providing quantitative diagnostic criteria (point measurements, scale drawings, illustrations of both complete and reworked artifacts) to use in the analysis of Early and Middle Archaic Period projectile points in the San Luis Valley and surrounding areas. The main goal of this thesis was to identify what Early and Middle Archaic projectile point technologies are represented in the Closed Basin of the San Luis Valley. Now that this has been done, the way is open for future archaeological work to make more meaningful inferences on Archaic people in this area. By taking this more comprehensive look at what was going on during the Early and Middle Archaic Periods, it is hoped that this work will encourage other Archaic Period researchers to look outside their specific areas of interest and attempt a more holistic comparison of technologies from surrounding regions to make a more meaningful contribution to the collective body of knowledge concerning the Archaic Period in the Southwest.
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