



Taylor & Francis
Taylor & Francis Group

plains
ANTHROPOLOGIST

Getting the Point: Metal Weapons in Plains Rock Art

Author(s): James D. Keyser and David A. Kaiser

Source: *Plains Anthropologist*, May 2010, Vol. 55, No. 214 (May 2010), pp. 111-132

Published by: Taylor & Francis, Ltd. on behalf of the Plains Anthropological Society

Stable URL: <https://www.jstor.org/stable/25746017>

REFERENCES

Linked references are available on JSTOR for this article:

https://www.jstor.org/stable/25746017?seq=1&cid=pdf-reference#references_tab_contents

You may need to log in to JSTOR to access the linked references.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



JSTOR

Taylor & Francis, Ltd. and Plains Anthropological Society are collaborating with JSTOR to digitize, preserve and extend access to *Plains Anthropologist*

Getting the Point: Metal Weapons in Plains Rock Art

James D. Keyser and David A. Kaiser

Metal projectile points were the earliest non-native made weapons to enter the Plains and would likely have caused significant changes in Protohistoric period warfare. Despite this there has been little effort to identify and study these artifacts in Plains rock art, even though it is almost our only archaeological record of warfare from this period. Recent research at Bear Gulch and Atherton Canyon, located in central Montana, has identified a number of metal projectile points used by shield bearing warriors. Described and discussed along with about 30 other examples from rock art sites across the region, these points provide significant insight into the introduction and earliest use of metal tools on the Plains.

Keywords: *projectile points, rock art, Protohistoric period*

The portrayal of metal weapons such as guns, tomahawks, and swords in Plains rock art compositions (Figure 1) is one of the best indicators available to archaeologists for assigning pictographs and petroglyphs an Historic period age (Keyser 2001:120–123; Keyser and Klassen 2001:20–22). Often such drawings can be reliably dated to relatively restricted periods, based on specific identification of the items depicted and the development of fine-scale chronologies that trace the introduction and spread of these weapons. Thus, spontoon tomahawks, found illustrated at several Plains sites (Conner 1984:132; Keyser 2006:65; Keyser and Cowdrey 2008:28), must date from the period between about A.D. 1750 and 1875, based on the historically known timing of the introduction and popularization of this weapon throughout the region (Taylor 2001:27–29). Likewise, swords, some types of knives, and various types of guns are equally indicative of specific dates (e.g., Bates et al. 2003:100).

Until recently, however, metal lance and arrow points—the earliest non-native weapons to

enter the Plains—have been little studied and even less discussed in Plains rock art research. But these items, when they can be confidently identified, offer a significant advantage to rock art archaeologists who wish to identify imagery of the Protohistoric period—the transition between stone age prehistoric culture and the direct contact period when European and American traders, explorers, and missionaries lived and worked among the Plains Indians.

Recent research with images from the key northwestern Plains sites of Writing-On-Stone (Keyser and Klassen 2001; Klassen 1995), Bear Gulch, and Atherton Canyon (Keyser 2006, 2008a; Poetschat and Keyser 2009; Poetschat et al. 2008) enables us to identify some of these early metal projectile points with reasonable certainty and thus provides the first glimpses of Plains Indian warriors' own illustrations of the trade goods that ultimately changed their way of life forever.

PROJECTILE POINTS

Projectile points are not commonly illustrated in any northern Plains rock art prior to the

James D. Keyser, US Forest Service (retired), 1815 SW DeWitt, Portland, Oregon 97239 jkeyser@fs.fed.us

David A. Kaiser, Oregon Archaeological Society, albion2000@netzero.net

Plains Anthropologist, Vol. 55, No. 214, pp. 111–132, 2010

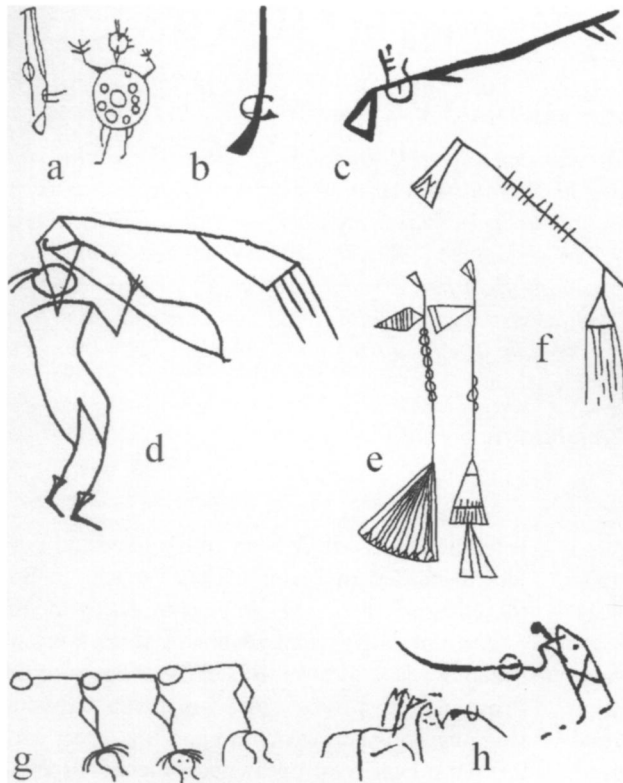


Figure 1. Metal artifacts in northwestern Plains rock art. a-c, h, guns; d-g, tomahawks (note spontoon tomahawks in d, e [left] and g [three]); h, sword, probably cavalry saber.

Ceremonial and Biographic traditions that span the three centuries from the late 1500s to the late 1800s (Keyser and Klassen 2001:45, 190–256).¹ For northern Plains artists who drew before approximately A.D. 1500, attention to small details of costume and weaponry is almost always understated, and with the exception of corner-notched stone projectile points worn or carried by several large Dinwoody tradition spirit beings (Francis and Loendorf 2002:93, 119; Keyser and Klassen 2001:9, 111, 117), detailed depictions of any weapons—and especially projectile points—are nearly absent (Keyser and Klassen 2001).² Instead, when infrequently shown, bows are simple arcs, arrows and spears lack defined points (Francis and Loendorf 2002:117; Keyser 2004:88), and atlatls and darts are so simple that they are barely recognizable (Sundstrom 1990:119). Only the few Dinwoody projectile points are shown in detail,

and these are carried or worn by large “Water Ghost” figures that apparently represent “ghost arrows” that were thought to derive from the spirit world and to cause disease (Francis and Loendorf 2002:115–116).

The relative absence of detailed material culture items changes radically with the florescence of Plains Ceremonial and Biographic rock art. Characterized by the illustration of fine detail for costumes, weapons, tipis, and horse trappings (Figure 2), these two closely related art traditions have a greater focus on material culture items than any other North American rock art (Keyser and Klassen 2001:203–204, 233–234).³ Frequently used to add specific information needed to create fully narrative scenes (Keyser and Klassen 2003), the illustration of such details often produces superb compositions, the most elaborate of which have a realistic, almost photographic quality (Keyser 2004:12, 34–35, 82, 101, 2008b; Keyser and Klassen 2001:230, 237, 242; McCleary 2008a, 2008b). Other compositions, though less realistic, still show equally fine detail for many different items, foremost among which are weapons and their component parts, including

the projectile points commonly illustrated on arrows, spears, and bow-spears (Conner 1962, 1984; Francis and Loendorf 2002; Keyser 1977a, 2004, 2006, 2008a; Keyser and Klassen 2001:190–256).

To assess the possibility of identifying the *earliest* metal projectile points in Plains rock art, we explored two different avenues of research. Initially, we reviewed all published Plains rock art examples where warrior artists used their own standardized conventions to identify metal projectile points. Such points occur as two distinct forms. The first (Figures 3, 4) shows a “notched tang” type point characterized by a large triangular blade with deep square notches formed by one or two crosspieces drawn perpendicular to the tang just below the blade. The second shows a triangular to lanceolate blade form with a quillon extending directly out from one or both sides of the base

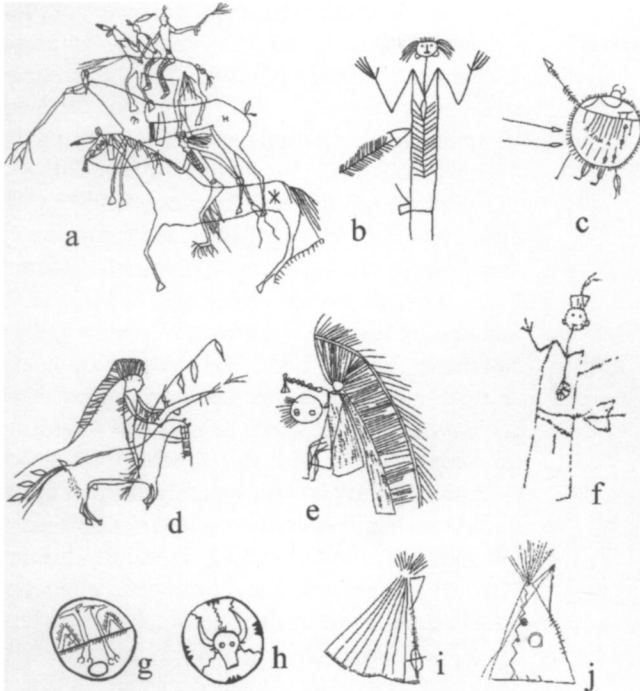


Figure 2. Details of costume, weaponry, tipis, and horse tack characterize Plains Indian rock art of the Ceremonial and Biographic traditions. Note detailed shield designs in g and h.

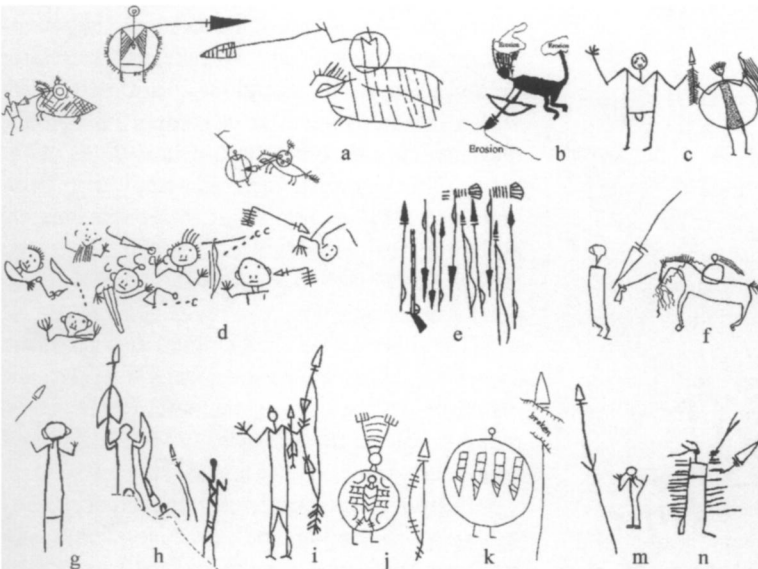


Figure 3. Metal projectile points and a knife (n) of the notched tang type from Plains sites. a, composition with three pedestrian vs. horsemen combat scenes at Writing-On-Stone, DgOw-32; b, f, No Water, 48WA2066; c, d Ellison's Rock, 24RB1019; e, Mijares Creek; g, h, North Cave Hills, 39HN17; i-m, Writing-On-Stone, DgOv-2; n, Writing-On-Stone, DgOw-20.

of the blade (Figure 5). We refer to this point type as "quillon-barbed."⁴ Both of these point forms are morphologically distinct from any known northwestern Plains chipped stone projectile point type.

For our second approach we measured the relative length of spear points illustrated at the related Bear Gulch and Atherton Canyon sites, where 1,025 shield bearing warriors are drawn as Late Prehistoric and Protohistoric period images. Of these, more than 90 hold spears with clearly drawn points illustrated. In this exercise we discovered that a significant number of the simple triangular and lanceolate spear points illustrated at these two sites are so large that they almost certainly represent metal blades.

ILLUSTRATED METAL POINTS/KNIVES

We were able to find 65 Plains rock art images identifiable as metal projectile points and three other obvious depictions of metal knives (Table 1, Figure 6). Of the projectile points, 50 are the notched tang type with one or two crosspieces drawn just below the blade; the other 15 specimens are quillon-barbed points. The knives include one notched tang blade with two crosspieces and two examples that show a quillon hand guard.

Although early authors (e.g., Dempsey 1973:13-14; Habgood 1967:3) initially assumed that notched tang points drawn at Writing-On-Stone represented metal blades, they presented no direct evidence in support of this identification, and thus Keyser (1977a:39) argued that the identification was premature. Now, however,

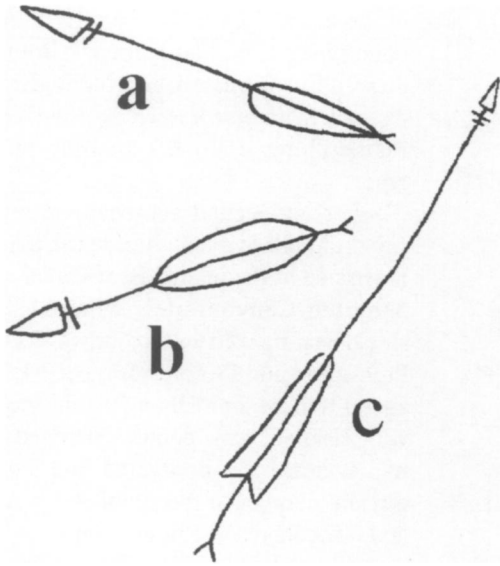


Figure 4. Arrows with metal points of the notched tang type. All three are superimposed on animals. a, Nordstrom-Bowen, 24YL419; b, Medicine Lodge Creek, 48BH499; c, Writing-On-Stone, DgOv-2.

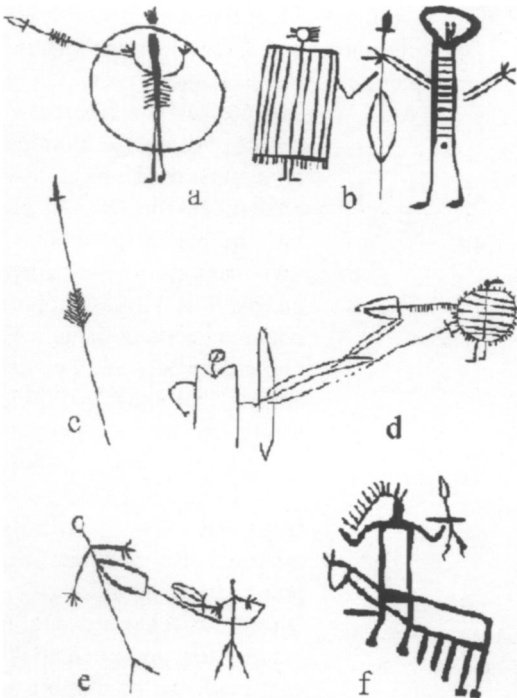


Figure 5. Metal projectile points and knives (e, f) of the quillon-barbed type from Plains sites. a, b, Red Canyon, Wyoming; c, Castle Gardens; d, Newell Creek, 24PR2317; e, White Mountain, 48SW302; f, La Barge Bluffs, 48LN1640.

there are multiple lines of evidence indicating that these are, in fact, metal blades. Initially, this shape is characteristic of the “Bayonet DAG” knife or lance point (Figure 7) that was one of the most common Historic period metal trade items on the Plains (Baldwin 1997:44–49; Taylor 2001:48; Western Archaeological Services 2007).⁵ Produced by both European weapons manufacturers and New World blacksmiths, these DAG forms range from the classic “Beavertail DAG” manufactured by the I & H Sorby and Jukes Coulson companies of Sheffield, England, to simpler triangular types manufactured with one or more crosspieces (Baldwin 1997:42–49). Classic Beavertail DAGs, with their distinctive “beaver tail” profile and superior metal, were first introduced into North America in the mid 1700s (Taylor 2001:48), but the simpler triangular-bladed, Bayonet DAG forms had been produced earlier both in Europe and on the American frontier (Figure 8; see also Peterson 2001:Figures 36–37; Taylor 2001:40–50). The wide variety of these earlier DAGs indicates that many were of North American frontier manufacture (Baldwin 1997:44–49; Taylor 2001:48–51).

One freestanding projectile point scratched in exquisite detail at Atherton Canyon (24FR3) clearly shows a Bayonet DAG point (Figure 9). The point shows a long straight tang extending below a distinctly triangular blade, just below which is a perpendicular crosspiece on the tang that creates square notches on both sides of the blade. This projectile point is completely unlike any known Plains lithic type, but duplicates exactly the form of frontier-made DAGs (e.g., Baldwin 1997:42, 45, 49, 2002:75; see also Figure 8i–m).

The other 50 notched tang blades are shown as tips for 38 lances, 4 bow-spears, 7 arrows, and one knife. Of these, eight examples (three lances, two bow-spears, two arrows, and the knife) have double crosspieces (Figures 3e, n, 4c, 10j, k).

Support for identifying the freestanding Atherton Canyon point, other similarly drawn rock art spear and arrow points, and the single knife blade (Figures 3, 4, 9, 10) as metal implements is provided by illustrations on three Plains Indian robes and a single ledger drawing from the mid

Table 1: Metal Projectile Points Illustrated in Rock Art.

	Point	Spear	Bow- Spear	Arrow	Knife	Reference
Notched Tang Type						
Writing-On-Stone						
DgOv-2	-	2	2	1	-	Keyser 1977a&b
DgOw-20	-	-	-	-	1	Keyser 1977b
DgOw-32	-	3	-	-	-	Keyser 1977a&b
Bear Gulch 24FR2	-	22	-	2	-	This report
Atherton Canyon						
24FR3	1	3	-	1	-	This report
Nordstrom-Bowen						
24YL419	-	-	-	1	-	Keyser 2005
Ellison's Rock						
24RB1019	-	3	-	-	-	Conner 1984
39HN17	-	2	-	-	-	Keyser 1984
Medicine Lodge Creek						
48BH499	-	-	-	1	-	Francis 2007
No Water						
48WA2066	-	1	-	1	-	Keyser and Poetschat 2009
Mujares Creek	-	2	2	-	-	Parsons 1987
SubTotal	1	38	4	7	1	
Quillon-Barbed Type						
Bear Gulch 24FR2	-	5	1 ^a	-	-	This report
Atherton Canyon						
24FR3	-	4	-	-	-	This report
24PR2317	-	-	-	1	-	Keyser 2005
39HN17	-	-	-	1	-	Keyser 1984
Castle Gardens	-	1	-	-	-	Gebhard et al. 1987
Red Canyon	-	2	-	-	-	Keyser and Klassen 2001
La Barge Bluffs						
48LN1640	-	-	-	-	1	Keyser and Poetschat 2005
White Mountain						
48SW302	-	-	-	-	1	Keyser and Poetschat 2005
Subtotal	-	12	1	2	2	
Grand Total	1	50	5	9	3	

^a The same bow-spear is illustrated four times and three have an obvious quillon-barbed point.

1800s that show direct correspondence of this pictographic form with actual DAG type points.⁶ The first of these is a series of drawings by the well-known Mandan warrior artist, Mato Tope, who drew his own spear with a point of this form (Figure 11) at least five times on three bison robes (Catlin 1973a:148–151; Keyser 2004:69–70; Maurer 1992:191; Taylor 2001:12; Thomas and Ronnefeldt 1976:220; Thompson 1977:153). We know that Mato Tope's lance was, in fact, tipped with a metal DAG point because the weapon was

clearly illustrated with such a point in an 1834 portrait by Karl Bodmer (Thomas and Ronnefeldt 1976:219).

A second example of this DAG form is illustrated in a portrait of Red Bear, an Arikara Buffalo dancer, drawn by an unnamed Arikara artist between 1872 and 1876 (Greene 2006:82, 84; see also Barbeau 1960:163). Red Bear carries a gunstock club whose blade is shown in the form of a Bayonet DAG with two crosspieces on the tang (Figure 12). While we have no known images

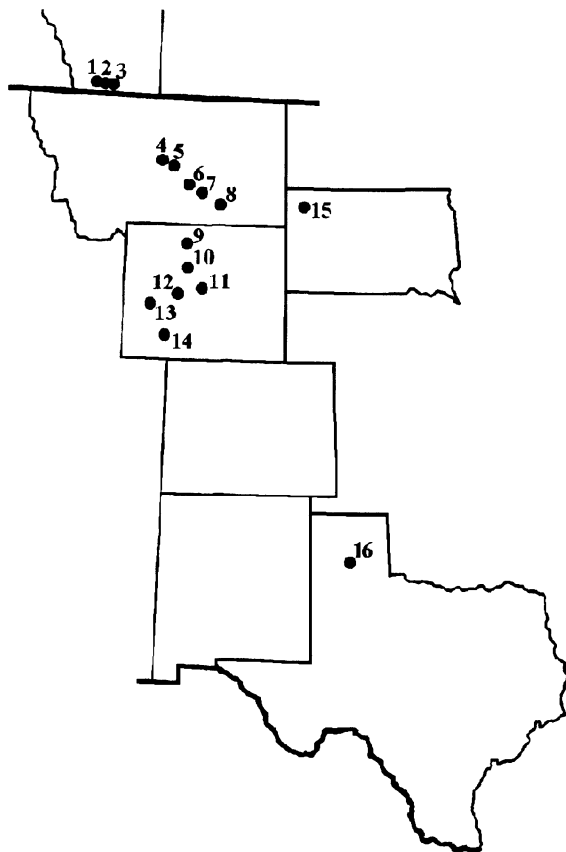


Figure 6. Distribution of Plains rock art sites with illustrated metal projectile points. 1, Writing-On-Stone, DgOw-32; 2, Writing-On-Stone, DgOw-20; 3, Writing-On-Stone, DgOv-2; 4, Bear Gulch, 24FR2; 5, Atherton Canyon, 24FR3; 6, Nordstrom-Bowen 24YL419; 7, Ellison's Rock, 24RB1019; 8, Newell Creek, 24PR2317; 9, Medicine Lodge Creek, 48BH499; 10, No Water, 48WA2066; 11, Castle Gardens; 12, Red Canyon; 13, La Barge Bluffs, 48LN1640; 14, White Mountain, 48SW302; 15, 39HN17; 16, Mjares Creek. Published sources for these sites are listed in Table 1.



Figure 7. Bayonet DAG style metal lance/knife point found near Rock Springs, Wyoming (Western Archaeological Services 2007). Deep, square cut, slightly irregular notches suggest that this is hand forged. Note native-cut nicks along both blade edges. Photograph courtesy of Bureau of Land Management, Rock Springs field office. Scale in cm.

of Red Bear's actual club, numerous gunstock clubs are illustrated in early frontier art (Catlin 1973a:Figures 63, 99, 104, 1973b:Figures 131, 150, 237, 254, 257, 287, 293; Hunt and Gallagher 1984:338; Thomas and Ronnefeldt 1976:235) and there are actual examples preserved in ethnographic collections (Penney 1992:231; Taylor 2001:23). Nearly all of these have a DAG blade used as their killing point. The only other type has multiple Bowie knife blades (e.g., Keyser 2004:20; Taylor 2001:35) whose form is distinctly different than a DAG.

Thus, for the DAG pictographic form we have actual metal trade points that share this unique shape, we have one such identically-shaped rock art point illustrated as a freestanding example that clearly shows the long tang extending below the blade and the cross piece, and we have drawings by two Indian artists where this form can be demonstrated to correspond to such metal points. As has been shown repeatedly in Plains Biographic and Protobiographic art, careful rendering of minute details is key to these compositions (Brownstone 2001a, 2001b; Keyser 1987a; Keyser and Cowdrey 2008; Keyser and Klassen 2003; Keyser and Poetschat 2005). Combined with the direct evidence from the art, this verifies that Plains Indian artists used this pictographic form to represent a metal projectile point—most often a DAG blade.

Twelve other rock art spear points, two arrow points, two knives, and the point on a bow-spear⁷ are triangular or lanceolate blades with barbs extending straight outward from the blade's base on one or (more commonly) both sides (Figures 5, 9 top, 10h, i). On larger spear points such barbs can indicate a quillon—the protruding piece of metal positioned to separate the blade and handle of a knife and serve as a hand guard for the user (Figure 8b, e, f; see also Baldwin 1997:Frontispiece), which is often forged as part of the blade itself (Baldwin 1997:21–22; Peterson 2001:Plates 22–29; Taylor 2001:38). On these large, long spear points a protruding quillon would not hinder penetration of the blade to a depth that would inflict a mortal wound. Thus,

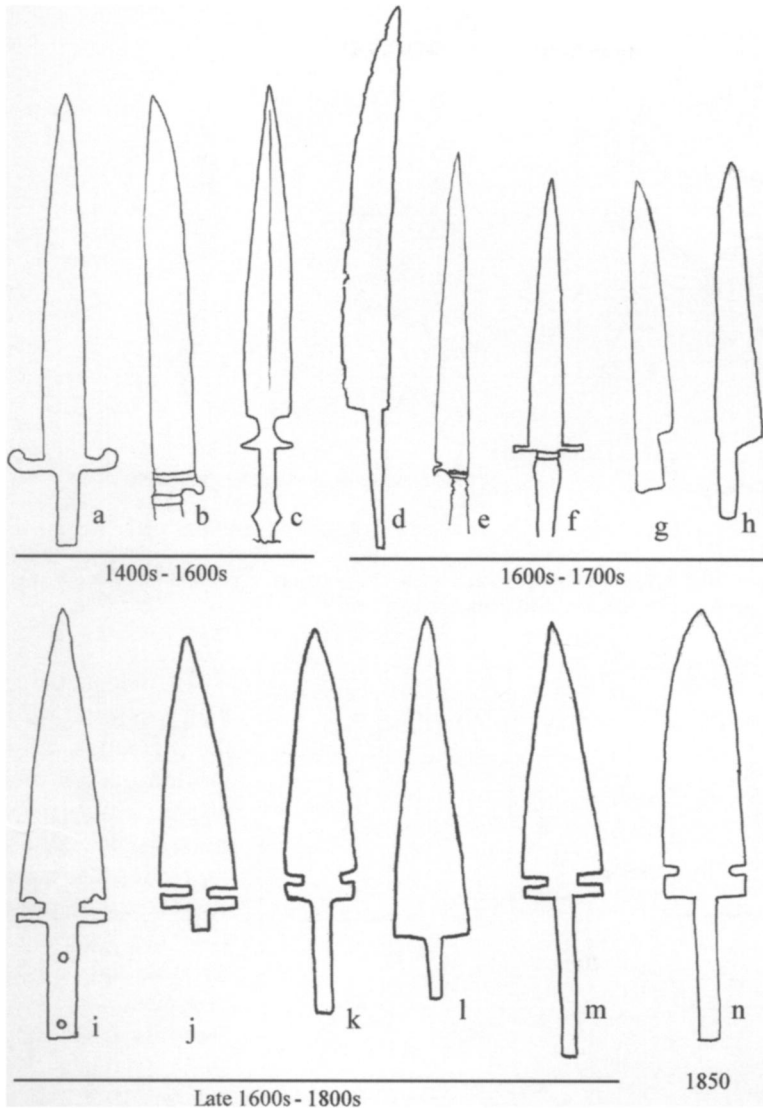


Figure 8. Quillon-barbed and notched tang type knives and lance points from various sources and time periods. Variable scale, but all blades are longer than 15 cm. The longest is d, a “Rifleman’s Knife” of the late 1600s to early 1700s, which is more than 40 cm long. Note that quillon-barbed type blades were made in Europe from the 1400s through the 1800s and that early handmade triangular DAG style points (i-m) were made before the better known Beavertail DAG, shown as n.

for large quillon-barbed spear points it seems likely that many of these actually represent knife blades used as lance points. Two such examples at Bear Gulch (Figures 10h, 13), one of which is the bow-spear illustrated four times, show a long blade with a very knife-like shape and a distinct quillon.

Arrow points, however, were unlikely to be

made from the portion of a knife blade that includes the quillon.⁸ If they were made from an entire knife blade, such points would be too heavy and awkward for easy use; and if they were instead made from just a shorter blade fragment that included the quillon, the way this feature protrudes would certainly have inhibited penetration and thus reduced killing power. Therefore, we suspect that the two quillon-barbed arrow points actually represent another way of drawing a notched tang type point. If this is the case, some quillon-barbed spear points might actually be notched tang type points drawn in this barbed form.

Like the DAG pictographic form, these quillon-barbed projectile points resemble no known lithic type, but the quillon feature characterizes many early knives (Figure 8a–f) that were traded into native North American cultural groups as early as the beginning of the 1500s (Baldwin 1997:21, 2002:81; Taylor 2001:38, 55). Such knives, including fighting daggers, dirks, cut down swords, plug bayonets, and bowie knives, made their way across North America from the Great Lakes region to the northwestern Plains via Indian middlemen/traders, arriving as early as A.D. 1600.

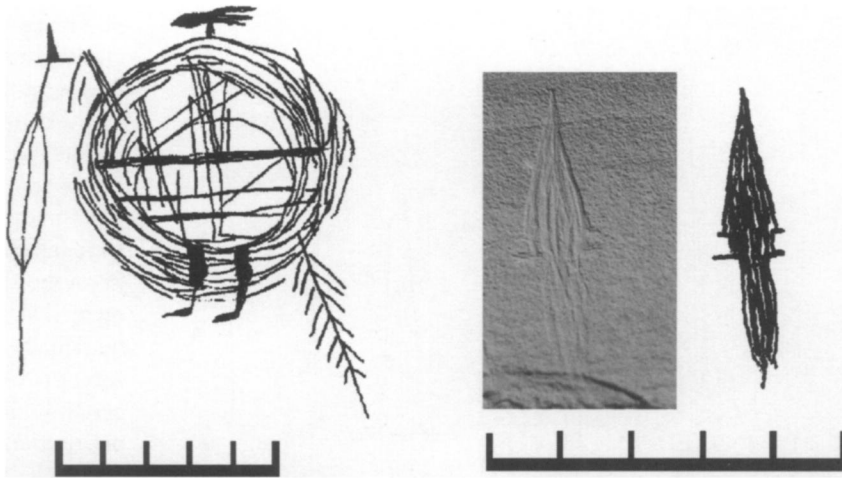


Figure 9. Metal projectile point (right) incised at Atherton Canyon (note drawing to right). Left is adjacent shield bearing warrior whose lance is tipped with a quillon-barbed type metal point. Scale bars represent 5 cm.

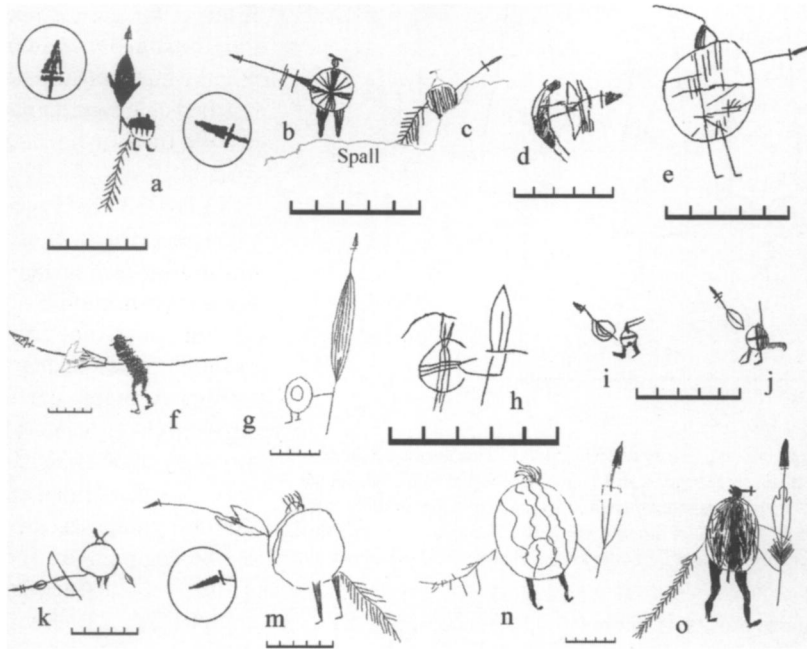


Figure 10. Metal projectile points of the notched tang and quillon-barbed types at Bear Gulch (a-d, f-j, m-o) and Atherton Canyon (e, k). Shield bearing warriors h and i have quillon-barbed type points. Note the knife-like shape of the point in h.

Although the evidence supporting the identification of the quillon-barbed pictographic form as a metal blade is simpler than that for the DAG form, it is almost equally persuasive. This form is used for spear tips in dozens of Plains Indian ledger drawings (Afton et al. 1997; Bates et al. 2003; Petersen 1971:219) and although we cannot match any particular drawing to a specific spear, Historic period lances were almost exclusively tipped with metal points, most frequently made from cut down sword blades, butcher knives, and manufactured lance points. Some actual specimens (Figure 8a, b,

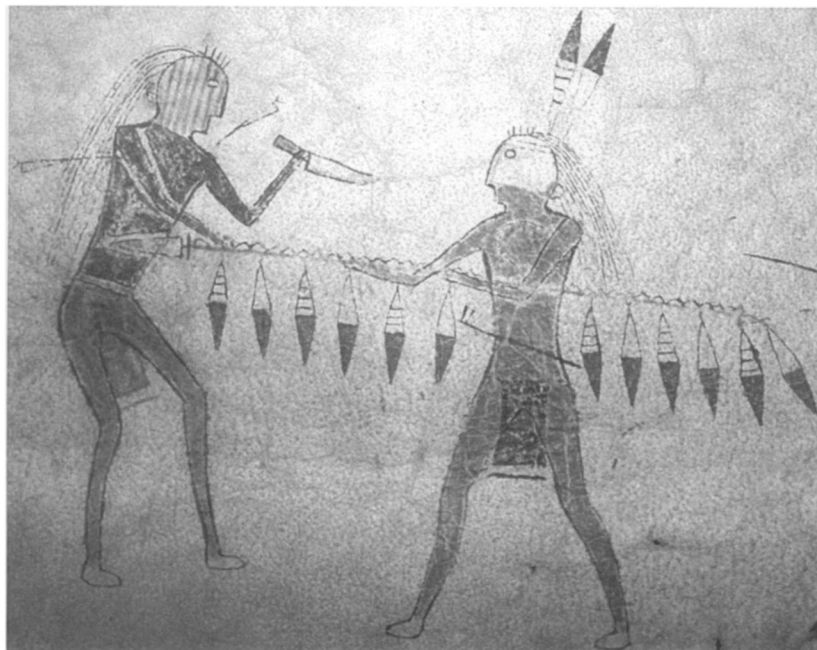


Figure 11. Robe painting by Mandan chief, Mato Tope, showing him killing an enemy with his lance tipped with a notched tang type metal point. Robe in collection of Bernisches Historisches Museum, Switzerland (author's photograph).

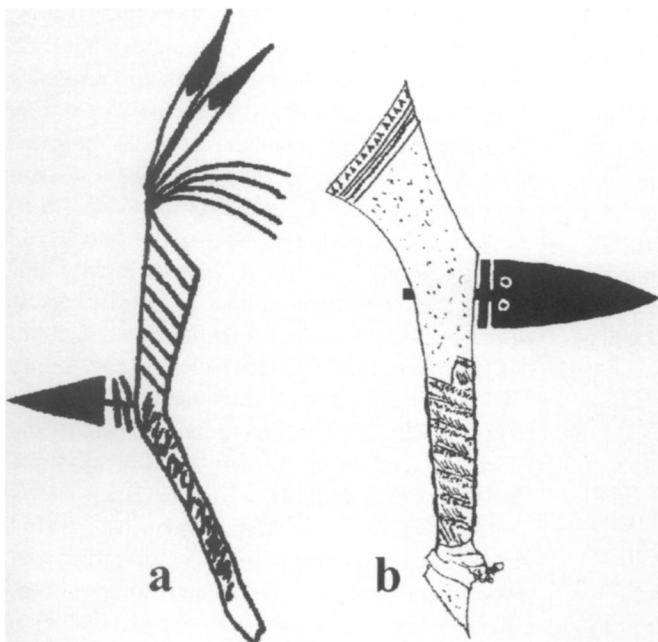


Figure 12. Gunstock clubs with DAG blades used as killing point. a, from ledger drawing by Arikara warrior, Red Bear; b, adapted from Taylor (2001).

e, and f) show the quillon or other barbs in the same position (Baldwin 2002:84, 96). In addition to the use of this form in ledger art, a quillon hand guard is shown as a distinguishing feature of two metal knives (Figure 5e, f) drawn in Wyoming's Green River Basin—one at White Mountain and the other at La Barge Bluffs (Keyser and Poetschat 2005:53). One specimen is a volute-handled knife identified primarily by its bifurcated handle; but with a clearly depicted quillon hand guard crossing the base of the blade just above the bifurcated handle. The combination of these

distinctive features clinches the identification of these specimens as metal-bladed knives.

There is even circumstantial evidence to support our suggestion that some rock art quillon-barbed projectile points actually represent a second way of drawing notched tang metal blades. Immediately adjacent to the freestanding, notched tang type metal point at Atherton Canyon is a shield bearing warrior with a long lance tipped with a distinctly triangular blade of the quillon-barbed type (Figure 9). While we have no way of proving that this shield bearer and his weapon were drawn by the same artist who drew the metal point, this isolated panel was used by only two or three artists. Support for suggesting that one artist produced both the metal point and the adjacent shield bearing warrior and his weapon is pro-

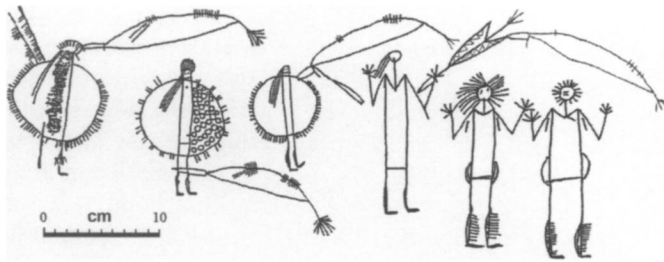


Figure 13. Partial coup count tally at Bear Gulch showing four versions of one bow-spear. The quillon-barbed point is clearly visible on weapons floating above enemies. Note the point's distinct knife blade shape, especially on far left example.

vided by the fact that the spear-wielding shield bearing warrior is a direct conjoined overlay superimposed on an earlier mace-armed warrior, indicating that he is late in the panel's use sequence (as obviously is the metal point). Additionally, both the metal point and the conjoined superimposed shield bearing warrior are drawn using numerous closely spaced scratches that create a "scraped" design that is not used for other earlier images on this panel. Thus, considering all the evidence, we propose that both images were drawn by the same artist and that the freestanding point is a detailed rendering of the quillon-barbed tip on the shield bearer's lance.

In summary, the rock art, robe art, and ledger art record strongly implies that there were two ways of drawing readily identifiable metal projectile points in rock art. The notched tang type is a true-to-life representation of a DAG type point, while the quillon-barbed form could illustrate either a point with a true quillon barb(s) or be a second way—one that is simply slightly less realistic—to show a DAG type blade.

MEASURING SPEAR POINTS AT BEAR GULCH AND ATHERTON CANYON

Of the hundreds of projectile points illustrated in all currently published Plains Ceremonial and Biographic rock art, the fact that only 65 can be readily identified as metal artifacts would suggest that such weapons were not particularly common across the region. In fact, quite the opposite is almost certainly true given the prevalence of metal projectile points throughout the Historic record as evidenced by paintings, photographs, and

ethnographic collections, coupled with the scarcity of very large stone or bone spear points in Late Prehistoric period northern Plains archaeological and Historic period ethnographic collections (Frison 1991:351–357; Keyser 1979; Reher and Frison 1980:27–28).⁹ Thus, we attempted to ascertain whether it might be possible to suggest that some of the many other spear points illustrated at Bear Gulch and Atherton Canyon were metal points, despite the fact that the artists illustrated no obvious identifying characteristics.

To do this, we measured the lances (and their points) carried by pedestrian shield bearing warriors and converted these measurements to both the metric and English systems by using a standardized diameter of 1.02 m (42 in or 3.5 ft) for the pedestrian shield as a reference. This measurement is the average for 36 Late Prehistoric and Protohistoric period pedestrian rock art shields measured in a separate study (Keyser 2010). It is also consistent both with the earliest historical drawings of such pedestrian shields (Catlin 1973b:Figures 172, 280, 293; Taylor 2001:86–87; Thomas and Ronnefeldt 1976:172, 212–213, 217) and the fact that nearly all Plains shield bearing warriors show the shield obscuring the warrior's body from at or just below the knees to at or just above the shoulders. For a warrior standing between 1.68 and 1.83 m (5.5 and 6 ft) tall, a shield covering that much of the body would measure about 1 m (3.5 ft) across. Finally, this size is also consistent with early historic reports of pre-horse period shields that "had a breadth of a full three feet [93 cm] or more" (Secoy 1992:37) and the three Pectol shields, which date to about A.D. 1500 and measure between 79 and 95 cm (31 and 38 in) in diameter (Loendorf and Conner 1993:218–222).

After carefully classifying and measuring 164 lances illustrated as pedestrian shield bearing warriors' weapons at Bear Gulch and Atherton Canyon, we were initially struck by the fact that 79 of these have greatly oversized triangular or lanceolate points, and we thought that it might be possible to identify—at least generally—some of these as

metal points based on their size.

First, however, it is obvious that many shield-bearing warriors' lances (and also some bow-spears) at these two sites are illustrated as much longer than they would have actually been in real life. Using our standardized measurement for each shield's diameter, we converted the lengths of all spears carried by shield bearing warriors to meters and feet. What this showed (Table 2) was that nearly half of the spears at the two sites were intended by the artists to be between 1.37 and 2.59 m (4.5 and 8.5 ft) in length—a measurement consistent with the historic record, where early historic artists' illustrations of nearly all such lances fall within this size range (Catlin 1973a&b; Kurz 1937; Thomas and Ronnefeldt 1976). Likewise, ethnographic descriptions from several tribes indicate that spears were in this size range. Blackfeet warriors reported that lances were approximately 5 to 6 ft (1.5 to 1.83 m) long (Ewers 1955:201), Coeur d'Alene warriors' spears measured 5 to 7 ft (1.5 to 2 m) long (Taylor 2001:62), and Sitting Bull's spear was "seven or eight feet [2.1–2.4 m] long and tipped with an eight-inch [20 cm] notched iron blade" (Utley 2008:19).

In addition, however, it also shows that the length of 28 percent of the illustrated spears at these two sites is significantly exaggerated, with examples at both sites drawn as more than 6 m (20 ft) long relative to the inferred actual size of their warrior's shield. Even acknowledging that the size of weapons in rock art is often greatly exaggerated—presumably to accentuate their supernatural power—the tendency toward exaggeration is extreme at both Bear Gulch and Atherton Canyon. Thus, we can also expect some exaggeration of the spear points (independent of whether the

length of the spear itself is exaggerated), since the killing tip would presumably also have been considered supernaturally powerful. Attribution of supernatural power would seem to be especially likely for early metal points, since they were newly acquired and had several notable qualities, probably the most significant of which was their resistance to breakage and thus their greater killing power.

In order to determine how much the Bear Gulch/Atherton Canyon artists were exaggerating the spear points themselves, we measured additional suites of lances and their points illustrated both in historic Euroamerican artists' portraits of Plains warriors and in ledger drawings done by Plains warrior artists themselves during the late 1800s (Figure 14a, b). It was relatively easy to select these samples. For early Euroamerican artists we used eight portraits by Catlin (1973a&b) and three by Bodmer (Thomas and Ronnefeldt 1976) that showed upper Missouri warriors posed with their spears. This enabled us to get some idea that the spear and metal point were shown in approximately realistic proportion. For ledger drawings we used those found in Berlo (1996) that included examples drawn by Arapaho, Cheyenne, and Kiowa artists, and those in Afton et al. (1997) all of which are Cheyenne drawings. These drawings spanned several different tribes and were done during or right after the last years of Plains warfare when all the spear points would have been metal.

To determine the size of these Historic spear points we calculated the ratio of point length to spear length and converted the measurement of the point to centimeters, using a standard spear length of 2 m (6.5 ft).¹⁰ The results show that metal

Table 2: Spear Length at Bear Gulch and Atherton Canyon.

Length Meters (Feet)	Bear Gulch	Atherton Canyon	Total
<1.37 (<4.5)	31 (24%)	11 (34%)	42 (26%)
1.37-2.59 (4.5-8.5)	67 (51%)	11 (34%)	78 (48%)
2.59-4.57 (8.5-15)	25 (19%)	7 (22%)	32 (20%)
4.57-6.09 (15-20)	5 (4%)	1 (3%)	6 (4%)
6.09-9.14 (20-30)	3 (2%)	2 (6%)	5 (3%)
9.14+ (30+)	1 (1%)	- (0%)	1 (1%)
Total	132 (100%)	32 (100%)	164 (100%)

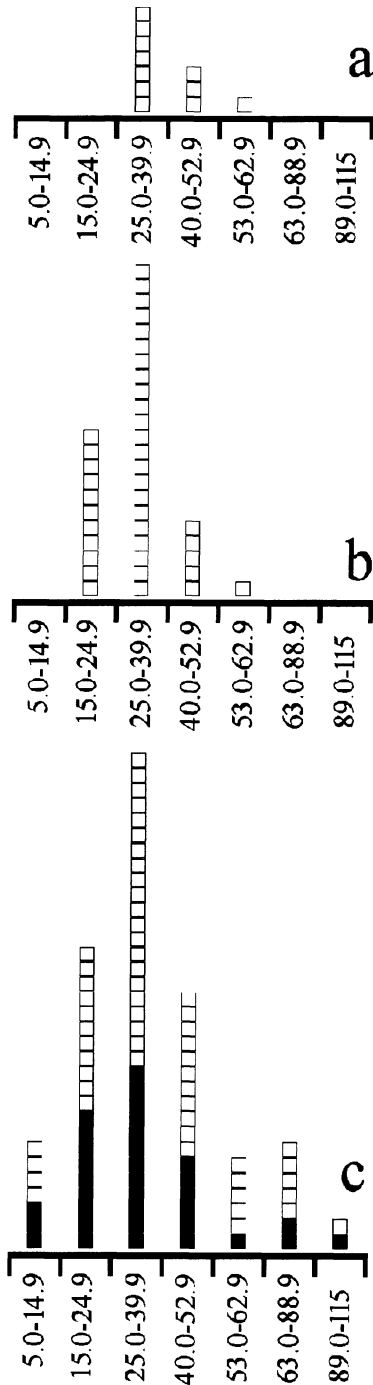


Figure 14. Distribution of projectile point sizes in various art media. a, early Euro-American artists; b, Plains Indian ledger drawings; c, rock art examples from Bear Gulch and Atherton Canyon. Filled squares in c are identifiable metal points. Measurements in centimeters.

points in historic Euro-American portraiture measure between 28 and 57 cm (11–22 in) in length (Figure 14a), while point sizes in ledger drawings are quite similar, ranging between 17 and 57 cm (6–22 in) long (Figure 14b). In both distributions there is a significant clustering of points in the 25 to 50 cm (10–20 in) range. This suggests that late Historic period Indian artists were equally as accurate as contemporary Euro-American artists in terms of representing spear point sizes. These size ranges, obtained from both Euro-American artists' and Plains ledger artists' work, correspond reasonably well to Ewers (1955:201) statement that Blackfeet iron lance points had a size range of 15 to 30 cm (6–12 in), with an added caveat that some actual hand-forged lance points were much larger, exceeding 46 cm (18 in) in length (Baldwin 1997:42, 45). The size range is also consistent with northwestern Plains metal points known ethnographically and archaeologically, which range from 17 to 41 cm (6.75–16 in) long (Greer 2009; Utley 2008:19; Western Archaeological Services 2007).

We then compared the measurements of 92 rock art spear points at Atherton Canyon and Bear Gulch (Figure 14c) with those from historic sources. This clearly shows two things. First, Protohistoric period artists at these sites were exaggerating the size of spear points in smaller quantities than they exaggerated the length of spears. For example, of the 34 points at these sites identified as metal points by the notched tang or the presence of a quillon, 4 (12 percent) are shown as longer than 53 cm (21 in). For all other triangular and lanceolate spear points, 19 percent (11 of 58) are represented longer than 53 cm (20 in). Thus, in total, 16 percent of all spear points were drawn longer than 53 cm. These percentages are even smaller than the 28 percent of rock art spears that are drawn with an exaggerated length.

Second, the size distribution of spear points drawn by Protohistoric period artists at Bear Gulch and Atherton Canyon (taking into account their propensity to exaggerate size) very closely mimics that of both the Euroamerican artists and the later historic period Indian ledger artists (Figure 14). In fact, 76 percent of the unexaggerated spear points (those drawn shorter than 53 cm) at

these two sites are depicted as though they were actually between 15 and 53 cm (6–21 in) in length. Therefore, it seems reasonable to propose that the Bear Gulch/Atherton Canyon artists were illustrating the same size points that the later ledger artists were and that many of these are likely to have been metal blades even though they have no defining attribute.

DISCUSSION

There are 39 projectile points depicted at Bear Gulch and Atherton Canyon with characteristic features of metal points. In addition, based on relative measurements of all spear points it appears that another 40 to 60 examples (those measuring 15 to 90 cm long) on shield bearing warriors' weapons at Bear Gulch and Atherton Canyon were intended by the artists to represent metal blades, even though they lack distinctive features. Hence, it seems likely that somewhere between 80 and 100 metal projectile points are illustrated at these sites. This use of metal is consistent with the "shock troop" warfare implied by the clubs and maces wielded by some 15 percent of the 1,025 shield bearing warriors at these sites, since stone points of the length indicated by our measurements would have been far too fragile for effective close-quarter combat with enemies armed with clubs and maces.

In this regard, we are well aware of the use of long stone spear points by Paleo-Indian bison hunters. We note two things, however; (1) bison are primarily trying to escape the hunter, rather than fight back, as would a human opponent armed with a mace or club and intent on killing his enemy and obtaining war honors; and (2) the Paleo-Indian weapon system for close-quarter hunting was apparently one where a hunter carried several socketed foreshafts, each tipped with a long stone point that could be "reloaded" onto a spear when one point broke or remained lodged in the quarry animal (Frison 1974:85–90).

Hence, given that Indian close-quarter warfare was structured to disarm an opponent with blows from clubs (see Denig 2000:161; Ewers 1955:202), we think it highly unlikely that warriors would enter such combat with only a single, outsized, extremely fragile, chipped stone spear point. Therefore, if they were using stone points,

they would almost certainly have had additional tipped foreshafts with which to "reload." However, no example of the 162 spear-wielding shield bearing warriors at these two sites holds extra foreshafts or carries a bag that might contain these, and we can find no published example at any other Plains site of a shield bearing warrior who carries such equipment.

Bone points are a possible alternative, and there is limited evidence for their use. In A.D. 1754 Anthony Hendry (1907:335) met "Archithinue" warriors (probably Blackfeet, but certainly a northwestern Plains group) armed with "bows and arrows and *bone spears and darts*" (our italics, which we believe indicates bone-tipped weapons). However, other ethnohistoric sources rarely mention bone spear points, and the Late Prehistoric and Protohistoric period northwestern Plains archaeological record contains only 10 such specimens from four sites (Mulloy 1958:48, 60, 102, 109; Reher and Frison 1980:27–28). In fact, seven of these archaeological specimens are barbed "harpoon" tips unlike anything illustrated in the rock art. Given the numbers of bone tools surviving in other sites of this age from Missouri River villages to nomadic warrior/hunter's campsites and bison kills (Frison 1991; Keyser 1979; Lehmer 1971) we should have more than these few examples of bone points if they were ever particularly common.

Thus, in the absence of compelling evidence in the archaeological record for large numbers of large stone or bone spear points in the Late Prehistoric and Protohistoric periods, we feel that many, if not most, of the large points illustrated at Bear Gulch and Atherton Canyon (and by extension, some large points illustrated at other sites) are likely to indicate metal points.

Given the presence of what we identify as metal projectile points on the weapons of 8 to 10 percent of the 1,025 shield bearing warriors at these two sites, what support do the archaeological, ethnohistorical, and historical records provide for the presence of such points among Protohistoric period northwestern Plains groups? Fortunately, these sources all contain quite suggestive evidence that metal points were present in considerable numbers during the period between

A.D. 1600 and 1750.

Archaeology

The archaeological record from the period between A.D. 1600 to 1750 at fur trading posts and Indian villages from New York through Michigan and Ohio to Missouri shows that large numbers of knives were being traded westward as the frontier advanced (Baldwin 1997:12–25). Presumably many of these could have reached the Plains where they could have been converted to spear points

On the northern Plains itself, the archaeological record at Post Contact Coalescent Missouri River villages indicates that the first metal tools had found their way into the region by the first quarter of the 1600s (Ahler 1993:86, 89; Ahler and Drybread 1993:290, 298–300; Ahler and Swenson 1985:110; Ahler and Toom 1995:377; Johnson 1998:320, 331; Weston and Ahler 1993:279–280) and then became increasingly common through time. Although archaeological finds of metal tools of any sort (including projectile points) are rare in Protohistoric period northern Plains sites, some examples do occur (Hamilton and Nicholson 2007; Pyszczk 1997), one of which is a horse burial in southwestern Wyoming that was butchered using metal tools about A.D. 1650 (Eckles et al. 1994). The paucity of these early metal tools in the archaeological record is not surprising, however, given that they were scarce commodities that by their nature would also likely have been curated and reused until only the smallest fragments remained (Ahler and Drybred 1993:290; Thiessen 1993:30–31). Also, iron tools, unlike stone tools, rust away quite rapidly in both surface and buried contexts in northern Plains sites (Frison 1991:123).

In fact, the same is true even for large metal spear points in Post-contact period Missouri River villages, where we know from the historic record (including Euro-American portraiture) that such points were actually quite common. When asked about finding such points, Ray Wood (who has extensive experience investigating Middle Missouri villages) indicated that he had seen just two such specimens recovered archaeologically—both from burials (Wood, personal communication 2006). He suggested that such artifacts would

likely have been intensively curated, and were not likely to be recovered from typical open plains archaeological contexts. Thus the “archaeological scarcity” of the earliest metal implements should not be seen as indicative of their actual presence in any site or their real numbers across the region.

History

Furthermore, the historic record provides considerable information that speaks to the prevalence of these artifacts in the fur trade from whence they passed into Indian hands. Trade in metal implements (especially knives) began almost immediately after Columbus. In A.D. 1497 European cod fishermen were trading knives to the natives of Newfoundland and by A.D. 1578 there “were 350 European fishing vessels at Newfoundland. . . [trading] metal implements (particularly knives) for the natives’ well worn pelts” (Wikipedia 2008). Russell (1967:164) notes that dagger type knives came to the New World with the first European adventurers, and by the sixteenth century, records indicate that northeastern Indians were making projectile points from iron knives obtained from French traders (Russell 1967:329).

Fur traders penetrated the continent’s interior before A.D. 1550 with Cartier establishing short term trading forts at the site of present day Quebec in 1535–1536 and 1541–1542. When Champlain founded Quebec City in 1608 and established a fur trading post at the present site of Montreal in 1611 the French were firmly established in the Great Lakes basin and explorers then navigated the Mississippi River south to Arkansas by 1675. Jesuit priests were not far behind, establishing missions from Lake Huron through Michigan to Wisconsin between 1625 and 1679. These settlements routinely had their own blacksmiths and would have provided a steady source of locally made metal implements to augment traders’ stocks. But such trade was not restricted to the eastern half of North America (Lehmer 1971). Furs quickly became trapped out close to settlements, forts, and trading posts so free traders (*coureurs des bois*) spread outward to the west and southwest of the Great Lakes to contact various tribes and create a system of Indian middlemen who moved European trade goods westward

from Hudson's Bay and the Great Lakes and returned beaver pelts and pemmican eastward to the settlements (Ray 1974). These early explorers, traders and missionaries would have been a ready source for metal implements that could have spread deep into the North American continent.

Metal items also came from the south as well. By A.D. 1560 Florida Indians were using daggers obtained from French and Spanish traders (Russell 1967), and in New Mexico Spanish conquistadors (who later colonized the region) began introducing metal tools by A.D. 1540 (Calloway 2003:146–160; Damp and Adams 2008). Such items included crossbow bolt points, knives, and sword blades, which quickly entered into the southern Plains, and certainly made their way north in small quantities into the northern Plains of Wyoming and Montana in the Protohistoric period (Damp and Adams 2008; Eckles et al. 1994; Frison 1991:122–125).

By the 1600s the European-Indian trade had become big business. Late in that century French forts in the Great Lakes region were the source of hundreds of knives for the Indian trade (Baldwin 1997:13–20). And at this same time both British and Dutch competitors also entered the Great Lakes region. Not to be outdone by French expansion, the British chartered the Hudson's Bay Company in 1670 and gave it a monopoly over "Rupert's Land," the drainage of Hudson's Bay (which includes nearly all of the northern Plains north of the present day U.S./Canadian border). By 1682 the Hudson's Bay Company had established Ft. Albany on James Bay and by 1684 York Factory, some 805 km (500 miles) to the west and that much closer to the northern Plains.

The traders' own records show what items were most desired by native tribes. After various types of cloth and beads, metal weapons and tools were the most common items traded to the Indian middlemen. These made up about 25 percent of the value of all trade goods, and included several types of knives, unhandled sword blades, and arrow points (Canadian Museum of Civilization 2008). The quantities of such implements brought to North America for the early fur trade was impressive. For instance, the Hudson's Bay Company traded more than 300 iron arrowheads into Ruperts

Land in 1671 (Russell 1967:329) and shipped 3,000 jackknives¹¹ and 5,000 butcher knives to Albany post on James Bay in 1684 (Kenyon 2008).¹²

With similar quantities shipped by both French and British companies for year after year through the seventeenth century, and similar items being traded north from Spanish settlements in New Mexico, it is clear that metal blades adequate for making spear points were one of the most common trade items that would have found their way to the northern Plains early in the Protohistoric period.¹³ Hudson's Bay Company records demonstrate that such quantities of knives continued to flow into the region for more than a century, since between A.D. 1720 and 1750 they were still trading more than 1,350 knives per year in the Saskatchewan District alone—translating to one knife per Plains lodge per year (Pyszczyk 1997:52).

Ethnohistory

Several ethnohistoric sources document the extent of this trade and the presence of trade goods on the northern Plains during the Protohistoric period. In 1738 Vérendrye, a French fur trader and explorer, traveled to the Mandan villages in what is now North Dakota. There he found that large quantities of trade goods already existed among these Indians. His own Assiniboine guides indicated that they had been carrying such items to the Mandans for a considerable time (Lehmer 1971:166–167; Thiessen 1993:32–33). An even earlier 1718 map shows a second trade route running west from the Mississippi River south of present-day LaCrosse, Wisconsin to the confluence of the Big Sioux and Missouri Rivers near present day Sioux Falls, South Dakota (Lehmer 1971:168).

Northern Plains reports verify that the Southwest was also the source of some metal tools. Schultz (1962:351–352) reports Blackfeet informants recounting their travels southward along the Green and Dolores rivers all the way to the pueblos to raid and trade for horses, metal goods, and big knives (swords). Such trips were reported to have occurred for more than a century before 1850.

But were Protohistoric period northwestern

Plains warriors actually armed with metal projectile points? One particular source provides excellent support for the idea that such metal points were relatively common on the Plains during at least the late Protohistoric period. In 1787 Sahkomaupée, a Cree warrior between 75 and 80 years old, told fur trader, David Thompson, of a battle he had participated in some 60 years before (about A.D. 1725). Sahkomaupée recalled coming to help the Blackfeet in their wars against the Snake Indians in central Alberta in a time before horses and guns had reached the region. He recounted:

Our weapons was [sic] a lance, *mostly pointed with iron*, some few of stone, a bow and quiver of . . . about fifty arrows, of which *ten had iron points*, the others were headed with stone. . . . they [the Snakes] sat down on the ground and placed their large shields before them, which covered them: We did the same, but our shields were not so many, and some. . . had to shelter two men. (Secoy 1992:34–35, italics ours)

Thus, eyewitness evidence indicates that before the coming of the horse, warriors had relatively good access to metal for projectile points. If “most” of the lances and 20 percent of the arrows in 1725 had metal points, it seems almost certain that there was a relatively long history of these items arriving in the region, and we can readily assume that the first of these metal points had reached the northwestern Plains by at least the mid 1600s—exactly the time frame suggested by Middle Missouri village archaeology and the historic trade records. Supporting the likelihood that these points at Bear Gulch are metal is a radiocarbon date of A.D. 1650 (Keyser 2006; Keyser et al. 2010) obtained from a piece of wood that was jammed in a crack in the cliff at a Bear Gulch panel of shield bearing warriors and other figures that include a bowman shooting an arrow with a metal point (Figure 10d).

These several lines of evidence clearly support the hypothesis that metal projectile points were widely used by Protohistoric Plains cultural groups. But how can those at Bear Gulch and Atherton Canyon be DAG-style lance points when we know that Hudson’s Bay Beavertail DAG knives (produced by I & H Sorby, Jukes Coulson, and other companies in Sheffield, England) were

imported into the Great Lakes region only in the mid-1700s (Taylor 2001:48); while every indication at Bear Gulch and Atherton Canyon indicates that there were DAG-style metal points predating approximately A.D. 1725 (Keyser et al. 2010)?

Careful reading of the historic record shows that dagger type points similar to the Beavertail DAG were manufactured by the French in the 1600s through early 1700s for the Indian trade (Peterson 2001; Taylor 2001:40–50). Points of this general “dagger” shape (Figure 8i–k) were also often manufactured locally by North American blacksmiths at forts, missions, and trading posts. Thus, the points illustrated at Bear Gulch and Atherton Canyon are likely to be some of the first dagger type blades to enter this area of the Plains, but since they clearly predate horses and guns (based on the absence of these items and the size of the warriors’ shields), they almost certainly represent the slightly earlier French dagger style points—or North American made copies of these—rather than the better known Hudson’s Bay Beavertail DAG knives.

Likewise, all points illustrated as notched tang specimens cannot possibly be DAG blades, since some are arrow points, which are far too small to be DAGs. We suggest that the triangular DAG shape (with its characteristic tang) was so different than any stone or bone projectile point that it was quickly adopted in Plains art to indicate any metal projectile point. Thus, notched tang points drawn at Bear Gulch and Atherton Canyon need not be true Beavertail DAGs; instead, they are probably earlier Bayonet DAG points and other metal blades whose notched tang form in the art simply indicates that they were metal.

In summary, our research and analysis suggest that the earliest metal points illustrated in the rock art at Bear Gulch and Atherton Canyon were of two basically different types, illustrated in three ways. The actual points themselves included some typical dagger forms and others that were made from knives, bayonets, cut down sword blades, or usable-sized fragments of any metal. In rock art any of these can be illustrated as a notched tang, DAG style point (because that unique shape apparently came to connote any metal blade, especially in Protohistoric period rock art). Likewise,

due to the difficulty of illustrating fine detail in many rock art images, any of these points could have been illustrated as quillon-barbed points, or simply exaggeratedly long lance points.

CONCLUSIONS

Metal lance and arrow points, though not common, can be confidently identified at 16 rock art sites scattered across the Plains from Writing-On-Stone, Alberta to the North Cave Hills of South Dakota, and south to the Texas Panhandle (Figure 6). These include a single freestanding point, 50 lance points, points on five bow-spears (see note 7), and nine arrow points. In addition, single metal knives are shown at three other sites, one at Writing-On-Stone and two in the Green River Basin of Wyoming. The 65 metal points include 38 lance points with cross piece on the tang (three with double cross pieces), four bow-spear points with cross piece (two with double cross pieces), seven arrow points with cross piece (two with double cross pieces), and 12 lance points, two arrow points and a single bow-spear point (see note 7) with quillon barbs. The knives include a large DAG with double cross pieces, a volute-handled specimen with quillon, and a third example that has a lanceolate blade with quillon hand guard. Bear Gulch has by far the most illustrated metal points, with 30 identifiable specimens, but Atherton Canyon has nine (including the only freestanding example). At Writing-On-Stone three sites have eight such points and one DAG knife; Mujares Creek in the Texas Panhandle has four points all shown in a single tally of captured weapons; and Ellison's Rock in Montana and 39HN17 in the North Cave Hills each show three metal points.

Metal points at sites other than Bear Gulch and Atherton Canyon are almost evenly split between those associated with pedestrian Shield Bearing Warriors (nine), those associated with horses or other Historic period indicators (10), and those associated with various other types of humans (nine).¹⁴ Since several of these "other" types of humans are likely to represent Historic period drawings (e.g., Francis 2007; Keyser 1984, 1987b; Keyser and Poetschat 2009:15), it seems reasonable to assume that more than half of the illustrated metal points at other sites on the Plains are of Historic period age.

At Bear Gulch and Atherton Canyon metal points are demonstrably earlier than many of the other illustrated examples across the Plains. Virtually all metal points at these two sites are associated with shield bearing warriors carrying full body size shields that are indicative of the Late Prehistoric or Protohistoric periods. This also includes the freestanding example, which is carved immediately adjacent to two shield bearers. Only three metal points are not directly associated with shield figures; two are arrow points and one is a spear point, all used by rectangular body humans. The bow-spear (illustrated four times) is associated with both shield bearing warriors and V-neck humans. There is no indication of any historic period association with these metal points at either Bear Gulch or Atherton Canyon, strongly suggesting that they predate the arrival of both horses and guns. Like those associated with shield bearing and V-neck warriors and very early horsemen at Writing-On-Stone, they illustrate some of the earliest metal points to arrive in this region.

All three of the readily identifiable metal knives at northern Plains sites are wielded by rectangular body or stick figure humans. Two of these are associated with horses; the other is part of the Protohistoric period Seedskaadee style (Keyser and Poetschat 2005:146–151).

In addition to the specimens intentionally illustrated as metal projectile points, Protohistoric period artists routinely drew simple triangular and lanceolate spear points as though they were between 15 and 53 cm (6 and 21 in) in length. The correspondence of this size range with that for known illustrations of metal points, coupled with the absence of similarly sized stone or bone spear points in Late Prehistoric or Protohistoric period archaeological collections, suggest to us that many of these large rock art spear points were intended to represent metal points, even though no other defining characteristics were included. This appears to be especially true for Bear Gulch and Atherton Canyon, but we suspect that measurement statistics would show similar size ranges for shield bearing warriors' weaponry at other northern Plains sites.

The number of readily identifiable and probable (based on their size) metal projectile points

at Bear Gulch and Atherton Canyon, suggests that many of the Bear Gulch style shield bearing warriors at these sites were drawn in the Protohistoric period, between approximately A.D. 1600 and 1750 before the widespread use of horses in Plains Indian warfare. This is consistent with a radiocarbon date associated with the art itself and other dates on cultural levels excavated in the valley floodplain at Bear Gulch (Keyser et al. 2010).

Stylistically, Bear Gulch style shield bearing warriors (see Kaiser et al. 2010 for detailed discussion of the Bear Gulch style) are the most common shield figures at these two sites, and considering the weaponry and accoutrements associated with them they appear to have been drawn during an approximately 300 year period that spanned the last century of the Late Prehistoric period and the entire Protohistoric period—approximately A.D. 1450–1750 (Keyser et al. 2010; Poetschat and Keyser 2009). Within this time frame, Plains Indian culture underwent the most significant changes in its history prior to the advent of the Indian wars and the resultant confinement to reservations between A.D. 1860 and 1880. This makes the hundreds of Protohistoric period figures drawn at Bear Gulch and Atherton Canyon the most significant historical record currently known for studying the origins of (and changes in) many of the various aspects that compose the early Historic period Plains warfare pattern. In combination with sites at Writing-On-Stone, Verdigris Coulee, and Pictograph Cave these two sites have already yielded significant information (Greer and Keyser 2008; Keyser 2006, 2007, 2008a, 2008c; Ray 2007, 2008) and they promise to continue doing so into the foreseeable future. This work is another such example, demonstrating that here and at Writing-On-Stone are illustrations of the earliest metal projectile points—some of the first non-native-made items to reach the northwestern Plains.

ACKNOWLEDGMENTS

The Bear Gulch project was funded by many different donors, including the Oregon Archaeological Society, The Montana Archaeological Society, Jean M. and Ray B. Auel, Carol Garner, David Easley, Greer Services, Alison Stenger, and more than 20 other individuals. The support of these people and organizations is appreciated very much. Mavis and John

Greer served with the senior author as project directors for the research. Landowners Macie Lundin, and her son Ray, and the Royal Melton family permitted access to the two sites. Macie Lundin also allowed use of the family ranch as a base camp, and assisted the project in many other ways. Mark Mitchell helped acquire several references.

REFERENCES CITED

- Afton, Jean, David Fridtjof Halaas, and Andrew E. Masich
1997 *Cheyenne Dog Soldiers: A Ledgerbook History of Coups and Combat*. University Press of Colorado, Boulder.
- Ahler, Stanley A.
1993 Plains Village Cultural Taxonomy for the Upper Knife-Heart Region. In *The Phase 1 Archaeological Research Program for the Knife River Indian Villages National Historic Site. Part IV: Interpretation of the Archaeological Record*, edited by Thomas D. Thiessen, pp. 57–108. Occasional Studies No. 27, Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.
- Ahler Stanley A., and Amy Drybred
1993 Analysis of Euroamerican Trade Artifacts. In *The Phase 1 Archaeological Research Program for the Knife River Indian Villages National Historic Site. Part III: Analysis of the Physical Remains*, edited by Thomas D. Thiessen, pp. 289–340. Occasional Studies No. 27, Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.
- Ahler, Stanley A., and Anthony A. Swenson
1985 *Test Excavations at Big Hidatsa Village (32ME12), Knife River Indian Villages National Historic Site*. Contribution 218, Department of Anthropology and Archaeology, University of North Dakota, Grand Forks.
- Ahler, Stanley A., and Dennis L. Toom
1995 Reflections on the Archaeology of the Medicine Crow Site Complex. In *Archaeology of the Medicine Crow Site Complex (39BF2), Buffalo County, South Dakota*, edited by Stanley A. Ahler and Dennis L. Toom, pp. 375–378. Reports of Investigations No. 52, Illinois State Museum, Springfield.
- Baldwin, John
1997 *Early Knives and Beaded Sheaths of the American Frontier*. Early American Artistry—Trading Company, West Olive, Michigan
2002 *Indian Guns, Spears, and Shields*. Early American Artistry—Trading Company, West Olive, Michigan.
- Barbeau, Marius
1960 *Indian Days on the Western Prairies*. National Museum of Canada Bulletin 163, Anthropological Series No.46, Department of Northern Affairs and National Resources, Ottawa.
- Bates, Craig D., Bonnie B. Kahn, and Benson L. Lanford
2003 *The Cheyenne/Arapaho Ledger Book from the Pamplin Collection*. Privately published by Robert Pamplin, Portland, Oregon.
- Berlo, Janet Catherine (editor)
1996 *Plains Indian Drawings 1865–1934: Pages from Visual History*. Harry N. Abrams, New York.
- Brownstone, Arni
2001a The Musee de L'Homme's Foureau Robe and its

- Moment in the History of Blackfeet Painting. *Plains Anthropologist* 46:249–267.
- 2001b Seven War-Exploit Paintings: A Search for Their Origins. In *Studies in American Indian Art: A Memorial Tribute to Norman Feder*, edited by Christian F. Feest, pp. 69–85. European Review of Native American Studies, University of Washington Press, Seattle.
- Canadian Museum of Civilization
2008 *The Fur Trade In New France: Voyageurs and Hired Men: Broadcloth, Weapons and Tools*. Electronic document, http://www.civilization.ca/cmc/index_e.aspx?DetailID=4777, accessed October 22, 2008.
- Calloway, Colin G.
2003 *One Vast Winter Count: The Native American West before Lewis and Clark*. University of Nebraska Press, Lincoln.
- Carlos, Ann, and Frank Lewis
2008 Fur Trade (1670–1870). In *EH.Net Encyclopedia*, edited by Robert Whaples. Electronic document, <http://eh.net/encyclopedia/article/carlos.lewis.furtrade>, accessed November 18, 2009.
- Catlin, George
1973a *Letters and Notes on the Manners, Customs, and Conditions of the North American Indians*, Volume I. Dover Publications, New York.
1973b *Letters and Notes on the Manners, Customs, and Conditions of the North American Indians*, Volume II. Dover Publications, New York.
- Conner, Stuart W.
1962 *A Preliminary Survey of Prehistoric Picture Writing on Rock Surfaces in Central and South Central Montana*. Billings Archaeological Society, Billings, Montana.
1984 The Petroglyphs of Ellison's Rock (24RB1019). *Archaeology In Montana* 25(2–3):123–145.
- Damp, Jonathan, and Christopher D. Adams
2008 For the Want of a Nail: The Battlefield Archaeology of Hawikku and the European Invasion of the American Southwest. Paper presented at the Society for Historical Archaeology Annual Meeting, Albuquerque, New Mexico.
- Dempsey, Hugh A.
1973 A History of Writing-on-Stone. Manuscript on file at the Glenbow Institute, Calgary, Alberta.
- Denig, Edwin Thompson
2000 *The Assiniboine*. University of Oklahoma Press, Norman.
- Diaz-Granados, Carol, and James R. Duncan
2000 *The Petroglyphs and Pictographs of Missouri*. The University of Alabama Press, Tuscaloosa, Alabama.
- Eckles, David, Jeffrey Lockwood, Rabinder Kumar, Dale Wedel, and Danny N. Walker
1994 An Early Historic Period Horse Skeleton from Southwestern Wyoming. *The Wyoming Archaeologist* 38:55–68.
- Ewers, John C.
1955 *The Horse in Blackfoot Indian Culture*. Smithsonian Institution Press, Washington D.C.
- Francis, Julie E.
2007 Imagery of Medicine Lodge. In *Medicine Lodge Creek: Holocene Archaeology of the Eastern Big Horn Basin, Wyoming*, vol. 1, edited by George C. Frison and Danny N. Walker, pp. 209–226. Clovis Press, Albuquerque, New Mexico.
- Francis, Julie E., and Lawrence L. Loendorf
2002 *Ancient Visions*. University of Utah Press, Salt Lake City.
- Frison, George C.
1974 *The Casper Site: A Hell Gap Bison Kill on the High Plains*. Academic Press, New York.
1991 *Prehistoric Hunters of the High Plains*. 2nd ed. Academic Press, San Diego, California.
- Gebhard, David, Fred Heaton, and Jonathan Laitone
1987 The Rock Drawings of Castle Gardens, Wyoming. Manuscript on file, Bureau of Land Management, Cheyenne, Wyoming.
- Grant, Campbell, James W. Baird, and J. Kenneth Pringle
1968 *Rock Drawings of the Coso Range*. Maturango Museum, China Lake, California.
- Greene, Candace S.
2006 Arikara Drawings: New Sources of Visual History. *American Indian Art Magazine* 31(2):74–85, 99.
- Greer, John
2009 Metal Points from Wyoming Archaeological Surveys: A Compilation of Wyoming State Historic Preservation Office Records and Photographs. Manuscript on file, Wyoming State Historic Preservation Office, Cheyenne.
- Greer, Melissa, and James D. Keyser
2008 Women Among Warriors: Female Figures in Bear Gulch Rock Art. *American Indian Rock Art* 34:89–103
- Habgood, Thelma
1967 Petroglyphs and Pictographs in Alberta. *Archaeological Society of Alberta Newsletter* 13-14:1–37.
- Hamilton, Scott, and B. A. Nicholson
2007 The Middleman Fur Trade and Slot Knives: Selective Integration of European Technology at the Mortlach Twin Fawns Site (DiMe-23). *Canadian Journal of Archaeology* 31(3:Supplement):137–162.
- Hendry, Anthony
1907 York Factory to the Blackfeet Country: The Journal of Anthony Hendry, 1754–1755. *Proceedings and Transactions of the Royal Society of Canada* 3(1):307–364.
- Hunt, David C., and Marsha V. Gallagher
1984 *Karl Bodmer's America*. University of Nebraska Press, Lincoln.
- Johnson, Craig M.
1998 The Coalescent Tradition. In *Archaeology on the Great Plains*, edited by W. Raymond Wood, pp. 308–344. University Press of Kansas, Lawrence.
- Kaiser, David A., James D. Keyser, Amanda Derby, and John Greer
2010 The Bear Gulch Shield Bearing Warrior: Defining a Cultural Type. *American Indian Rock Art* 36:37–52.
- Kenyon, Walter A.
2008 Indian Trade Goods. The Canadian Encyclopedia. Electronic document, <http://www.thecanadianencyclopedia.com/index.cfm?pgNm=TCE&Params=A1ART-A0003982>, accessed October 22, 2008.
- Keyser, James D.
1977a Writing-On-Stone: Rock Art on the Northwestern Plains. *Canadian Journal of Archaeology* 1:15–80.

- 1977b The Rock Art of Writing-On-Stone. Manuscript submitted to Alberta Recreation and Parks, Edmonton, Alberta.
- 1979 Late Prehistoric Period Bison Procurement on the Milk River in North-Central Montana. *Archaeology in Montana*, 20(1):1–221.
- 1984 Rock Art of the North Cave Hills. In *Rock Art of Western South Dakota*, Special Publication No. 9, pp. 1–51, South Dakota Archaeological Society.
- 1987a A Lexicon for Historic Plains Indian Rock Art: Increasing Interpretive Potential. *Plains Anthropologist* 32:43–71.
- 1987b A Graphic Example of Petroglyph Superimpositioning in the North Cave Hills. *Archaeology In Montana* 28(2):44–56.
- 2001 Relative Dating Methods. In *Handbook of Rock Art Research*, edited by David S. Whitley, pp. 116–138. AltaMira Press, Walnut Creek, California.
- 2004 *Art of the Warriors: Rock Art of the American Plains*. University of Utah Press, Salt Lake City.
- 2005 Rock Art of the Ashland Ranger District, Custer National Forest. *Archaeology In Montana* 46(2):1–52.
- 2006 Bear Gulch and the Origins of Narrative Art. *Archaeology In Montana* 47(2):57–75.
- 2007 The Warrior as Wolf. *American Indian Art Magazine* 32(3):62–69.
- 2008a Prehistoric Antecedents of the Plains Bow Spear. *American Indian Art Magazine* 33(2):60–73, 92.
- 2008b Two Ute Portraits: Late Rock Art on the Colorado Plateau. In *Utah Rock Art: Papers Presented at the Twenty-Sixth Annual Symposium of the Utah Rock Art Research Association* vol. XXVI, edited by Anne McConnell and Elaine Holmes, pp. 1–8. Utah Rock Art Research Association, Salt Lake City, Utah.
- 2008c “These Curious Appendages:” Medicine Bundles in Bear Gulch Rock Art. *American Indian Rock Art* 34:61–72.
- 2010 Size Really Does Matter: Dating Plains Rock Art Shields. *American Indian Rock Art* 36:85–102.
- Keyser, James D., and Mike Cowdrey
2008 Northern Plains Biographic Rock Art: Ethnography Written on Stone. *Archaeology In Montana* 49(1):19–34.
- Keyser, James D., and Michael A. Klassen
2001 *Plains Indian Rock Art*. University of Washington Press, Seattle.
- 2003 Every Detail Counts: More Additions to the Plains Biographic Rock Art Lexicon. *Plains Anthropologist*, 48:7–20.
- Keyser, James D., and George Poetschat
2005 *Warrior Art of Wyoming's Green River Basin: Biographic Petroglyphs Along the Seedskadee*. Publication 15, Oregon Archaeological Society Press, Portland.
- 2009 *Crow Rock Art in the Bighorn Basin: Petroglyphs at No Water Wyoming*. Publication 20, Oregon Archaeological Society Press, Portland.
- Keyser, James D., John Greer, Carl M. Davis, Mavis Greer, Marvin W. Rowe, Sara A.
Scott, and George Poetschat
2010 Dating the Bear Gulch and Atherton Canyon Rock Art Sites, Central Montana. *Archaeology In Montana*, in press.
- Klassen, Michael A.
1995 Icons of Power, Narratives of Glory: Ethnic Continuity and Cultural Change in the Contact Period Rock Art of Writing-On-Stone. Masters thesis, Department of Anthropology, Trent University, Peterborough, Ontario.
- Kurz, Rudolph Friedrich
1937 *Journal of Rudolph Friedrich Kurz: An Account of His Experiences Among Fur Traders on American Indians on the Mississippi and Upper Missouri Rivers During the Years 1846 to 1852*. Bureau of American Ethnology Bulletin 115, Smithsonian Institution.
- Lanford, Benson L.
2003 American Indian Material Culture. In *The Cheyenne/ Arapaho Ledger Book from the Pamplin Collection*, edited by Kenneth E. Kahn II, pp. 144–205. Privately published by Robert Pamplin, Portland, Oregon.
- Lehmer, Don
1971 *Introduction to Middle Missouri Archaeology*. National Park Service, U.S. Department of the Interior, Washington, DC.
- Loendorf, Lawrence L.
2009 Shields and Shield-bearing Warriors: What We Thought We Knew, but Did Not! Paper presented at the Legend Rock Petroglyph Site symposium, Cody, Wyoming.
- Loendorf, Lawrence L., and Stuart W. Conner
1993 The Pectol Shields and the Shield-Bearing Warrior Rock Art Motif. *Journal of California and Great Basin Anthropology* 15(2):216–224.
- Lothson, Gordon Allan
1976 *The Jeffers Petroglyphs Site: A Survey and Analysis of the Carvings*. Minnesota Historical Society, St. Paul, Minnesota.
- Lowie, Robert H.
1913 *Societies of the Crow, Hidatsa, and Mandan Indians*. Anthropological Papers Vol. 11, Pt 3, American Museum of Natural History.
- Maurer, Evan M.
1992 *Visions of the People: A Pictorial History of Plains Indian Life*. The Minneapolis Institute of Arts, Minneapolis, Minnesota.
- McCleary, Tim
2008a Writing On The Wall: Crow Interpretation of the Joliet Rock Art Panels. *Archaeology In Montana* 49(1):35–62.
- 2008b Ghosts on the Land: Apsaalooke (Crow Indian) Interpretations of Rock Art. Unpublished Ph.D. dissertation, Department of Anthropology, University of Illinois at Urbana-Champaign, Urbana, Illinois.
- Mulloy, William
1958 *A Preliminary Historical Outline for the Northwestern Plains*. University of Wyoming Publications, Vol. 22(1), Laramie.
- Parsons, Mark L.
1987 Plains Indian Portable Art as a Key to Two Texas Historic Rock Art Sites. *Plains Anthropologist* 32(117):257–274
- Penney, David W.
1992 *Art of the American Indian Frontier: The Chandler-Pohrt Collection*. University of Washington Press, Seattle.
- Petersen, Karen D.
1971 *Plains Indian Art from Fort Marion*. University of Oklahoma Press, Norman.
- Peterson, Harold L.
2001 *Daggers and Fighting Knives of the Western World*.

- Dover Publications, New York.
- Poetschat, George, and James D. Keyser
2009 Atherton Canyon Rock Art: Part of Central Montana's Bear Gulch Complex *American Indian Rock Art* 35:185–202.
- Poetschat, George, James D. Keyser and John Greer
2008 Bear Gulch: Fifty Years Later. *American Indian Rock Art* 34:9–21.
- Powell, Peter J.
2002 Bearers of the Sacred Thunder Bow: Part I. *American Indian Art Magazine* 27(3):62–71.
- Pyszczyk, Heinz W.
1997 The Use of Fur Trade Goods by the Plains Indians, Central and Southern Alberta, Canada. *Canadian Journal of Archaeology* 21:45–84.
- Ray, Arthur J.
1974 *Indians in the Fur Trade: Their Role as Hunters, Trappers and Middlemen in the Lands Southwest of Hudson Bay 1660–1870*. University of Toronto Press, Toronto, Ontario.
- Ray, Melissa Marie
2007 The Shield Bearing Warriors of Bear Gulch: A Look at Prehistoric Warrior Identity in Rock Art and Places of Power. Unpublished Masters thesis, Department of Anthropology, University of Montana, Missoula.
2008 The Shield Bearing Warriors of Bear Gulch: A Look at Prehistoric Warrior Identity in Rock Art. *American Indian Rock Art* 34:23–35.
- Reher, Charles A., and George C. Frison
1980 The Vore Site, 48CK302, A Stratified Buffalo Jump in the Wyoming Black Hills. *Plains Anthropologist* 25(88, Part 2).
- Russell, Carl P.
1967 *Firearms, Traps, and Tools of the Mountain Men*. University of New Mexico Press, Albuquerque.
- Schaafsma, Polly
1980 *Rock Art of the Southwest*. University of New Mexico Press, Albuquerque.
- Schultz, James Willard
1962 *Blackfeet and Buffalo*. University of Oklahoma Press, Norman.
- Secoy, Frank Raymond
1992 *Changing Military Patterns of the Great Plains*. University of Nebraska Press, Lincoln.
- Sundstrom, Linea
1990 *Rock Art of the Southern Black Hills: A Contextual Approach*. Garland Publishing, New York.
- Taylor, Colin
1994 *The Plains Indians*. Crescent Books, New York.
2001 *Native American Weapons*. University of Oklahoma Press, Norman.
- Thiessen, Thomas D.
1993 Early Explorations and the Fur Trade at Knife River. In *The Phase I Archaeological Research Program for the Knife River Indian Villages National Historic Site. Part II: Ethnohistorical Studies*, edited by Thomas D. Thiessen, pp. 29–46. Occasional Studies No. 27, Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.
- Thomas, Davis, and Karin Ronnefeldt
1976 *People of the First Man: Life Among the Plains Indians in Their Final Days of Glory*. E. P. Dutton, New York.
- Thompson, Judy
1977 *The North American Indian Collection: A Catalogue*. Bernisches Historisches Museum, Bern, Switzerland.
- Utley, Robert M.
2008 *Sitting Bull: The Life and Times of an American Patriot*. Henry Holt and Company, New York.
- Western Archaeological Services
2007 Wyoming Cultural Properties Form for Site 48SW16815. Manuscript on file, Wyoming State Historic Preservation Office, Laramie, Wyoming.
- Wikipedia
2008 *Fur Trade: North American Fur Trade*. Electronic document, http://en.wikipedia.org/w/index.php?title=Fur_trade, accessed January 25, 2008.
- Weston, Timothy, and Stanley A. Ahler
1993 Modified Bone and Antler Remains from the KNRI and the Upper Knife-Heart Region. In *The Phase I Archaeological Research Program for the Knife River Indian Villages National Historic Site. Part III: Analysis of the Physical Remains*, edited by Thomas D. Thiessen, pp. 273–288. Occasional Studies No. 27, Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.

NOTES

1. While Ceremonial tradition art likely had its inception earlier than A.D. 1500 (Keyser and Klassen 2001:206–208), our interest is restricted to this later part of the Late Prehistoric period and into the Protohistoric period because that is the time when most shield bearing warriors were apparently produced. Early dates of about A.D. 1100–1300 on Castle Gardens style shield figures have recently been shown to be contaminated by old charcoal, and newer, more reliable dates suggest an age of about A.D. 1500 (Loendorf 2009). Likewise, the only directly dated shield bearing warriors that are likely to be significantly earlier than this (e.g., Francis and Loendorf 2002:145–147) lack the characteristic weaponry that is of interest to this study.

2. This contrasts markedly to neighboring regions including the northeastern Woodlands, Southwest, and Great Basin where various types of weapons (e.g. atlatls) and weapon points are frequently illustrated in considerable detail in both Archaic and Late Prehistoric period rock art styles (Diaz-Granados and Duncan 2000:96, 145; Grant et al. 1968:37, 49, 54, 61, 81, 84, 97, 107; Lothson 1976:25; Schaafsma 1980:56–59).

3. More than 60 different items of material culture have been recognized in Ceremonial and Biographic rock art drawings, and several (e.g., headdresses/hairstyles, guns, horse halter decorations) have as many as six to twelve clearly different varieties.

4. Lanford (2003:190) refers to points of this type as having “basal spalls” but this does not conform to the commonly accepted archaeological definition of spall, and the projection is more correctly called a quillon. Nonetheless, Lanford (2003:190) notes that such points “are typical of those furnished by Euro-American traders.”

Although—as this piece shows—such metal blades were commonly serrated by filing or sawing small nicks along one or both edges (Figure 7; see also Frison 1991:123–124; Lowie 1913:263) detail such as this would be almost impossibly small

to illustrate in any Biographic art medium. We can find only two examples of such serrations, both on Cheyenne Thunder Bows, one held by Bear Foot (Powell 2002:65) and the other brandished by Thunder Hawk (Afton et al. 1997:250–251). Additionally, we cannot know when this practice of serrating metal points started among Plains tribes, but it is unlikely to have been used in Protohistoric times, given the presumed scarcity of metal files or saws available to Plains Indians at these early dates.

6. Dozens of other robe and ledger illustrations use this pictographic form for lance points (e.g., Afton et al. 1997:67; Barbeau 1960:137; Brownstone 2001a:254, 2001b:70–73; Taylor 1994:184–186, 2001:116) and almost certainly portray metal weapons, but for these drawings we have no directly corresponding artifacts.

7. This bow-spear, drawn at Bear Gulch (Keyser 2008a:68), is illustrated four different times, with three of these clearly showing the quillon on the large, knife-shaped point.

8. On the other hand, knife blade tips or fragments could readily be made into arrow points, and the ethnohistoric record indicates just such manufacture (Russell 1967:329).

9. In fact, large chipped stone projectile points are so scarce in Late Prehistoric period Plains archaeological collections that Frison (1991:355–357) uses the size of the few large specimens that are known, to argue for a special, non-utilitarian function for such points.

10. We chose 2 m based both on the common occurrence of historic portraits of warriors holding spears of this approximate length, and Ewers' informants' assertions that Blackfeet weapons were approximately this long. In fact Ewers notes (1955:201)

that a significantly longer lance was thought to signify a coward among both the Blackfeet and Crow.

11. These were large jackknives with blades between 8 and 10 cm (3.5 and 4 in) long.

12. The scarcity of guns compared to metal knives and projectile points in the early fur trade period is clearly illustrated by this same citation, which notes only 300 flintlock muskets brought in versus the more than 8,000 knives.

13. One reviewer noted that we had not taken into account the “fall-off rate” for trade items that must travel significant distances from their source. While we know of no specific rate for knives or metal items in the earliest fur trade, a worst case scenario still results in quite a large quantity of knives on the northwestern Plains, even at these early dates. Given the records showing 8,000 knives available at Albany Post in 1684 (Kenyon 2008) and more than 3,500 knives and bayonets at York Factory in A.D. 1740 (Carlos and Lewis 2008:Table 2), a very conservative estimate would be 3,000 knives per year entering the fur trade in the Hudson's Bay area. Even if we then assume a fall-off rate of 99 percent for those reaching the northwestern Plains, for the 50 year period between A.D. 1680 and 1730 that would mean 1,500 knives reached the region. We do not feel that the illustration of fewer than 100 of these at Bear Gulch and Atherton Canyon over this period stretches the bounds of credibility.

14. This total is 28 rather than 25 specimens because three points at DgOW32 at Verdigris Coulee are counted twice since they are associated with both horses and pedestrian shield bearing warriors.