

Paleo Tools of the Great Basin

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Introduction

A variety of distinctive stone tools are common in Paleoindian assemblages in the Great Basin. Frequently overlooked, but usually identifiable, these tools can reveal details about the activities of the earliest people of the region. Interestingly, as researchers have found, the earliest Americans consistently sought aesthetically pleasing materials to use for projectiles and tools (Bradley et al, 2010, p. 8). Regarding Clovis, Bradley continues with:

“The selection of exotic materials is especially evident in Western Caches” and “Clovis knappers had preferences for...particular colors, textures or even stones from places that held special significance.”

Stone quality and color was clearly important. With a widely diverse variety of toolstone available in the Great Basin it is clear these toolmakers valued the best materials found across the landscape for *non-projectiles*. Great Basin Paleoindian *projectiles*, such as Western Stemmed (WST) and fluted points, were more commonly made from volcanic stones (obsidian and basalt). This was likely due to the abundance of volcanic sources. The brittle nature of volcanics was also more acceptable for projectiles. For tools however, durability was much more important as damage from constant usage is more easily correctable and a longer use-life was possible. Still, obsidian was used near the large obsidian sources for thousands of years. Close to these large quarries, it was more economical to simply make new tools to replace broken or exhausted ones. A by-product of obsidian projectile-making is obviously flakes, so in areas where obsidian projectiles were made, flake tools are also found. With migrations far from any source, harder and more durable materials were more highly valued. The earliest Indians however, still transported obsidian over long distances, perhaps because they hadn't yet familiarized themselves with the toolstone landscape.

This commentary attempts to illustrate the extremely wide array of tools and tool materials used in the first few millennia of human activity in the Great Basin. Many of these relics are identifiable as repeatable tools with specific intended uses, even though we often debate what those uses were. Many others (blades from prepared cores or spurred end-scrapers, for instance) appear as products of specific technologies as seen in other regions. There is also considerable overlap in tool technologies that compounds the never-ending debates on definitized typology. In many instances, tools shown here could be placed in multiple categories due to multiple attributes. For example, some blades are made into end-scrapers, side-scrapers, spokeshaves, etc. The intent here is to illustrate the importance and repeated occurrence, of a number of recognized “types”, or possibly more accurately “categories” of tools used by Paleoindians in the Great Basin. And also, to highlight the attention to quality, repeatability and appealing appearance evident in the end-products they left. These artifacts are described in the following sections as an initial attempt categorize paleolithic tools of the region from a form, function or technology perspective:

1. End Scrapers (with and without spurs)	9. Blade Tools
2. Specialized Spurs and Gravers	10. Biface Flake Tools
3. Side-Scrapers	11. Denticulates
4. Convergent Scrapers	12. Overshot Flake Tools
5. Beaked Scrapers / Gravers	13. Hafted Biface Tools
6. Bifacial Knives / Scrapers	14. Chisel Bits
7. Domed Scrapers	15. Bipolar Tools
8. Spokeshave Tools	16. Limaces

Examining each of these categories of tools will hopefully add to our ability to recognize these artifacts as paleolithic. In some cases, similar artifacts appear throughout pre-history (end-scrapers for example). An end-scrapers with a built-in spur however, is considered to be from the paleo era. All artifacts depicted in this document are used because they were found associated with defined paleo projectile types, or at least in settings where one would expect to find paleo artifacts almost exclusively.

1. End-Scrapers

Paleo End-Scrapers (PES) are numerous in paleolithic assemblages across the continent. In Eren, Jennings and Smallwood (2013), *spurs* on end-scrapers were extensively researched to determine if these features were intentional or somehow produced as a biproduct of the continual re-working of unifacial scrapers. Their conclusion was they were not accidental and did not appear with any more or less frequency as a function of size or mass of the tool. This seemingly obvious conclusion (in this author's opinion) is important as it relates to lithic practices of the earliest Americans. Spurred end-scrapers have been associated with Clovis, Folsom and Midland in many sites across the continent. Figure 1 shows such scrapers from Blackwater Draw in New Mexico (from <http://www.lithiccastinglab.com/gallery-pages/2012octoberblackwaterdrawpage1.htm>). Figure 2 is from the El Fin del Mundo Clovis site in Sonora, Mexico (Sanchez-Morales et al 2022 p.533). Figure 3 is from the Pavo Real site in Texas (from <https://www.texasbeyondhistory.net/pavoreal/paleoindian.html>) Figure 4 are Folsom/Midland scrapers (from <https://www.texasbeyondhistory.net/theme/tools/images/Lithics-MB12.html>). Folsom points are rare to non-existent in the Great Basin, so it is reasonable to conclude they were left by Clovis Indians or possibly by the makers of Blackrock Concave Base points. Technological and historical connections to Folsom/Midland (and Goshen) are suspected (Garrett 2025). These end-scrapers were likely hafted and frequently show use-wear consistent with hide-scraping (Jones 1996, p. 152).

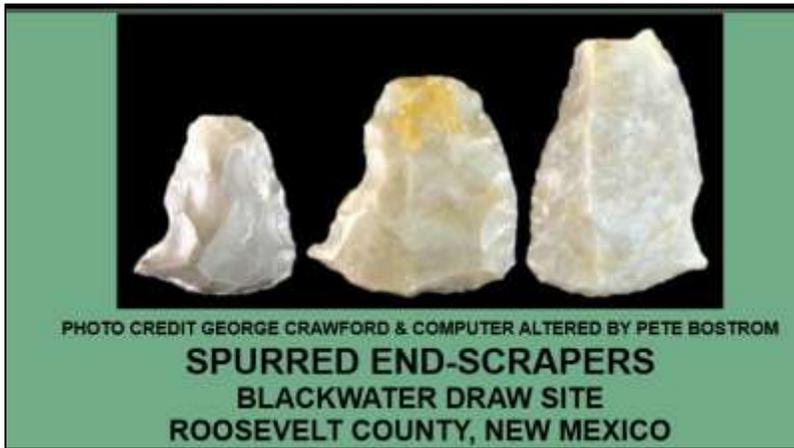


Figure 1 Spurred End-Scrapers from Blackwater Draw

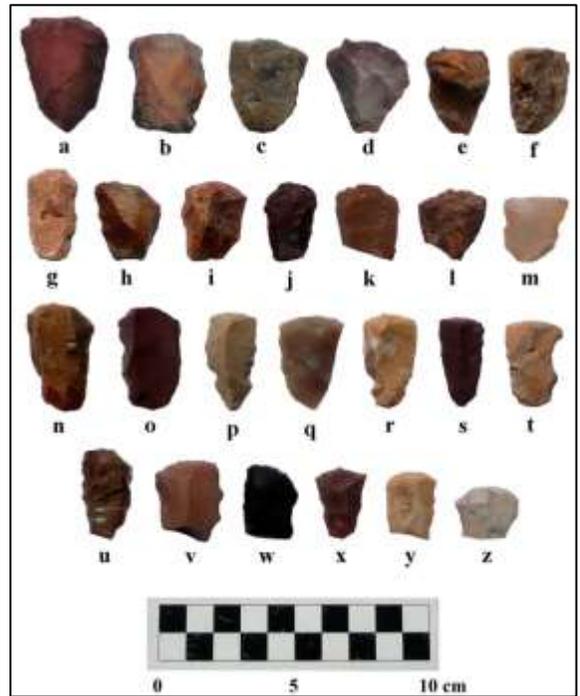
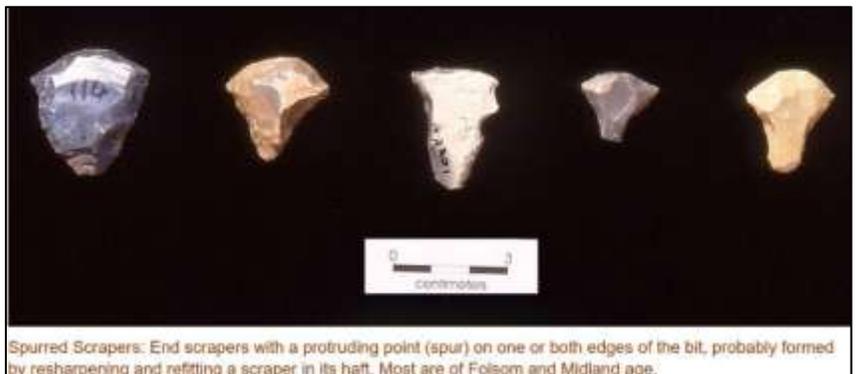


Figure 2 End-scrapers from El Fin del Mundo



Selection of end scrapers made on flakes and on blades. Those on blades are probably of Clovis origin whereas those on flakes could be of either Clovis or Folsom affiliation.

Figure 3 Pavo Real Texas End-scrapers



Spurred Scrapers: End scrapers with a protruding point (spur) on one or both edges of the bit, probably formed by resharpening and refitting a scraper in its haft. Most are of Folsom and Midland age.

Figure 4 Midland / Folsom scrapers from Texas

The following images show numerous paleo end-scrapers found within the Great Basin. Many have spur or graver features consistent with similar equivalents from other regions but also reveal the priority given to the material choices.



Figure 5 Spurred End-scraper of Bright and Distinctive Green Material



Figure 6 Curved End-scraper with Small Graver Features

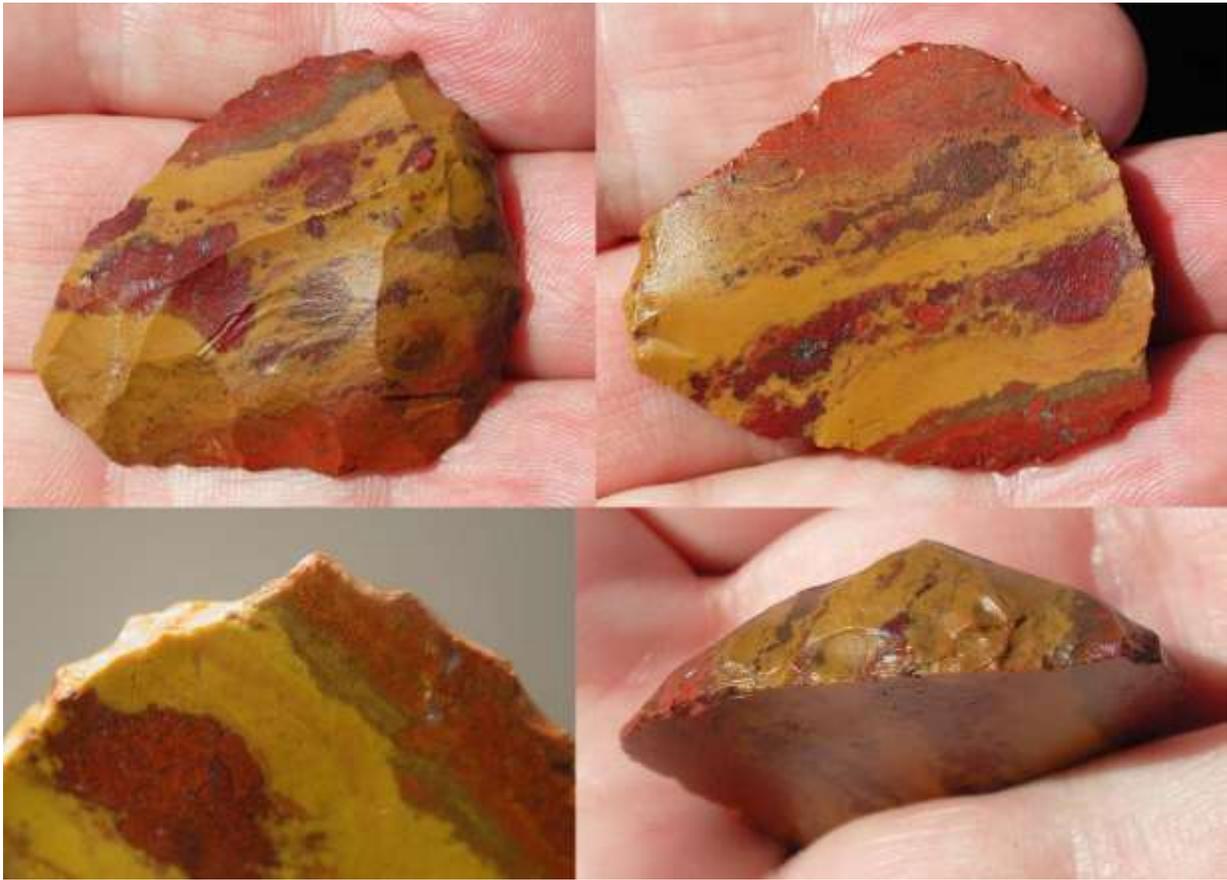


Figure 7 Brightly-Colored Spurred End-scraper



Figure 8 Paleo End-scraper with Prominent Spur



Figure 9 Well-used Paleo End-scraper with Hafting Element



Figure 10 2.6-Inch Obsidian End-scraper with Long Hafting Element or Handle

Figure 11 is an end-scraper that has a small beak-like feature. It also has an eraille scar originating from the point of percussion impact. An eraille is a small flake that self-detaches from the ventral face of a larger flake, in the percussion bulb near the point of impact, but leaves no evidence on the core itself. The presence of erailles is often seen as evidence of human knapping.



Figure 11 Green Paleo End-scraper with Beak Graver, or "Hook"

Figure 12 shows a thick and heavily patinated end-scraper with multiple gravers or "teeth".



Figure 12 Heavily Patinated End-scraper with Small Gravers



Figure 13 High-quality Jasper Paleo End-scraper

Figure 14 below shows a small heavily re-worked end-scraper with a prominent triangular cross-section. This possibly originated from a Clovis prismatic blade.



Figure 14 Re-worked End-scraper, Prismatic "Blade-like" Shape



Figure 15 Small Brightly-colored End-scraper

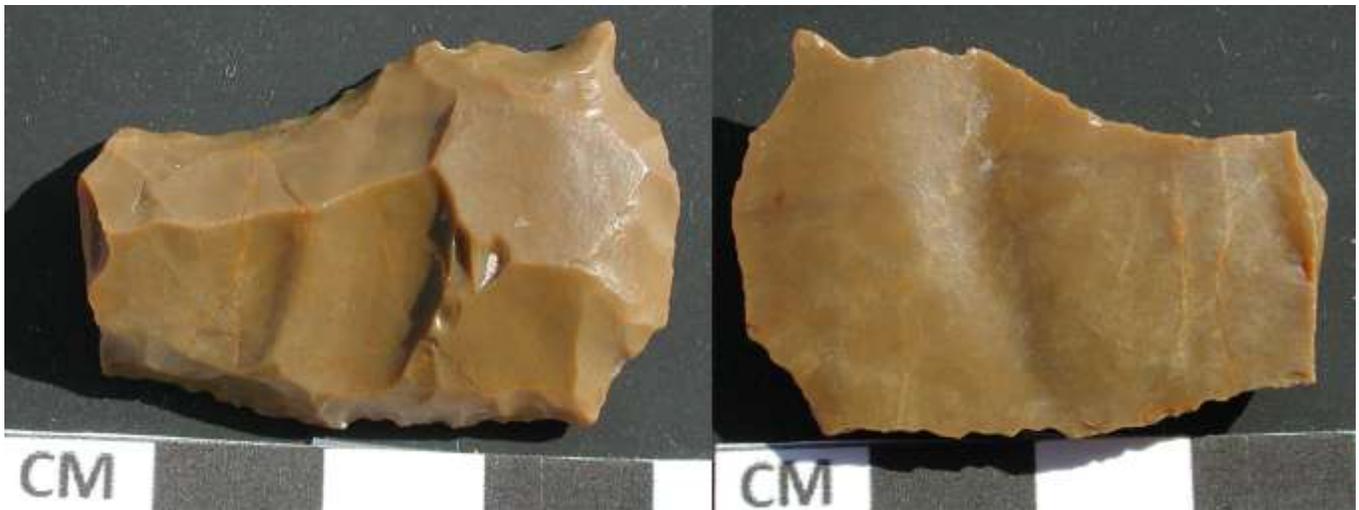


Figure 16 Paleo End-scraper with Prominent Gravers (Both Corners)



Figure 17 Small (1.1-Inch-Long) & Highly Curved Paleo End-Scraper

The end-scraper shown below in Figure 18 is a unilaterally re-touched base from a Western Stemmed (WST) point. This is not an unusual occurrence. These WST examples have not been observed (so far) to have spurs or gravers however. The conclusion here is end-scrapers made with spurs were left by Clovis or Blackrock point-makers.



Figure 18 Western-Stemmed Point base, Resharpener into an End-Scraper

2. Specialized Spurs and Gravers

Specialized gravers were also made and used that don't appear to be hafted. Frequently quite small, these tools often show multiple "bits". Figure 19 below (all taken from <http://www.lithiccastinglab.com/gallery-pages/2008augustgraverspage1.htm>) shows a variety of paleolithic gravers from other regions.



Figure 19 Paleo Gravers from Around the Continent

Figure 20 illustrates similar lithic tools, including small graters, from the Aubrey Clovis site in North Texas (Ferring 2001, p. 164).

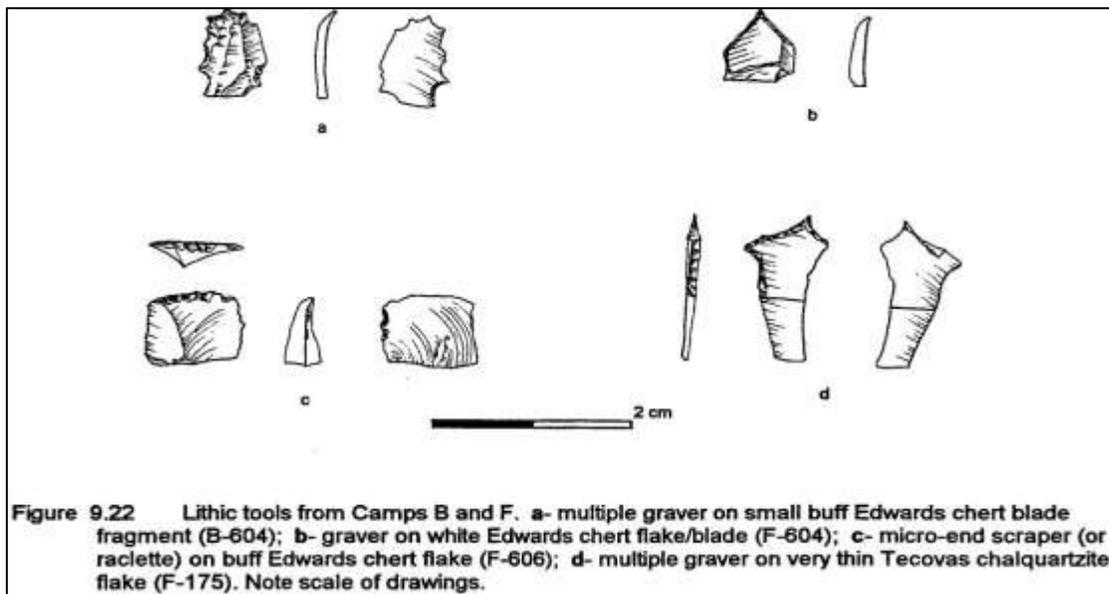


Figure 20 Clovis Gravers from the Aubrey Site in Texas

The following images illustrate numerous specialized Paleolithic graters and spurs from the Great Basin.



Figure 21 Graver on Side-scraper

Figure 22 is a unique paleo artifact, used as a side-scraper on all edges, with a sharp point on one end and most notably, a “dual” graver feature on the other end.



Figure 22 Dual-Graver, Obsidian



Figure 23 Small Round Tool with Multiple Graver Features



Figure 24 Small Flake Graver



Figure 25 Small Flake Graver, Green Chert



Figure 26 Small Flake Graver, Brown Chert



Figure 27 Small Flake with Multiple Gravers

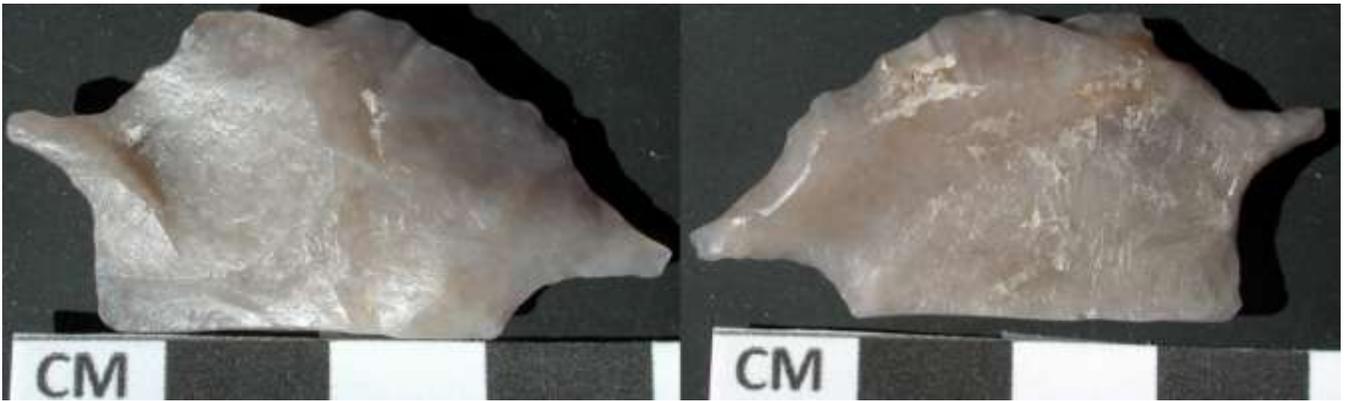


Figure 28 Small Bifacial Plunge-Failure Flake with Opposing Gravers

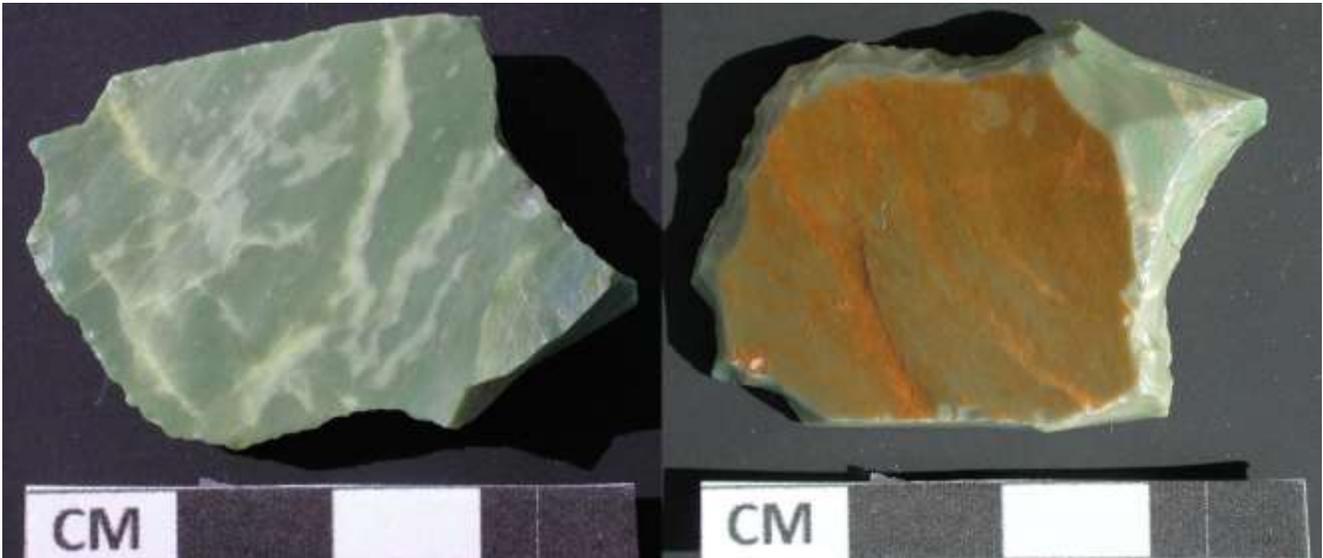


Figure 29 Small Green Chert Cortex Scraper with Graver



Figure 30 White Chert End / Side-scraper with Multiple Graver Tips

3. Side-Scrapers

Side-scrapers are generally unifacial flakes created as part of many lithic-reduction processes, from large cobble spalls to small flakes. These flakes were modified for use as tools. Side-scraper size can vary greatly, but most show extensive edge-work and use-wear. Figure 31 is a large side-scraper made from bright green chert.



Figure 31 Large (3.2-Inch) and Heavily Used and Patinated Green Side-scraper

Figures 32 and 33 are side-scrapers that could also be considered spokeshaves or gravers.



Figure 32 Chert Combination Side-scraper / Graver



Figure 33 Chert Combination Side-scraper / Graver

4. Convergent Scrapers

A convergent scraper is one that has two adjacent re-touched margins converge together (Dibble 1987, p.116). Figure 34 is a curved convergent scraper, worked on all edges. It could be considered a beaked scraper as well. The material is a high-quality jasper which is possibly heat-treated. The beaked scraper in Figure 50 is made from the same toolstone.



Figure 34 Jasper Convergent "Crescentic" Scraper

Convergent scrapers similar to those shown in Figure 35 below, have been documented from the Anzick Clovis burial and recognized from other early sites from other regions including Vail the northeast and the Adams site in the southeast U.S. (Jones, 1996, p. 149).



Figure 35 Classic paleo Convergent Scrapers

Figure 36 is an obsidian example unique in that the use-wear is not unifacial. The sharpening and wear alternate edges. This tool was likely used in a clock-wise twisting motion, as to bore holes in some organic material.

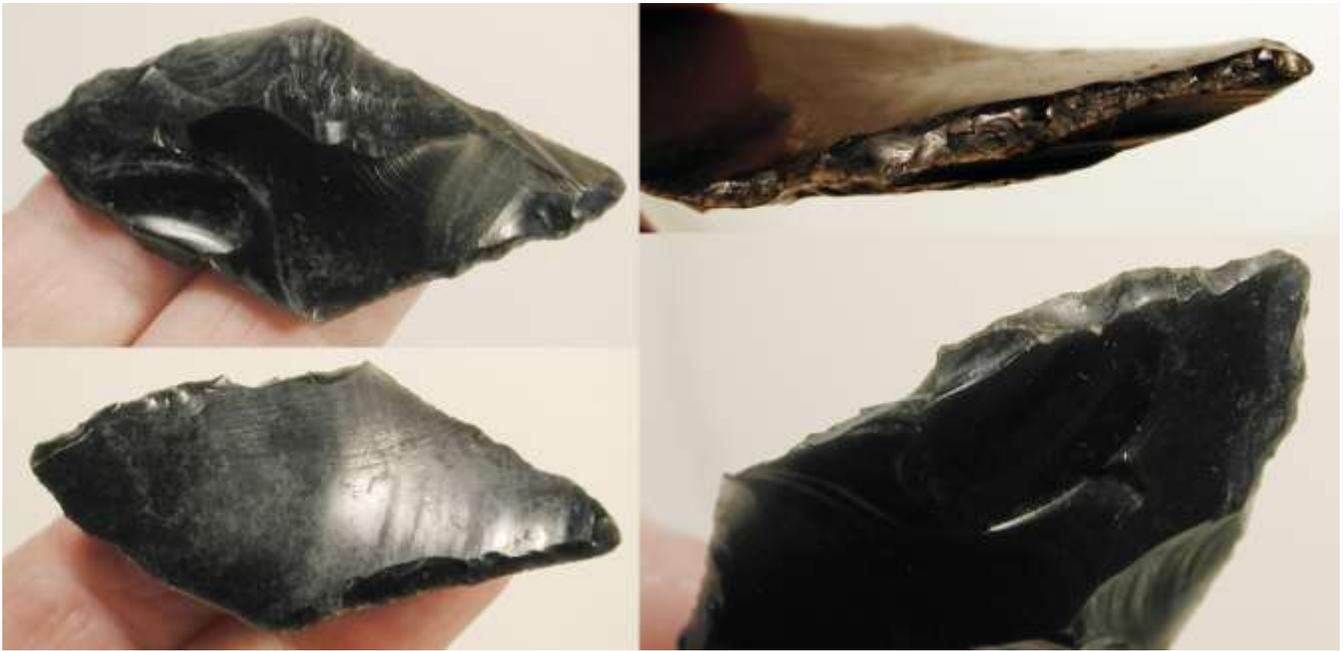


Figure 36 Obsidian Alternately Edge-sharpened and Worn Tool

Figure 37 shows a white chalcidony convergent scraper with graver features.



Figure 37 Convergent Scraper with Gravers

The Withington Clovis/Gainey site in Wisconsin produced a variety of convergent scrapers (among many others) that retain sections of cortex similar to Figure 38 below. This was interpreted as tools that “reached the site as transported tabular flake blanks or in finished form” as opposed to utilized flakes produced in the manufacture of bifaces or points (Loebel 2015, p. 229).



Figure 38 Convergent Scraper on Cortex Flake

5. Beaked Scrapers / Gravers

One specific form of convergent scrapers is often referred to as a beaked scraper or graver. According to Duke, beaked scrapers “exhibit a steep convergence of two worked edges to form a ‘beak.’ Their implied use is as a graver, but they vary in form between subtle to prominent and pointed to rounded precluding an exact functional assignment” (Duke 2011, p.141). Figure 39 is a fine example of a large beaked graver.



Figure 39 Large (3-Inch), Well-prepared Paleo Beaked Scraper

Figures 40-42 Illustrate high-quality Great Basin paleo beaked gravers on flakes. All with thick patina and heavy use-wear.



Figure 40 Jasper Beaked Graver, Heavy Use-wear



Figure 41 Tiny Small Polished Beaked Graver (possibly heat-treated)



Figure 42 2.6-Inch-Long Flake Polished Beaked Graver

Figure 43 below shows a Blackrock Concave Base point that was broken and reworked into a classic beaked graver. The shoulders of the “bit” appear to have been used for some scraping or spokeshaving function as well. This is evidence that at least the Blackrock makers made and used these beaked graters. Little evidence has surfaced to demonstrate beaked graters with any other paleo point type in the Great Basin, although Estes reports they were found in a single component Haskett/Cougar Mountain site in Jakes Valley, NV (Estes 2009 p. 111).



Figure 43 Blackrock Concave Base Point Re-worked into a Beaked Graver

The following images (Figures 44-49) show a variety of graver tools made by Paleoindians in the Great Basin.



Figure 44 A Long Beaked Graver on a Bifacial Reduction Flake



Figure 45 A Slightly Damaged Beaked Graver with Side-scraper Use-wear



Figure 46 A Green Chert Beaked Graver Opposite an End-Scraper



Figure 47 A Small Specialized Beak Graver



Figure 48 A 2.9-Inch-Long Biface-reduction Flake Modified as a Beaked Graver



Figure 49 A Very Small Jasper Beaked Graver

The beak tool in Figure 50 is unusual in that it is not formed on a thin flake. The steeply worked edge is quite thick and almost has the appearance of a micro-blade core, although that is unheard of in the Great Basin. It is also made from the same possibly heat-treated material as the convergent scraper in Figure 34.



Figure 50 An Unusual 2.8-Inch-Long Beaked Scraping Tool Made from Jasper

6. Bifacial Knives / Scrapers

Large Bifacial (Plano-Convex) scraper-knives were made and used by Great Basin Paleoindians as shown below.



Figure 51 A Large 3.3-Inch-Long, Well-used Biface, Likely Used In-Hand

A similar plano-convex (slightly humped) biface is shown in Figure 52. Flaking appears to show a preference for one flat-ish surface, with the other face steeply flaked for scraping activities. Both of these bifaces show very heavy use-wear.



Figure 52 A Similar Large 3.4-Inch-Long, Well-used Biface, also Likely Used In-Hand

The biface in Figure 53 was most-likely hand-held, possibly with some handle covering, and used in an end-scraper fashion. An extreme layer of manganese/iron rich “desert varnish” has accumulated on this indicating significant age.



Figure 53 A Large (3.8-inch), Basalt Biface Scraper with Heavy Varnish

7. Domed Scrapers

Domed scrapers, or “scraper planes” appear numerous in Great Basin “Western Lithic Co-Tradition” paleo sites according to Loren Davis (2011 p.6). Sometimes referred to as “keeled” scrapers, these tools are usually round or elongated, relatively large, steeply flaked and mostly unifacial. Sometimes with a handle for hafting, these scrapers would be efficient at heavy duty scraping tasks. Use-wear can be extreme with battered edges where significant force was applied. The following figures 54 through 61 show a variety of these tools.



Figure 54 3.3-Inch-Long Hafted Paleo Domed Scraper



Figure 55 A Pair of Obsidian Domed Scrapers, Flat Side Indicates Extent of Use-wear on Original Flake



Figure 56 Nearly 3-Inch-Long Jasper Domed Scraper



Figure 57 2.6-Inch Basalt (Uncommon for the Type) Domed Scraper



Figure 58 2.3-Inch High-Quality Jasper Domed Scraper



Figure 59 2.5-Inch Green Chert Domed Scraper



Figure 60 1.8-Inch Colorful Jasper Domed Scraper



Figure 61 1.9-Inch Nevada Wonderstone Chalcedony Domed Scraper

8. Spokeshave Tools

Spokeshaves (spoke shaves or spoke-shaves) are considered diagnostic of the Lake Mojave Complex (Jenkins 1991, p. 11). Likely use of this tool was to “plane shafts of small diameter” (Sanchez 2010, p. 282). These tools are typically made on small flakes of high-quality durable toolstone. Figures 62 through 65 show a cross-section of spokeshaves left by Great Basin Paleoindians. The spokeshave in Figure 62 has a curvature of roughly 0.7-inches, or about the size of a dime.



Figure 62 1.9-Inch-Long Spokeshave with Use-wear on all Useable Edges



Figure 63 Similar to Previous Spokeshave in Size and Shape



Figure 64 1.8-Inch Red Jasper Spokeshave



Figure 65 1.65-Inch Light Green Chert Spokeshave with Graver Feature

Blades and Blade-like Flake Tools

The following two sections have a combined introduction to provide context on various similar-looking unifacial tools made and used by Great Basin Paleoindians. The purpose here is to provide basic information, with images, that in some cases, may be useful in identifying and understanding who made such tools and why. In most cases overlap, ambiguity and tool-use wear/damage render that discrimination difficult, if not impossible. But many tools left by the earliest inhabitants of the region can be identified and appreciated as more than simple “expedient debitage.” First, in the “Blade Tools” section, the term is reserved for blades made by Clovis Indians from intentional and prepared wedge or conical lithic “cores”. Blades from these cores conform to many specific attributes. Following that, the “Biface Flake Tools” section describes various unifacial tools that are sometimes referred to as being made on “blade-like flakes”. These can usually be separated from those made from blades in a number of ways. Biface Flakes is in itself a category that includes a variety of subtly different flake “types” including biface core flakes, bifacial reduction flakes (flakes from the manufacture of points and knives), flute channel flakes, and bipolar core flakes. The intent here is not to exhaustively discriminate between all these subtle differences. There are however, occasional examples that are clear, and in some cases, possible candidates. This section will show images of strong candidates for each of these technologically distinct artifacts that were ultimately used as tools.

9. Blade Tools

Among many attributes, a blade is defined as a long flake deliberately taken from a prepared conical or wedge core with the intended use as some form of tool. This was a major component of the Clovis technological manifestation. These blades were used as cutting tools, end-scrapers and gravers/spurs. Not all paleo end-scrapers and gravers were made from Clovis blades however. Figure 66 below (left) shows Clovis blades from the Gault site in Texas (from <https://www.texasbeyondhistory.net/gault/images/MB25.html>). Figure 67 on the right shows Clovis blades from the Topper site in South Carolina (Smallwood 2015, p. 77).



Figure 66 Blades from the Gault Clovis Site



Figure 67 Blades from the Topper Clovis Site

According to Collins in *Clovis Blade Technology* (1999, p. 63) Clovis blades are characterized by:

1. Small platforms
2. Almost no bulbs
3. Minimal ripple marks on the interior surface
4. Strong curvature

Later, Bradley et al (2010, p. 11) added as part of a “distinctive constellation of attributes”:

1. Length-to-width in excess of 3:1
2. Robust cross-sections that are triangular or prismatic
3. Exterior scars of previous blade removals closely parallel to the same axis (or crested with or without cortex in the case of initial blade removals)

Clovis blades from the Topper site in South Carolina however, tend to be not as strongly curved, shorter on average and have wide/deep platforms. All blades across the continent have a bulb of force that is diffuse and flat, platforms that exceed 60 degrees and all previous blade removal scars are in the same axis (Sain 2012 p. 93). Figure 68 below is from Sain, p. 135. Figure 69 is from p. 96.

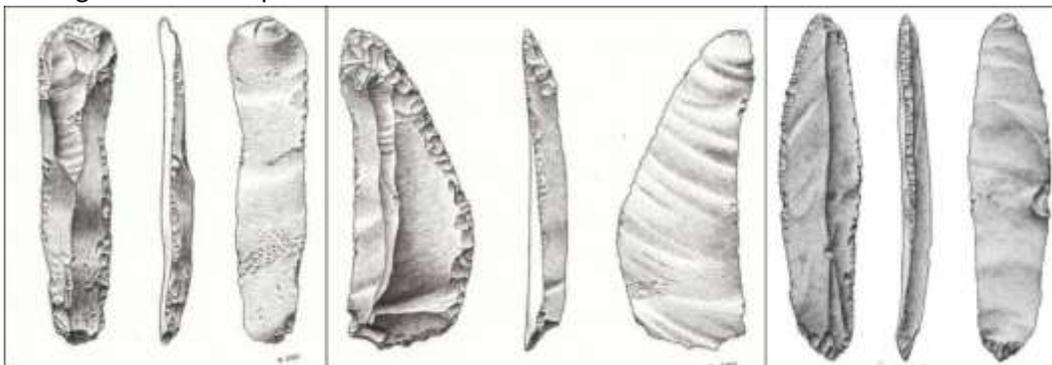


Figure 68 Blade Depictions from the Topper Site Showing Various Characteristics

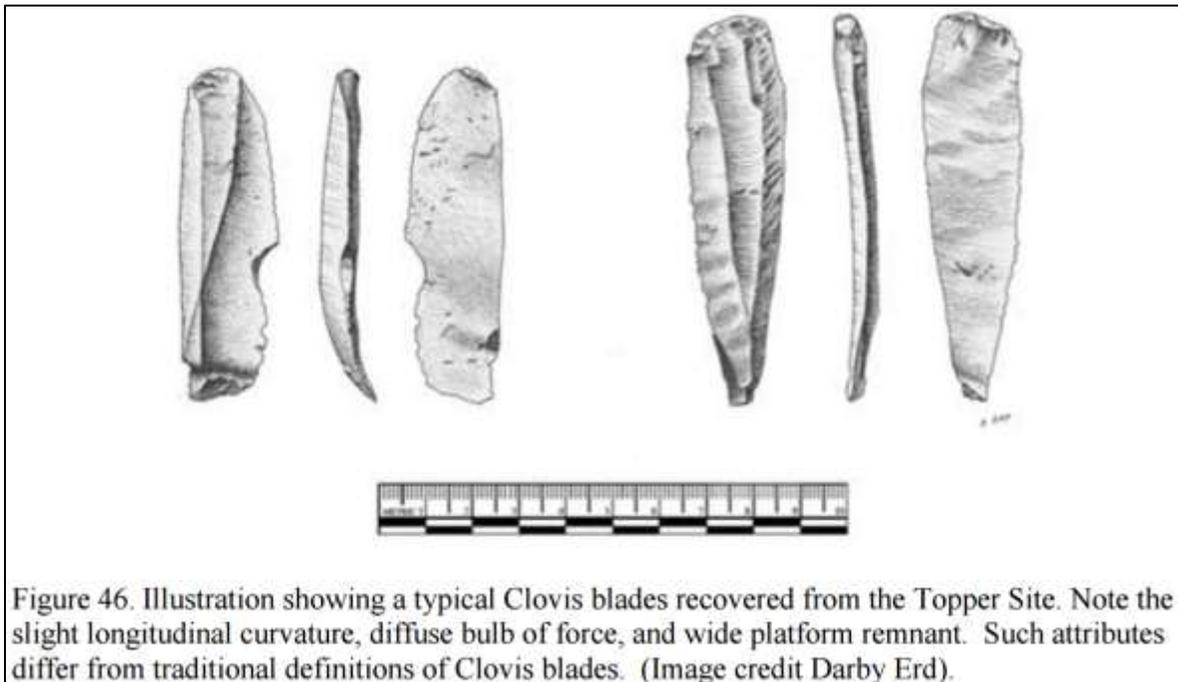


Figure 69 Additional Blade Depictions from the Topper Site

Blade attributes that are consistent across the continent with wide agreement include the following:

1. Roughly parallel margins
2. Two or more parallel removal scars originating from the same location
3. All flake scars are in the same directional axis
4. Roughly centered dorsal ridge formed from previous removals or in some cases, cortex
5. Small and diffuse bulbs
6. Very smooth ventral surface
7. Platform angles greater than 60°

The next three figures show four blades, found together (among other Clovis artifacts) in the Great Basin. These four blades were clearly taken from the same distinctive obsidian core and meet all criteria for Clovis Blades. Figure 70 shows the profile illustrating the curvature and relative lengths (longest is 98.3 mm or 3.9 inches). All four have extensive use-wear along most edges including spokeshaves as shown in Figure 71.



Figure 70 Obsidian Clovis Blades from the Same Core



Figure 71 Use-wear on Clovis Blades

Figure 72 shows the smooth ventral surface with small bulbs and platforms. Every flake scar on all these is in the same directional axis, and all platforms that have not been erased from use exceed 60° (some $> 90^\circ$).



Figure 72 Smooth Ventral Surfaces with Diffuse Bulbs

Figure 73 appears to be a prismatic (triangular cross-section) Clovis blade that conforms with most of the accepted diagnostic attributes for Clovis and was used as an end-scraper. It is the proximal half of a larger blade that was broken. Even though the distal end was used as a scraper, the margins show no use-wear, despite being extremely sharp. In obsidian-rich environments, tools were made/used for a specific purpose. Presumably, in this case scraping was needed whereas slicing might not have been.



Figure 73 Prismatic / Trapezoidal Clovis Blade as End-scraper

Figure 74 is a large obsidian blade with a prominent curve frequently associated with Clovis blades. It also has a distinct square cortical facet on the distal end which was undoubtedly removed by intent in a similar fashion to Clovis overshoot flakes in biface reduction. Figure 75 shows additional images highlighting the use-wear and the cortical section removed by the knapper.



Figure 74 3.5-Inch-Long Obsidian Clovis Blade

Figure 76 is unique, and included here as it was part of a Clovis blade core that has edge tool use-wear indicated by the yellow arrow. The battered end in the center of the right image is the platform where the entire piece was removed from the parent core. The strong ridge down the dorsal side is the peak between two previous blade removals. The green arrows indicate the direction those previous removals. This artifact is likely a blade core face flake or fragment that was removed by error, or an attempt to “fix” the parent core for further blade production (Rondeau 2014, p. 24)



Figure 75 3.5-Inch-Long Blade Showing Cortex, Use-wear and Smooth Inner Surface

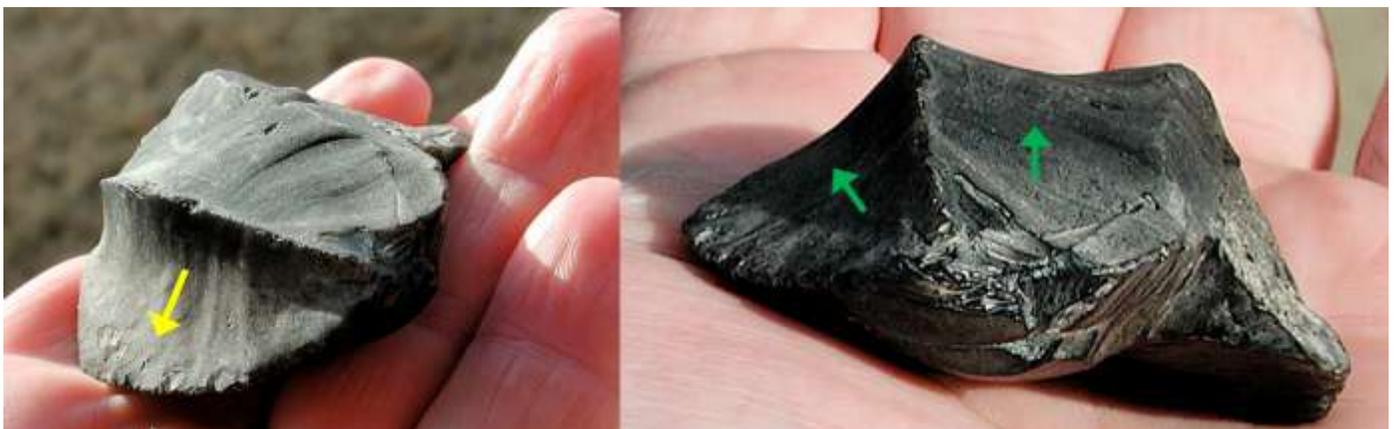


Figure 76 Clovis Core Face-Flake with Tool Use-wear

10. Biface Flake Tools (Biface Reduction, Core Reduction and Flute Channels)

Unlike blades which can be solely attributable to Clovis, biface flake tools were made by all Paleoindians of the Great Basin. Biface flakes can be produced either from biface reduction, i.e. the process of making a point or knife, or from bifacial cores (not conical or wedge) intentionally made to produce flakes.

Biface flakes have the following characteristics:

1. Expanding proximal margins, irregular shape
2. Removal scars not necessarily co-located
3. Multi-directional flake scars
4. Dorsal ridges:
 - A. Sometimes offset on biface reduction flakes (not as centered as blades)
 - B. Dual or widely spaced arrises on bifacial core flakes
 - C. Diagonal or orthogonal ridges on flute channel flakes
5. Large prominent bulbs with occasional errailles (indicating likely hard-hammer percussion)
6. Ripples on ventral surface
7. Wider and deeper platforms than blades
8. Platform angles less than 60° (Note: Many GB obsidian biface flakes have angles greater than 60°, due to differences in materials?)
9. Curvature:
 - A. Bifacial reduction flakes can have pronounced curvature
 - B. Biface core flakes and flute channel flakes are flatter

Figure 77 shows an obsidian bifacial reduction flake tool from the Great Basin. The entire perimeter shows heavy use-wear as a scraper. Hard-hammer percussion was likely used to remove this from the biface. Prominent erraille scars are typical for this method.



Figure 77 Paleolithic Bifacial Reduction Flake Used as a Tool

Figure 78 shows a heavily used scraper from Nevada on the left, next to a nearly identical example (only larger) from the Clovis assemblage at the Gault site in Texas (Bradley et al, 2010, p. 57). These examples have dual parallel ridges (arrises) that mark where previous flakes were taken. These were likely removed from bifacial cores where the priority was to create a flake to be used as a tool, as opposed to removing mass from a biface that was intended to become a point.



Figure 78 Paleolithic Flake Tool from a Bifacial Flake Core

Figure 79 shows the same Nevada piece highlighting the large platform and flat profile.



Figure 79 Additional Views of Biface Core Flake

Figure 80 below shows a high-quality dual-arris flake that conforms with some of the Clovis blade attributes (long, smooth interior, dorsal scars originating in the same location and in the same direction) but it more likely a biface core flake. The widely spaced arrises suggest an intentional removal for tool-use as opposed to an opportunistic reduction flake that was utilized. The bulb of percussion is prominent. This is most likely a Clovis biface core flake, or similar from Blackrock point makers.



Figure 80 High-quality Dual-Arris Flake Tool from a Biface Core

Flute channel flakes are flat with diagonal or orthogonal dorsal flake ridges. Additionally, flute channel flakes commonly have hinge terminations and wide platforms that are ground or faceted (Littlefield 2015, p.55-58).

The following biface flakes are unique as they exhibit *some* characteristics of Clovis flute flakes. All were utilized as tools. Figure 81 is an obsidian flake tool with spokeshaves on both sides. Most likely a Clovis biface thinning flake it shows a very flat inner surface, a small bulb as well as orthogonal dorsal flakes from previous thinning strikes. It terminated in a hinge and has a ground and isolated platform consistent with other flute flakes. Regardless, it was used as a side-scraper with spokeshave features. Figure 82 is similar but with slightly more curvature. Its edge-use shows a prominent graver. It is most likely a Clovis biface thinning flake, not necessarily a flute channel.



Figure 81 Possible Flute Channel Flake of Obsidian



Figure 82 Most Likely a Clovis Biface Thinning flake, with a Graver

Figure 83 is likely a Clovis flute flake with the distal end missing. It is shown in Figure 84 along with an early-stage obsidian Clovis preform for comparison. The top left shows the flake overlaying the flute channel. Bottom left shows what the prepared platform might have looked like. The bottom right shows the edge-view, highlighting the flat profile of each. The flake has a large dorsal scar running from right to left and both edges have extensive tool-use.



Figure 83 Probable Clovis Flute Channel Flake with Use-wear



Figure 84 Clovis Flute Flake Inserted into an Early Clovis Fluted Preform

Figure 85 shows another heavily used flake that shows many attributes of a flute flake. The original platform no longer remains. Nearly the entire perimeter has been used for scraping.



Figure 85 Possible Clovis Flute Flake Used as a Tool

The following tools have overlapping characteristics that prevent positive identification as either a blade or a flake. Figure 86 is a large (>3.5 inches) heavily used tool. This meets many of the criteria for a Clovis blade (small bulb, smooth interior, long roughly parallel sides). But it doesn't show dorsal scars, possibly due to use wear. It does retain a small patch of cortex. This might be a flake from some early biface reduction or possibly a heavily used Clovis blade. Since there are no dorsal features and the platform is missing, the possibility exists this is not a paleo artifact at all although that is unlikely.

Figure 87 is an extensively used unifacial side-scraper that has attributes of many different technologies. It is highly curved with a very smooth ventral surface. Originally it was much wider. This was most likely a bifacial reduction flake.



Figure 86 Possible Clovis Blade or Biface Thinning Flake Tool



Figure 87 Possible Clovis Blade or Biface Thinning Flake Tool

11. Denticulates

Figure 88 shows a drawing of a denticulate tool with the definition “tooth-like serrations on the margins of artifacts” (Crabtree 1972 p. 37). Figure 89 on the right shows an obsidian denticulate tool from a paleo site in the Great Basin. These tools are known from most Clovis and Folsom sites (Hopkins 2008, p. 21). Similar serrated and denticulated blade-tools were recovered from the Clovis assemblages at Gault (Collins 1999, p.189). Later Indians also made

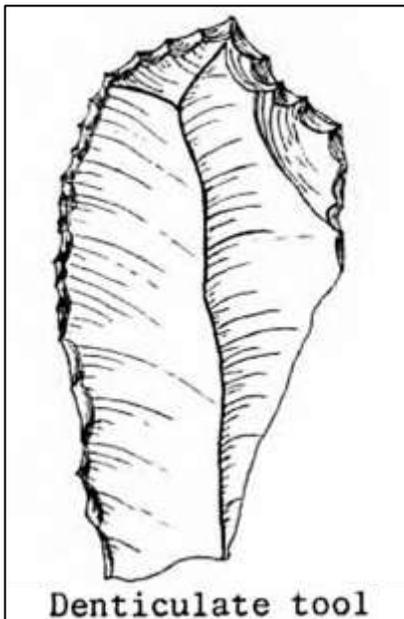


Figure 88 Denticulate from Crabtree serrated tools and denticulates. The obsidian example here, found with fluted points, meets all the criteria for a Clovis Blade however. Figures 90 and 91 are from other mixed-component paleolithic sites.



Figure 89 Obsidian Denticulate with Blade Characteristics



Figure 90 Tiny Denticulate Tool



Figure 91 Denticulate Tool on a Flake, Serrated Along Entire Perimeter

12. Overshot Flake Tools

Overshot flakes are almost always associated with Clovis biface reduction in the Great Basin and throughout the continent. In Great Basin sites where fluted points are found, these flakes occur in numbers and are considered part of the Clovis technological complex. A relatively small percentage of these flakes were used as tools.

Figure 92 shows a flake that meets many of the criteria for a blade (smooth inner surface, small bulb, strong curvature, etc.) but also has one previous removal scars running against the primary axis. It also shows a square distal facet that indicates it was more likely an overshot thinning flake. Regardless, this was used as a tool.



Figure 92 3.25-Inch-Long Overshoot Flake Tool

Figure 93 shows additional close-up views of the platform and edge use-wear.



Figure 93 Edge-work Along the Convergent End (Proximal) and Scraper Use Along the Distal Facet

Figure 94 is a small overshoot, unique in that it has an overshoot flake scar on its dorsal surface. This “overshot-on-top-of-overshot” illustrates the flaking strategy of removing square facets on the opposite edge of a biface. This flake has multiple use-wear patterns, including one long edge (in the yellow box) that was most likely the result of repeated wear against some soft organic material. Below that is a spokeshave-like edge. Figure 95 is a smaller overshoot flake that has use wear along both long edges.



Figure 94 Compound Overshoot Flake with Tool Use-wear



Figure 95 Small (1.7-Inch) Overshoot Flake Used as an Edge-scraper

The previous overshoot flake is repeated here in Figure 96 showing both faces, alongside a nearly identical one (in size and form). These were found together but the white one does not show signs of being used. Why one was selected for edge-use and the other one was not, is a mystery.

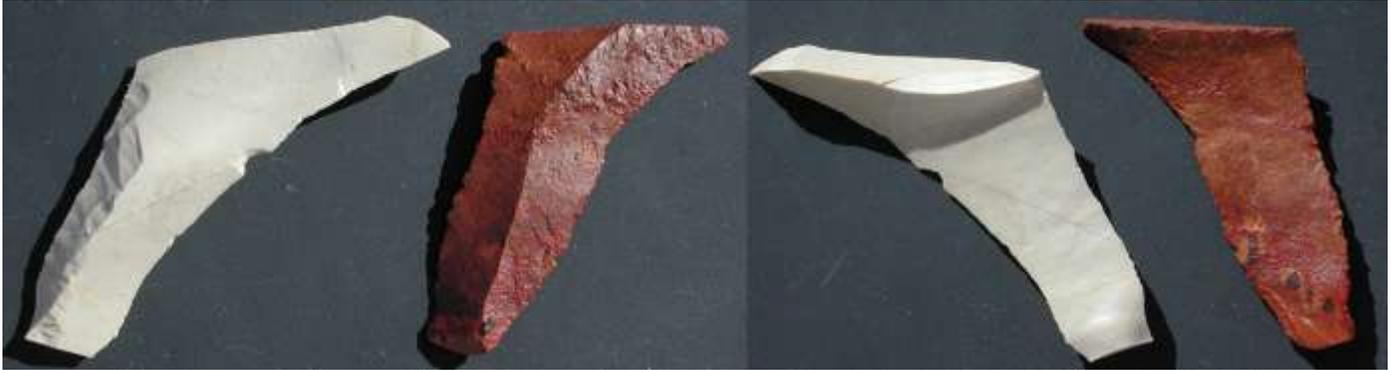


Figure 96 Two Nearly Identical Overshoot Biface Reduction Flakes

13. Hafted Biface Tool

Most likely part of the Western Stemmed point series, the artifact in figure 97 below appears to be a hafted knife, based on its curved bit and heavy use-wear. It is made from obsidian and has extensive grinding in the stem area. It also has the remnants of possible overshoot thinning. Tools such as these occasionally show up but are rare.



Figure 97 2.1-Inch Hafted Biface Paleolithic Knife Found in the Great Basin, Made from Obsidian

14. Chisel-Bit Tools

One unique aspect of the Western Stemmed paleo projectile series is the “chisel bit”. This deliberate and frequent feature is usually installed on the distal end of what most would consider WST “points”. One or two flakes at the tip, most often taken at opposing angles, form a useful tool that would have been suitable for scoring or graving organic materials. Beck and Jones provide a compelling argument for this feature representing some non-projectile use-case and occurs on slightly more than half of the points they looked at. (2009, p. 192). They provide images shown in Figure 98 here (p. 191).

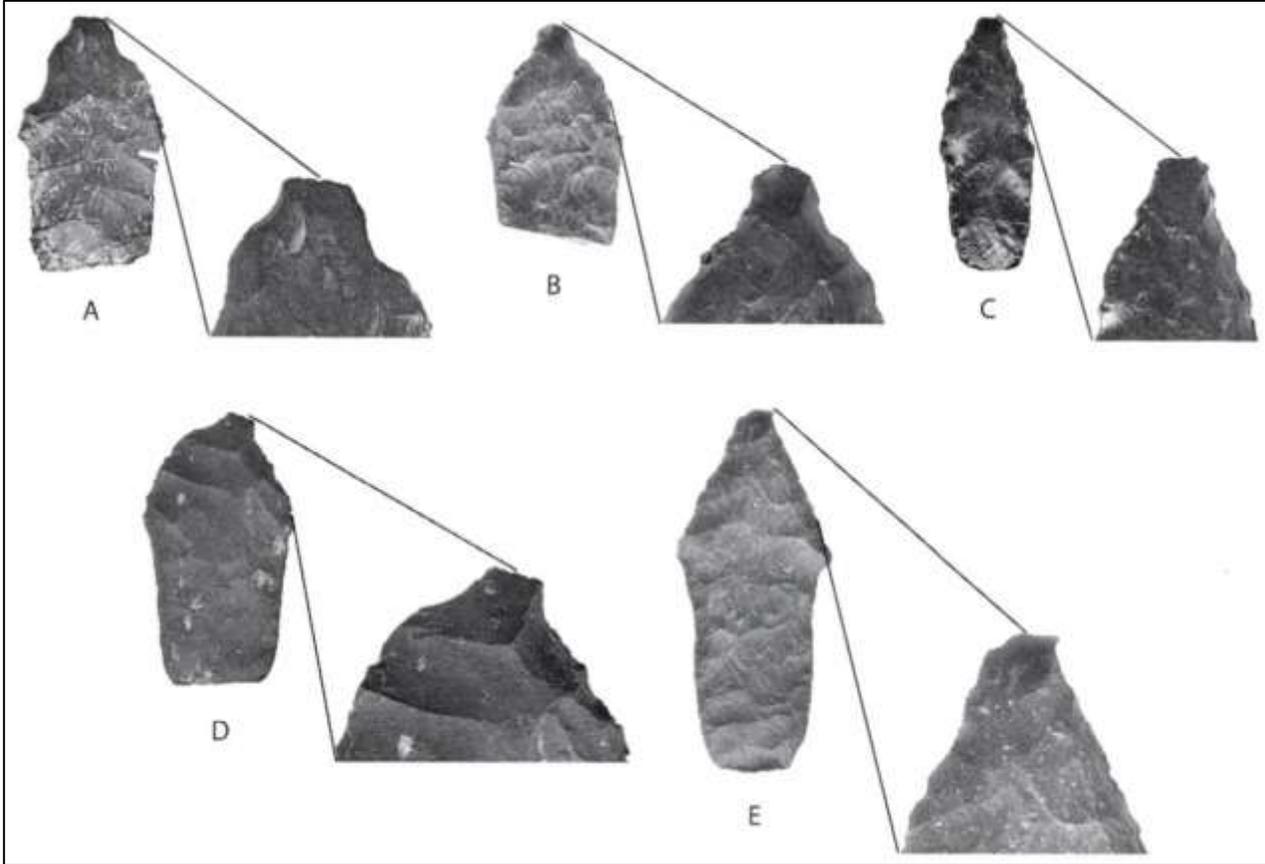


Figure 98 Examples and Close-ups of Chisel-bit Tips on WST Points (Beck and Jones 2009)

Figure 99 is a small WST biface with two deliberate high-points that almost appear as graver-like.



Figure 99 Very Small (1.2-Inch) Western Stemmed Point with Chisel-Tip

Figure 100 shows a large WST artifact with small flakes near the tip removed from both faces at alternate angles forming a very thin tip that would seem unnatural for a projectile point. Figure 101 is a well-made obsidian WST point with this prominent feature carefully flaked. Figure 102 shows both faces of three additional artifacts illustrating this familiar feature.



Figure 100 2.9-Inch WST Point with Chisel-Tip



Figure 101 2.5-Inch WST Point with Chisel-Tip



Figure 102 Three Small WST Points with Chisel-bits

Finally, Figure 103 depicts a tool that was obviously not intended to be a projectile but has the same design feature.



Figure 103 Small Hand-tool with Similar Chisel-bit Feature

15. Bipolar Tools

Commonly overlooked, and poorly understood bipolar tools are described here in two categories. The first (Figure 104) has the appearance of a bipolar core. Characterized by its relatively large size (3 inches in length), flakes removed in opposite directions (bi-polar), some cortex present and heavily battered and wedge-shaped end(s). This artifact was possibly used as a tool, in addition to a blade core, for working hard organic materials (bone/wood/etc.)



Figure 104 Bi-polar (anvilled) Flake/blade Core/Tool (?), Obsidian

The second bipolar-flaked tool is occasionally found in paleo sites. These much smaller tools (~1 inch) appear to be similar to *pièces esquillées* (French for “splintered pieces”), common to Upper Paleolithic sites in Europe. Characterized by multiple opposing bi-polar flake scars, bifacial, battered/splintered flaking with steps and ripples associated with anvillike use. Figure 105 shows images of *pièces esquillées* from the Vail Clovis Site in Northwestern Maine, where 567 examples of these bipolar tools were recovered (Lothrop, et al, 1982, p. 4).

This basic technology has been in use for a very long time as Lothrop points out (p. 9). They were documented by Mary Leakey at Olduvai Gorge and Louis Leakey in East Africa and date to greater than 1 million years. They persisted in Africa well into the Middle Stone Age and were used for thousands of years in Australia. They are rarely recognized or documented in North America, although over a thousand were found at the Debert site in Nova Scotia, and numerous at Bull Brook in Massachusetts.

In Siberia, researchers believe evidence indicates these were used for chiselling, notching or cutting ivory tusks (Semenov 1964, p. 148). The same activity would have been used on bone or wood. Also, these artifacts have been shown to be salvaged fragments of other tools or projectile points vs. intentionally manufactured like end-scrapers for instance (Lothrop p.8). The logical conclusion for the Great Basin examples is they should predominantly be made from obsidian, which indeed appears to be the case.

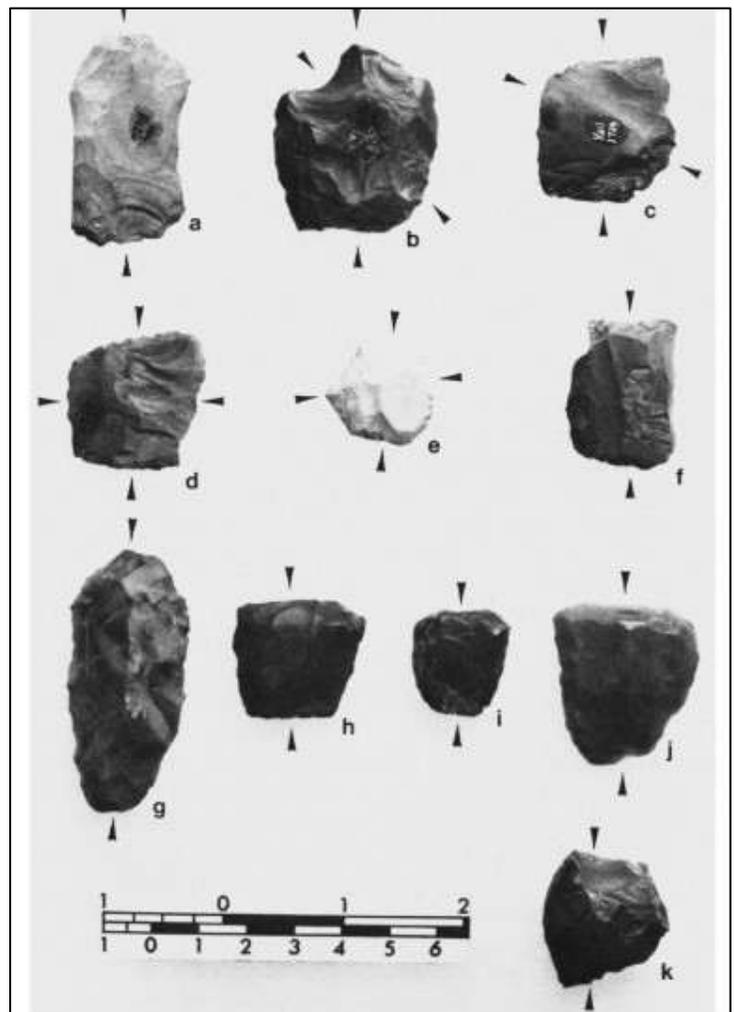


FIGURE 4. *Pièces esquillées* from the Vail site. Obverse view. Arrows indicate opposed striking platforms which constitute individual axes of percussion. Specimens b-e each possess two axes of percussion. Specimens g-k all are found on trianguloid endscraper forms.

Figure 105 Bi-polar Tools from the Vail Clovis Site

Figure 106 shows both faces of three such artifacts from the Great Basin. Figure 107 below that depicts a variety of bipolar tools (pièces esquillées) from Upper Paleolithic Siberia (Kolobova et al, 2021)



Figure 106 Splintered Tools, or pièces esquillées, from the Great Basin

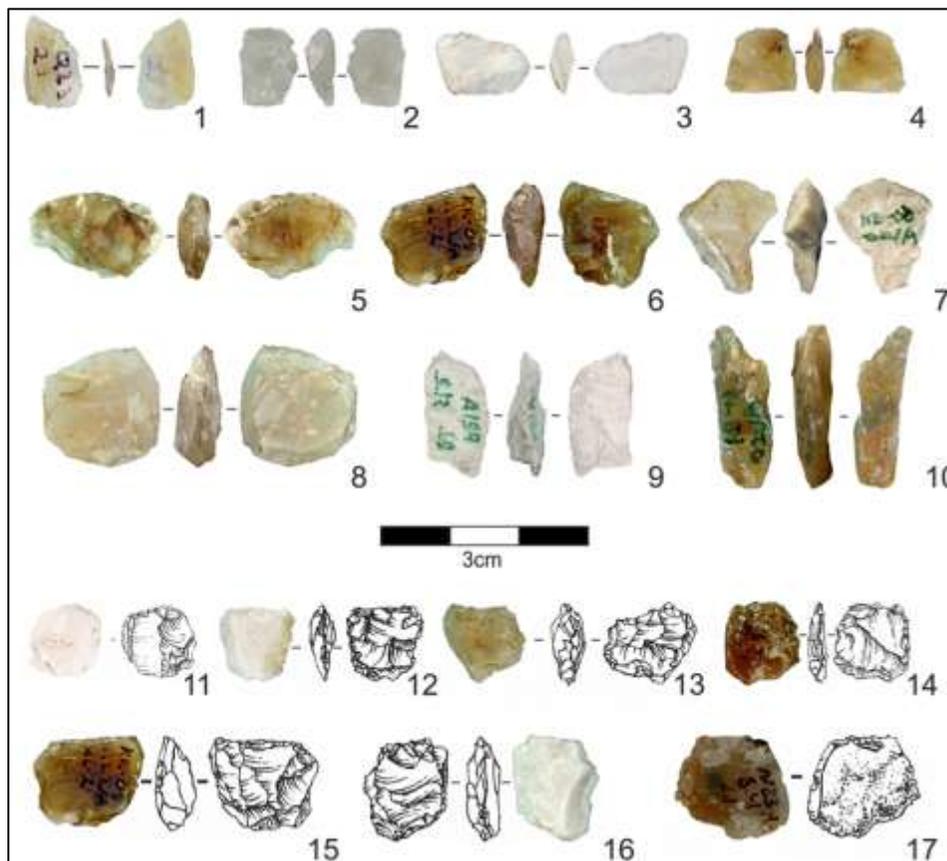


Figure 107 Splintered Tools, or pièces esquillées, from Paleolithic Siberia

16. Limaces

Limaces are “slug-shaped” tools that appear in many early sites in the Great Basin. Limaces are tools that have “steep invasive retouch on both lateral margins that meet at the mid-line forming a ‘slug-shaped’ scraper” (Estes 2009, p. 65). Figure 108 shows drawings of 3 examples from the Lindenmeier Paleoindian site in Colorado (Wilmsen and Roberts 1978, p. 24). A recurring and well-made version, referred to as “humpies” have been documented along the Pleistocene shores of Tulare Lake in the Central California Valley (Hopkins 2008, p. 25). Limaces are considered tools used to gouge or shave/plane hard materials such as wood, and are frequently found with fluted points (Sampson 1991, p.198).

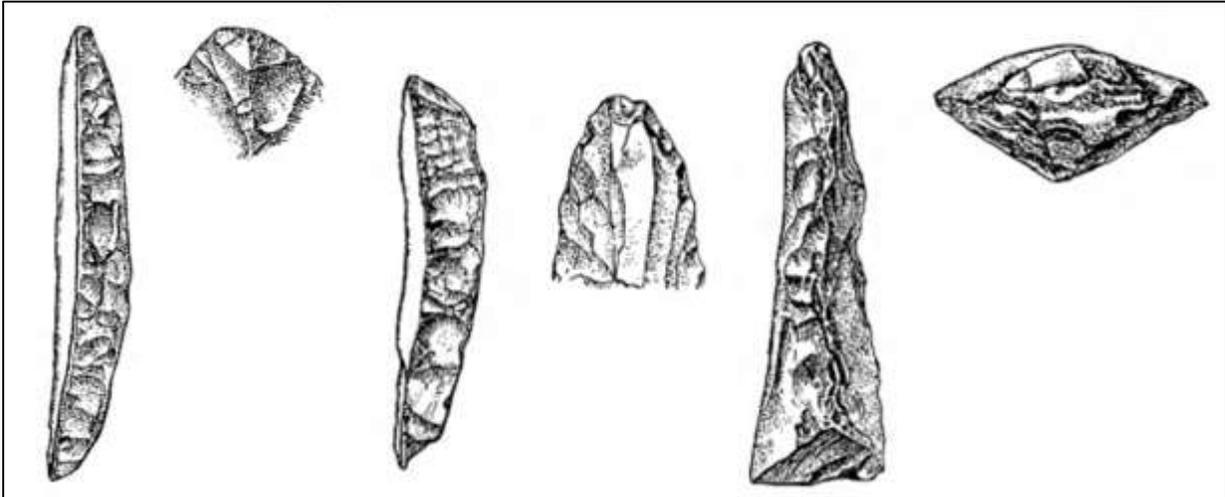


Figure 108 Lindenmeier Site Paleoindian Limaces

Figures 109-113 show a variety of Great Basin Paleolithic Limaces.



Figure 109 Multiple Views of two Great Basin Paleolithic Limaces, longest is 2.1 Inches



Figure 110 A Small (Length = 1.6 Inches) Great Basin Limace



Figure 111 A 2-Inch Section of a High-quality Toolstone Limace



Figure 112 A 2.1-Inch Obsidian Limace



Figure 113 A 2.6-Inch Chert Limace from the Great Basin

Summary and Discussion

Paleoindians of the Great Basin made a variety of specialized stone tools for a few thousand years. Some groups likely inhabited the region relatively briefly such as Clovis and Blackrock, while Western Stemmed point makers persisted for much longer. Similarly, some tool technologies are sparse and others are much more numerous. Quality and physical appearance was important, possibly only reflected by the fact the durability of certain stones, which was a priority, is greatest in these colorful chalcedonies. Obsidian, on the other hand, is readily available in massive quarries. The “inexpensive” nature of obsidian made it more acceptable for many projectiles where damage and rework were more tolerable. This changed as people moved further from the lithic sources.

A number of conclusions can be made on many of these tool types and technologies (not absolute, but based on the weight of the currently observed evidence). In no particular order, these generalizations are made:

- Clovis Indians existed in the Great Basin based on specific and repeatably observed tool technologies. Many researchers debate whether “true Clovis” existed in the Great Basin vs. some form of “Western Fluted” tradition. There does seem to be some minor deviations in Clovis technology here, but no greater than the diversity in Clovis between other regions (e.g. Gault in Texas vs. Topper in South Carolina). Clovis may have been late (or early?) and it may have been in the process of evolving or fading. The tools along with other artifacts beyond what are covered here, provide evidence.
- “Beaked Gravers” appear to have been predominantly left by the makers of Blackrock Concave Base points. Many of these beaks are subtly different from spurs and micro-drills. Some are relatively quite large. Surface proximities, material similarities and beaks flaked into Blackrock points support this conclusion.
- Domed scrapers are possibly the most common paleo tool in the region. They were likely made and used throughout the period by most or all inhabitants.
- End-scrapers, in general, were also made throughout the period. They were made throughout American prehistory right up to western-contact. The quality and prevalence in paleo settings are notably more common however.
- Spurred end-scrapers, and generalized gravers and spurs were most likely left by Clovis people (few) and Blackrock people (mostly). This is additional support for a probable connection between Blackrock and Goshen or Folsom/Midland. Blackrock points are possibly much older than what is generally accepted.
- Bipolar cores are observed in paleo sites but appear to be possibly more associated with Western Stemmed technologies. This is an area that is very poorly researched and understood. These bipolar cores may represent an “anvilled” technique for making blade-like flake tools, as well as possibly a method for making large wedge-shaped tools.
- Bipolar tools, a.k.a. *pièces esquillées*, do exist in the region. They are rare however. Like bipolar cores, further research would be beneficial to understand their uses and technologies in the Great Basin, and to a larger extent the rest of the continent. Much more attention has been given to this in other parts of the world.

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