

ARCHEOLOGICAL USE OF CAVES ON THE NORTHWESTERN PLAINS, USA

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Abstract: Prehistoric and early historic Native American use of caves in the mountains of the northwestern Plains of North America is most evident in areas within or near entrances. Habitation debris mostly is in open entrance areas, whereas rock art sometimes extends back into the twilight zone, transitional dark zone, and interior dark zone -- dark areas necessitating artificial light for viewing. Some rock art is intentionally placed to interact with natural light coming through the cave entrance. Night use of enclosed entrance rooms would experience the same characteristics of total darkness and isolation as rituals done in a true dark zone setting or deep areas of difficult access. Collected and modified speleothems expand cave use into non-cave landscapes.

Keywords: caves, dark zone, Native American, prehistory, archaeology, rock art, human remains

Resumé: L'utilisation de grottes par des groupes amérindiens préhistoriques dans les montagnes des plaines du nord-ouest de l'Amérique du Nord est la plus évidente dans les zones à l'intérieur ou près des entrées. Les débris provenant des activités résidentielles sont localisés principalement dans les zones d'entrée ouvertes, tandis que l'art rupestre s'étend parfois jusque dans la zone d'ombre, la zone de transition vers l'obscurité, et la zone obscure intérieure – les zones d'obscurité nécessitant l'apport de lumière artificielle pour la vision. Certaines œuvres rupestres sont intentionnellement placées pour interagir avec la lumière naturelle provenant de l'entrée de la grotte. L'utilisation nocturne de salles d'entrée fermées donnerait les mêmes expériences caractéristiques par l'obscurité totale et l'isolement que lors de rituels effectués dans un environnement qui serait une véritable zone d'obscurité totale ou des zones profondes d'accès difficile. Des spéléothèmes collectées et modifiées étendent l'utilisation de la grotte dans un paysage externe.

Mots-clés: grottes, zone d'obscurité, Amérindiens, préhistoire, archéologie, art rupestre, restes humains

INTRODUCTION

Dark zone cave use of deep caverns, far from natural light, has been documented in several parts of North America. Although examples are found across the continent, the most prominent areas are the Southeastern United States (particularly the states of Tennessee, Kentucky, and Alabama), the Southwestern United States (particularly New Mexico), and various parts of Mexico from north to south. Central America and the Caribbean contain numerous caves with ceremonial use most evidenced by pictographs and material remains of ceremonies, often deep within dark zone passages.

Our work has documented variable cave use on the northwestern Plains of North America, just south of Canada, in the states of Montana and Wyoming. This western territory is composed mostly of open plains and rolling prairie, interrupted by localized mountain ranges. Most cave areas are composed of limestone, while granite and other igneous materials mostly occur slightly further west but also form the central cores of the limestone mountain uplift areas. Limestone canyons, some very deep and impressive, often dominate the outer portions of the mountain islands. High altitude karst areas — containing some of the deepest cave systems in North America — sometimes cover the high upper crests of the large ranges. Caves in the dense limestone layers occur as rockshelters, enclosed rooms, tunnels, complex passageways, sinkholes, vertical shafts, and more extensive systems.

Many caves were used prehistorically for a number of purposes, here as anywhere in the world. Although painted rock art is perhaps the most obvious cultural addition or modification in limestone caves, especially interior dark zone locations, material remains evidencing other cave use also occurs, and it is useful to consider the total use of caves and the kinds of archeological materials that occur in them.

In this paper we provide brief information on caves on the northwestern Plains, and look at the kinds of caves, their locations, and cultural materials in those sites. This small sample, from our personal experience, is intended as a brief overview.

CAVE ATTRIBUTES

Physical attributes of caves, together with the context of the cultural remains they contain, help define the details of cave archeology. It is useful to consider kinds of caves that were utilized, settings within sites where materials occur, and the kinds of materials that occur there.

Caves are measured from front to back, from mouth to most distant extent of the back wall. Rockshelters are wider than they are long (or deep), and caves are longer (or deeper) than they are wide. This is an old definition, long in use, and at least distinguishes cliff faces from deep passages. Caves generally have some degree of light restriction, such as an enclosed room, extended passa-

geway, or complex underground system. The entrance may be large (and allow passage of considerable light), or it may be small and difficult to negotiate. Large, open entrances are essentially daylight settings although they may change quickly in character and lead almost immediately into total darkness, depending on the interior character of the system.

Caves, as a class, includes categories that range from deep rockshelters, some large and impressive, to horizontal tubes, enlarged joints and cracks, large enclosed rooms, multiple rooms, multiple levels, larger complex systems, and even expedition quality underground caverns. Caves may be strictly horizontal, a combination of horizontal and vertical, vertically oriented pits, or systems hundreds of feet deep and necessitating technical equipment for entry. Some caves are very large; others barely hold one person.

NATURAL LIGHTING

Archeological materials in caves occur in various settings relative to available natural light. Light can be considered to have four primary kinds of settings.

- The **Daylight Zone** includes the immediate entrance where direct sunlight penetrates and lights up the area on a daily basis for essentially constant use. This is the most common setting for archeological materials, not just in this part of North America, but anywhere in the world. Cultural remains include houses, hearths, bones, lithics, occupational debris, and rock art. Paintings occur on limestone walls, and in some cases on granite, sometimes on high-quality metamorphic surfaces, and less commonly sandstone. Petroglyphs occur mostly on sandstone. Since most caves considered here are in limestone karst areas, most of the rock art associated with caves is painted, and is especially common in the Daylight Zone around the entrance.

- The **Twilight Zone**, or **Shadow Zone** or **penumbra**, is further inside the cave, in permanent shadow past direct sunlight, but with visibility during most daylight hours. This is an interior area, perhaps within an extended entrance room or the beginning of a large passage. There is light, but no direct sunlight, and artificial light or torches may be necessary to view paintings on the walls and ceiling. Structures and other features constructed in caves by prehistoric inhabitants occur in Montana and Wyoming, but their occurrence is unusual and probably associated with processing, storage, mineral extraction, or ritual, more than simple habitation in the usually cold, eternal shadow of the interior Twilight or Shadow Zone. Rock art occurs in this shadow zone at several sites.

- The third area is the **Transitional Dark Zone**. It is eternally dark, with no natural light, and is located further from the entrance, but in an area where natural entrance

glow can be seen from a distance, either directly or with very little movement from the specific location. The cultural consideration is a beacon of light to guide one out of the cave, at least during the day, with little or no orientation problem and no fear of becoming lost. Traversing the route from a particular point toward the entrance may be a problem, depending on obstacles, such as areas of large breakdown, vertical walls along the route, or deep pits in the floor, but the distance and direction of exit are discernible within this Transitional Dark Zone. Rock art occurs in this zone at several sites.

- Finally, there is the **Interior Dark Zone**, that area of total darkness far from the entrance and with no visible indication of distant light. The setting is deep within a cavern, perhaps within a maze of passages, around a series of corners, deep within a pit or series of pits, or within a more extensive cavern system. Maneuvering in this environment, or travel through it, would require reliable artificial light, a degree of experience in such settings, attention to detail, and preferably familiarity with the specific location. Experience in maneuvering through such an environment in total darkness would be helpful. Exploration of vertical pits would necessitate special equipment, although rawhide ropes or special climbing tools, such as those used by honey climbers in Mexico, might suffice in some cases. So far, there are few examples in Montana or Wyoming of Interior Dark Zone exploration, including rock art, and there is no indication of prehistoric entry into vertical pits, as there is in northern Mexico. This is an area needing much more exploration and research.

Thus, in summary, light settings include the *Daylight Zone*, *Twilight Zone*, *Transitional Dark Zone*, and *Interior Dark Zone*. In the Montana-Wyoming area, archeological materials and evidence of use occur in all settings, although very few examples are known from the Interior Dark Zone. Use of that setting is known in surrounding regions to the west and south, and more examples are expected to be found here during continued detailed inspection of cave walls.

ROCK ART

Looking at kinds of caves and cultural materials that occur in the region (Figure 17.1), we begin with rock art. Painted figures, especially, occur naturally in lighter areas around the entrance but also extend back into dark interior passages and rooms of the *Transitional Dark Zone*. Several sites contain paintings (and in some rare cases, petroglyphs) in areas where artificial light is necessary to see the art. No carved or modified speleothems have been reported in caves within our study area.

Landslide Cave, high on the Rocky Mountain Front in central Montana, has a very tiny entrance and a steep climb-down slope into total darkness. The cave consists of a single narrow passage, perhaps 25 meters long and



Fig. 17.1. Northern Plains primary study area

2.5 meters tall. The long interior dark room has red figures painted along the flat ceiling. Reaching the elusive, tiny entrance high on the mountainside is difficult, while other nearby sites are near the bottom of the mountains, are larger, and mostly open. This cave, therefore, is unique within an area of painted sites.

Long horizontal tubes occur mostly in limestone and extend far back into complete darkness. In Triangle Cave (24ME42), central Montana, the wall from front to rear contains an extensive row of paintings relating to shamanism. The line from the bottom of the shaman extends past dozens of hand-smear stylized figures and runs all the way down the passage to the cave entrance.

Horizontal cracks and tubes in sandstone, though relatively rare, similarly extend back into near darkness. Two elongated systems in separate mountain areas have sandstone walls intensively covered from front to rear with carved petroglyphs. Ludlow Cave (39HN1), on the western edge of South Dakota, has a wide entrance and deep, irregular passage extending deep into the hillside. Medicine Creek Cave (48CK48) in northeastern Wyoming is a relative narrow, elongated crack but also with bright light in the entrance area.

Horizontal caves also occur in a number of other forms. Single large rooms may be open, with large entrances, or nearly closed, with small constricted openings. Paintings occur not only in *Daylight* entrance areas but also back

into the totally dark interior on walls and low ceilings. In one small cave, Crawl Cave (24JF1556) in southwestern Montana, it is necessary to slither backwards into the low entrance, facing upward, and use artificial light to view painted figures in the ceiling cavity — much like some solution cavities at Hueco Tanks in western Texas. Other sites contain ceiling domes and indentations with painted figures viewable only with portable lights. Many of these appear to be associated with shaman activity more than simple beliefs, myths, history, or narrative.

Some caves are composed of multiple rooms and multiple levels. Several such large development tube complexes contain paintings in *Daylight* and *Twilight* areas.

In one example, an enclosed room in Lookout Cave (24PH402) in central Montana is accessible, with some difficulty, from the large adjacent rockshelter. Sunlight enters the room through a small hole and momentarily lights up a small portion of the opposite wall, and it is in this specific area that a stylized red bison is painted. Most other figures around the room are in near to total darkness. This is one of the few sites with clear sunlight interaction.

Large complex horizontal systems also contain rock art mostly in entrance and twilight areas. One large complex, Frozen Leg Cave (24BH425) in southern Montana, has pictographs of different ages and traditions in two large twilight rooms. There is also other evidence of use in dark



Fig. 17.2. Two Hands Cave, Montana



Fig. 17.3. Juniper Cave, Wyoming

passages and cultural deposits in dark interior rooms in this same cavern complex.

Another cavern, Blacktail Cave (24LC151) in central Montana, has pictographs at the entrance placed there for tourism. The landowner maintains that the figures were only enhanced and not created recently, but rock art researchers there in the 1960s (and supported by photographs) maintain that paintings were not present at that time. Figures are of local content and style and introduce modern visitors to rock art and various research questions. Of perhaps even more interest at this site, however, are artifacts and possible evidence of ritual deep within the associated cavern, dating perhaps 2000 years ago, and a suggestion of earlier use about 11,000 years ago. Cultural artifacts and dark zone paint smears on interior walls indicate that people at least ventured into large rooms and passages believed to have experienced ceremonial use.

At deep sinkholes, pictographs are mostly at the entrance, in full or restricted daylight, and not in underground settings. In some cases, such sinkholes descend gradually or steeply into huge rooms with flat floors suitable for complex rituals. Some continue down into cavern systems. Paintings, however, are almost exclusively outside the entrance.

OBJECTS REMOVED FROM CAVES

Prehistoric cave visitation or use can be evidenced — besides artifacts and features actually in the cave — by objects or materials taken from caves or made from cave formations. Although such occurrences are fairly common in other parts of North America, they are rare in the Montana-Wyoming area of the Plains.

Mining

Mineral extraction for pigment use is evidenced at the deep sinkhole of Hand Stencil Sink (24BW1053) in central Montana. In the entrance area are two red hand

stencils, while at the base of the long, steep entrance slope, in an interior passage off the huge entrance room, a large deposit of bright red ochre has been mined. The red paint material, fine quality hematite, is suitable for long distance, regional redistribution, and trade. A historic mention of Indians mining red ochre as paint from a cave in these mountains may refer to this site. In the main room, rocks have been moved and positioned on the flat floor as if during some activity or construction. The only paintings, however, are the red handprints at the top of the entrance slope.

In the Montana-Wyoming area there is no evidence of collection of wall deposits, such as soft calcium carbonate coatings (e.g., *moon milch*), such as there is in other caves around the world. There are no areas of scrapings that would suggest collection of the white or light gray material as a dietary supplement, salt, fertility powder, pigment or extender for paint, or any other use.

Crystals and formations

The only known use of cave formations or crystals in the Montana-Wyoming area is single portable object found out-of-context in eastern Montana. The small, white stalactite was broken and removed from an active cave, polished, and then finely incised with a complex design of multiple motifs. The result is an elongated, three-dimensional piece that appears to represent a salamander. It was found in an area of late prehistoric agricultural villages dating around 1500 A.D.

In other regions of the world there is evidence that formations were part of ritual activity, and it is surprising that no additional — and no in-cave — evidence of prehistoric crystal extraction, speleothem modification, or breakage has been observed in the northern Plains. The varied practice is fairly common in other areas, particularly to the south. In Cueva Higuera, in the Sierra de El Abra of northeastern Mexico, for instance, we have observed large areas of stalactites that were broken, with very old breaks, but with no pieces of those formations on the flat dirt floor of the large room. In Cueva del Aire,



Fig. 17.4. Rainbow Bear Cave, Montana



Fig. 17.5. Red pictographs in Triangle Cave, Montana

also in northeastern Mexico, we have observed that most stalactites and small stalagmites were intentionally broken and scattered across the floor of the lowest room of the which continues today with the local Huastecan Indians. The breakage, as before, appears to be early, probably prehistoric. Similar examples are known in other parts of the world, including Paleolithic caves in southern France (Jean Clottes, personal communication) but not on the northern Plains.

In an example of another use of cave formations, we once did a small sample study of ceramics in El Abra area caves of northeastern Mexico. This is an area of Huastecan occupation, with ceramics generally tempered with limestone. Sherds in open village sites were found to be tempered with non-crystalline limestone, as was expected. Prehistoric ceramic fragments inside caves, in areas that suggested ritual use, however, were mostly tempered with finely ground calcite crystal, almost certainly finely ground cave formations. Several caves in the area, like Higuierón mentioned above, appear to have been used as crystal sources, and it appears that at least one use of those crystals was for temper inclusion in ritual ceramic vessels. Use of cave crystal, therefore, is possible for a number of uses.

CONSTRUCTION IN CAVES

Evidence of feature construction in caves is rare, but there are a few examples. Most are remains of wickiups and walled rooms mostly believed to represent habitation structures or small houses.

Logs and branches from a possible wickiup are in the back, dimmest part of a passage deep in the *Twilight Zone* of Frozen Leg Cave (24BH425) in southern Montana. The cave has evidence of perhaps 2000 years of use, of which this is only a part. Other remains of wooden structures are in twilight and transitional dark zone settings of this cavern system, and paintings occur in the twilight zone of the two entrance rooms.

In another canyon of northern Wyoming, Juniper Cave (48BH3178) contains several stone-lined house floors in the entrance area, in front of the large entrance room and back just inside the entrance. One of these floors contains large bison bones, and chipped stone artifacts are scattered across the floor. A simple black pictograph consisting of a series of parallel lines is on the ceiling ledge above the interior house floors.

Another nearby cave in southern Montana also contains remains of similar stone-rimmed houses in a large



Fig. 17.6. Red pictographs in Pass Creek Cave, Wyoming



Fig. 17.7. Yellow pictographs in Frozen Leg Cave, Montana



Fig. 17.8. Yellow pictographs in Frozen Leg Cave, Montana



Fig. 17.9. Carved stalactite in form of a snake, Sidney Montana

passage, in the *Daylight* and *Twilight* zones. No rock art appears to be associated with those floors although pictograph sites are in nearby canyons.

In the very large, deep Devils Rockshelter (48BH739), situated in the upper wall of a huge limestone canyon in the same general area of northern Wyoming, there are several small enclosed natural rooms, two of which are sealed from the inside with juniper logs to form an effective wall and close the dark room interiors. There is no associated rock art, although the huge rockshelter contains intensive cultural deposits full of animal bones and stone tools.

HABITATION

Other kinds of habitation debris occur mostly in entrance areas and less commonly down into the *Twilight* zone of elongated entrance rooms. In the lower entrance room of Horsethief Cave (48BH304), a large cavern in northeastern Wyoming, there are intensive ashy deposits with burned rock, chipped stone tools, flaking debitage, and large amounts of butchered bone that indicate repeated use of the interior entrance area for habitation.

HUMAN REMAINS

Human remains have not been reported in this area from contexts within true caves. In other areas there are intentional interments (essentially ritual burial) in *Daylight* and *Twilight* zones and back into darkness. Also in other areas (e.g., Felton Cave in western Texas and Hourglass Cave in western Colorado), remains have been found indicating accidental death deep within long cavern systems — presumably people lost in meandering passages during the distant prehistoric past. Nothing has been found yet on the Northern Plains.

DISCUSSION

Function of utilized caves appears at least partially to be related to concepts of light and darkness. The distinction, however, is not universally clear. *Twilight* interior areas in many cave entrance rooms, especially enclosed rooms, *at night* are completely dark and isolated from external influences of light and sound, exactly the same as distant, interior dark zone settings. Rituals and other activities carried out in these dark rooms and passages would have much the same characteristics as those done in completely

dark, remote, underground locations. For such activities, the important cultural factor could be the darkness — access to and interaction with darkness, placing oneself in a kind of isolation, partial sensory deprivation, absolute visual effect, and perceived auditory effect — all characteristics of the darkness experience. In many cases, human psychology, and certainly beliefs relating to caves and supernatural association with the underground, designate caves as important and special locations with varying degrees and kinds of cultural meaning and personal effect, or translate those settings as culturally important places. The characteristics of total darkness within a constricted space surrounded by solid rock, with the auditory effects of pounding trance-inducing reverberations and imagined supernatural noises, would be similar between enclosed entrance rooms and deep cavern passages. The degree and intensity of interaction with the earth— and whatever it represents — would presumably change with the depth one goes into the cavern and the degree of isolation one would experience. Although activities could take place in enclosed entrance rooms, one would expect that activities conducted far within the Interior Dark Zone of a deep cavern would have different psychological — and presumably cultural — effects and meaning.

Our small sample shows that cave use was culturally important throughout prehistory on the Northern Plains of North America, as it was on other parts of the continent. Cave mouths and twilight zone settings were used for a variety of purposes relating mostly to habitation, subsistence, and performance of daily routines. Locations deeper within the extended twilight zone, transitional dark zone, and the most distant interior dark zone of larger caverns also were used, but probably more for special purposes and rituals than more mundane practices of everyday life. Painted rock art occurs in all zones of these limestone cavities, but with most intensity around the

open, well lit areas of the cave mouth, and with decreasing frequency into the deepest recesses of darkness. The change from daily activities and casual appearance of open-air simplicity of the art to more complex themes and presentation in deeper, darker areas is suggested by the paintings, as it is by other kinds of cultural remains. The interior dark zone appears to be under-represented in the sample, and more intensive investigation in this region, and possibly within these caves, will probably change the results of our brief survey.

We continue to search throughout the Americas – from Canada to Argentina -- for locations of culturally utilized caves and the activities that were performed within them. The small sample of caves on the Northwestern Plains of the United States serves as examples of the kinds cave use known in the Americas.

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