

## ARCHEOLOGICAL CAVE USE 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 appears to have been limited to areas within or near entrances. Habitation debris mostly is in open entrance areas, while rock art sometimes extends back into twilight zones and 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 cave rooms in isolated areas of difficult access would produce a similar ritual effect to activities done in a true dark zone setting. Collected and modified speleothems expand cave use into non-cave landscapes.

In this paper we move to 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 areas with caves are composed of limestone, with granite and other igneous materials mostly in the west but also forming the central cores the 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. Caves are found in the dense limestone layers and 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 our personal interest is in rock art in caves, especially interior dark zone locations, it is useful to consider the total use of such caves and the kinds of archeological materials that occur there.



In this paper, then, we provide some 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.

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 — some sort of enclosed room, extended passageway, 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 glorified rockshelters 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 universally 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.

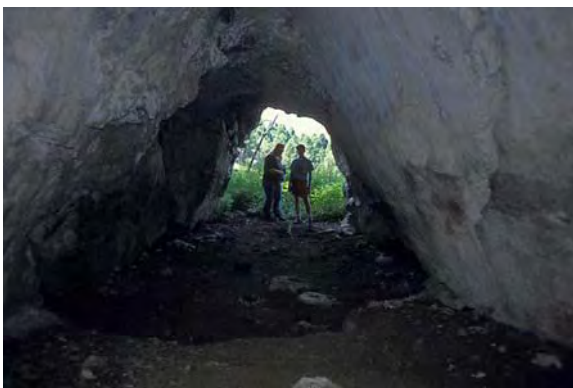


Paintings occur on limestone walls, and in some cases on granite, sometimes on high-quality metamorphic surfaces, and less commonly sandstone. Petroglyphs occur mostly on sandstone. Since most caves considered here are in limestone karst areas, most of the rock art associated with caves is painted, and 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 absolutely 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 Mexico. This is an area needing much more exploration and research.



So, to recap — 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 have been found in all settings, although with very few examples from 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

We may look at kinds of caves and cultural materials that occur in the region — beginning 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.

One cave high on the Rocky Mountain Front has a steep climb-down entrance into total darkness. This long interior dark room has red figures painted on the ceiling. Reaching the elusive, tiny entrance is difficult.



Long horizontal tubes occur mostly in limestone and extend far back into complete darkness. In one cave 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 extended 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 back with carved petroglyphs. 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, 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 West 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.



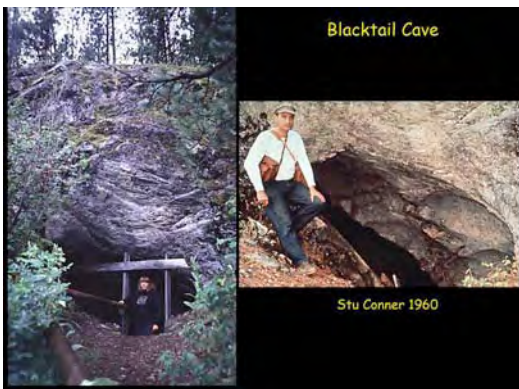
Some caves are composed of multiple rooms and multiple levels. Several such large development tube complexes contain paintings in Daylight and Twilight areas.



In one example, an enclosed room 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 has pictographs of different ages and traditions in two large twilight rooms. There is also other evidence of use in dark passages and cultural deposits in dark interior rooms in this same cavern complex.



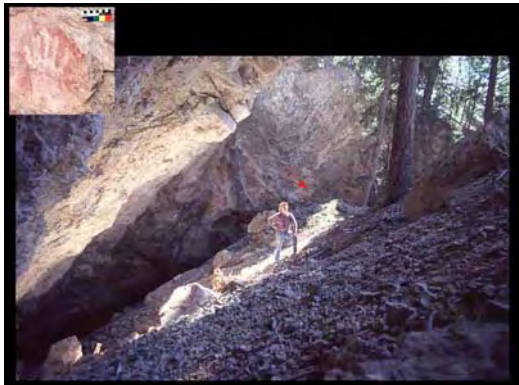
Another cavern may have contained a few dim pictographs (now enhanced for tourism) in the small climb-down entrance. Also of interest here are artifacts and possible evidence of ritual deep within the associated cavern, dating perhaps 2000 years ago, and a suggestion of earlier use about 11,000 years ago.





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.

**Mining**, for instance, is evidenced by remains of mineral extraction. At this deep sinkhole (with hand stencils at the entrance) a large ochre deposit appears to have been mined from an interior passage off the huge entrance room at the base of a steep rocky slope. The red paint material, fine quality hematite, is suitable for long distance, regional redistribution and trade. A historic reference to 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.



**Crystals and formations** in other regions were taken from caves, and it is surprising that evidence of prehistoric crystal extraction has not been reported from Montana. The nearest thing so far known is a small stalactite in eastern Montana that has been polished and then finely incised into what appears to be a snake or salamander. This is a three-

dimensional piece that was broken and removed from an active cave, polished, and then finely carved with a complex design of multiple motifs. It was found in an area of late prehistoric agricultural villages dating around 1500 A.D.

### Constructions in Caves



cavern system.

Evidence of feature construction in caves is rare.

- Logs and branches from a possible wickiup are present in the back, dimmest part of a passage deep in the Twilight Zone. The cave has evidence of perhaps 2000 years of use, of which this is only a part. Paintings and other constructions occur in other parts of the

- A nearby cave room, in another canyon, contains several cleared, stone-lined house floors in the entrance area. One of these contains bison bones.







A simple black pictograph consisting of a series of parallel lines is on the ceiling ledge above the interior house floors.

- Another nearby cave also contains remains of similar stone-rimmed houses in a large passage, in the Daylight and Twilight Zones. No rock art appears to be associated with those floors.
- A very large, deep shelter in the same general area has 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, situated high on the cliff of a deep limestone canyon, contains intensive cultural deposits full of animal bones and stone tools.



### Human remains

It appears that 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, 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.



### 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 one large cavern 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.

### Final Statement

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 locations.







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 stress could be on 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 imagined supernatural noises and pounding trance-inducing reverberations, 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 into which 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.

And our search continues — not just on the northwestern Plains, but throughout the Americas — for evidence of those activities and those locations.

**END**

