KEYWORDS: ***Pictogram – Petroglyph – Bighorn sheep – Split twig figurine – Mojave Desert***

RITUAL, CEREMONY AND SYMBOLISM OF ARCHAIC BIGHORN HUNTERS OF THE EASTERN MOJAVE DESERT: NEWBERRY CAVE, CALIFORNIA

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Abstract. Newberry Cave (CA-SBR-199 or SBCM 102) is a large, multi-chambered, dry cave in the eastern Mojave Desert, California, in the United States. The pre-Historic artefacts and paintings are unusual. The cave is important since its contents have been precisely dated and provide a window into practices of Late Archaic (2000–1000 calibrated BCE) people that used the cave. The authors posit that this was a multi-generational ceremonial site that was used by desert bighorn sheep hunters as a place for rituals and ancestor veneration. We argue that Newberry Cave is a likely example of 'increase totemism', and we further hypothesise that Newberry Cave was a site for a men's bighorn sheep, totemic, hunting society (exogamous moiety or clan). Rituals appear to have been conducted to promote the life and health of a supernatural, ancestral, totemic animal — the desert bighorn sheep. Newberry Cave rock paintings are consistent with and relate to this central principle of increase and fertility. We suggest that the predominant green colour, employed for the cave paintings and portable artefacts, may have acted as a symbolic metaphor for life renewal, vitality, increase, fertility and fecundity. Data and evidence to support these hypotheses are presented.

Introduction

Newberry Cave is in the eastern Mojave Desert (Fig. 1a), just a short distance up a steep and somewhat treacherous drainage in the Newberry Mountains (Fig. 1b). An enormous boulder conceals the entrance. The boulder appears to have fallen from the cliff face — broken out of the face of the drainage. The immense, school bus-sized, irregularly shaped rock is of a red-brown andesite, which is a volcanic stone.

Wood rats (*Neotoma lepida*) occupy the confines of the deep cave that has four 'rooms'. Bighorn sheep (Fig. 2) bed down in the cave during summer months, finding the cool shelter to be beneficial. Newberry Cave is a special place. Some of the pre-Historic artefacts recovered are unusual as are the accompanying cave paintings. We believe that the full significance of this site has not been thoroughly brought to light.

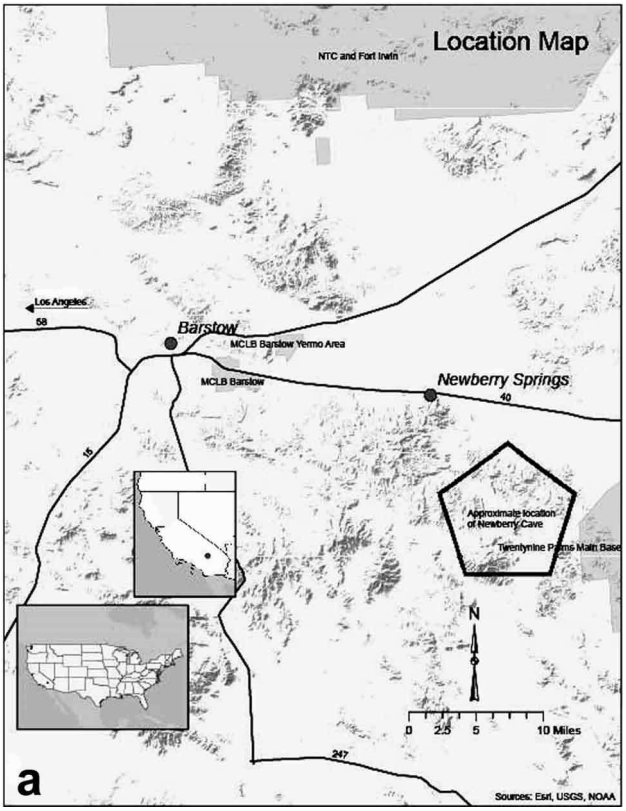
The location, archaeological and palaeontological assemblage, age and associated rock art argue for an interpretation that this place was a distinctive site of great religious significance to the local Native people. This religious site figured prominently for many generations of desert bighorn sheep hunters and their society. We argue that Newberry Cave represents a particularly striking and persuasive example of what Coulam and Schroedl (2004) have identified as 'increase totemism'.

Coulam and Schroedl's model: social and increase totemism

A bold and innovative exposition of the nature and character of the split-twig figurine complex in the Far West of the United States has been espoused by Coulam and Schroedl (2004). Split-twig figurines from eastern California, the Great Basin and American Southwest were found to date exclusively between 3000 and 1250 BCE (calibrated radiocarbon determinations based on the midpoints of their one sigma determinations). The figurines were first reported in the 1930s and are typically associated with the Grand Canyon in Arizona and the Green River region of Utah.

There are about 400 split-twig figurine specimens that have been discovered to date, and these artefacts come from 30 pre-Historic archaeological sites. The figurines are made by splitting, bending and wrapping a long, thin, single branch of willow to craft a representation of a miniature animal.

What Coulam and Schroedl (2004) argue is that these figurines are not simply fetishes or unique talismans. They are objects that are patterned, replicated and



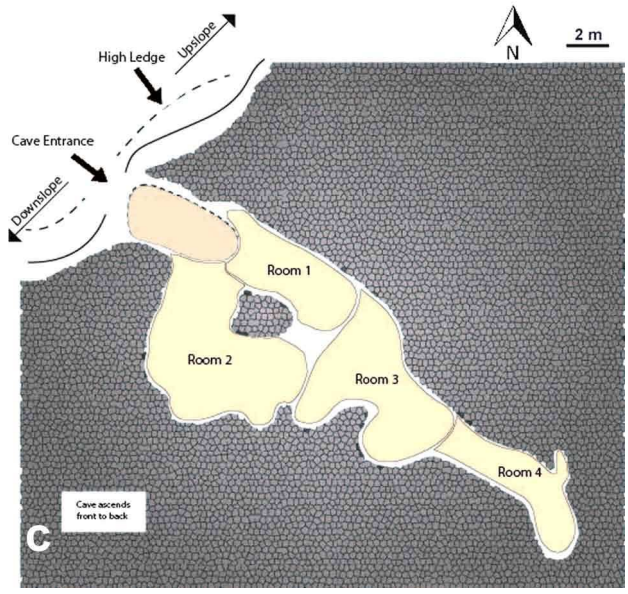


Figure 1. *(a) Map showing the general location of Newberry Cave in the eastern Mojave Desert, Newberry Mountains, California. (b) Newberry Cave, entrance to cave in red-brown andesite canyon wall. (c) Plan view of Newberry Cave. Map rendered based on figure in Leska (2009), originally developed by Don Christensen. Present figure drafted by Phil Chick.*

transmitted from one generation to the next. Hence this was a manifestation of a belief system that was not representative of an individualistic cult but instead was a communal cult.

These researchers examined the archaeological context of the total corpus of sites with split-twig figures and conclude through cross-cultural comparison, based on the ethnology of foragers worldwide, that there were two classes of such figurine-producing archaeological sites in the region. These sites are clustered in two different geographic areas and represent two distinctive construction styles. The larger figurines are of the Grand Canyon style and occur in Arizona sites (n = 16), Nevada (n = 2) and California (n = 1). The smaller figures are exclusively from Utah (n = 11) and are classified as Green River style.

Sixteen sites were argued to represent sites of social totemism, and those expressing increase totemism numbered 14. Social totem sites were domestic sites that served as habitation loci, and increase totem sites were exclusively ceremonial. In terms of overall classification, sites with Green River style figurines were mainly of domestic or social context, while those of the Grand Canyon type were predominantly religious expressions.

Social totemism is where equivalent social groups adopt a symbolic totem as a representation for the group acting as a differentiator from other groups. Social totemism correlates with kinship systems regulating marriage to a spouse outside of one's lineage, moiety or clan. Its main functions relate to spousal selection and the naming of individuals. No magical rites are associated with social totemism, but representations of these totems are fashioned (painted, carved, woven, tattooed or embroidered) to evince group membership.

Increase totemism also provides identification for forager social groups. However, this form of totemism includes elements of magic and ritual. It incorporates sociological elements regulating marriage and exhibits patrilineal inheritance. Further, the magical rituals of increase totemism are specifically crafted to increase and maintain animal species serving as the group's ancestral totem.

The best examples of increase totemism are found among the Arunta, Katish and Unmatjera tribes of Australia and the Marain of Arnhem Land (McConnel 1930; Piddington 1932; Peterson 1972; Elkin 1976; Berndt and Berndt 1988; Myers 1991; Belier 1997). Australian foragers are the classic ethnographic example. Additional defining elements of this expression include: a

natural species that serves as a group's totem; a patrilineal clan or moiety with inherited rights to land or resources; sacred places where the totem is plentiful, where the totem is believed to have originated, and where rituals are enacted that ensure fertility of the totem; and finally, a sacred narrative that identifies the totem as an ancestral relation — in essence uniting or interrelating the totem, the religious place and the clan or moiety.

Ethnographic descriptions (especially those from Australia) tell us that increase totemites are all males, and these male totemites travel to these totemic sacred sites within their clan territory. There men perform rituals to regulate, maintain and increase their clan totem. These ceremonies can be annual events, but they can be less frequent, occurring only once every 15 to 20 years when environmental conditions allow such an aggregation event.

At the totem centres, participants call out the name of the totem, sing songs and dramatically act out sacred oral traditions associated with the religious site. There at the totemic ritual site acts of imitative and contagious magic take place. Red ochre or blood may be dripped on totemic figures to promote the life and health of the totem. These ceremonies are meant as a means to supernaturally propagate the totemic species and also to maintain the cosmological order of nature.

Figure 2. *Group of Newberry Mountains bighorn sheep photographed in the immediate vicinity of Newberry Cave (photograph courtesy of Carlos Gallagher). Rams, ewes and a juvenile are elements of this herd. These are native, indigenous animals descending from those hunted and venerated by the Newberry Cave people.*

Pre-Historic archaeological studies appear to support the thesis that increase totemism was important in ancient human societies (Mithen 1998). The spiritual relationships of increase totemism are actually afforded through sacred rituals that fuel the strength and fecundity of the animal ancestor and the group revering them (Lewis 1969). Hence, totemism and ritual are inextricably related in an interdependent, dynamic set of relationships. Totemic institutions are correlated and intimately associated with marital clan exogamy, imitative magic and zoomorphic ancestor worship (Thomson 1978).

According to Coulam and Schroedl (2004), the archaeological sites classified as representing increase totemism lack cultural deposits. However, they show evidence of magic with spear-pierced, dung-filled, split-twig figurines and do contain the bones of extinct Pleistocene megafauna. The split-twig figurines, it is argued, were placed near the ancient bones in order to increase the number of game animals. Coulam and Schroedl identify Newberry Cave as having Grand Canyon style figures, but they classify this site as an example of social totemism rather than increase totemism.

We concur largely with the Coulam and Schroedl's ethnographic reconstruction in broad generalisation and in the nature of their reconstructions relating to increase and social totemism. However, we feel that the researchers may have been misled in classifying Newberry Cave as a domestic social totemism site (cf. Leska 2009).

Coulam and Schroedl appear to have gathered data on Newberry Cave and reported it correctly but thought that the excavated deposit was sufficiently large and diverse that it must have been a site of habitation and considerable occupational activity. In the latter they are correct to a degree. There was a substantial inventory of artefacts and a massive amount of deposit, but the deposit is attributable to the activities of wood rats and bats in creating a rich, thick guano midden rather than to humans. Therefore, the deposits are not easily equated with residential activity. In fact, the landform and natural setting of Newberry Cave is one that would be adverse to habitation or domestic activities. Additionally, the site did not contain any standard elements of a typical, pre-Historic occupation including economic archaeofaunal and palaeobotanical elements (faunal remains and plant macrofossils) representing the refuse from animal or plant foods, nor did it exhibit a diverse artefact assemblage that includes cultural materials ordinarily associated with women, including milling equipment and domestic basketry (e.g. basketry food bowls, burden baskets or basket storage containers).

We believe that Newberry Cave was a site for an exclusively male, bighorn sheep, totemic hunting

society (moiety or clan) where rituals were carried out to promote the life and health of a key supernatural, ancestral, totemic animal — the desert bighorn sheep.[1] We believe that the Newberry Cave paintings are consistent with that interpretation and relate to the principle of increase and fertility. Finally, we suggest that green pigment, used for the cave paintings, figures prominently with respect to a symbolic metaphor of life, vitality, increase and fecundity (Fig. 3).

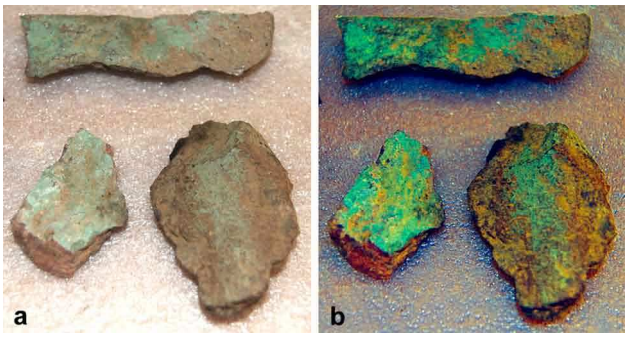


Figure 3. *Fragments of local stone smeared with green pigment (celadonite). Figure 3a is unenhanced; Figure 3b is enhanced with DStretch (Harman 2016) to accentuate the green pigment adhering to the rock.*

Animism, shamanism and relational ontology

Scholars have conducted extensive comparative studies of forager religion worldwide. The latter includes varying sets of animistic beliefs including the identification of guardian spirits and the concept of an integrated web of power (Guenther 1999; Winkelman 2000). The religious expressions of foragers consist exclusively of totemism and shamanism.

The people who used Newberry Cave led very different lives than we do today and perceived their world in a significantly disparate fashion. These were pre-literate people with sacred, oral traditions that were organised and connected differently. These early Native people used various means to communicate with what we regard as nonhuman or nonliving things, and these ideas formed part of an animistic attitude or ontology that fully embraced and experienced their world.

On a broader level, the Newberry Cave people based much of their spiritual beliefs on a system of thought in which inanimate natural objects, such as trees, stones, mountains or artefacts, are regarded as being alive and en-souled (Ingold 2006: 9; Tilley 1999, 2004: 20). It is a thought system in which people, animals and things reciprocally participate in each other's existence.

Things in the world can be experienced as animate or alive in a variety of ways, which include social, biological, linguistic and belief systems (Knappett 2002: 98). Nurit Bird-David (1999: 67) has referred to such a mode of thought as 'relational ontology'. This mode of thought does not embrace Cartesian dualism. Animistic relational ontologies synthesise and integrate diverse environmental elements into a dynamic and holistic network. A relational ontology is not dependent on prior subject : object and nature : culture oppositions. Relational ontology is best understood as a way of thinking that integrates and combines the natural and cultural environment into a holistic and systemic union.

Perhaps the distinction between modern, industrialised, relatively nonreligious societies and archaic cultures is best exemplified in the discussions of Eliade (1957: 9–18). Eliade describes these different cosmologies; in a pre-modern worldview the sacred is equivalent to supernatural powers and this sacredness saturates the world, versus in a modern, industrialised state where many lives are experienced without religious feelings in a desacralised world. The former reality Eliade terms a 'sacralised world of being' or a 'sacralised cosmos'.

1 To California and Great Basin Natives the present order of the universe is a reversal of primal times. Earlier animals were humans, and humans were animals. In the present order of things, men and animals carry residual traces of their former selves. Animality was the intrinsic component of the condition of the beings of the first race - the forbearers of the foraging-hunting society. Oral memories attest to how animals gave their bodies to people agreeing to become food because of their established kinship relations. Oral traditions, embodied in song and dance, recall the earlier era when animals danced, sang, and rejoiced.

The notion that a Native Californian group of indigenous people is descended from a bighorn sheep animal-person may not be as distant or foreign as we might imagine. Ernest H. Siva is a fluent Native speaker of Serrano, a Californian Indian language. The Serrano are an ethnolinguistic group that inhabited territories in the mountains and deserts of southern California. Siva has ancestry traced both to a Serrano lineage and an adjacent tribe of desert dwellers, the Cahuilla. Siva has preserved his ancient cultural roots both through language documentation, oral traditions and also through his music. He plays the wooden flute and sings the ancient songs that he has inherited. One class of songs is that of the desert bighorn sheep.

In these songs Siva tells us that the Creator transformed his people into bighorn sheep and that these people gave up their human lives and volunteered to become sheep. Hence, bighorn sheep are regarded with great respect. Bighorn were important game animals to both the Serrano and the Cahuilla (both Takic Family languages of the Uto-Aztecan linguistic stock) and songs are sung in respect and with gratitude for their transformation and to ensure success in the hunt.

A bighorn sheep hoof rattle accompanied the singing. The sheep rattle was attached to the leg as the singer danced. Several bighorn sheep songs are incorporated into a book and CD published by Siva (2004: 36–41). Other desert bighorn sheep songs are also known by Siva and will be made available to the public in Book Two of the Voices of the Flute. At present, interested members of the local community are learning to sing the songs on a regular basis. Alan Garfinkel was honoured that Ernest Siva shared his view that the desert bighorn sheep are his people's ancestor spirits and that the Desert Serrano and Desert Cahuilla are indeed descendants of these ancient animal-persons.

In that same light, aesthetic and symbolic values influence meaning in hunting and gathering societies, with much of this relating to ideas about *power*. This power is sometimes derived from Ancestral Beings that created the landscape, and was harnessed and heightened through ritual, storytelling, painting and other ceremonial practices (Taçon 1991: 194).

History of excavations and cultural studies

Gerald Smith, former director of the San Bernardino County Museum, first identified Newberry Cave in 1938 and brought the rich archaeological assemblage to light. Local residents already knew of the cave, and in the 1940s workers from the Barrett Echo Ranch mined pack rat and bat guano from the cave to sell and use as fertiliser. The Archaeological Survey Association of Southern California put Newberry Cave artefacts on display in 1953. In order to deal with the vandalism problem and illicit collecting activity, Gerald Smith organised excavations at the cave and assembled a group of over 80 volunteers that removed the deposits and collected the artefacts. According to Smith about 70 cubic metres of deposit were excavated (Smith et al. 1957).

The resulting collection of artefacts is curated at the San Bernardino County Museum, and a limited number of these artefacts are also on display at the Victor Valley (Victorville) Museum. In 1981 Alan C. Davis wrote his master's thesis on Newberry Cave. He was fortunate to have completed his scholarly work directly with Gerald Smith with whom he reviewed the collections. Their work was published by the San Bernardino County Museum (Davis and Smith 1981). In 2000 Newberry Cave was placed on the National Register of Historic Places.

Amy Leska (2009) is one of the most recent researchers to study the collection. Leska's work focuses on new discoveries including her identification of the source of the green pigment as a mineral called celadonite. Additionally, she and her colleagues provide the first detailed documentation of the remarkable rock art record from Newberry Cave.

Our work (PG, DA and AG) was more archival. We reviewed the collection available at the San Bernardino County Museum in association with Dee Schroth, Curator, and with the aid of Justin Farmer, Ipai Native Californian, author, researcher, and basket weaver. During our review we photographed the collection with both still and motion picture photography and included a short segment of our study of the Newberry Cave material in the documentary film *Talking stone* (Goldsmith and Garfinkel 2013). Further, we were fortunate to receive the original documentation provided by Amy Leska, Don Christensen, David Lee, and Jerry Dickey on the rock art record that they provided for Newberry Cave. Donald Austin used Jon Harman's DStretch program (Harman 2016) to enhance the photographs of Leska, Christensen, Lee and Dickey to bring out the painted elements at Newberry Cave.

Figure 4. *Split-twig figurines from Newberry Cave. Figure 4a shows a fragmentary twig figurine with only the body and rear leg elements remaining. The artefact is from the Newbery Cave collection curated at the San Bernardino County Museum, Redlands, California. Figure 4b is an overview of the full display case enclosing three different figurines with the largest one at the rear of the case. All aspects of the full figure can be reconstructed from these fragments including the head, neck, body and legs.*

Description and archaeological assemblage

Newberry Cave is distinctive in a number of respects. Primarily, this is a *dry* cave where it is often the case that typically perishable artefacts that do not preserve in open-air sites still survive. This was the case at Newberry, where a remarkable assemblage of objects was discovered. This is the only California cave where archaeologists have discovered split-twig figurines.

Further, it is the only known use of a green pigment during the Late Archaic (c. 2000 BCE to 600 CE) in California. Other rock art found throughout the state

Figure 5. *Dart shaft fragments. The photo is enhanced using DStretch (Harman 2016) to emphasise the decorative green pigment adhering to the shaft fragments.*

during this time span is most often in the form of petroglyphs rather than paintings. We believe that the colour green and its use at Newberry Cave have metaphoric and cosmological significance.

Newberry Cave is perhaps best described as having five sections: the entrance and apron of the cave and four rooms. The entrance includes the talus slope in front of the cave, and the bulk of the paintings are arrayed along the opening. As one enters the cave it diverges with one room to the north (room 1). Room 2 is a recess that extends to the south and is separated from room one by a rock pillar. Room 2 is several feet higher in elevation than the adjacent room 1. Continuing towards the rear of the cave, room 3 is in a narrow eastern section of the cave and is 27 m (89 feet) from the entrance. At the rear of the cave and further to the east is room 4.

The artefact inventory numbers 3089 items. Those materials (in order of frequency) include: split-twig figurines and fragments (eleven largely complete and 1049 fragments; Fig. 4a and b), dart shaft fragments (1019; Fig. 5), projectile points (310; Fig. 6), flaked stone debitage (620) and painted stones, which are also identified as palettes (34). The far less numerous but perhaps in some cases more important items include: cordage (12), milk-white quartz pebbles (4), blocks of pigment (>6), leather scraps and thongs (4), bone/wood awls (3), bone flaking tool (1), quartz and calcite crystals (3; Fig. 7), fire drill and hearth blocks (6), cut sticks (2), shells (2), grass bedding materials (3 concentrations), sandals (4), wrapped feathers (1; Fig. 8), 'wands' (2), leather thong-wrapped sheep dung (1; Fig. 9), chewed yucca fibre quids (2) and a mano/hammerstone (1).

The largest class of objects forms almost 40% of the assemblage and includes 11 nearly whole and 1049 split-twig figurine fragments. Almost of equal number to the figurines are dart shafts. A total of 1019 dart

Figure 6. *Dart projectile points. Sample of dart projectile points found in Newberry Cave. Nearly complete specimens are mainly Elko series examples. Top row: third point from the left is a rare obsidian example. Third row from the top, second and third artefact from the left retain animal sinew hafting elements on their bases.*

Figure 7. *Close-up of quartz crystal (5.0 cm in length) painted with green lines with a lump of asphaltum adhesive at base.*

Figure 8. *Wrapped, entwined bundle of feathers (unidentified as to species). The mass (5.0 cm in length) is covered with green pigment.*

shaft fragments were retrieved. Significantly, at about half the number of figurines and dart shafts are many nearly complete and serviceable dart projectile points (n = 310).

Compared to many domestic/habitation sites the Newberry Cave artefact assemblage is highly divergent, having a large number of points with a very modest assemblage of flaked stone debitage. The flaked stone material is typically related to stone tool production, finishing and repair. The 620 debitage pieces suggest lithic manufacture and repair was not a major activity at this site, especially when viewed relative to the figurines.

Almost one-third of the cultural assemblage was recovered at the entrance of the cave. This is partially explained by the size of the area and the degree of openness and light it provides. Over 200 dart shaft fragments (n = 213) and 157 stone dart points were found there. Three of the five blocks of pigment were excavated at the entrance, and all were green-coloured celadonite. The small bundle of feathers wrapped with green-painted cordage and two of the four leather scraps were all discovered at this location. Finally, the bulk (25 of the 34) of natural stones exhibiting paint were identified on the apron at the front of the cave.

Room 1 had a small organic deposit 30 cm in depth. This room had the second largest amount of flaked stone debitage (109 items) and exhibited 109 complete or nearly complete dart points. The only chewed yucca fibres (known as quids) were in room 1. Also in room 1 was an object interpreted as a mano for grinding seeds or pigment, which was instead perhaps used as a hammerstone. Significantly, no objects identified as metates (milling slabs), either in portable or bedrock form, were recorded.

Room 2 is the largest area of the cave's interior. It is the only area of the cave that has an elevated floor. The room was the most disturbed by bat guano miners and by illicit artefact collectors. The remaining deposit was shallow at about 10 cm in depth. However, room 2 did contain 52 split-twig figurine fragments and three dart shafts. No other pre-Historic cultural materials were recorded.

Room 3 is a continuation of and adjacent to room 1. From a narrow corridor it balloons to a full compartment. These cultural deposits were the deepest in the cave, ranging up to almost one metre and on average having 90 cm in depth. Three grass-lined pits and a 'bed' were identified here, and these may have been places for resting or for ceremony and ritual. One of the two red pigment stones was discovered in this room. Both quartz crystals and the only white quartz pebble with provenience were also discovered here. One nearly complete split-twig figurine, the largest in the Newberry Cave inventory, was in room 3. The large, split-twig figure measures a maximum of 22 by 15 cm and is somewhat larger than many split-twig figures found elsewhere in the Far West. One hundred fifty dart shaft fragments were also in this part of the cave.

Figure 9. *Single pellet of bighorn excrement tied or encased by a few strands of sinew along its length and width. A faint dusting of green pigment adheres to the pellet.*

Rounding out the collection from this location were nine flaked stone dart points and two awls or pressure flaking tools (one bone and one wood).

Room 4 is the smallest of the Newberry Cave chambers. It was subject to extreme mixing due to extensive wood rat activity. It was filled to the very ceiling with wood rat midden and cultural remains. Among the remarkable artefacts in this room was a sinew-wrapped pellet of bighorn sheep dung (Fig. 9). The sinew-wrapped dung may have been dusted with the unusual and distinctive Newberry Cave green pigment. Room 4 had the greatest number of complete and fragmentary split-twig figurines. This is also the darkest part of the cave, and the three fire blocks (fire starters) were here. An extensive inventory of dart shafts (629) was also identified. Some of these dart shafts retained sinew wrapping and adhesive. Twelve exhibited paint on their margins and were further adorned with black and red bands.

Quartz crystals and white quartz

Two quartz crystals, one calcite crystal and four milk-white quartz pebbles were recovered from Room 3. Quartz crystals were sometimes set atop ceremonial wands and baton-like artefacts by means of asphaltum adhesive (Koerper et al. 2002: 62–63). The largest quartz crystal identified from Newberry Cave has asphaltum adhesive and could have served to tip such a wand.

Quartz crystal and milk-white quartz have magical and religious properties for indigenous peoples throughout the world (Heizer 1949: 31). Research into traditional Native Californian ritual and metaphor indicates a linkage of quartz crystal to weather control, lightning, thunder and rainbows. Additionally, quartz crystals played a role in divination, supernatural travel and transformation from human into animal forms (Koerper et al. 2002).

Quartz crystals are widely recognised as powerful physical embodiments of sacred, natural environmental energies. Crystals are considered power objects perceived to be living beings that operate as allies in the

Figure 10. *Selected and representative examples of the nearly 400 individual instances (elements) of rock paintings adorning the walls of Newberry Cave. Figure 10a photo is unenhanced, showing the discernible images. Figure 10b is the same photo as 10a with DStretch enhancement (Harman 2016) for the green, red and white abstract elements. Figure 10c is a zoomorphic element (10 cm in length) enhanced with DStretch.*

realm of spirits (Levi 1978). Jay Miller (1983: 81), in his study of Native American and Great Basin religion, makes a special point of emphasising that quartz crystals were recognised as animate 'cosmic mediators' representing crystallised thought and memory. Miller also reports that crystals were intimately related to both water and supernatural power. Words for these elements in Numic (Great Basin Paiute Shoshone languages of Uto-Aztecan stock) show close associations for the interrelated concepts of water and power. The terms for water (*paa*), power (*puha*), path (*po'ai*), and to breathe or think (*sui*) are semantically and phonologically intertwined. These words evince deep, epistemological connections and imply that quartz crystals (*pihituu-vi* or *pihitoo-vi*) were considered by aboriginal Native Californian and Great Basin peoples to be living, powerful, mystical objects.

Milk-white quartz, when fractured, pounded, or shattered, gives off light, sparks and colour both outside and inside the stone. This property is known as triboluminescence. This unusual characteristic perhaps helps us explain its significant religious associations (Whitley et al. 1999). White quartz was used as a way to communicate with the world of the supernatural. When this stone was shattered or when two white quartz stones (known to Californian Natives often as 'lightning stones'; Mandy Marine pers. comm. 2000) are struck together, power was released as a cold, luminescent glow. This is ethnographically attested from a variety of archaeological and indigenous sources throughout the world (Reynolds 2009).

Rock paintings

In the 1950s some very preliminary and crude documentation was produced for the rock paintings of Newberry Cave. Later during research for Alan Davis' MA thesis about 20% of the rock art was recorded. It was not until 2004 when Amy Leska, Don Christensen, David Lee and Jerry Dickey began their work that there was a detailed inventory of the rock art of Newberry Cave. Copies of their documentation were submitted to the Bureau of Land Management and are also on file with the San Bernardino County Museum. Sixty-six rock art panels were identified. These 66 panels have 374 individual design elements. Nine panels lay outside the cave entrance on the south and east walls, but most of the panels are in the first five metres inside the cave. Eight panels are in the dark zone at the back of the cave in room 4. Five design elements are polychromatic (red, white and green). Sixty-one design elements are exclusively white, 53 are red, and an impressive 255 (70%) are fashioned in a distinctive green colour (Fig. 10).

All the rock art at Newberry Cave was painted, with the exception of one incised cross. The majority (75%) of elements are

abstract images. However, the representational images (13%) are zoomorphic figures that appear to sometimes mimic the character and morphology of the split-twig figurines. These *painted* animals are unusual and are believed to be some of the only ones known throughout the central and eastern Mojave Desert region of California that date to this early time span.

Representations of serpentine lines and abstract, yet patterned, configurations occur throughout the Americas in many rock art traditions. These snake-like lines, radiating emanations and curvilinear meanders are believed to be symbolic displays of spiritual energy. Such symbolism of metaphysical power has been variously labelled as life-energy, lines of magic, lines of force, lines of power, or *tigunas* (cf. Kirkland and Newcomb 1967: 67; Vastokas and Vastokas 1973: 67; Labbé 1998: 43; Berlo 2000: 45; Jones 2010).

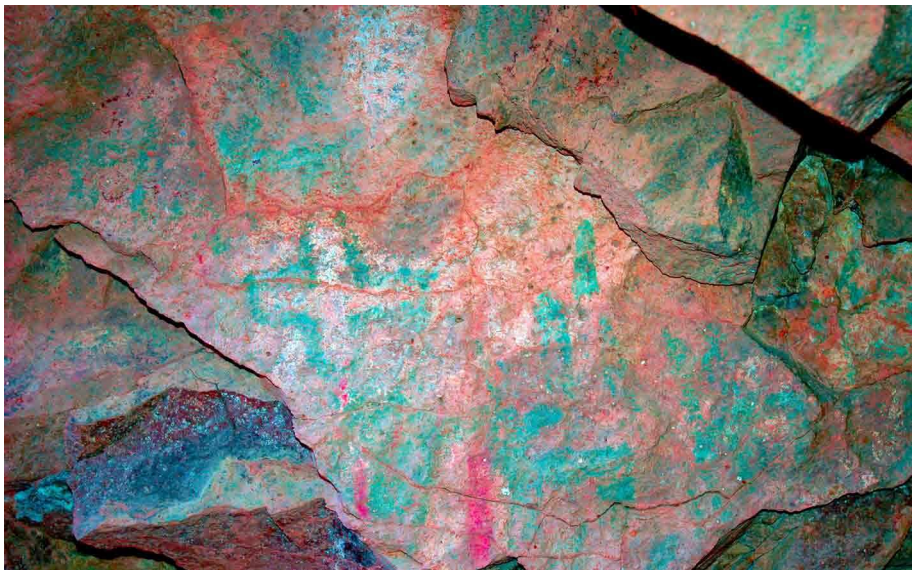


Figure 11. *Outlined cross (photo centre), zoomorphs (possibly bighorn sheep in profile, bottom right), and centre right possible depiction of an Elko series projectile point, Newberry Cave enhanced with DStretch (Harman 2016).*

Rock art symbols, whether abstract or representational, effectively integrate many ideas and emotions simultaneously. Their sacral significance may often evade our scientific efforts at deciphering them; however, ritual actions and sacred symbols undoubtedly evoked emotional associations and supernatural values, defining Newberry Cave people as to who they were individually and who they were as a corporate group (cf. Bell 1997: 156–157).

Why bighorn sheep?

One of us (AG) has written extensively on the multifaceted meanings and compound, imbricated, metaphors embodied in the Native ideas and ritual behaviours associated with bighorn sheep in the far western United States. Obviously this was one of the largest and most majestic animals within the desert habitat for Newberry Cave hunters. During the use of Newberry Cave, bighorn were likely one of the more valuable sources of meat. However, the animal was not just a food source but also a creature of religious significance.

Bighorn were considered prestigious animals, understood as metaphorically manifesting the powers and attributes associated with its habits and habitat. Living in the mountain heights it symbolised power, holiness, strength, rain, renewal and immortality (cf. Garfinkel 2006; Garfinkel et al. 2009; Garfinkel and Austin 2011; Yohe and Garfinkel 2012). All of these meanings were embedded in an interrelated package and essence. Of course in the case of the Newberry hunters, the bighorn might have been even more special as their totemic ancestor and as such may have been venerated as a supernatural, immortal, animal-human ancestor.

Newberry Cave ritual behaviour might show us something about what the hunters thought of the animal. They painted its picture over 30 times on the walls of the cave in a green pigment and they fashioned what could be estimated as hundreds of figurines representing the form of this creature. They also took a desiccated piece of bighorn excrement and fashioned it into a talisman by entwining it with sinew.

The crosses of Newberry Cave (painting and rock drawing)

Two cross elements have been recorded that embellish the walls of Newberry Cave. One is an incised design (the only such incised design identified at the cave); the other is a painted element rendered in the colour green (Fig. 11).

Throughout the indigenous Americas, many prehistorians and rock art scholars have remarked on the boxed cross symbol, which is commonly known as the outlined cross. This design element is most frequent in southern and western Arizona in the United States but also occurs throughout southern California, Central America and South America. Jones (1998) recognises that there are few symbols that exhibit such a wide distribution both in time and space than this simple cross.

One meaning attached to the outlined cross is that it represents the Morning Star (the planet Venus). Could such a symbol have been employed at the Newberry Cave creation site in association with men's' totemic increase rituals? Could the associated compound metaphors and polysemous qualities of such a Native symbol come into play here?

Anthropologists and students of comparative

Lab number	Conventional age	1-sigma age (calibrated)	Material
LJ-993	2970±250	1500–840 BCE	Split-twig figurine (composite)
UCR-1097	3205±170	1675–1295 BCE	Split-twig figurine
UCR-1093	3015±200	1495–960 BCE	Dart shaft fragment
UCR-1095	3015±90	1395–1120 BCE	Dart shaft fragment
UCR-1092	3070±185	1515–1035 BCE	Dart shaft fragment
UCR-1103	3300±180	1765–1405 BCE	Dart shaft fragment
UCR-1096	3320±180	1865–1415 BCE	Split-twig figurine
UCR-1094	3765±100	2320–2030 BCE	Dart shaft fragment

Table 1. *Newberry Cave radiocarbon dates.*

religion recognise that the rising of the Morning Star has been interpreted as symbolic of the rising of a creator deity from death to rebirth (Spindel 1975: 93; Sejourne 1976: 65–74, 89–96; Aveni 1979: 274–285; Johnson 1995). The beauty of the rising Morning or Dawn Star has been noted figuratively as the rising of the creator from an underworld home to the newness of life — in essence a rebirth and resurrection.

Dating

We can indirectly estimate the age of a deposit by evaluating the styles of artefacts found to be time diagnostic. Such artefacts include styles of projectile points. The dart points in Newberry Cave were overwhelming (and with only one or two exceptions) of the Elko and Gypsum series. These points date to the Newberry period, placing them during a time from c. 2000 BCE to 600 CE (Garfinkel 2007).

One of the most effective means of dating archaeological sites is using the direct radiocarbon dating method. Fortunately Newberry Cave has organic material that was directly amenable to radiocarbon dating. In 1981 Davis ran seven radiocarbon dates on five dart shafts and three split-twig figurines. One date had been run earlier in 1965. The dates range in age from 3765 to 2970 radiocarbon years before present, or using the midpoints at one sigma of the calibrated ages for these determinations, these dates range in age from 2175 to 1170 BCE. All those dates when calibrated at one sigma and employing their midpoints fall within a 1000 year period of time (Table 1).

Davis and Smith (1981) thought that the cave could have been used most intensively for a period as short as 500 years. Hence, the cave might have been employed for as little as 20 generations (calculated at 25 years per generation). Just what were the Native people doing at Newberry Cave through their presumed recurrent ceremonies and rituals for an enduring period of time over some 500 to 1000 years? Why did the cave provide such an unusual array of artefacts?

Environmental background

Climate in California's Mojave Desert area has varied over time. Antevs' (1955) pioneering environmental reconstruction posited three long-term climatic phases since the Pleistocene. First, there was a time of generally lower temperatures from 12 000 to 8000 BP (the Anathermal). This was followed by a period of elevated temperatures from 8000 to 4000 BP (the Altithermal). Finally, there was a period of essentially modern temperatures since then (the Medithermal).

However, superimposed on these major trends were higher-frequency fluctuations. Mehringer and Sheppard (1978) conducted lake-core sampling at Little Lake, California, on the edge of the western Mojave Desert. They identified that available water increased about 3000 BP, with subsequent dry periods at about 2000, 1250 and 250 BP. Cool winters of the relatively wet Neo-pluvial period occurred between 4000 and 2000 radiocarbon years BP (Wigand and Rhode 2002). The evidence for these mesic (moister and cooler) events is much more pronounced in the pollen record for sites in the northern half of the far western United States rather than in the southern half. This Neo-pluvial period was characterised by a dramatic increase in precipitation at the same time that much cooler temperatures occurred. These conditions appear to have terminated about 2000 radiocarbon years BP. The impact of Neo-pluvial conditions appears to have been similar throughout the West (Wigand and Rhode 2002) and may have had a positive effect upon bighorn sheep numbers and vitality in the Newberry Mountains during this colder and moister episode in pre-History. The use of Newberry Cave appears to have been roughly coincidental with the Neo-pluvial period. The Neo-pluvial conditions may have been one element that indirectly fostered the intensity and character of the cultural expressions manifested at Newberry Cave.

Newberry Cave meaning and function

It seems evident that Newberry Cave artefacts are overwhelmingly related to men's hunting and ritual activities. However, hunting for hunter-gatherers was not exclusively about the male acquisition of food; it is rather a world-renewing effort that intricately weaves both human and non-human beings (cf. Descola 1992, 1996; Ingold 2000; Harvey 2005a, 2005b; Dowson

2009). The hunt is a sophisticated and complex manner of engaging the world that ensures the circulation of supernatural forces. Foragers hunt animals for subsistence while simultaneously acting with reverence and respect, working towards this effort of giving that provides a supernatural benevolence for the tribe. Hence, a central and integral part of the hunt is a sense of empathy, given that the hunters' prey is considered a moral and sentient kindred being (Guenther 1988).

The location and contents of Newberry Cave are significant for determining its function. It is difficult to access and does not contain occupation deposits or middens with organic materials and food refuse. Absent are baskets, milling equipment and other items that could be associated with women's work. These attributes argue that the site is not oriented towards conventional village life or even extended, temporary occupation. Instead this is a site of apparent religious emphasis and one distinctly oriented towards the hunting of bighorn sheep.

Newberry Cave is a distinctly male-gendered locus. The extensive rock art and substantial quantities of hunting weaponry (both dart points and dart shafts) support the hypothesis that this site was associated with hunting game animals. The only large game animal of some frequency in the Mojave Desert is the bighorn sheep. Additionally, Newberry Cave contained several kinds of artefacts and features that are typically identified as exclusively religious or ideological. Such items associated with indigenous rites (ceremonies and rituals) include split-twig figurines, paint and painted stones, crystals, wrapped feathers, wrapped sheep dung, white quartz pebbles and rock art.

Sympathetic and contagious magic

We believe that certain Newberry Cave artefacts represent clear evidence of what Frazer (1961) calls sympathetic or contagious magic. Sympathetic magic is where like produces like and thus effect resembles cause. This relationship implies that things that were once in contact with one another continue to act upon each other. Further, that a real and tangible relationship of identity is developed between an image and its subject. Hence, acting upon an image equates with acting upon the object represented (in this case an animal).

For the Newberry Cave bighorn sheep hunters two objectives appear to have been their primary foci: hunting and slaying game animals and fertility magic. The latter involves magical rites revolving around a basic assumption that by creating an illusion you can and do control reality. The central theme of such sympathetic magic is that the external world can be changed by our subjective attitude towards it. Such magic implies that by possessing the image of a desired prey animal one can possess and influence the animal itself. Simply, analogic magic acts on the real by its representation.

People who practise 'increase totemism' travel to sacred sites they believe are the origin or creation sites for their ancestors. There they dance, sing and act out rituals and ceremonies designed to remind attendees of the sacred narrative of their tribe. These rituals are performed to maintain and propagate the ancestral totemic species and to renew and assure the cosmological order of nature. Since this is a time of great religious veneration and ancestor worship, it seems plausible that Native peoples during this interval often initiate young men into adulthood. At the sacred totem creation site the foragers also engage in acts of sympathetic magic as discussed above.

The inaccessibility of Newberry Cave adds to the awe and drama of the journey to reach it. Newberry Cave is in good bighorn sheep hunting territory and desert bighorns still bed down in the cave (Fig. 2). The large boulder concealing the cave could have functioned as a natural hunting blind. There is also a natural *tinaja* or tank where water coalesces and a game trail runs by the site that is used by bighorn to this day (pers. comm. Carlos Gallinger 2016).

Wrapping, binding, bundling and supernatural, metaphysical power

The concept of an invisible force that binds or interconnects or unites all things is found worldwide (cf. Sliver 2000: 187; Harvey 2005a, 2005b). This perception is recognised in the cosmology of many Native American groups recognising a universal life force. It is named by many native cultures and translates into English loosely as 'power'. Power is envisioned as interconnected energy patterns in constant flux, invisible to the waking eye. This stream or network of power is symbolically visualised on ritual materials or in rock art employing undulating, zigzag and grid-like lines. The keepers of power are spiritual entities, animal familiars or masters of the animals, which abide in this power matrix. Power is encountered by humans and mediated by spirits while in a dream, trance or vision.

Eliade (1991) argues that binding symbolism may be an archetype recognised by man worldwide. Binding by knots, woven enclosures or nets are considered cross-culturally as visual symbols of the ephemeral, omnipotent, metaphysical uniting force of this mystical power. A wrapped piece of sheep dung encased by strands of sinew in Newberry Cave was possibly a talisman because it is from the interior of a once living animal, a part for the whole — this piece of dung is entwined with animal sinew, perhaps created in such a fashion to metaphorically contain, magically hold or compartmentalise the beast, to capture its life essence, strength and power.

Vitebsky (1995: 68) in his wide-ranging discussion on the subject of shamanism notes that a medicine man from the Crow tribe on the American Northern Plains had a vision of an eagle. Vitebsky suggests that this Crow religious specialist tied up the skin of an eagle into a tightly-packaged, medicine bundle specifically to

secure or capture its power. This action might parallel in meaning the significance of the small bundle of wrapped bird feathers recovered from the Newberry Cave assemblage.

Split-twig figurines

The split-twig figurines at Newberry Cave are large in comparison to others recovered in the Far West. The figures are made with a single willow branch bent into the shape of an artiodactyl (deer or sheep). The Grand Canyon style of those at Newberry Cave does not show horns, while the Green River style figurines are smaller and sometimes do depict horns.

Examining desert foragers worldwide for an analogue for hunter-gatherers producing such miniature sculptures we found that these are best equated with the desert foraging cultures of Australia (as identified above specifically for the Arunta, Katish and Unmatjera tribes of Australia and the Marain of Arnhem Land; McConnel 1930; Piddington 1932; Elkin 1964; Peterson 1972; Berndt and Berndt 1988; Myers 1991; Belier 1997). Societies who make and use such objects trace their ancestry to a totem — typically an animal or plant. The totemic artefacts represent their affinity and connection to this ancestor through representations that symbolise group unity. Increase totemism includes magical rites and rituals that are intended to ensure the increase of the totem animal or plant species. These actions also allow them to be hunted and slain through ritual and magic. The best way to get into the mindset and connect with an animal is to fashion it as three-dimensional figures and to paint its likeness on the cave walls of a creation site.

Eleven nearly complete and over a thousand fragmentary split-twig figures were discovered at Newberry Cave. These figures were made over at least 25 generations and discarded there at the site.

One of the split-twig figurines from Newberry Cave was found to have grass in its interior and contains a piece of flaked stone inside its belly. Grass is perhaps a metaphor for food for the animal, and the single piece of flaked stone potentially represents the stone weaponry used to slay the animal.

Linguistic pre-History and the Newberry Cave hunters

Although we cannot speak to or ask questions directly of the inhabitants of Newberry Cave, we do know that the ancestors of the Historic Native inhabitants of the eastern Mojave Desert were the ancient precursors of the Historic and ethnographic Chemehuevi Indians. The Chemehuevi were a Southern Paiute tribe who spoke a language of Numic affiliation. The Numic grouping is a division of the larger Uto-Aztecan language stock and, based on comparative and historical linguistics and the genetic relationships of these languages, it is likely that the Newberry Cave inhabitants would have spoken an ancestral Uto-Aztecan language, which is believed to have originated in northern Mexico.

Moratto (1984: 559) reviewed data based on lexico-statistical dating (glottochronology) and the internal genetic (hypothesised historical) relationships of California languages of Uto-Aztecan affiliation. He argues that Uto-Aztecans entered the Mojave Desert of California from the east about 5000 years ago. Also Moratto notes that Uto-Aztecan expansion throughout California would have dated to c. 2000 BCE and hence would have been coincident with the initiation of the Newberry period. This is the same time as the initial occupation of Newberry Cave and contemporaneous with the initial use of the Gypsum and Elko series projectile points found in the cave.

We believe that perhaps the cosmology of the Newberry Cave bighorn hunters was mirrored in the ancestral language and religious symbolism similar to Numic and Uto-Aztecan Natives of California, the Great Basin, American Southwest and Mexico.

The colour green: ethnographic metaphor and symbolism

For many hundreds of years (500 to 1000 years by various estimates), the colour green may have expressed the feelings and religious intentions of Newberry Cave hunters. They discovered that a volcanic stone found in the vicinity of the cave (celadonite) could be ground and prepared sufficiently to produce the colour green for paint. This was a relatively unusual expression, as green is one of the rarest pigments identified in pre-Historic cave paintings in California.

Green paint was used to fashion many (n = 255 or 70%) of the painted rock art elements adorning the walls of Newberry Cave. It was also used to embellish the ritual and ceremonial objects employed in what are believed to be magical rites. It was added to a quartz crystal, it was ground on palettes, it was added to dart foreshafts and it was the colour employed on the wrappings surrounding a package of feathers and perhaps dusted on the bound bighorn excrement.

What is it about the colour green that so entranced the aboriginal hunters of Newberry Cave? We believe that green was likely seen as a life-affirming hue because it was associated with water, new vegetation, growth, supernatural power, and the renewal or resurrection of life (cf. Vander 1997: 241–246; 272–274). There are also possible metaphoric associations of the colour green based on historical ethnological data for Native peoples who are affiliated with the Numic (Great Basin Paiute and Shoshone) and broader Uto-Aztecan language groups. This is one way of exploring what cognitive associations the colour green might have had for the ritualists and artisans of Newberry Cave.

Vander (1997: 240) tells us that for the Great Basin Paiute Shoshone people of Numic ethnic and linguistic affiliation, green was associated with plants and new plant growth in spring. Green represents earth renewal, making things grow and come alive, and for the land to have life. Further, green acts as an important metaphor

for the centrally significant element of all life — water. One of Judith Vander's Wind River Native Shoshone consultants, Emily Hill, reported that green implied the earth turning over, the grass turning green and growing tall, green and damp, and greenery was to be food and nourishment for animals.

Vander (1997: 272–309) further shares that green in Great Basin and Desert West Native thought has a host of both practical and symbolic meanings. The term green (which also refers to grass) resonates with multiple metaphors and associations. The linguistic term, *pui'*, means green and blue in Shoshone (Crapo 1976: 138–139). A Northern Paiute shaman, interviewed by Park (1938: 54), perceives the term green as combating a whirlwind that caused sickness. If the shaman in trance sees his patient walking on green grass it means he would get well and be healthy. Green also was perceived as implying a long life. Shoshones from Elko, Nevada, told Julian Steward (1941: 264) that dreams of green things mean life and vitality.

Green also implied resurrection. In Northern Paiute sacred narrative, Coyote makes a wind come up and it blows to the shore of a lake where bones of deceased, drowned people were found. The breath of life arrives, makes the green grass grow that is interspersed and nested with the bones — revitalising the dead, making them come alive again (Kelly 1938: 414). In a footnote, Vander (1997: 597) reports that Aztec song texts from the late 16th century share the word *xopan*, meaning a green location and this term denotes the growing season but also in song implies the greening of the spirits of the dead (e.g. resurrection to new life). Green also is meant to correspond to growth. The Paiute and Shoshone have a traditional cultural habit to bury baby teeth lost in early childhood under grass or a green bush or tree (Steward 1941: 410, 1943: 342, 387). Some Natives choose a shrub that grows fast so that the replacement teeth will come in quickly.

Green also has associations with the season of spring and the presence of lighting for eastern California Paiute and Shoshone. Certain months exhibiting early greening are deemed to be early spring. When Coyote in his race to Coso Hot Springs wins the race and throws all the losers, including the Sun, into the fire, darkness covers the earth at this time and all creatures tried to stay safe in a house. Coyote sends Lizard out to see what is happening in the world. Lizard returns and reports that there are many berries that are already ripe. Then Mallard and Goose sing and cause the light to return. The world then brightens and all turns green (Steward 1936: 415). Hence, the story is one of creation, illumination and transformation.

Green is also correlated with the presence of water. A Northern Paiute sacred narrative reports that water could not be found. Then the Natives went to a tree and opened it up and out poured water. Father tells them to just look at the places that are green and they will discover water (Powell 1971: 219).

Vander shares that the Wind River Shoshone associate green with water and with supernatural power — especially with power that comes in religious trance, dreams or visions. She reports that religious ceremonies align green with a vision of the Land of the Dead and the ascent of the soul alighting on an earthly place of green before travelling to the Sky World (Vander 1988: 100–101).

It may be intentional that black is not used as a colour on the wall paintings of Newberry Cave. Black pigment is used to decorate dart shafts of the hunting weaponry used to slay game animals. If the ancient cosmology of the Newberry Cave desert bighorn sheep hunters was anything like that of the Historic Numic and Uto-Aztecan foraging people who occupied that same region, then black was a colour symbolising death and war (Goss 1972).

Pleistocene megafauna

Newberry Cave fits a number of other parameters as being a site of communal religious rituals and the place of origin and creation of a key totemic animal person, ancestor for the Newberry Cave bighorn sheep hunters. It contains the remains of Pleistocene age vertebrates, specifically the giant ground sloth (*Megatherium americanum*). This animal was the size of an elephant and measured 6 m in length from head to tail. If one places split-twig figurines in association with the bones of these mega-creatures, these ancient giants (akin to the ancestral beasts of creation time) may gain supernatural power from the ancients and increase game acquisition for the split-twig figurine makers. This line of thinking was originally developed by Coulam and Schroedl (2004). Also, it is understood that objects and images of great size are cross-culturally associated with indigenous conceptions of divine ancestor figures (Ewing 2012; Hyland 1997).

Newberry Cave is nearly a perfect expression of what the authors believe is a Desert West increase totemism site. Archaeologists discovered examples of ancient Pleistocene megafauna in Newberry Cave and in other sites throughout the Far West that have been hypothesised as expressions of increase totemism (cf. Coulam and Schroedl 2004). At Newberry Cave perhaps the Shasta giant ground sloth bones helped define the location as an ancient or primeval creation site where the mythical ancestral beasts grew to an excessively large and grand size.

Summary and conclusion

We hypothesise that Newberry Cave was an increase centre for a particular species of artiodactyl — the desert bighorn sheep. We suggest that the bighorn hunters saw Newberry Cave as an increase centre and believed that a totemic, immortal, animal-human ancestor — the bighorn sheep, animal-person originated there — at their creation site. Support for this is based in part on the cave location, which is in good bighorn sheep hunting territory. However, Pleistocene megafaunal remains (skeletal parts) also testify that in the ancient mythic

past there lived even grander examples of certain ancestral beasts of relatively immense proportions.

Acts of magic at Newberry Cave employed quartz pebbles, quartz crystals, wrapped feathers, and wrapped bighorn sheep dung, but even more so they involved production of hundreds of split-twig figurines representing the bighorn and additionally the painting of bighorn sheep figures. Possible Venus star images (crosses) and abstract symbols embodied the mystical qualities of Newberry Cave. The bighorn hunting society's cosmological universe would have incorporated the power and magic of this place.

Dances, rituals, recounting of sacred oral traditions and songs were most likely part of the totemic rites associated with religious ceremonies. The crafting of split-twig figures probably was a centrally important part of the pre-hunt ceremonies, while painting of images may have been a precursor to or a testament of the hunting of revered bighorn. The visual symbol of green is a prominent, recurrent theme for the Newberry Cave rock paintings, evidenced by the grinding of paint on palettes and the painting of various ritual objects and weaponry. We argue that this green colour was a visual symbol, an affirmation and prayer for water, new vegetation, growth, fertility, and for the supernatural power of life-renewal, creation and transformation.

This dry eastern Mojave Desert cave was a significant place, which was central and meaningful for many generations of ancient desert foragers. The Newberry hunters left a rich record of their activities that reflects on the legacy of a society that once flourished three to four thousand years ago.

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