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COLUMBIAN MAMMOTH PETROGLYPHS FROM THE SAN JUAN RIVER NEAR BLUFF, UTAH, UNITED STATES

Ekkehart Malotki and Henry D. Wallace

Abstract. Authentic petroglyph portrayals of Columbian mammoths and a possible bison at the Upper Sand Island rock art site along the San Juan River in south-eastern Utah in the United States are described and illustrated. Evidence is presented supporting their authenticity, including rock varnish and wear observations and comparisons to nearby Puebloan and Historic period petroglyphs, depiction of anatomical details not commonly known to the public, depiction of relatively small tusks (which differs from typical public perceptions), and the presence of accompanying motifs produced in a similar previously unknown style. The most likely dating of the motifs is between 13000 and 11000 years BP.

Palaeoamerican immigrants and Pleistocene-Holocene transition rock art

Whether one subscribes to the orthodox 'Clovis-first' paradigm (i.e. that the earliest entrants into the New World arrived from Siberia and became the Clovis culture about 13500 years ago), or to the now generally accepted notion that there were multiple waves of immigrants prior to Clovis, it is surprising that pictorial evidence for the co-existence of pre-Clovis people and Ice Age megamammals has not to date come to light. Because humans elsewhere in the world were image-makers, one assumes that the earliest Palaeoamericans, whether pre-Clovis or Clovis, would have brought with them universal predispositions for image-making, including the making of rock art. Yet, until the present study, no unambiguously ancient rock art imagery of Ice Age megafauna has been found. In this paper, we present strong evidence for the pre-Historic depiction of mammoths at a site in southern Utah.

Instrumental methods for dating petroglyphs, such as cation-ratio, varnish microlamination and x-ray fluorescence are currently considered experimental and generally show large error parameters that often do not meet the scientific expectations of contemporary rock art research. Consequently, rock art researchers must obtain circumstantial evidence for potential Pleistocene-Holocene Transition (PHT) rock art by relying on more traditional, indirect clues such as style, differential repatination and weathering. Taphonomically, only two types of rock art are conceded to have the capability of surviving from the Pleistocene: paintings and engravings

in protected environments such as overhangs and caves; and deeply pounded or pecked petroglyphs on open sites of weather-resistant lithology (Bednarik 2010). Apart from these conditions, definitive attribution of art to the PHT era could certainly be made based on the depiction of megafaunal animals, most notably the icons of the Ice Age — mammoth (*Mammuthus*) or American mastodon (*Mammuth americanum*), which were extinct at the latest by 10800 BP (see below).

As it turns out, however, the most ancient recognisable/datable palaeoart in the American West (conveniently designated as 'western archaic tradition' or WAT), is almost exclusively noniconic, with an overwhelming predilection for abstract-geometric motifs. To be sure, proto-iconic elements such as mammal and bird tracks and human hand and footprints occur relatively early and could be regarded as precursors or bridging motifs to later 'biocentric' styles that depict life forms such as anthropomorphs and zoomorphs (Malotki 2010). Nevertheless, until now, the earliest datable imagery in the western United States conformed to the pan-globally observable pattern that all earliest surviving palaeoart, both as rock art and mobiliary art, is nonrepresentational.

Claims for rock art depictions of Pleistocene megafauna in the American West

Understandably, the search for graphic portrayals of Pleistocene megafauna, concerned primarily with the identification of proboscideans, has led to an assortment of claims that range from the absurd to the potentially



Figure 1. 'Seeing' a mammoth-like zoomorph in this petroglyph can be attributed to such phenomena as auto-suggestion or pareidolia (photograph E. Malotki).

plausible and powerfully persuasive. For example, exemplifying the naiveté of the time, members of the Doheny expedition into Havasupai Canyon, a side drainage of the Grand Canyon in northern Arizona, reported discovering both 'the picture of the most



Figure 2. The cloven hoofs of this zoomorph suggest the likely identification of a 'bison' rather than that of a proboscidean (photograph E. Malotki).

terrible carnivorous dinosaur that ever existed on earth, the gruesome Tyrannosaurus of the late Cretaceous Period' and, in close proximity, 'an elephant, attacking a large man' (Hubbard 1927). The first, and somewhat more serious, pictorial claim in the scientific literature for a coeval existence of man and megamammals during the terminal Pleistocene can be found in a 1935 account relating the depiction of a 'mastodon' along the Colorado River, downstream from the town of Moab, Utah (Gould 1935). Unfortunately, the image, which nowadays shows several gunshot impacts, was rendered archaeologically useless years ago by individuals who, perhaps well-meaningly, 'enhanced' it by re-engraving its accreted patina for better visibility (Malotki and Weaver 2002: Pl. 200).

While the final verdict is still out on the elephantine image in Yellow Rock Canyon, Nevada — three researchers are reasonably convinced of its Pleistocene antiquity (Tuohy 1969; Clewlow and Uchitel 2005), while another maintains that it was created during the Gold Rush era in the 1840s (Layton 1976). In our opinion the style marks it as being of Historic vintage rather than pre-Historic. Modern forgery has clearly been established for the painted proboscideans in Birch Creek near Ferron, Utah (Malotki and Weaver 2002: Pl. 199). Fraudulent manipulation was also confirmed for the Holly Oak pendant whose depiction of a woolly mammoth on a piece of genuine pre-Historic seashell was found to have been modelled on the well-known Palaeolithic engraving of La Madeleine (Griffin et al. 1988). Dozens of other claims for pachyderm portrayals on stone tablets or rock surfaces, often poorly documented in obscure publications, can be attributed to wishful thinking, autosuggestion, and mindsight or pareidolia. Excellent examples of these psychological phenomena are the mammoth-like petroglyphs at China Lake Naval Air Weapons Station (Kaldenberg 2005:

Fig. 1), at Hieroglyphic Canyon, Arizona (Fig. 1), and in the vicinity of Suwanee, New Mexico (Fig. 2).

Some potential candidates can easily be eliminated from serious consideration due to their low degree of revarnishing, which typically betrays recent rock art production (Austin n.d.). Others, albeit suggestive of proboscidean features at first sight, fail to qualify because such depictions do not fit the iconographic context in which they occur. Thus the Manila, Utah, 'mammoth' (Thompson 1993: Fig. 1), actually a mountain sheep with oddly misplaced horns, is associated with Anasazi-influenced Fremont culture rock art (approx. 700 to 1300 CE), while the Craneman Hill 'mastodon' near Mayer, Arizona, is surrounded by imagery

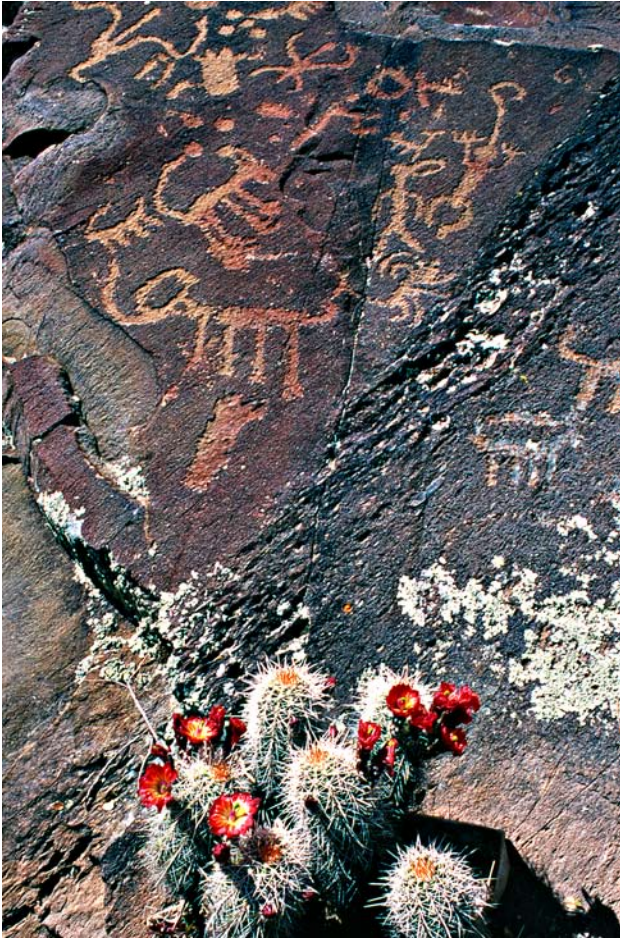


Figure 3. The iconographic context of late pre-Historic imagery (c. 600 to 1450 CE) rules out the large circle-headed quadruped as a candidate for a mastodon (photograph E. Malotki).

typically produced by late pre-Historic farmers between 600 and 1450 CE (Fig. 3).

Claims for non-proboscidean fauna from the PHT period include a possible *Equus occidentalis*, or Western horse, at Legend Rock, Wyoming (Whitley 1996: 96) and a possible *Camelops* at Surprise Tank, California (Whitley 1999). Both genera roamed western North America until the end of the Pleistocene or, in the case of the camelid, even into the early Holocene. While the identification of the Legend Rock engraving has not been corroborated by archaeologists intimately familiar with the site (Mike Bies, pers. comm. 2010), the suggested similarity of a quadrupedal petroglyph at Surprise Tank, California, to that of a Mojave Desert llama, a camelid species related to modern camels (Fig. 4), rests on the blind test of a palaeontologist (Whitley 2009: 102). Lacking multiple diagnostic traits and comparative varnish/repatination investigation, we believe the case must be considered speculative.

In light of this array of mostly unverified, suspect or downright fraudulent claims, the discovery of a realistic mammoth portrayal on a mineralised extinct animal bone fragment at Vero Beach, Florida, first announced in the media in 2009 and now, after a variety of tests,



Figure 4. Determined by the blind test of a palaeontologist, this quadruped is said to depict a 'camelid' of Pleistocene antiquity (photograph E. Malotki).

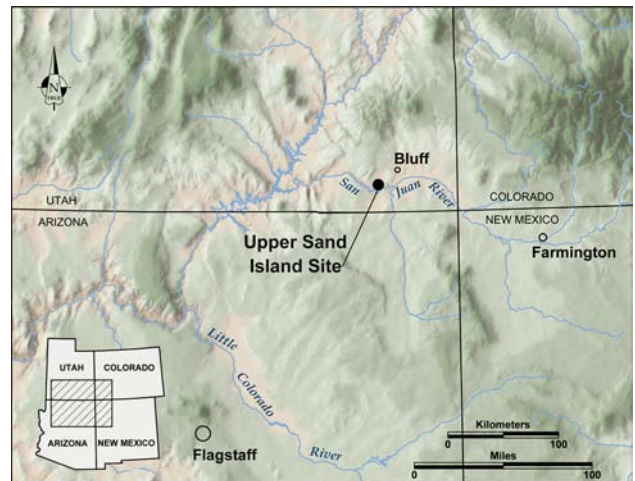


Figure 5. Map of the San Juan River region near Bluff, Utah, indicating the location of the Upper Sand Island mammoth site (map C. Gilman).

scientifically verified as authentic (Purdy 2010), can be seen as a truly sensational piece of pictorial evidence for the contemporaneity of Palaeoamericans with Ice Age megafauna. We can now add to this notable specimen of mobile art the equally newsworthy and bona fide rock art depictions of proboscids at the Upper Sand Island site along the San Juan River near Bluff, Utah.

The Upper Sand Island rock art site

The Upper Sand Island rock art site (42Sa 3589), situated about a kilometre upstream from the well-known impressive Sand Island site (Fig. 5), extends intermittently for several hundred metres along the vertical Navajo Sandstone cliffs bordering the floodplain of the San Juan River on its north side. Consisting exclusively of petroglyphs, the site was first recorded in 1985 by the Crow Canyon Center for Southwestern Archaeology, Cortez, Colorado (Cole 1985) without mentioning, however, the mammoth depiction in its



Figure 6. Close-up of mammoth 1's tusks and a portion of the front of the head and start of the trunk showing continuity in patination from unmodified rock surface to pecked portions of the design. The natural rock fissure discussed in the text is clearly visible (photograph H. Wallace).

field report. With the exception of a brief paper on the extensive archaic Glen Canyon linear component (Pachak 1994), none of the different rock art styles, occurring in multiple clusters at the site, have been described. They include basketmaker, San Juan anthropomorphic and various Puebloan expressions, as well as Ute-Paiute and Navajo images from the more recent Historic past (Sally Cole, pers. comm. 2010; personal observation by the authors).

Joe Pachak, an artist from Bluff, Utah, who with the aid of the Crow Canyon report began investigating the Upper Sand Island site on his own, introduced Malotki to it in the early 1990s and specifically pointed out a panel that in his eyes depicted two megafaunal genera: 'mammoth' and bison. The image was therefore known to some archaeologists and rock art enthusiasts, but because of its difficult access — on a vertical cliff face several metres above ground level — was never scientifically investigated. A published illustration of it, occurring in a mix of outline drawings presumed to testify to the pictorial presence of proboscideans on the Colorado Plateau, is inaccurate, in that it errs in the number of legs attributed to the animal, among other things (Agenbroad and Hesse 2004: Fig. 16.7). Malotki and Weaver (2002: Pl. 1), in their overview of Colorado Plateau rock art, offered the first photograph of the mammoth-bison scene as the only plausible example of Palaeoindian art in the study area. However, at the time of publication, due to its placement high on the sheer cliff, its authenticity remained in question.

For a variety of reasons to be described below, we consider the two depictions that are the focus of this investigation to be representations of a mammoth

and a bison, although we are most confident about the mammoth. The locality with the presumed palaeo-depictions is unremarkable compared to other locations — just another spot along the cliff face. The base rock on this portion of the cliff face is a light pinkish-brown sandstone that exhibits only slight rock varnish growth, suggesting some erosion of the surface or a lack of grains on which the varnish can develop. The varnish present is grey and covers the rock surface, sometimes in a reticulated pattern with micro-pitting lacking varnish. The micro-pits do exhibit mineral surface oxidation and they are a lighter pinkish-brown. The 'mammoth' and 'bison' are both pecked and ground, although the degree of grinding is difficult to ascertain due to the significant degree of

weathering. Most pecked and ground or abraded parts are revarnished with a light-grey varnish (lighter than the native rock varnish around the designs), and are notably lacking in reticulation (Fig. 6). Some pecks, especially on the lower 'belly' line of the 'mammoth', are lighter in colour. They have no varnish, only chemical weathering.

Some portions of the design follow natural microscopic fissures in the sandstone cliff face. This is the case for the anterior margin of the mammoth's head and the trunk, raising the question of whether these portions of the image are actually not of anthropogenic origin. Comparison with many such fissures, some cross-cutting other portions of the mammoth, lay these concerns to rest. The natural unmodified fissures lack the wide depressions seen in the trunk and front of the head. Furthermore, some individual peck marks or weathered clusters of peck marks are discernible in these areas. That the artist who pecked this design chose to select this location and draw the most diagnostic portions of the design following a natural feature of the rock face is of some interest. It demonstrates that the artist 'saw' the mammoth in the rock prior to making the image.

A visual examination of the incised lines by the authors using a hand lens with 5× magnification revealed no evidence for any use of metal tools or recent additions to the imagery. Instead, various degrees of varnish formation were noted. For comparison to the possible palaeo-designs, nearby horse images of Historic Ute origin located on a comparable exposure were inspected. They showed notable chemical/mechanical weathering but no varnish formation within

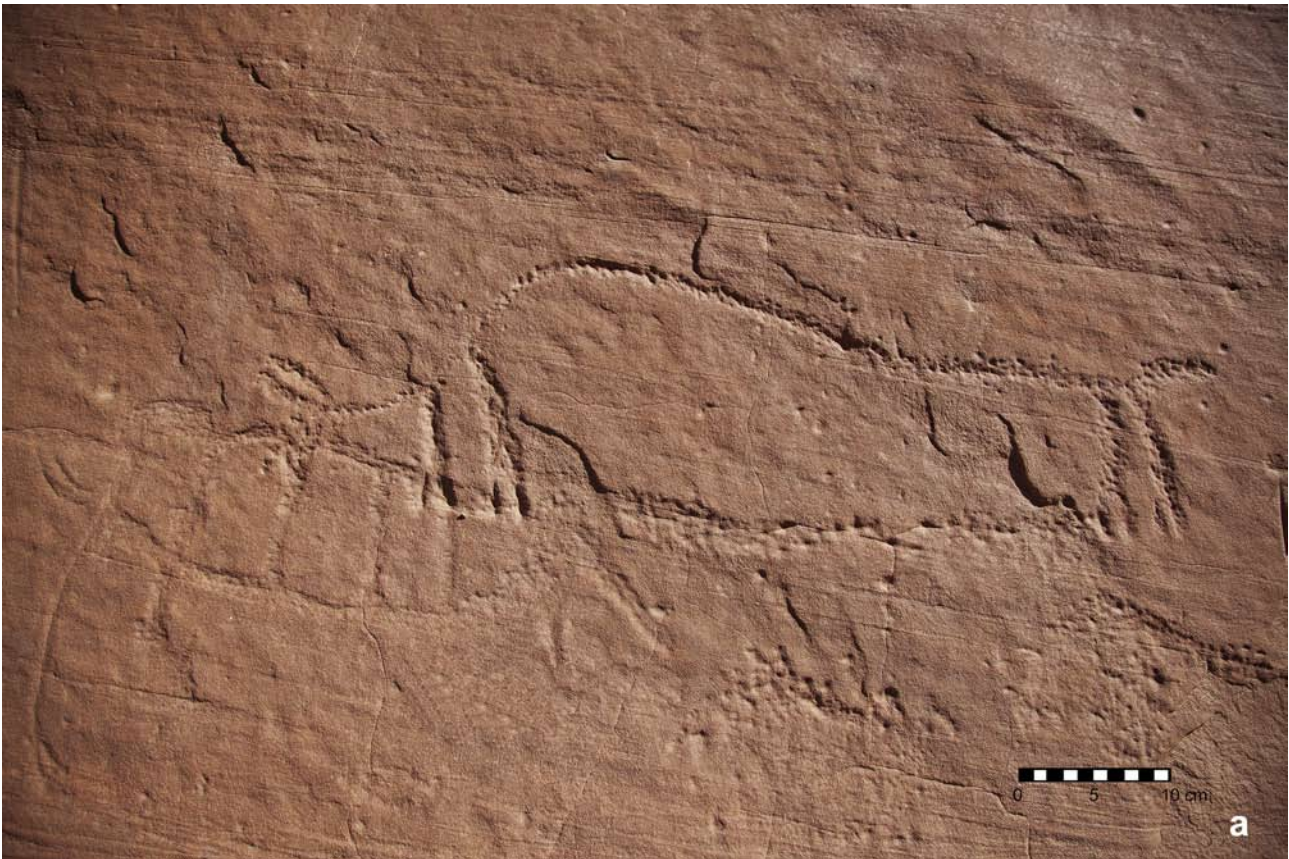


Figure 7. (a) Close-up of 'mammoth' and partially superimposed 'bison'. Width from the tips of the 'mammoth tusks' to the end of the 'bison tail' 87 cm (photograph H. Wallace). (b) Close-up line drawing of 'mammoth' and partially superimposed 'bison' (drawing Rob Ciaccio).



the pecked areas. This leads us to conclude that the possible palaeo-designs are in fact significantly older than the Ute horses and are therefore not modern fakes. The nagging suspicion that the whole petroglyph or some part of it might be the work of a modern forger has therefore been laid to rest. The image is unmistakably pre-Historic and thus, if the depiction is accepted as a mammoth, is most reasonably dated to the span when humans and mammoths overlapped in the region.

The mammoth petroglyph panel at the Upper Sand Island site

Closely associated with what we refer to as mammoth 1 is a much larger animal that, on the basis of its prominent frontal bulge, suggests identification as a bison. It visibly dominates the scene due not only to its size but also to its more deeply scored outline that partially overlaps the dorsal ridge of the underlying pachyderm. Taphonomically, the mammoth's more smoothly worn channels or engraved lines and overall softer rock wear (Figs 7a, 7b) indicate that it may have experienced a higher degree of weathering than the bison, thereby supporting its earlier origin. This observation, however, does not rule out the possibility

that the bison may represent a late-Pleistocene *Bison antiquus* (David Gillette, pers. comm. 2010).

The joined megamammals, measuring 87 cm from the tips of the 'mammoth tusks' to the end of the 'bison tail', are best viewed under conditions of strong side light. Their placement on the unscaleable cliff at a height of some 5 m above the remnants of an ancient gravel bar (Fig. 8), which in turn rises an additional 7 to 8 m above the current floodplain, not only betrays the panel's deep antiquity but also renders it (hopefully) relatively safe from potential acts of vandalism. At the time of its manufacture, presumably toward the end of the Pleistocene, the artist's access to the sandstone rock face must have been facilitated by considerably higher ground level. According to geomorphologist Jack Oviatt (pers. comm. 2010), who mapped Pleistocene-age river gravel terraces immediately upstream from the Upper Sand Island mammoth site (Oviatt 1985), the San Juan River flowed at much higher levels during times of Pleistocene glaciation. As a result, outwash alluvium may have aggraded the river's valley floor by as much



Figure 8. Access to the palaeopanel, five metres above ground level, is only possible with special equipment (photograph E. Malotki).

as 20 m, which allowed execution of the imagery at its present location. Downcutting and lateral erosion by the river during the post-glacial Holocene subsequently removed all but a few remnants of the Pleistocene gravels, which explains the images' present-day inaccessibility. While the 'palaeoscene' constitutes the uppermost layer in the pictorial stratigraphy observed on this section of the cliff, numerous other glyphs, both amorphous and representational, populate the wall immediately adjacent or directly below it.

With respect to proboscidean anatomy, several diagnostic features unequivocally point to the portrayal of a *Mammuthus columbi* or Columbian mammoth. Facing left, the animal's dome-shaped head is marked by a solidly pecked top-knot, which rules out identification as a mastodon (David Gillette, pers. comm. 2010). The eyeless head sits on a rather elongated, oval-shaped body that, compartmentalised into multiple segments, conveys a somewhat insectile impression. The two tusks, neatly aligned in parallel fashion, are relatively short and may be a sign that the artist intended to portray a young or female animal (David Gillette, pers. comm. 2010). The overlong trunk, shown in profile, may indicate that the artist was overly impressed by it. Exaggerated rendering of certain diagnostic animal

parts as seen for the mammoth's trunk is a common practice in rock art iconography and is frequently seen, for example, in the portrayal of oversized paws for bears, antlers for ungulates, and tails for mountain lions in later rock art in the region.

Extending straight downward from the face of the mammoth, the trunk ends in a remarkable bifurcation that may be a portrayal of what mammalogists call 'fingers.' As appendages of prehension, fingers of varying species-specific length and proportions served all taxa of the Order Proboscidea for picking up vegetation. This morphologic detail alone supports the authenticity of the depiction, because no modern forger or later pre-Historic Native American (assuming that tribal memory and/or oral tradition might have prompted the drawing) would be likely to have been familiar with it. Interestingly, the pincers shown on woolly mammoth paintings at Old World Palaeolithic cave sites such as Rouffignac, La Baume-Latrone and Chauvet, all feature one long and one short projection, with the latter usually referred to as a thumb (Clottes 2003: 182). The question whether two fingers of equal length on the Upper Sand Island specimen is simply the result of artistic license or actually reflects a North American species characteristic can be only a matter of speculation. Of the animal's limbs, only one front leg is discernable. The two hind legs, on the other hand, stick-like and slanted backward, are clearly visible. No tail is visible. If it was ever drawn, it appears to have been obliterated in the merging of the beast's posterior with the superimposed 'bison'.

Body segmentation, as seen in the Sand Island mammoth depiction, is nearly standard in Glen Canyon linear style quadrupedal petroglyphs (McCreery and Malotki 1994: Fig. 2.2a; Schaafsma 1994: Fig. 67) where it occurs both in vertical and horizontal form. Glen Canyon linear style, generally attributed to the Middle Holocene, is amply attested at the Upper Sand Island site (Pachak 1994: Figs. 4 and 5). Whether the 'palaeoscene' described in this paper should be considered part of that style remains to be determined. At present, the mammoth body segmentation is the only trait we would consider reminiscent of the style.

During our fieldwork at the Upper Sand Island site we carefully examined and photographed the broader context of the mammoth/bison depiction, documenting a range of other petroglyph designs in the vicinity that are not readily identified as to species or motif. We also determined that the 'mammoth' and 'bison' had distinctively weathered and repatinated, enabling a reasonable guess which other designs were likely contemporaneous or nearly so with the mammoth/bison. It was not until Robert Ciaccio, who assisted us by drawing the panel using the photographic documentation, called it to our attention that we recognised a second mammoth portrayal on the panel, in line with the row of glyphs thought to be roughly coeval with it. Figure 9 displays the portion of the cliff face with all designs thought to be of PHT age. The



Figure 9. All designs thought to be roughly contemporaneous with the 'mammoth'/'bison' images on the right side of the drawing. Mammoth 2 is on the far left (drawing Rob Ciaccio).

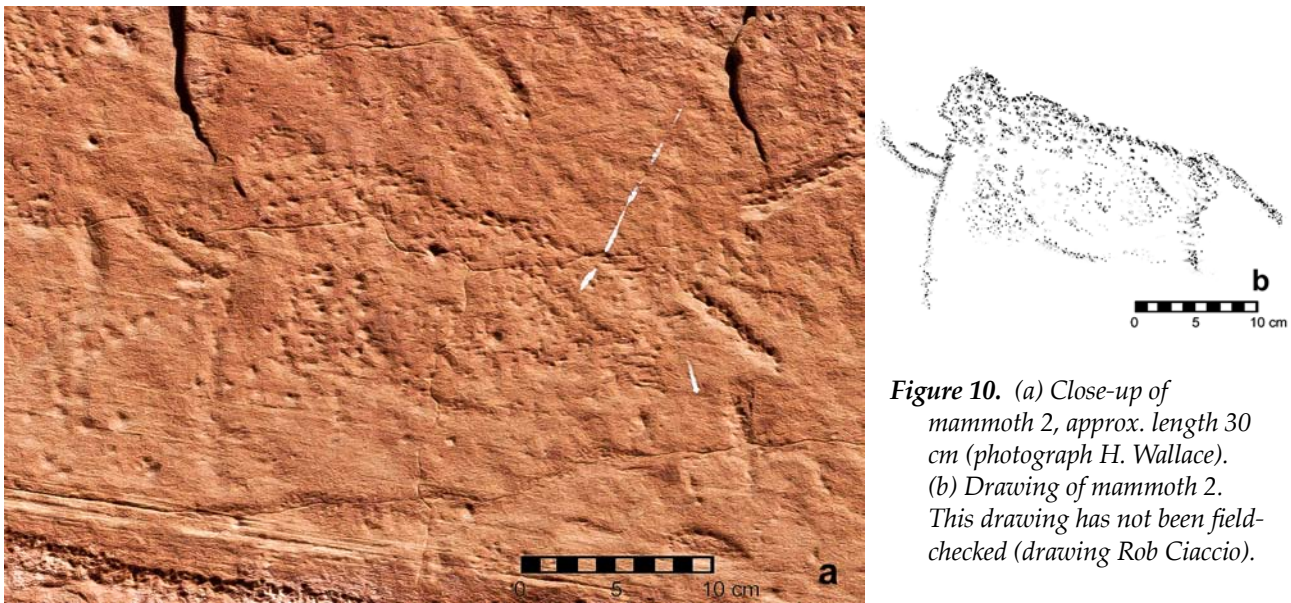


Figure 10. (a) Close-up of mammoth 2, approx. length 30 cm (photograph H. Wallace). (b) Drawing of mammoth 2. This drawing has not been field-checked (drawing Rob Ciaccio).

second mammoth is shown facing left at the far left of the row of PHT designs. Figures 10a and 10b offer a closer view. As with mammoth 1, mammoth 2 has the distinctive dome-shaped head, small tusks and trunk, although much of the rest of the body is either weathered away or was never clearly pecked. What is convincing in this case is that the portion clearly displayed shows the diagnostic traits of *Mammuthus*. We did not examine this design under a hand lens in the field so that confirmatory step is recommended for future work. Nevertheless, our photographic documentation leaves little doubt in our minds of its authenticity. For the reader, we also provide Figure 11, which shows a larger detailed drawing of the panel the PHT designs were placed on, displaying the varied designs we believe post-date them, based on patination and pecking style.

Archaeological and palaeontological context of the Upper Sand Island mammoth site

The authentication of two petroglyph depictions of mammoths along Utah's San Juan River clearly confirms the consensus of Late Pleistocene researchers that Paleoamerican humans lived side by side with now-extinct megafauna in the fossil- and archaeologically-rich region of south-eastern Utah. Due to the lack of accurate, replicable dating methods for petroglyphs, it may be impossible to determine exactly when the panel in question was pounded into the rock. There

is ample evidence for the existence of Proboscidea on the Colorado Plateau (Agenbroad and Mead 1989). However, the actual causes of their late Quaternary extinction, variously attributed to such factors as hunting overkill, environmental changes in climate and vegetation, hyperdisease and even meteor impact (Faith and Surovell 2009), continue to be subject to debate, if not controversy.

Relying on dated macrofossils such as bones and teeth, the final demise of the large mammals in North America is traditionally placed at approximately 13 800 to 11 400 calendar years BP (Faith and Surovell 2009). New research on the recovery of ancient DNA from permafrost soil samples in Alaska, however, has revealed that in that part of the New World the woolly mammoth survived until about 10 500 BP, several thousand years later than originally derived from the fossil record (Haile et al. 2009). Furthermore, some remnant mammoth populations may have persisted in certain ecological niches much longer than commonly assumed. This is certainly indicated for the Colorado Plateau, where a nearly complete Columbian mammoth skeleton was retrieved, in association with Palaeoindian occupation evidence, at an altitude of 2740 metres. Named after a drainage on the Wasatch Plateau of central Utah, the Huntington Canyon mammoth lived and died at a location some 500 km northwest of the Upper Sand Island site. Its bones are reliably radiocarbon dated to between 11 500 and 9500 years BP



Figure 11. Sand Island petroglyph panel showing PHT designs in red and designs believed later in age in blue. Many other petroglyph panels are located nearby (drawing Rob Ciaccio).

(Gillette and Madsen 1993), or approximately between 13 390 and 10 810 calendar years BP (Jim Mead, pers. comm. 2010).

Considerably closer, a mere 120 km away in the Escalante River drainage of southern Utah, is Bechan Cave, where archaeological investigations uncovered over 225 cubic metres of mammoth dung. Based on radiocarbon ages obtained for two of the coprolites, 11 670 and 12 900 years BP (Davis et al. 1984) or c. 13 480 and 15 220 calendar years BP (Jim Mead, pers. comm. 2010), the immense cavern was frequented by mammoth for a period of over 1700 years. Translated into calendar years, this means that mammoth may have survived on the Colorado Plateau until about 11 000 BP, perhaps even 10 800 BP (Jim Mead, pers. comm. 2010). This age determination provides a minimum age for the creation of the mammoth petroglyph at Upper Sand Island. A more precise time frame for the art may be deduced from archaeological evidence at the Lime Ridge Clovis site, situated a mere 12 km southwest from the Upper Sand Island rock art location. The site, characterised as a hunting stand, yielded some 300 stone artefacts, including six Clovis projectile point fragments. Davis (1994: 5) conjectures

that the site was selected because riparian corridors in the area may have attracted large mammals in the otherwise arid landscape of the Late Pleistocene. No dates are available for the site. However, on the basis of chronometric reassessments of existing Clovis sites, as well as newly obtained radiocarbon ages, the Clovis palaeocomplex is now more accurately dated to a temporal niche of a mere 300 years between 13 200–13 100 to 12 900–12 800 years ago (Goebel et al. 2008: 1499). With this temporal window serving as a possible maximum age, and provided that the mammoth panel was not made by pre-Clovis foragers, we can assume that it was most likely cut in the rock sometime between 13 000 and 11 000 calendar years ago.

Concluding remarks

Based on the knowledge that all cultures throughout time have made use of the arts in their struggle for survival, one can safely assume that 'artification' *sensu* Ellen Dissanayake (2009, 2010) also played a major role in the lives of Palaeoindians. Though abstract-geometric petroglyphs were apparently the predominant mode of graphic expression for these people – at least they are the dominant surviving mode – the remarkable

discovery of the naturalistic depiction of mammoth on a piece of bone at Vero Beach, Florida, indicates that figurative representation, although perhaps highly exceptional if not anomalous in PHT times, was apparently also part of their artistic tool kit. This has now been corroborated in the authentication of two rock art mammoth portrayals at the Upper Sand Island site along the San Juan River near Bluff, Utah. We base our interpretation of authenticity on these factors:

1. Although not drawn as elegantly or with the same anatomical precision as the Vero Beach specimen, the depictions show the diagnostic features of a Columbian mammoth. In particular, mammoth 1 includes one outstanding anatomic detail that no hoaxer would have been likely to know — the beast's bifurcated trunk, which is tipped with two prominent 'fingers'. In addition, contrary to most known modern counterfeits, the tusks shown on the Upper Sand Island mammoths are small, and clearly not drawn to be the focus of attention.
2. Repatination and weathering of the pecked and abraded mammoth 1 design is greater than that observed on nearby Puebloan and Historic-period petroglyphs in geologically and microenvironmentally comparable settings. (This also appears to be the case for mammoth 2, based on our photographs; however, this remains to be definitely proven by field inspection.) This repatination evidence unequivocally places the depiction (and the superimposed bison and adjacent designs) in the pre-Historic era prior to 900/1000 CE.
3. Modern counterfeit designs are generally shown in isolation by the hoaxer involved. The Upper Sand Island 'mammoths' and 'bison' are actually part of a panel that includes other nearby petroglyph designs which, based on repatination and weathering, appear to be coeval with the 'mammoths' (see Fig. 9).
4. If this were a case of mistaken interpretation of designs pecked during the known sequence of rock art in the region, we would expect to see at least one of the motifs present to fall into an identifiable style and to be recognisable as a motif seen at other sites. Instead, *none* of the motifs fall into any previously reported style, and we are confident in identifying only the depictions of the mammoths and bison. Two of the designs may have been practice attempts to produce the mammoth-bison depictions as they have similar overall 'body' forms and one of these designs, though lacking legs and trunk, has tusks comparable to the identifiable mammoth (Fig. 9).
5. Any lingering doubts about the intent of the pre-Historic artisans with the depiction of mammoth 1, given the overlapping design and the segmented body, is removed in our minds with the discovery of mammoth 2 which has none of these idiosyncrasies. Taken together, the two designs are clearly mammoth portrayals.
6. Although the existence of mammoth 1 has been

known for some time, prior to our documentation of the panel (and the sharp eye of our illustrator!), mammoth 2 was never noticed in the field by a range of archaeologists and rock art specialists. Though not ruling out fakery, such subtlety is unusual for hoaxers.

In conclusion, neither blind tests nor speculative interpretation are required to identify the Upper Sand Island petroglyphs as depicting the bona fide signature animal of the Pleistocene. Although it is impossible to offer an absolute point in time for their creation, both the archaeological and palaeontological contexts in south-eastern Utah suggest a window between 13 000 and 11 000 calendar years before the present (although we cannot rule out a pre-Clovis age for it). Together with the mobile artefact from Florida, the parietal mammoth images from Utah unequivocally confirm extant archaeological data that both humans and now-extinct megamammals shared the same North American landscape at the end of the last Ice Age. Furthermore, given that they were not pecked in isolation, there is the implication that other rock art dating to this era is likely present in the area.

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Professor Ekkehart Malotki
Department of Modern Languages
Northern Arizona University
Box 6004, Flagstaff, AZ 86011
U.S.A.
E-mail: ekkehart.malotki@nau.edu

Henry D. Wallace
Desert Archaeology, Inc.
3975 N. Tucson Blvd.
Tucson, AZ 85716
U.S.A.
E-mail: hwallace@desert.com

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