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NEW METHODOLOGICAL APPROACHES TO INDIAN ROCK ART: PRELIMINARY REPORT FROM THE KURNOOL DISTRICT ARCHAEOLOGICAL PROJECT

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In 2003, as part of a program of archaeological survey in the southern part of Kurnool District in Andhra Pradesh, south India, a series of previously unreported rock art sites were recorded. These primarily consist of pictographs, painted onto the walls of quartzite rock shelters and boulders. They appear to cover a range of time periods from the present day and potentially extending back into the Pleistocene. This paper presents the results of the research undertaken by the authors in Kurnool district of Karnatak.

Keywords: Rock art - Kurnool district - Karnatak - India.

India has a rich and diverse body of rock art that is found in a wide range of ecological and geographical settings. Rock art in the subcontinent covers a substantial time period, from the Pleistocene and through the Holocene (Chakraverty 2003), and continues to be produced today. Many scholars over the last century have studied this rock art corpus from the micro-scale of individual rock art sites through to the macroscale of the subcontinent as a whole (e.g., Allchin and Allchin 1994-95; Boivin 2004; Chakraverty 2003; Bednarik and Chakravarty 1997; Gordon and Allchin 1955; Neumayer 1993). Nonetheless, rock art studies in India, as in numerous other regions of the world, remain in their infancy, and a number of outstanding problems exist in fieldwork practices, analyses and interpretations.

Chronology and Dating

Few attempts have been made to systematically date rock art in the subcontinent (though see Bednarik and Chakravarty 1997). Dating of rock art in India often relies on content, such that, for example, art showing wild animals and people with bows and arrows and the like is frequently designated as 'Mesolithic' in age. Depictions of cattle and plows are often attributed to the Neolithic, while metal objects and weapons are taken to indicate Iron Age art (e.g., Neumayer 1993; Pandey 1993) ((e.g.eeee . While the use of content to assist dating is common practice and can be very informative, it is necessary to critically assess the chronological categories used. Given the extended period over which hunting and gathering and many other practices depicted in rock art have been undertaken, it is

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problematic to use such features as exclusive indicators of chronology. Many of them can do little more than provide an upper limit for the age of the images.

In building up rock art chronologies, it is necessary to draw upon a variety of lines of evidence, rather than a single rock art feature, and this can be a slow process. Supporting evidence for constructing rock art chronologies can be drawn from associated archaeological deposits, buried ochre, stylistic depictions from excavated material culture, such as pottery, and by investigating pigments, subject matters, styles, patination and taphonomic impacts, and patterns of super-positioning in rock art (Chippindale and Taçon 1998; Dorn 1995, 1997, 1998, 2001; Francis *et al.* 1993; Keyser 1987; Keyser and Klassen 2001; Rowe 2001). The application of Harris matrices to rock art panels has yielded important results (e.g., Chaloupka 1993; Chippindale and Taçon 1993; Loendorf 1990; Loubser 1996; Magar and Davila 2004). Such site specific chronologies cannot, however, inform the researcher of the time elapsed between painting episodes; it is important to recognize that panels may have been created, transformed or rejuvenated over a long time period.

Where possible absolute dating methods should be employed (see Whitley 2001). This is most readily done with paintings, when some charcoal from the original pigment remains on the surface and can be direct dated. Charcoal is not always present for dating, however, and other less direct methods of dating rock, such indirect stratigraphic dating, are sometimes necessary (Aubert *et al.* 2007; Pettitt and Pike 2007). These, however, are still being developed, and most remain controversial (Pettitt and Pike 2007). Nonetheless, they have sometimes been applied with apparent success, and are worth attempting in the Indian context, where absolute dating would in some cases shed significant light on the chronology and interpretation of paintings.

Documentation

Documentation and recording of rock art should be systematic and as faithful as possible to the original image, as artistic approaches are not representative of the material. Standards of documentation should be followed as some techniques (such as chalking or wetting images to render them more visible) will damage the art. No single recording system will be applicable in all circumstances, but a number of guides exist that are suitable for most situations (e.g. Loendorf 1998; Swartz 2006; Whitley 2001). Effective rock art documentation usually includes sketching (often with a wooden, scaled reference frame), professional tracing (unless the pigment is poorly bonded to the rock surface), photography (under varying light conditions) and the use of GPS and GIS analysis.

Systematic and Quantitative Studies

Rock art research in India has rarely involved quantitative or systematic analyses, although it is clear that patterns, quantities, proportions and distributions can tell

researchers much about relative chronology, dating and motivations for rock art production. Patterns of rock art distribution in the landscape can provide clues as to who was creating rock art and why (Chippindale and Nash 2004; Chippindale and Taçon 1998). Rock art sites in the midst of settlements were clearly created in different circumstances than rock art sites in difficult to reach locales. Based on this and other lines of evidence, Lewis-Williams has cogently argued that rock art produced deep in caves systems in southwest France may have been the work of shamans embarking on ritual journeys (Lewis-Williams 2002). With well-defined objectives, quantitative studies can reveal important evidence for rock art researchers. Numerical relationships between animals and anthropomorphic figures, and between rock art images and group size, have been successfully employed by researchers worldwide in offering interpretations of rock art (e.g., Layton 1992; Maggs 1967, 1971; Pager 1971; Vinnicombe 1976; Whitley 2001), and these analyses have allowed more in depth investigations into different stylistic traditions (e.g., Keyser and Klassen 2001; Schaafsma 1980; Turpin 2001; Whitley 2001).

Within the subcontinent Raymond and Bridget Allchin have shown that the relationship between rock art sites – comprising of almost obsessive depictions of bulls and cattle – and Neolithic pastoral and agricultural sites can be useful for dating (Allchin and Allchin 1994-95; Allchin 1963). Similarly, K. Paddayya and Nicole Boivin have drawn upon the repeated associations of Neolithic and Iron Age rock art sites in the south Deccan plateau with rock 'gongs' to argue that ringing rocks played a part in prehistoric rock art practices (Boivin 2004; Boivin *et al.* 2007; Paddayya 1976). Such associations are potentially highly meaningful, but analyses of these patterns are best suited to the results of systematic surveys.

Ethnographic Studies

India is one of a few places left in the world where traditional rock art practices are ongoing, and can be studied and documented. Despite the ethnographic importance of rock art production in India, few researchers have taken the opportunity to conduct anthropologically-informed studies of contemporary rock art practices (though see Jain 1984). It would be encouraging to see researchers try to understand the methods of production of rock art, as well as its role in social and ritual practices in India. This would in addition potentially offer the opportunity to shed light on the activities and beliefs of marginal groups in the subcontinent. Contemporary rock art is produced by a variety of groups and individuals, and it is likely rock art has played a role negotiating and contesting identity in recent and contemporary Indian society.

Ethnographic studies of rock art production in India will also assist researchers in understanding the prehistoric archaeological record, both in India and elsewhere. Studies of contemporary rock art furnish researchers with a better basis of knowledge from which to begin to comprehend rock art creation in the past, by providing information about the reasons rock art is produced, and its broader role within

society (e.g., for South Africa see Lewis-Williams 1980; Solomon 1998; for Australia see Moorwood and Hobbs 1992). Although no direct parallels can be made between modern and prehistoric behaviour, an anthropologically informed rock art perspective and corpus of data has much to offer researchers of rock art worldwide.

Rock Art and the Kurnool District Archaeological Project

In 2003, as part of a program of archaeological survey in the southern part of Kurnool District in Andhra Pradesh, south India (Fig. 1), a series of previously unreported rock art sites were recorded. These primarily consist of pictographs, painted onto the walls of quartzite rock shelters and boulders. They appear to cover a range of time periods from the present day and potentially extending back into the Pleistocene. The Kurnool region is important in terms of both regional and global prehistory (Cammiade 1927; Foote 1884; Murty and Reddy 1975; Petraglia *et al.* 2007; Petraglia *et al.* forthcoming a; Petraglia *et al.* forthcoming b) and so a program of systematic rock art recording and analysis was initiated. So far, three seasons of work have been undertaken, and although the analysis of collected data is incomplete, the methods, preliminary findings and future plans of the Kurnool rock art project illustrate our attempts to address some of the issues in Indian rock art studies outlined above.

Rock Art Setting

The rock art have examined in most detail is located north of the village of Jwalapuram in the Jurreru river valley (Fig. 1). The first season of research conducted on this

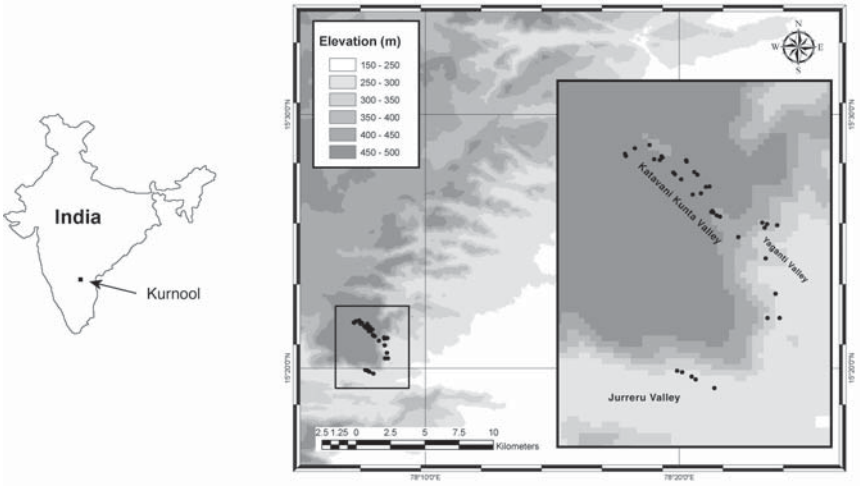

Figure 1: Map showing the location of Kurnool District in India (left), and sites in the Jurreru and Katavani Kunta valleys (right).

corpus (in 2003) focused on the general locating and recording of sites, the second (in 2004) on more detailed and systematic recording of sites with some additional survey, and the third (in 2007) on systematic survey to assess the patterning of rock art sites with respect to archaeological remains. Further seasons will hopefully include additional specialists and approach the rock art with new methods.

The rock art under discussion in the present paper is situated in three separate valleys, which we refer to as the Jurreru River valley, the Katavani Kunta valley and the Yaganti valley. Geologically, the region is part of the Cuddapah Supergroup, a crescent-shaped basin of Proterozoic age (Gupta *et al.* 2003).

The Jurreru River valley is steep-sided but relatively wide, and runs on an east-west axis. Five rock art sites, painted in red and white, have been identified on its northern slopes on southern overhangs of variously-sized quartzite boulders (sites identified as JWP). All but one of the rock art sites are on the lower slopes of the valley side, and they were all on the south- or west- facing sides of the boulders, facing onto the valley.

Katavani Kunti valley (referred to as KK) is a significantly smaller upland valley cutting the quartzite plateau, running northwest to southeast and lying above the Jurreru valley. The initial survey revealed a number of sites close to the dirt road in the valley, but subsequent systematic survey has revealed rock art sites further up the escarpment. Quartzite boulders and rock art sites are more numerous than in the Jurreru valley, and more substantial overhangs are present (at least today). A total of 47 sites are found in the KK valley. The valley sits on a pilgrimage route between two Hindu temples and some 14 of these sites, painted in white, appear to relate to contemporary or recent religious activity. A further 33 sites contain a distinct corpus of predominately red images.

The Yaganti valley (YAG) is a subsidiary valley to the KK valley, and runs along a northwest to southeast axis. All but one of eight sites are located on quartzite boulders relatively high up on the valley's eastern limestone slopes overlooking the Yaganti Hindu temple to the west. Most paintings are in red, but some are also in white and black.

Taphonomy

Taphonomic impacts on the rock art and associated sites are not insignificant, although far less severe than many rock art regions worldwide. Taphonomic effects, while negative in many respects, nonetheless also hold the potential to shed light on rock art chronologies and dates.

Taphonomic processes that have affected the Kurnool District site are of various types. Many of the shelters where rock art is found, particularly in the KK valley, are currently used by local farmers, herders, travelling pilgrims and/or *saddhus*, amongst others. Shelter floors have often been partially cleared of stones and/or vegetation, and in some cases simple structures and shrines have been built, while

in other cases associated megaliths have been disturbed. One rock art site in the Jurreru valley has been used for target practice, evidenced by spent shells recovered during excavations, and others have seen non-archaeological excavations, apparently to obtain some sort of useful sediment. There is also evidence of damage to the rock art by rain, termites, insects, birds, algae and acacia branches.

Undoubtedly one of the most obvious and potentially important taphonomic processes documented at the sites relates to the rock coatings that cover the boulders in the Kurnool District. These are often substantial, with many rocks exhibit coatings in a range of colours, including red, orange, yellow, white and black. Dorn (2001) has described some 14 different classes of rock coating, and following this, the rock coatings at Kurnool deserve further study, as the rates and methods of their formation may offer insights into dating the rock art. While many images are obscured by such precipitates, it is possible that they are also preserving much rock art to some degree, as evidenced by crisp bright images revealed in areas where precipitate has recently flaked off.

Mechanical weathering of the rock substrates themselves is likely to have impacted the rock art sites. Evidence for spalling and exfoliation is evident at many shelters and it is likely that rock art, particularly older rock art, has been destroyed by such processes. The rate at which exfoliation occurs in the valleys and varies between shelters is of substantial interest, and a focus for further archaeological and geological study by the Kurnool District Project.

Dating the Kurnool Rock Art

Dating the Kurnool rock art will present a substantial challenge, as is generally the case in rock art studies. However, the degree of fading of some of the red ochre images, and the thick mineral washes that cover many of the images suggest they have been produced over a lengthy time period. Also, many of these sites are associated with archaeological remains, often of substantial antiquity. The 2004 survey indicated that of 27 sites with images in red ochre, 13 of the associated shelters have archaeological remains that are visible on the surface. Four shelters have microlithic artifacts, 2 shelters have potsherds, 5 shelters have both microlithic artifacts and potsherds, and 1 has a megalithic cist. The 2007 survey revealed 21 new rock art sites, 10 of which were associated with surface archaeology, including 3 shelters with lithics, 2 with potsherds, 1 with a stone structure, 2 with potsherds and lithics, 1 with lithics and a stone structure, and 1 with potsherds, a stone structure and a human interment. By specifically focusing upon the associations between rock art and archaeology, two sites discovered during previous work were also shown to have surface assemblages: 1 included lithics, and 1 had potsherds, lithics and a stone structure.

So far, only one rock art site has seen excavation to a significant degree, but this has provided exciting results. Excavations in 2003 and 2004 at JWP 9, a rock

art site in the Jurreru river valley, revealed over 3 m of archaeological deposits. The overwhelming majority of these were aceramic and dominated by microlithic assemblages, with ceramics only recovered from the latest level (Petraglia et al. forthcoming a). Radiocarbon dating of finds from the site **indicates** that occupation deposits go back to at least 30,000 BP (and further, planned excavations will undoubtedly extend this occupation). Ochre, found throughout the occupational deposits at JWP 9, add another interesting line of enquiry. The findings at JWP 9 suggest long-term hunter-gatherer occupation of the region, and it is likely that such groups had a role to play in the production of rock art. Although the question of whether art produced by Pleistocene hunter-gatherers remains visible today remains open, findings from sites such as JWP 9 suggest that it is not beyond the realm of possibility that some of the older art in the region is of a substantial age.

Some of the images at the shelters are clearly of a more recent date, and ethnographic enquiries indicate that rock art is still being produced today. A clear majority of this later and contemporary rock art relates to Hindu religious practices, including marks made during *puja* (worship) and, in the KK valley, marks made by passing pilgrims. It is also probable that some or even much of this art was produced by Neolithic and Iron Age groups, and excavations at another rock art site, JWP 11, revealed a Megalithic burial site of early date, perhaps from ca. 1,200 BC (Petraglia et al. forthcoming a). JWP 9 may have been an early Megalithic burial site in its later phase, as similar styles of pottery were observed there, and possible broken cairn structures and burial pits were identified in the late levels of the site (Petraglia *et al.* forthcoming a). Both preliminary and subsequent systematic surveys (see below) indicate a significant quantity of Megalithic cists and cairns in the Jurreru and K.K. valleys, many in direct or nearby association with rock shelters.

Despite having been produced over an as yet indeterminable but probably significant time period, only a limited internal chronology is possible for dating these images (see next section). Many images at the rock art sites are solitary or in non-overlapping groups, and so in only a small number of cases are superimpositioning studies applicable. It is hoped that absolute dating may clarify the dates and relative chronologies of the rock art. Accelerator mass spectrometry (AMS) radiocarbon dating requires only small quantities of organic material, such as charcoal (from, perhaps, the black paintings in the Yaganti valley, though these are probably the younger paintings), plant fibres trapped by or within pigment, or binding agents (perhaps animal fat or fluids) that help adhere the pigment to the rock surface (Keyser **and** Klassen 2001). While the accuracy of AMS dating is occasionally questioned (Keyser **and** Klassen 2001; Rowe 2001), when used alongside other techniques, such as cation ratio rating, which measures the leaching of potassium and calcium out of rock varnish on engravings, and biofilm dating, it can be used effectively (Dorn 1995, 2001).

Due to the rock coatings and exfoliation processes seen in Kurnool, certain destructive taphonomic processes may shed light on relative chronology and dating. Patterns of superimpositioning of paintings and the coatings that under and overlap them can be studied to help define relative chronologies (Chippindale and Taçon 1993, 1998; Dorn 2001; Keyser and Klassen 2001; Loendorf 1990; Loubser 1996; Rowe 2001). Coatings may also provide *terminus post quem* and *terminus ante quem* dates if they can be absolutely dated. However the complex microstratigraphy of coatings themselves makes this a challenging enterprise (Rowe 2001). Excavated rock spall may include painted surfaces, thus providing a means of absolute dating of the Kurnool District rock art – but so far no such surfaces have been identified during excavations.

Creating Categories: Towards an Internal Chronology

With the aim of beginning to establish relative chronologies, a simple division of the rock art was made in the 2004 season into two categories: 'newer' and 'red ochre' sites (with a total of 40 sites). These categories are supported by taphonomy, content and associated archaeological deposits, although there is some overlap, as some red ochre sites also include recent rock art.

Newer Sites

Thirteen locations have been classified as 'newer' rock art sites, as they are clearly relatively recent and do not contain images or symbols that might be of any significant antiquity. Most are painted in white paint, but the few red depictions found also appear to be relatively recent, based upon their content, shade, and lack of fading. There is a heavy focus upon Hindu symbolism at these newer sites, and most likely relate to Hindu pilgrimage or other religious activity in the KK valley (Fig. 2). Ethnographic inquiries indicate that the white images, made from kaolin and/or lime, are still being produced today. The Hindu symbols are necessarily less than ca. 2,000 years old (the beginning of the 'modern' Hindu religion), and these particular ones are almost certainly less than 500 years old (the age of the Yaganti temple). 'Newer' rock art is distinguishable not only by its content, but also by the thick, white, well preserved kaolin and lime pigments used to create it. Since white pigments do not preserve as well as red, the degree of preservation and bright colour suggest a relatively recent date. Some white images are reported from inside dolmens in south India, potentially indicating Iron Age antiquity (Rajan, pers. comm. 2005), although it cannot be discounted that more recent activities may have produced such rock art.

Red Ochre Sites

Twenty-seven of the 40 sites documented in 2004 have images in red ochre (ferric oxide) pigment (Fig. 3) and many may initially have been painted using a finer brush in the prehistoric era. Of these 27 sites, nine also have images in white

Figure 2: White Hindu symbols in the KK valley.

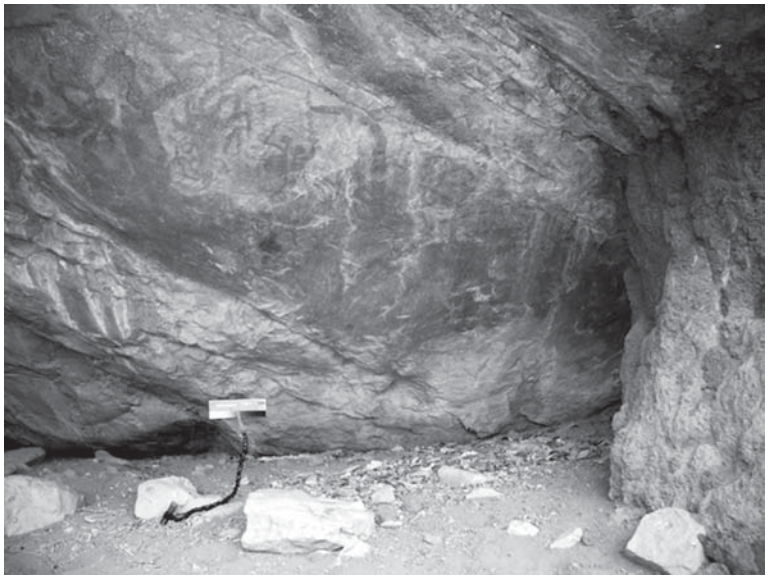

Figure 3: The exceptional main panel at KK 3 featuring fine-lined profiled anthropomorphs with bent and raised arms. The largest anthropomorph (centre) is 75 cm tall. Note also the superimposition, which is rare at Kurnool District sites.

pigment, including Hindu symbols found at the newer sites, thus blurring the division between the newer and red ochre sites. Studies worldwide have shown that most pre-ceramic paintings are red, because the iron oxide seeps *into* the rock through capillary action (Chippindale and Taçon 1998; Whitley 2001), and a working rule of thumb in rock art studies may be that while all old paintings are likely to be red, not all red paintings are old. Thus, some of the red paintings at the red ochre sites may be of significant antiquity, but the rule of thumb just outlined, as well as the variation in the degree of fading that the paintings exhibit, suggest that some may be more recent. The presence of white painting clearly indicates painting activities have occurred at some of the sites in relatively recent times, since white pigments sit on the rock and therefore do not preserve as well (Chippindale and Taçon 1998).

Distribution Studies

Another way of approaching the issue of chronology is to try to systematically examine the relationship between rock art and archaeology. As many of the Kurnool sites are associated with surface finds, it was decided to examine the degree to which such surface finds of different ages correlate with the distribution of rock art. In 2007, work was undertaken to systematically examine and compare distributions of rock art and surface archaeology finds in the KK valley specifically. A benefit of this approach is that it enabled the investigation of the relationship between rock art and archaeology without the need for excavation, an inevitably destructive endeavour.

The 2007 survey was designed to systematically sample the KK valley by walking along transects on the valley slopes, spaced 50 m apart, recording any form of archaeological material encountered. A total of 164 transects were recorded and a further 35 new sites were revealed beyond the rock art sites mentioned above. The archaeological remains at these sites are comprised of a mix of potsherd scatters, lithic scatters and stone structures. Significant spatial clustering of the various archaeological phenomena was revealed, suggesting distinct focal areas for activity in a variety of time periods. Correlations between rock art sites and lithic scatters support evidence from previous seasons suggesting that the two may be linked, and this association may be useful in dating the rock art. While the possibility cannot be excluded, differential spatial patterning of rock art sites and stone structures suggest a limited relationship between the two. While the 2007 survey does not prove that any of the rock art is of early Holocene or Pleistocene antiquity, it does not provide evidence to dispute this hypothesis, and has provided an interesting new line of evidence concerning the dating of the art.

Anthropological Perspectives

Contemporary rock art in the YAG and KK valleys provides an excellent opportunity to examine modern rock art practices in India. Much of this rock art, predominantly

consisting of symbols drawn in white paint, undoubtedly relates to Hindu pilgrimage activity in the two valleys in recent and contemporary times (though perhaps stretching back centuries).

The temple at Yaganti is known as the Sri Yaganteshwara Swamy Temple or Temple of Uma Maheshwar. It is a Saivite temple apparently built in the 15th century, and is associated with a natural spring and a number of notable natural limestones caves, which have been incorporated into the temple complex. The presence of the spring and caves suggests that the locality likely had some sort of sacred significance prior to the building of the current temple. The temple at Yaganti is a destination of pilgrimage, and pilgrims apparently pass through the Yaganti and Katavani Kunta valleys (traditionally on foot) when travelling from the Sri Maddileti Narasimha Swamy Temple in Rangapuram village, in Bethamcherla Mandal. The latter is apparently a Vaisnavite temple. Both Vaishnavite and Saivite imagery is found within the Yaganti temple complex.

Nine of the 'newer' sites in the KK valley have tens and sometimes hundreds of superimposed white, broad-brush or daubed V-shaped symbols that likely relate to Vaisnavite worship and/or pilgrimage. These mark several large boulders next to the side of the road, just before it descends from the upland valley to the Yaganti temple. Some sites contain numbers and graffiti that may document the names and dates of pilgrims moving through the valley. Four of the newer sites have engravings: these consist of 2 *lingas*, 1 Nandi (the sacred bull), and 1 pair of engraved feet positioned in front of a shrine. At two of the KK sites there are anthropomorphic figures executed in modern white paint, and recent broad charcoal outlining of older red paintings. Another site in the KK valley has a contemporary and well-used local Hindu shrine and enquiries have indicated it is dedicated to the goddess Gangamma.

The variety of rock art motifs and styles seen in the Kurnool District likely relates to the shared use of the valley by different groups and for numerous purposes. In recent times, rock art and associated features are likely to have been produced by hunter-gatherers, settled cultivators, pastoralists, and various pilgrims, itinerant wanderers and ritual specialists. The differential but shared use of the valley by these individuals, and the spatial layers and temporal cycles that rendered the same spaces both sacred and profane to different groups at different times in recent history and up to the present day deserve further investigation through detailed ethnographic and historical study. One of the aims of the Kurnool Project is to ensure that such study is undertaken so that rock art landscapes in the region can be examined in long-term perspective.

Images

Due to the rock coatings discussed above in the section on taphonomy, it is important to emphasize that much of the rock art in the three valleys is difficult to see. Images

commonly peek out here and there from beneath colourful coatings (Figs. 4-6), but are frequently unidentifiable. In some cases it is impossible to distinguish patterns or motifs, and only faded red images make the identification of the presence of rock art possible (Fig. 7). This does, however, suggest that much of the rock art is of substantial antiquity, rendering it highly significant from an archaeological perspective. Despite the taphonomic impacts upon many images, there are many more that are recognisable and traceable (see Figs. 8 and 9), especially when digital enhancement technology is utilised.

In discussing the images here, we have concentrated on the paintings at the red ochre category of sites. The 400 paintings documented in 2004 – mostly solid or outlined red – at the 27 red ochre sites, comprise:

- 106 red anthropomorphic figures (19 of which are shown in profile with a bent leg and bent, raised arm; see Fig. 3, for example)
- 22 red lizard-like therianthropes (comprising both animal and human features; see Fig. 9 for example)
- 83 animals (54 of which are indeterminable); most of the diagnosable animal species are quadrupeds, including 9 deer, 6 goats, 4 boars, 2 monitor lizards, 2 carnivores, an elephant, and a cow, but there is also a snake and 3 fish (see Fig. 4)

Figure 4: Fish-like indeterminate (35 x 20 cm) with fin-like protrusions at JWP 13; note the mineral wash on the right of the image.

Figure 5: Lizard-like therianthrope (20 cm tall) obscured by mineral wash at JWP 9.

Figure 6: Crab-like figure (15 x 8 cm) at JWP 13.

Figure 7: Mineral wash obscuring images at JWP 13.

Figure 8: Redrawing of an anthropomorph superimposed on a 16 x 25cm outlined deer at KK 1.

Figure 9: Redrawing of two lizard-like therianthropes from JWP 13 with 3 fingers on each hand; the larger (30 x 15 cm) has clear legs.

- 83 red geometric figures (including 7 sets of nested V-shapes, 2 sets of concentric circles, 5 zigzags, and 3 sets of dots; six of these geometric figures follow rock step contours)
- 70 white geometric figures (including 31 V-shaped or trident symbols), and 2 black charcoal geometric figures
- 7 handprints
- 8 depictions of what appear to be (ceramic?) pots
- 2 hands, and 5 pairs of feet
- remnants

The proportions of these different classes of images are summarised in Figure 10.

Ten of the 27 red ochre sites have superimpositioning, but in most cases only one or two figures are imposed upon previously painted images, partly due to the frequency of isolated figures. The lack of composite imagery appears intentional, although the rock coatings that cover many areas of extensive rock art production make it difficult to establish this pattern for certain. As in the Bellary District of Karnataka, 120 km west of Kurnool (Boivin 2004; Boivin *et al.* 2007), there are

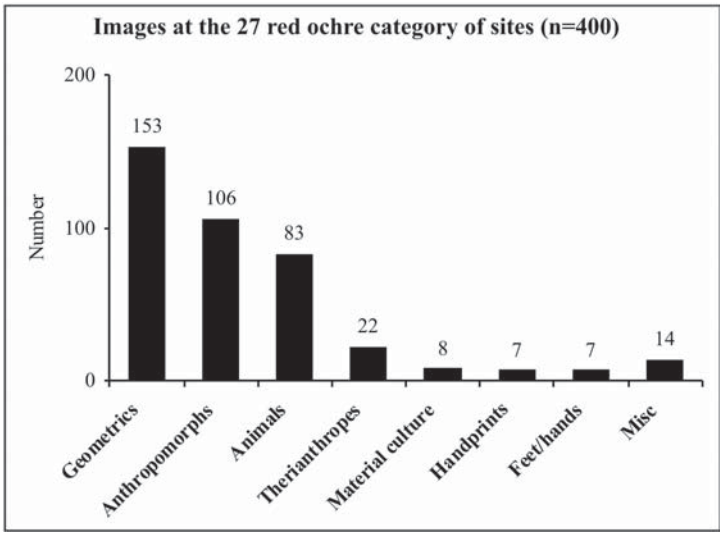

Figure 10: The relative proportions of different types of images at the 27 red ochre sites.

several examples of a solid anthropomorph superimposed over an outlined figure, usually animal. Dating the rock art stylistically (however defined) is difficult, but it is possible that outlined elements, in general, preceded solid figures. There is widespread superimpositioning at most of the heavily painted Hindu pilgrim sites, where people are still adding symbols and images today.

Digital Enhancement of Images

It has been shown in some cases that both the recording and analysis of rock art can benefit from digital enhancement techniques (Clogg *et al.* 2000; David *et al.* 2001). Experiments in Photoshop suggest that the study of at least some of the Kurnool rock art can benefit from these techniques. In particular, alteration of saturation levels seems to significantly improve the visibility of fainter images. It does not appear to significantly improve the visibility of images masked by precipitates, although further study is required to confirm this. Digital enhancement does nonetheless enable easier differentiation of red pictographs from iron-impregnated precipitates and underlying iron-rich rock.

Pigment Source

One potential source of pigment was located near JWP-9, where soft, iron-rich stones were found in red, orange and yellow and further studies are planned to investigate more fully the likely origins and make-up of the ochre identified during excavations, and in the rock art itself. The process of making rock art is often overlooked, despite the possibility that the *production* of the images may have

been more important than the images themselves to the original artists and viewers (Boivin et al. 2007). Evidence from the 2007 season suggests that red ochre was used in the form of a 'crayon' (Fig. 11), as well as paint in the creation of the images. Further analysis will focus on matters such as: which ochre sources were chosen and why; how the ochre was prepared; and which binders were used to adhere the pigment to the rock surface. Chemical analyses may yield significant results.

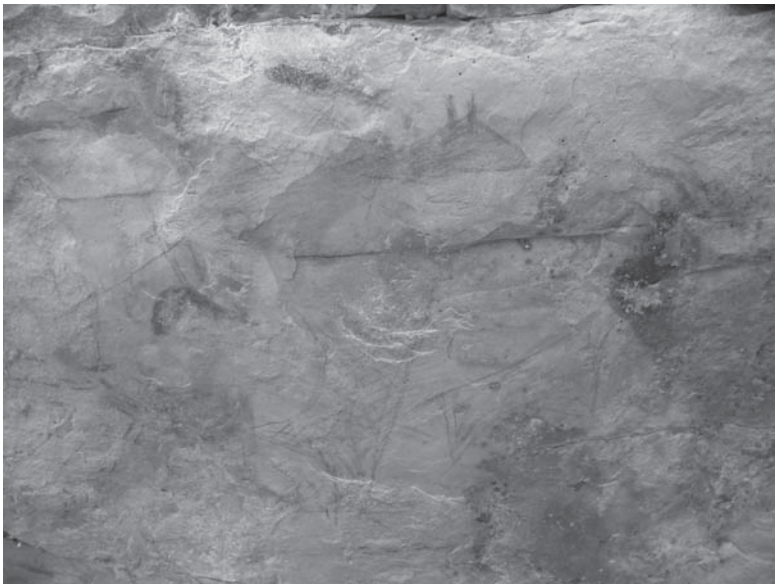

Figure 11: 'Crayon' drawn pictures in the KK valley.

Rock Art Contexts

As suggested in the introduction, rock art context is potentially informative about past rock art practices, and the importance of contextual studies in Kurnool, where much of the imagery is masked by precipitates, would seem to be particularly heightened. Several scales of contextual analysis are suggested to offer potentially informative approaches.

Examination of the relationship between images and surface topography suggested interesting correlations in some cases. For example, natural features in the rock surface have sometimes been used to accentuate the shapes of motifs. Also interesting is the relationship between rock art and rock coatings. While the coatings covering the rock art have been regarded as a taphonomic issue, it is entirely possible that rock art was deliberately located in areas where it was predicted that it would be covered up by rock varnish. Data analysed from the 2004 season

suggested that a minimum of 16 of at least 40 rock coatings cover pigment at the sites. This kind of pattern seems particularly interesting where images appear to depict water-dwelling creatures (such as the fish and possible crab depicted at JWP-13, which are partially covered by precipitates that appear to flow down the rock surface). Water symbolism may have been relevant here (as also discussed in Blinkhorn 2004), though it is also possible that the spectacular, multi-coloured flows were seen as dividing the everyday world from the supernatural or divine world beneath the rock, which gradually 'reclaimed' the images as they disappeared under progressive layers of rock varnish (for related arguments with respect to patination, see Lewis-Williams and Dowson 1990 and Ouzman 2001; Arsenault 2004 also features an interesting discussion of the potentially sacred dimensions of similar coatings at Canadian rock art sites).

Another potentially interesting area of study is the height of the rock art above the ground surface. While much of the Kurnool rock art is at or just above eye level, some of it is high up on the rock surface, raising the question of how it was produced. At JWP 9, 12 and 13, much of the rock art is found between 2 and 6 metres above the present ground surface, which appears to be higher today than in antiquity. Paintings high up on the rock face are more rare at Yaganti and Katavani Kunta valley sites, although occasionally painted upon accessible rock shelter ceilings, suggesting that at least some of the art in the different valleys was made for different purposes and/or audiences.

Planned Rock Art Studies

There are a number of areas of study that we believe would potentially yield significant results in terms of our understanding of the nature and chronology of the Kurnool rock art, and which we hope to pursue further in future seasons.

- It is hoped to analyse the animal depictions in more detail, in collaboration with the team zooarchaeologist, in order to try to more clearly identify what species may be depicted, and to understand the relationship of depictions to zooarchaeological assemblages. This might permit linkage of animal motifs with particular periods.
- Panels usually comprise anthropomorphic, animal *and* geometric figures. Of the 27 red ochre sites, all but 9 have anthropomorphs or therianthropes. Of the 18 sites that *do*, all but 4 have animals, and all but one have geometrics. If a site contains depictions of anthropomorphs, therefore, it is highly likely to contain both animals and – even more likely – geometrics. Such preliminary chronological frameworks would no doubt be improved by the application of Harris matrices, and such work is planned.
- Anthropomorphic figures are sometimes depicted in groups or flanked by other figures. When depicted in groups they are usually identifiably male, although some figures have both male and female genitalia. More work is

needed on the significance of both groups and 'processions', and also on gender relationships.

- The relationships between animals (including aquatic figures), anthropomorphic figures (both profiled and face-on with arms bent and raised) and therianthropic figures are key, and deserve further study.
- Further research is also needed on identifying the protrusions emanating from the torsos of certain anthropomorphic figures and on the relationship between the white Hindu symbols and the older red paintings.
- We hope to sample the pigment from some sites, in order to learn more about pigment composition, sources and binders, and to obtain absolute dates.

Conservation of Heritage

Many of the apparently older rock art sites in all three valleys are currently under some degree of threat from contemporary activities, including the production of rock art by present-day inhabitants and visitors. The new road that has been built in the Yaganti valley has led to increased traffic through the valley, especially by visitors to the temple at Yaganti. This will likely result in greater exposure of both archaeological and rock art remains to destructive processes. Discussion of how best to deal with this and other threats to these sites should be prioritised.

Conclusion

The rock art in the Kurnool District of Andhra Pradesh is an excellent example of the spectacular rock art sites with which the Indian subcontinent is blessed. By embarking on a long-term, systematic study of the Kurnool rock art, the Kurnool District Archaeological Project aims to generate better understanding of and appreciation for India's superb rock art record. Much work remains to be done. The threat to many rock art sites makes systematic research at Kurnool and other Indian rock art sites an urgent priority.

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References

Allchin, F. R. (1962). Neolithic Cattle-keepers of South India: A Study of the Deccan Ashmounds. Cambridge: Cambridge University Press.

Allchin, F. R. and B. Allchin (1994-95). Rock Art of North Karnataka, *Bulletin of the Deccan College Post-Graduate and Research Institute* 54-55: 313-39.

Arsenault, D. (2004). From Natural Settings to Spiritual Places in the Algonkian Sacred Landscape: An Archaeological, Ethnohistorical and Ethnographic Analysis of the Canadian Shield Rock Art Sites', in *The Figured Landscape of Rock-Art: Looking at Pictures in Place*, ed. by C. Chippindale and G. Nash, pp. 289-317. Cambridge: Cambridge University Press.

Aubert, M., S. O'Connor, M. McCulloch, G. Mortimer, A. Watchman and M. Richer-LaFlèche (2007). Uranium-series Dating Rock art in East Timor. *Journal of Archaeological Science* 34: 991-996.

Bednarik, R. G. and K. K. Chakravarty (1997). *Indian Rock Art and its Global Context*. New Delhi: Shri Jainendra Press.

Blinkhorn, J. (2004). *Journeying through Landscape and Rock Art Contexts: A Study of Recent Findings in Kurnool District, Andhra Pradesh, India*, Unpublished BA dissertation, University of Cambridge.

Boivin, N. (2004). Rock Art and Rock Music: Petroglyphs of the South Indian Neolithic, *Antiquity* 78: 38–53.

Boivin, N., A. Brumm, H. Lewis, D. Robinson and R. Korisettar (2007). Sensual, Material and Technological Understanding: Exploring Prehistoric Soundscapes in South India, *Journal of the Royal Anthropological Institute (N.S.)* 13, 267-294.

Cammiade, L. A. (1927). Prehistoric Man in India and the Kurnool Bone Caves: A Neglected Field of Inquiry, *Man in India* 7(1), 1-12.

Chakraverty, S. (2003). *Rock Art Studies in India: A Historical Perspective,* Kolkata, The Asiatic Society.

Chaloupka, G. (1993). *Journey in time,* Sydney, Reed.

Chippindale, C. and G. Nash (Eds.) (2004). *The Figured Landscapes of Rock-art: Looking at Pictures in Place*. Cambridge: Cambridge University Press.

Chippindale, C. and P. S. C. Taçon (1998). The Many Ways of Dating Arnhem Land Rock-art, North Australia, In *The Archaeology of Rock-Art,* ed. by C. Chippindale and P.S.C. Taçon, pp. 90-111, Cambridge, Cambridge University Press.

Chippindale, C. and P. S. C. Taçon eds. (1998). *The Archaeology of Rock-Art.* Cambridge, Cambridge University Press.

Chippindale, C. and P. S. C. Taçon (1993). Two Old Painted Panels from Kakadu: Variation and Sequence in Arnhem Land Rock Art, in *Time and Space: Dating and Spatial Considerations*

in Rock Art Research, ed. by J. Steinbring, A. Watchman, P. Faulstich and P.S.C. Taçon, pp 32-56. Melbourne: Occasional AURA Publication 8.

Clogg, P., M. Díaz-Andreu, and B. Larkman (2000). Digital Image Processing and the Recording of Rock Art, *Journal of Archaeological Science* 27: 837-843.

David, B., J. Brayer, I. J. McNiven, and A. Watchman (2001). Why Digital Enhancement of Rock Paintings Works: Rescaling and Saturating Colours, *Antiquity* 75: 781-791.

Dorn, R. I. (1995). *Cation Ratio and Radiocarbon Ages for Wyoming Petroglyphs*. Report Submitted to the Bureau of Land Management District Office, Worland WY.

Dorn, R. I. (1997). Constraining the Age of the Coa Valley (Portugal) Engravings with Radiocarbon Dating, *Antiquity* 71(271): 105-115.

Dorn, R. I. (1998). *Rock Coatings.* Amsterdam, Elsevier.

Dorn, R. I. (2001). Chronometric Techniques: Engravings, in *Handbook of Rock Art Research* (Whitley, D. Ed.), *pp* 167-189, Walnut Creek, CA, Altamira Press.

Foote, R. B. (1884). Rough Notes on Billa Surgum and other Caves in the Kurnool District, *Records of the Geological Society of India* 27:27-34.

Francis, J. E., L. L. Loendorf and R. I. Dorn (1993). AMS Radiocarbon and Cation-ratio Dating of Rock Art in the Bighorn Basin of Wyoming and Montana, American *Antiquity* 58(4): 711-737.

Gordon, D. H. and F. R. Allchin (1955). Rock Paintings and Engravings in Raichur, Hyderabad, *Man* 55:97-99.

Gupta, S., S. S. Rai, K. S. Prakasam, S. Srinagesh, B. K. Bansal, R. K. Chadha, K. Priestley, and V. K. Gaur (2003). The Nature of the Crust in Southern India: Implications for Precambrian Crustal Evolution, *Geophysical Research Letters* 30: 141-149.

Jain, J. (1984). *Painted Myths of Creation: Art and Ritual of an Indian Tribe*, New Delhi, Lalit Kala Akademi.

Keyser, J. D. (1987). A Graphic Example of Petroglyph Superimpositioning in the North Cave Hills, *Archaeology in Montana* 28(2): 44-56.

Keyser, J. D. and M. A. Klassen (2001). *Plains Indian Rock Art*, Seattle, University of Washington Press.

Layton, R. (1992). *Australian Rock Art: A New Synthesis*, Cambridge, Cambridge University Press.

Lewis-Williams, J. D. (2002). *The Mind in the Cave: Consciousness and the Origins of Art*, London, Thames & Hudson.

Lewis-Williams, J. D. (1980). Ethnography and Iconography: Aspects of Southern San thought and Art, *Man (N.S.)* 15: 467-482.

Lewis-Williams, J. D. and T. A. Dowson (1990). Through the Veil: San Rock Paintings and the Rock Face, *South African Archaeological Bulletin* 45: 5-16.

Loendorf, L. L. (1990). A Dated Rock Art Panel of Shield-bearing Warriors in South Central Montana, *Plains Anthropologist* 35(127): 45-54.

Loendorf, L., L. Olsen, S. Conner and J. C. Dean (1998). *A Manual for Rock Art Documentation* 2nd ed. N.P.

Loubser, J. H. N. (1996). The use of Harris Diagrams in Recording, Conserving, and Interpreting Rock Paintings, *International Newsletter on Rock Art* 18:14-21.

Magar, V. and V. Davila (2004). Considerations on the Dating of Rock Art from the Sierra de San Francisco, Baja California, Mexico, *Rock Art Research* 21:129-136.

Maggs, T.M.O'C. (1971). Some Observations on the Size of Human Groups, In *Rock Paintings of Southern Africa,* ed. By M. Schoonraad, pp. 49-53. Johannesburg: South African Journal of Science, Special Publication 2.

Maggs, T.M.O'C. (1967). A Quantitative Analysis of the Rock Art from a Sample Area in the Western Cape, *South African Journal of Science* 63:100-104.

Moorwood, M. J. and D. R. Hobbs (eds.) (1992). *Rock Art and Ethnography*. Occasional AURA Publication No. 5. Australian Rock Art Research Association, Melbourne.

Murty, M. L. K. and K. T. Reddy (1975). The Significance of Lithic Finds in the Cave Areas of Kurnool, India, *Asian Perspectives* 18: 214-26.

Neumayer, E. (1993). *Lines on Stone: The Prehistoric Rock Art of India,* Delhi, Manohar.

Ouzman, S. (2001). Seeing is Deceiving: Rock Art and the Non-visual, *World Archaeology* 33(2): 237-56.

Paddayya, K. (1976). Cup-marks in the Shorapur Doab (South India), *Man* (N.S.) 11: 35-8.

Pandey, S. K. (1993). *Indian Rock Art.* Delhi: Aryan Books International.

Pager, H. (1971). *Ndedema*. Graz: Akademische Druck.

Petraglia, M., R. Korisettar, N. Boivin, C. Clarkson, K. Cunningham, P. Ditchfield, S. Jones, J. Koshy, M. Mirazon Lahr, C. Oppenheimer, D. Pyle, R. Roberts, J-L. Schwenninger, L. Arnold and K. White (2007). Middle Paleolithic Assemblages from the Indian Subcontinent before and after the Toba super-eruption, *Science* 317: 114-116.

Petraglia, M., R. Korisettar, M. Kasturi Bai, N. Boivin, C. Clarkson, K. Cunningham, P. Ditchfield, D. Fuller, J. Hampson, S. Jones, J. Koshy, P. Miracle, C. Oppenheimer and K. White (forthcoming a). Cave and rockshelter records, the Toba super-eruption and forager-farmer interactions in the Kurnool District, India, Submitted to the *Journal of Eurasian Prehistory*.

Petraglia, M., R. Korisettar, C. Clarkson, H. James, N. Boivin, P. Ditchfield, M. Haslam, J. Koshy, P. Miracle, M. Mirazon Lahr, R. Roberts and L. Arnold (forthcoming b). Earliest microlithic assemblages and ornaments in the Indian subcontinent, Submitted to *Proceedings of the National Academy of Sciences.*

Pettitt, Paul & A. Pike. (2007). Dating European Palaeolithic cave art: Progress, Prospects, Problems. *Journal of Archaeological Method and Theory* 14(1): 27-47.

Rowe, M. W. (2001). Physical and Chemical Analysis, In *Handbook of Rock Art Research,* ed. by D. Whitley, pp. 190-220. Walnut Creek, CA: Altamira Press.

Schaafsma, P. (1980). *Rock Art of the Southwest*. Albuquerque, NM: University of New Mexico Press.

Solomon, A. (1998). Ethnography and Method in Southern African Rock-art Research, In *The Archaeology of Rock-Art,* ed. by C. Chippindale and P.S.C. Taçon, pp. 268-284, Cambridge, Cambridge University Press.

Swartz, B. K. (2006). Minimum Standards for Recording Rock Art, revised, *Rock Art Research* 23: 264-265.

Turpin, S. A. (2001). Archaic North America, in *Handbook of Rock Art Research,* ed. by D. Whitley, pp. 361-413, Walnut Creek, CA, Altamira Press.

Vinnicombe, P. V. (1976). *People of the eland: Rock paintings of the Drakensberg Bushmen as a reflection of their life and thought*. Pietermaritzburg: University of Natal Press.

Whitley, D. S. (ed.) (2001). *Handbook of Rock Art Research*. Walnut Creek, CA: Altamira Press.

Zaehner, R. C. (1962). *Hinduism*. Oxford: Oxford University Press.