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ADVANCES IN ROCK ART RESEARCH FROM THE KIMBERLEY, NORTH-WEST AUSTRALIA

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This session aims to profile a suite of current and past Australian Research Council and other research projects from across the Kimberley over the last decade

a) Regionalism in Kimberley rock art

The Kimberley has been characterized as a style province for over 40 years even though it shares many style elements with Arnhem Land. There are also significant variations within the Kimberley repertoire at the regional and sub-regional level. Clearly different scales of spatial resolution will be fruitful in addressing both a) shared style elements over larger areas, and b) understanding variability at the (sub)regional level as a product of socio-linguistic, demographic and temporal factors. Issues to be addressed include the identity of the individual and group; the transmission of new traditions through time and space; art in mediating demographic, environmental and social dynamics; and the relationship of changes in graphic vocabulary and regional technological organization as deduced from habitation records.

b) Advances in dating rock art

Multi-institutional projects are developing novel methods and techniques to date the stylistically distinct art periods from the Kimberley. These include U-series dating of mineral crusts (beyond oxalates), cosmogenic radionuclide dating of scars and roof fall events, and a combination AMS and OSL dating of mud-wasp nests and plasma oxidation pre-treatment for AMS dating. A suite of new absolute dates are being generated for the Kimberley which will extend the known age of the early figurative traditions and provide far greater resolution for styles initiated at the Pleistocene-Holocene transition and through the Holocene. These advances will be profiled likely with discussion of new comparative dating frameworks emerging from Arnhem Land.

c) Art within archaeological contexts

The excavation of occupation sites associated with art production has increased in northern Australia, adopting an archaeo-morphology approach as advocated from work in the Aurignacian-aged cave systems of France (such as Grotte Chauvet) and sites like Nwarla Gabarnmang in the Northern Territory. The approach can recover plaques with pigment art fallen from rock shelter walls and

re-fitted using laser techniques. Micro-fragments of ochre as well as crayons can be recovered as well as paint splashes and other forensic traces. In addition, other types of symbolic behaviours (such as ornament production and ochre application on human bodies, wooden artefacts and stone tools) can also be deduced from recovered assemblages. Recent research projects adopting these approaches will be profiled.

d) Contact rock art

The North-West of Australia has a long history of contact spanning the era 1606 until the 20th century and possibly earlier from pre-Macassan voyagers from SE Asia. These encounters and sometimes economic and social relations are captured in contact art ranging from various sailing vessels from SE Asia, Europe and the Americas through to pastoral themes such as the buggy, horse and rifle. The contact art of the Kimberley speaks to Indigenous resilience in the face of European colonization and the new economies which emerged from pearling, pastoralism, mining and missionary expansion. Art illustrating social relations over large geographic areas will be profiled here from northern Australia.

e) Advances in theory

Both existing and new theoretical approaches deployed to understand Kimberley rock art will be profiled in this strand with a focus on their utility in describing changes in wider occupation patterns through space and time. They will also be situated within recent forums on rock art theory such as the 2016 ACRA 3 Conference in Alta, Norway and the 2017 Wenner-Gren Foundation Conference “Innovating Rock Art Research Theory and Practice Workshop” in Salzburg. Approaches will likely include: formal methods, style aesthetics and context; information exchange theory; engendered and subaltern approaches; group boundary formation models; relational ontologies; phenomenological approaches, personhood and identity; and PCA analysis of style and language congruence.

Inputs of the analysis of colouring and coloured matters into the integrated study of the rock art site of Nawarla Gabarnmang (Arnhem Land, North Territory - Australia)

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Keywords: Rock art; Colouring/coloured matters; Physico-chemical analysis; Integrated study; Nawarla Gabarnmang

In the rock art site of Nawarla Gabarnmang – radiocarbon-dated from $\geq 48,000$ cal BP to the early twentieth century – in the Jawoyn country (Arnhem Land – Australia), excavations have revealed a large number of artifacts. The ceilings of the site contain well over 1400 still-visible paintings in multiple, superimposed layers. This art raises questions: is it an expression of the first humans arrived in Australia 65,000 years ago, or the evidence of recent occupation periods? How does this art inform us about the cultural practices? To get a better insight into the artistic and cultural practices, the temporality as well as the uses of Nawarla Gabarnmang since the first prehistoric activities until the recent periods, the colouring and coloured matters excavated under the painted panels on the ceilings are studied. Through an integrated approach, the analysis allows to rebuild the steps of the “chaîne opératoire” leading to the production of paintings. Then, cross-referenced with archaeological, archaeomorphological and rock art studies, the results provided by the integrated study of the artifacts bring information as well on technical and behavioral evolutions, as on the cultural involvement of this site, not only in its spatial but also in its temporal dimensions.

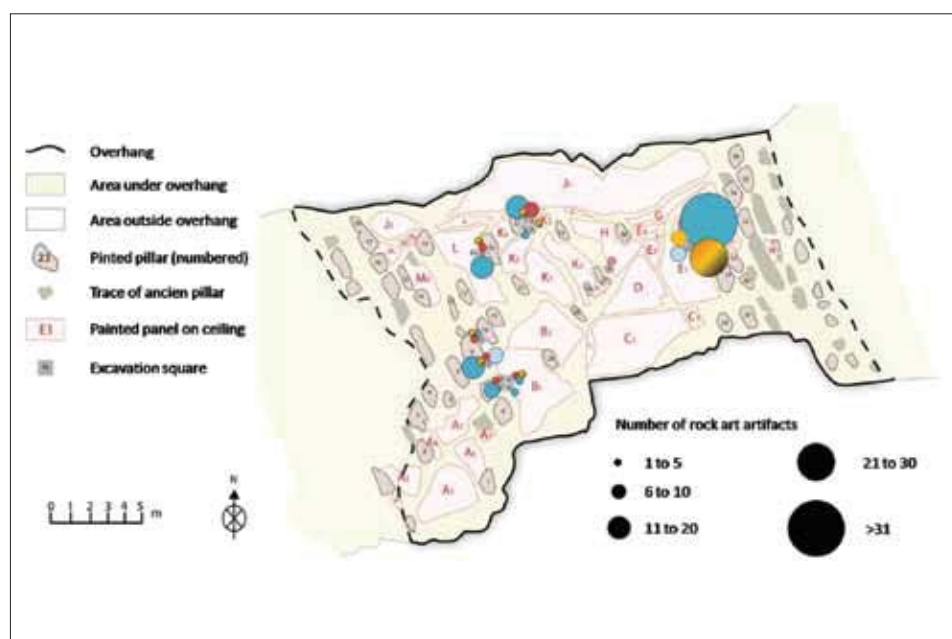
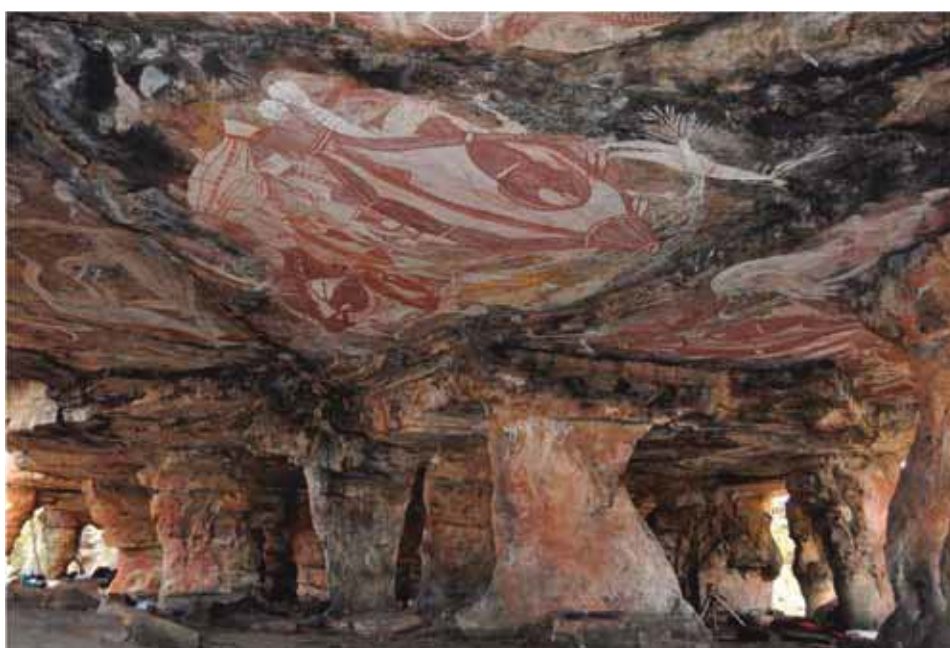


Fig.1 - Photograph of the interior of the rock art site of Nawarla Gabarnmang (© J.-J. Delannoy)

Fig.2 - Distributions of the rock art artifacts at Nawarla Gabarnmang (© G. Castets) (grindstones; ‘crayons’; colouring matters; white clayey matters; drops of paint; coloured rock fragment)

Rock-art shelter dating using cosmogenic Be-10 and Al-26 in the Kimberley region, Australia

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Keywords: aboriginal rock art, rock art dating, cosmogenic nuclides

The Kimberley region, possesses an extensive collection of aboriginal rock art that potentially dates to more than 40,000 years ago. However, dating of such art using conventional techniques remains problematic. Here, we develop a new approach which makes use of the difference in production rates of in-situ ^{10}Be and ^{26}Al between intact rock walls and exposed surfaces of detached slabs from rock-art shelters to constrain the age of Aboriginal rock-art. In the prevailing sandstone lithology of the Kimberley region, open cave-like rock shelters with cantilevered overhangs evolve by the collapse of unstable blocks weakened typically along joint-lines and fractures. On release, those slabs which extend outside the rock face perimeter will experience a higher production rate of cosmogenic isotopes than the adjacent rock which remains intact within the shelter. The dating of these freshly exposed slabs can help reconstruct rock-shelter formation and provide relative ages for the rock art within the shelter. Seven rock-art sites have been dated and results range from 9.8 to 230 kyr. A large number of similar sites in the region have been mapped and are potential candidates for this new approach which can constrain the controversial relative chronology of the various aboriginal rock art styles.



Plants and pictures: geophyte exploration and Kimberley rock art

This paper discusses the exploitation of geophytes (tubers of perennial plants used for starch storage) as Indigenous food in the Kimberley region, Western Australia and their portrayal in rock art. The social and economic significance, as well as the seasonal exploitation of geophytes and the antiquity of Aboriginal settlement in the Kimberley region is explored. Our investigation focuses on the study of these tubers in rock art images, together with the ancient starch preservation in associated archaeological deposits. The use of modern reference botanical collections and the archaeological sampling of ancient grinding stones beneath the art panels and elsewhere is described. By identifying the plants from which the starch residues are derived and determining their age, we may indirectly date the antiquity of the plant motifs in the rock art. Many of the plant species represented in the motifs were commonly utilised in Aboriginal subsistence practices in northern Australia in the early ethnography, especially, but not restricted to, long yam, cheeky yam, three species of waterlily and bush potato. Preliminary results suggest both seasonal geophytes exploitation and their concomitant portrayal in the Kimberley rock art.

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Keywords: rock art, plant
motifs, starch grain analysis,
nutrition, Kimberley

How well-defined is regionalism in Kimberley rock art?

The Kimberley region of Western Australia has many thousands of rock art sites scattered throughout a vast rugged wilderness that is larger than Italy. People have lived in the Kimberley for more than 50 000 years, and although still poorly constrained, rock art probably dates from at least 40 000 years ago. At the time of European settlement 150 years ago there were thirty distinct Aboriginal languages in the Kimberley, so clear regional variations in rock art styles might be expected to follow traditional language boundaries. There is a well-established relative chronology of major rock art styles across the Kimberley, and the limited spatial distribution data for some of the earlier styles (>20 000 years old) clearly indicates broadly transgressive relationships with modern language boundaries. The more-recent Wanjina painting tradition (<5000 years old) has a narrower distribution, largely confined to three main language group areas. This paper presents stylistic distribution data from over 1000 art sites across the region.

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Keywords: Gwions, Wanjinias, relative chronology, Kimberley, rock art

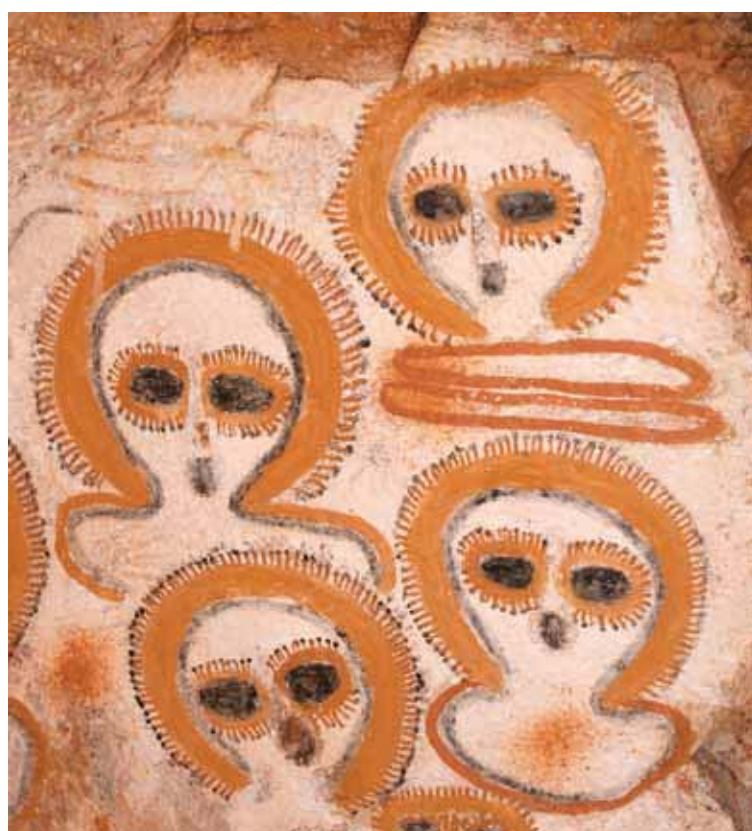


Fig.1 - Yowna Gwion Roe River
Kimberley.

Fig.2 - Wanjinias Kimberley Australia.

Estimating the age of Australia's Kimberley region rock art using radiocarbon dating of mud wasp nests

One of the techniques being developed in the Australian Research Council Linkage project "Dating the Aboriginal rock art of the Kimberley region, West Australia" uses radiocarbon dating of mud wasp nests. Mud wasp nests in this region of Australia are known to survive for as long as 30,000 years. It is their ability to survive for many millennia, and their ubiquity in shelters where rock art is found, that make them a target for investigation. While it has been possible to collect many mud wasp nests that have a clear and direct association to rock art motifs, the small sample size and very low carbon concentration pose significant challenges. Uncertainties that can detract from the application of this technique to rock art dating are those of the inbuilt age of carbon incorporated into the nest at the time of construction, and potential contamination of nests, post construction, with unknown carbon sources. Current research is focussed on methods to reduce these uncertainties as well as methods to extract carbon suitable for dating.

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Keywords: radiocarbon dating, mud wasps, pretreatment, Kimberley



Mineral accretion systems associated with rock art in rock shelters of the Kimberley region, NW Australia

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Keywords: rock art, Kimberley, Australia, mineral accretions, dating

Mineral coatings, fringes, glazes and skins forming on the surfaces of sandstone rock shelters in Western Australia's Kimberley region offer the potential to provide both datable materials to bracket ages of rock art motifs, with which they are often spatially associated. As part of a major rock art dating project, we have combined field observations and laboratory characterisation techniques to identify a series of largely discrete mineral deposition systems operating on rock surfaces in the region. These mineralising systems have differing sources, transport mechanisms and depositional styles, and include polychrome lateral fringes, dispersed wall coatings, layered shelf deposits, floor glazes and silica skins. Mineralogies are dominated by combinations of sulphates, phosphates, oxalates, and, in some cases, silica. Carbonates are almost entirely absent. The Mg-phosphates are uranium-bearing and prime targets for U-series dating, whereas the Ca-oxalates are suitable for radiocarbon dating. Coherent internal stratigraphies at mm scale within layered polychrome fringes and shelf deposits, are essential for the reliable application of U-series techniques, and for cross-calibration between methods. This study has provided a rigorous basis for establishing targeted sampling and analysis strategies essential for replicable rock art dating, and also has potential for informing future rock art conservation strategies.



Fig.1 - Lateral polychrome fringes, Kimberley rock shelter

Fig.2 - Grooved floor glaze, Drysdale River area, Kimberley, NW Australia

Dating mineral accretions at rock art sites in the Kimberley, North West Australia

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Keywords: Rock Art, Dating, U-Series, Radiocarbon, Accretions, Mineral

Mineral coatings forming at the interface between the atmosphere and host rock on the surfaces of sandstone rock shelters in Australia's Kimberley region, offer the potential to provide datable materials to bracket ages of rock art motifs with which they are often spatially associated. An increased understanding of complex processes behind the formation and preservation potential of these mineral deposition systems has been achieved by combining detailed field observations with multiple mineralogical and geochemical characterisation techniques. In turn, the different characteristics of each deposition system have been used to assess their suitability for the application of radiometric dating methods. Coherent internal stratigraphies are identified in several of the depositional systems, essential for the reliable application of uranium-series dating techniques, whilst floor glaze mineralogy, identified as dominated by carbon-bearing calcium oxalate minerals, provides radiocarbon dating opportunities. Trace element pre-screening maps are used to identify areas of high uranium and layers likely to contain oxalate within the accretion stratigraphies, allowing suitable material to be identified and targeted for the application of different dating techniques. This study provides a rigorous basis for establishing targeted sampling and analysis strategies essential for reliable rock art dating as well as having implications for rock art conservation.

The antiquity of north Australian rock art? Reassessing the chronologies of western Arnhem Land and the Kimberley within an archaeological and environmental context

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Keywords: western Arnhem Land, Kimberley, radiocarbon dating, chronology, Pleistocene

Recently published radiocarbon age determinations for the figurative anthropomorphic dominated rock art style known as the 'Northern Running Figures' have changed the previously proposed age estimations for 'Early' and 'Middle Period' rock art styles in the western Arnhem Land rock art sequence (Jones 2017). A revised chronology for 'Early' to 'Middle Period' western Arnhem Land rock art is presented with the assigned age estimations for different stylistic periods evaluated against newly reported archaeological evidence in conjunction with environmental data. The implications of the newly proposed western Arnhem Land chronology for the current Kimberley rock art chronology (Veth et al 2017), and north Australian figurative rock art more broadly will then be discussed.

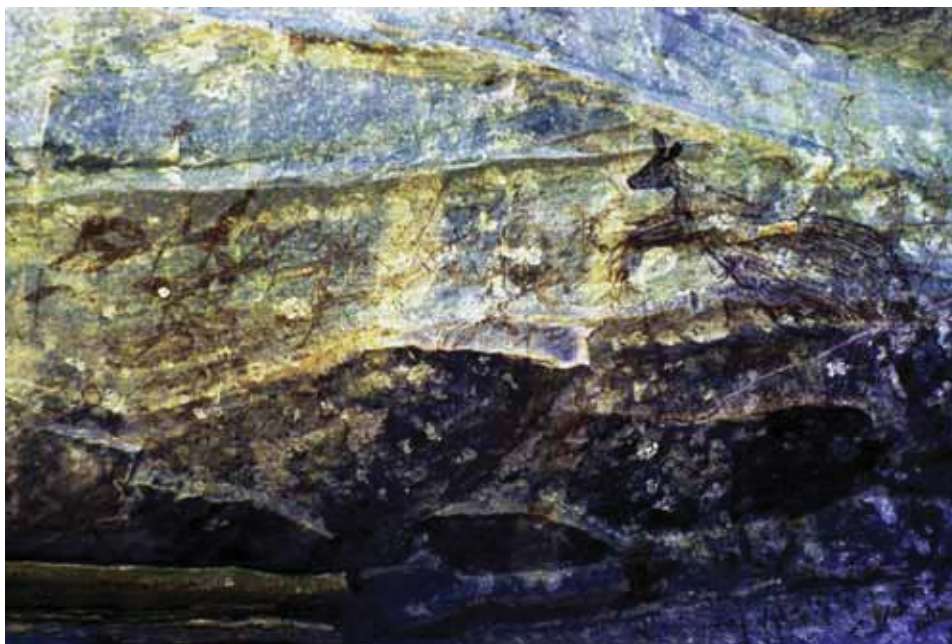


Fig.1 - Western Arnhem Land, Northern Territory. (Author: George Chaloupka / The Australian National University)

Fig.2 - King George River, North-East Kimberley. (Author: Sven Ouzman, Kimberley Visions, Balangarra Aboriginal Corporation / Kimberley Land Council)

Oxalate minerals for rock art dating: study continues

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Keywords: Rock art dating,
experimental archaeology,
radiocarbon, AMS, Calcium
oxalates

Development of AMS allowed targeting oxalates – whewellite and weddellite as a dating material for rock art. Further studies have confirmed that carbon in oxalates is not derived from the substrate on which they grow but most probably originate from microbiotic activity on rock surfaces utilising atmospheric source. The other rock surface objects which potentially carry oxalates are the remnants of mud dauber nests. Oxalates could form post-construction from bacterial activity in the nest stump. Another recognised source of oxalates associated with rock art is the use of plant sap as a binder for mineral pigments. In all instances oxalates on the rock surface exist in a mixture with other materials which may contain carbon bearing contaminants. Hence the study of a bulk sample averages radiocarbon of all carbon compounds with unknown source and relationship with the rock art. Therefore, chemical pre-treatment methods were developed to isolate a specific compound, in our case calcium oxalate. We present data of exploiting such compound-specific dating approach on mineral skins, pigments and other surface deposits from northern Australian and African rock art sites. The presence of whewellite was investigated with XRD, SEM and FTIR methods. Selectiveness of the method and further studies are discussed.



Two Women and Bush Honey

The narrative of two women and their experience gathering bush honey is a significant story that crosses the landscape of Wanjina Wunggurr Wilinggin people. One of the places the women visited is Nyornja, at the eastern end of Jilariba (currently known as the Munja Track) in the centre of the Kimberley region of northwestern Australia. As part of a community history project initiated by the Wilinggin Aboriginal Corporation to record stories about archaeological sites along Jilariba, Nyornja and five other sites were visited in 2017. Guided by Traditional Owner Mr Dutchie and his family, narratives about the two women were recorded at the sites. Some of these sites were included in a 1980s repainting program that resulted in several of the images being entirely obscured by new images painted on white background - all in acrylic paint. Despite this, the narratives and significance of the sites to the sites have remained unchanged. Nevertheless, the lack of visibility the motifs supporting this important story, could well its disappearance in the stories of future generations. Here we discuss the role of the narrative, people's response to the new paintings and their plans for reparation. Implications for interpreting rock art are also considered.

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Keywords: Aboriginal narratives, visitor impacts, central Kimberley, overpainting rock art



Being and Otherness: new perspectives on the study of Personhood and Identity in NE Kimberley (Australia) rock art repertoire

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Keywords: identity,
personhood, embodiment,
Kimberley rock art,
Iconographic analysis

Rock art research has increasingly focused on the study of social identity, with efforts concentrated on elucidating past ethnicity and identity signalling. This paper is concerned with the exploration of different approaches that link theoretical advances in identity studies with the representation of anthropomorphs in the rock art repertoire from the NE Kimberley, Australia. The current research explores the embedded character of rock art with the surrounding landscape and expands on interpretations of social identity signalling by considering human experience as relational and embodied. The analysis will involve an iconographic description of human figures and their associated components (such as accoutrements, weapons, and clothing items) belonging to Gwion Gwion and Static Polychrome stylistic phases, with the aim of exploring (i) how the human body was constructed and represented in these two styles and (ii) if categories of personhood were grounded on a previous understanding of the human body. The paper will contribute to more nuanced understandings of how social identity was demarcated and inscribed in social bodies.



Fig.1 - Gwion composition from King George River. (Kimberley Visions Project/Balanggarra Aboriginal Corporation)

Fig.2 - Group of Static Polychrome Figures, Drysdale River. (Kimberley Visions Project/Balanggarra Aboriginal Corporation)

Performance in the recent rock art of the southern Kimberley

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The Kimberley region of north west Australia is well known for its extensive Aboriginal rock art, particularly the iconic Gwion Gwion and Wanjina figures suggested to date from the terminal Pleistocene and late Holocene, respectively. However, most research so far on this art has been concerned with its antiquity, the motifs represented, their song lines and the sequences in which they have been made. Our research indicates that Kimberley rock art in the more recent past is tremendously diverse and that this diversity is largely unrecorded. The recent art corpus includes scratchwork, pecking, engraving, painting and drawing. These styles occur in combination, and contrasting techniques and are used to augment or mark existing images, indicating that the recent art is associated with a complex performative narrative. The performative aspect of rock art is not often discussed in the archaeological literature. In the anthropological literature art performance is often described in the context of ceremonies where decorative accoutrements such as elaborate headdresses, play an important role. In this paper we record and discuss the performative elements of a new body of Kimberley art.

Keywords: performance, Kimberley rock art

River and Coast. Regionality in Kimberley Rock Art

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Keywords: Kimberley, Western
Australia, rock art, regionality,
Bradshaw (Gwion-Gwion / Giri-
Giri) Ar

Over the past thirty years an elaborate stylistic chronology has been created for the Kimberley art sequence. What has not been addressed is regionality, the geographical and temporal distribution of stylistic periods within the body of art. I will discuss this in relation to two research areas, the northern Drysdale River and the north Kimberley coast, west of the King George River. The art sequence covers a time of extreme climate change, from the aridity of the Last Glacial Maximum (LGM) to the end of the Ice Age, and the ensuing world-wide sea level rise and changing weather patterns. Whilst the river was no doubt affected by changes in climate which impacted on water flow, tens of thousands of square kilometres of low lying coastal land was first exposed, and then inundated by changing sea level. This flux may be evident through the distribution of changing art styles with time, perhaps more pronounced on what is now the coast, than inland rivers.

Some insights into the Gwion - Straight Parts Figure periods

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Keywords: East Kimberley, rock art, Western Australia, Gwion, stylistic analysis

Fig.1 - Kimberley CP Gwion Figures 2014. (photo Joc Schmiechen)
Fig.2 - Kimberley DRNP Bi chrome Rock Transition Straight Parts Gwion 2009. (photo Joc Schmiechen)

In the Kimberley Rock art chronologies developed by Welch 1993 and Walsh 1994, the Straight Parts Figures (previously called Clothes Peg) period is placed between the 'Classic' Tassel and Bent Knee/Sash and Painted Hand Periods. The Straight Parts period includes many different style variations and associated motifs and is one of the most widely spread in the Kimberley art body. The stylistic evolution and changes from the earlier Tassel - Bent Knee/Sash Gwion figures, which has drawn considerable attention, raises numerous interesting questions. There appears a clear link with the earlier period figures in accoutrements and some of the signature indicators that point towards a more contemporaneous association, rather than a sudden major cultural change. There are numerous transition elements as well as possible interesting links with the Elegant Action Figures. From the earliest observed rigid 'straight part' or 'static polychrome depictions a much more diverse range of presentation and interaction has been noted from extensive recording and observation of this style period in the Drysdale River Region and more recently other major art areas in the Kimberley. This paper will highlight key observations and thoughts to illuminate some aspects of this very complex period in the Kimberley art body.



The 'Kimberley-Arnhem Land rock-art Province': fact or fiction?

Although geographically distant, the rock art of the Kimberley and western Arnhem Land in Australia has often been identified in the literature as sharing some stylistic similarities. This is particularly true for the earlier periods (the Gwion Period of the northwest Kimberley and the Dynamic Figures of western Arnhem Land), which primarily depict anthropomorphic figures engaged in activities with similar material culture assemblages. Previous researchers have considered the stylistic and material culture similarities so striking that they argued for a cultural connection between the two regions, known as the 'Kimberley-Arnhem Land rock-art Province'. Using a robust approach from targeted case study areas in both regions, this paper seeks to quantify the similarities and/or differences between depictions of material culture items within the Gwion Period and the Dynamic Figure rock art. We assess the feasibility of the 'Kimberley-Arnhem Land rock-art Province' hypothesis based on our new findings and consider the implications for our understanding of early human occupation of these regions and interactions across the vast Australian continent.

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Keywords: Kimberley, Arnhem Land, material culture, Gwion Period, Dynamic Figures

Signifying Animals and the Archaeozoology of Bidwern (rock art), Arnhem Land, Australia

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Keywords: Australia, Arnhem
Land, fauna, archaeozoology,
ecology

Analysing animals depicted in rock art can provide an important approach to understanding human, animal, and ecological relationships that are encoded within the abundant Indigenous rock art of western Arnhem Land, Australia. Without a late Pleistocene paleontological faunal assemblage in northern Australia, rock art provides a potential record of the interaction between people and fauna beyond the early Holocene. For palaeontologists, the discovery of any previously unreported species in northern Australia can significantly shift the Australian natural history record owing to the current fragmentary evidence and contested timings for fauna extinctions. This paper also reports on the application of archaeozoological identification and analytical methods applied to an Arnhem Land rock art assemblage. This research into Indigenous human-animal relationships and environmental change are also applicable to global rock art contexts. The lack of any overarching synthetic framework to identify fauna in rock art has meant interpretations are open to question, often debated, and sometimes inconclusive. Accurate identification of animals in rock art will enhance our understanding of human-animal relationships past and present especially during and after the Pleistocene-Holocene transition when major environmental change occurred across northern Australia.



Fig. 1 - Arnhem Land, X-Ray Barramundi
Painting. (photo Daryl Wesley)

Fig. 2 - Arnhem Land, Macropod. (photo
Daryl Wesley)

Tackling gender in Kimberley rock art

This contribution discusses the methodological and theoretical challenges underlying the ongoing study of rock art representation of gender in two topographically distinct catchments researched by the Kimberley Visions team in 2017: the Drysdale River and the King George River (KGR). In particular, I will explore the differences between the representations of human figures in different styles such as the Irregular Infill Animal Period art, the Gwion imagery and the most recent Wanjina period as an attempt to elucidate ways to understand the fluid construction of social subjects through time. I will also report on a series of sites in the KGR where human bodies with exaggerated body parts might be providing insights into a complex social dynamism due to environmental change and contact and interaction with cognate regions such as the Central Kimberley and the Victoria River District in the Northern Territory. The analytical categories that will be employed in this formal approach to tackle gender representations will be enriched by the initial information shared by some Traditional Owners especially senior female elders.

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Keywords: gender, rock art, interaction, human figures, change through time