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METHODS, MORELLI, ROCK ART, ART HISTORY: THE MORELLIAN METHOD AND ITS POTENTIAL IN ROCK ART RESEARCH

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Abstract. In the late nineteenth century, art historian Giovanni Morelli attempted to formalise a logical approach in the attribution of Renaissance paintings. This ‘method’ was based on the identification of subtle cues unique to particular artists. While having many problems in reality, in theory the method is applicable to Aboriginal rock art and other artistic modes. The identification of individual artists can highlight their preference for particular subjects and places they have visited in their landscape. The method also has value when used in conjunction with superimpositioning and other forensic techniques in establishing artistic layers and their ages. This paper presents an overview of the method, its application, limitations and potential in rock art studies.

Introduction

Methods for studying spatial and temporal patterns in rock art have developed significantly since the first recording by Breuil and others over a hundred years ago (Breuil 1952; Bahn and Vertut 1988). In particular, the use of analytical dating techniques, such as radiocarbon, uranium series, optically stimulated luminescence and portable x-ray fluorescence, have begun to provide a firm chronology for some of the art, both confirming and dispelling some previously held assumptions (Valladas et al. 1992; Lorblanchet 1993; Valladas and

Clottes 2002; Watchman 2004; Aubert 2012; David et al. 2013; Wesley et al. 2014). The Harris Matrix has added an invaluable objective technique in the sorting of superimposed motifs and the definition of artistic layers (Harris 1989; Chippindale and Taçon 1993; Harris and Gunn 2017). The Harris Matrix is a diagrammatic way of representing how motifs are superimposed and, in conjunction with other archaeological techniques (such as radiocarbon dating of pigments), can be used to determine layers of contemporaneous images (stratigraphic units; Fig. 1).

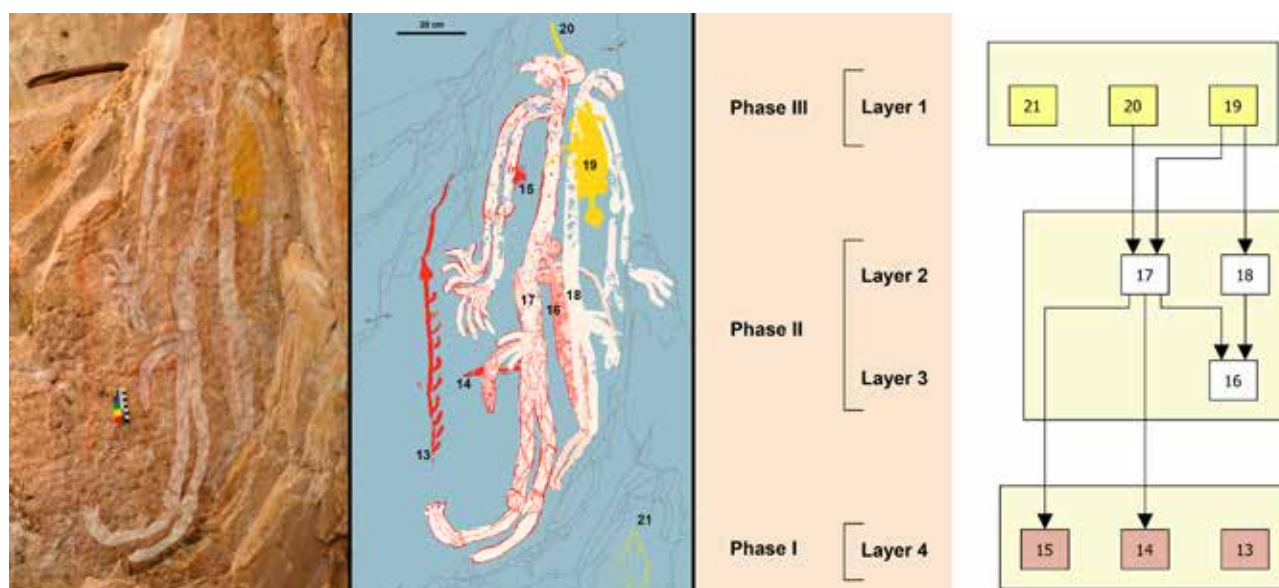


Figure 1. Photograph, photo-tracing, and interpreted Harris Matrix of motifs on a rock art panel.

Unlike archaeological sites or geological layering, rock art sequences cannot be inverted through disturbance: paintings may deteriorate with time but a later motif can never be transposed to precede an earlier motif. Similarly, rock art has no encompassing deposit that binds two or more motifs into a single layer. The problem for rock art then is the correlation of different motifs of a panel, or on different panels, into meaningful layers. For many researchers, the elusive notion of style is most commonly, if often incorrectly, used to create such a relationship. However, the identification of a range of artistic attributes, which may or may not include the attributes of a particular style, holds a greater potential for accurate association of contemporaneous motifs. The Morellian method offers a means to not only associate different motifs that are roughly contemporaneous, but also to identify the work of individual rock art artists at different sites across a personal artistic landscape (cf. Haskovec and Sullivan 1989). This paper, then, presents an overview of the Morellian method, its limitations and potential in rock art research, particularly when combined with the Harris Matrix and other forensic techniques.

The Morellian method

Giovanni Morelli (1816–1891) was an art historian, critic and connoisseur who, in the 1870s, developed a technique to critically evaluate artworks on the basis of the examination of minute aspects of a work's execution to verify or refute its attribution to a particular artist (Ginzburg 1983; Fernie 1995). He recognised that, within particular cultural systems, individual artists had particular traits, idiosyncrasies or stylistic details, which they repeated throughout their lives (mostly these were traits or details of which they were scarcely conscious), and which are highly unlikely to be copied or developed by another artist. Examples include the manner in which brushstrokes are applied or the shorthand rendering of minor details, such as the shape of ears, toes or hands in background figures (Fig. 2). These unconscious 'formulas' (habits) were consistent and were repeated throughout the artist's lifetime, regard-

less of any stylistic evolution in their work. One of the keys to the successful application of this method was having a detailed knowledge of the artist's repertoire as well as the standard conventions of the time so that individual style could be determined and standardised features could be disregarded.

Similar ideas, comparing the individuality of a painter's work to an individual's handwriting and thereby highlighting forgeries, had been proposed by Giulio Mancini in Rome in the seventeenth century; however, his writings were not published until the mid-twentieth century (Ginzburg 1983). Morelli, in contrast, published his method, under the pseudonym of Ivan Lermolieff, in a series of articles in *Zeitschrift für bildende Kunst* 1874–76. Six years later, these ideas were brought together in a large and unusual critique of paintings displayed within many European galleries (Morelli 1892). Morelli's studies challenged the findings of his art-historical contemporaries who were using more orthodox theoretical and academic studies, such as the treatment of light or overall composition in a work, or the analysis of the work's supporting documentation. The many reattributions he ascribed to art gallery paintings at the time met with a large degree of success and his method became foundational to the field of connoisseurship (Melucco Vaccaro et al. 1996).

In assessing artworks, Morelli contends that 'Every true artist is committed to the repetition of certain characteristic forms or shapes' through the involuntary use of habitual modes (Morelli quoted in Wollheim 1973: 81, 194). In selecting suitable features for use with Morelli's method, the feature must:

- have a form amenable to individual expression;
- not be one characteristic of a school or tradition;
- not be one depicted in an accidental or haphazard fashion; and
- not be one of a suite of similar features that require variation, such as the ears of four people standing side by side (Wollheim 1973: 195–196).

The method was seen by Morelli as a means for correcting or refining an initial assessment, rather than doing away with other means of assessment (Wollheim 1973: 193). Morelli's method was taken up vigorously by his pupil and later eminent art-historian, Bernard Berenson (1865–1959), who applied the method, along with an evaluation of the work's overall quality, to the assessment of Renaissance painting auto-graphs (e.g. Berenson 1962). Berenson's later penchant for economic priorities to override his academic acumen did little to promote the validity of the method or endear it to other connoisseurs (Cohen 2013).

Also, during the late nineteenth century, this method of relying on observing minutiae rather than obvious features to reach conclusions was promoted by A. Conan Doyle through his fictional detective *Sherlock Holmes* and the psychoanalytic rationalisations of



Figure 2. Giovanni Morelli and various manners of representing ears by Renaissance artists: one of an artist's more obvious diagnostic traits (drawing adapted from Morelli 1892).

Sigmund Freud. While Freud had had direct contact with Morelli's writings, Conan Doyle derived the ideas from his teacher at medical school, Dr Joseph Bell, who taught his students the importance of observation in deducing a diagnosis. Rather than the use of deduction, which Holmes continually espoused to Watson, the form of reasoning used by Morelli, Holmes and Freud is essentially abductive reasoning (*abduction*); the process of arriving at an explanatory hypothesis that accounts for the observations using a plausible-reasoning technique. Unlike deductive reasoning, abduction does not assure the conclusion but provides the basis of a hypothesis, derived from a largely intuitive reading of the facts, and its validity is arrived at, in part, through the experience of the investigator in that field (see Sebeok and Sebeok 1981).

In the story 'The cardboard box' (Conan Doyle 1893: Fig. 3), Holmes gives an example of his methods on a very Morellian subject:

As a medical man, you are aware, Watson, that there is no part of the human body which varies so much as the human ear. Each ear is as a rule quite distinctive, and differs from all other ones. In last year's Anthropological Journal you will find two short monographs from my pen upon the subject. I had, therefore, examined the ears in the box with the eyes of an expert, and had carefully noted their anatomical peculiarities. Imagine my surprise then, when, on looking at Miss Cushing, I perceived that her ear corresponded exactly with the female ear which I had just inspected. The matter was entirely beyond coincidence. There was the same shortening of the pinna, the same broad curve of the upper lobe, the same convolution of the inner cartilage. In all essentials it was the same ear.

Of course, I at once saw the enormous importance of the observation. It was evident that the victim was a blood relation, and probably a very close one (Conan Doyle 1893; quoted in Ginzburg 1983: 83–84).

Holmes' conclusion is not one of proof but, following abductive reasoning, he accepts the proposed relationship as the simplest and, hence, the most logical conclusion (see also Sebeok and Sebeok 1981).

Morelli, however, did not limit his analysis purely to observing minutiae. He also used conventional stylistic features as well as other knowledge, such as identifying the deterioration qualities of a specific pigment that was indicative of a particular painter (Modestini 2014: 144): a point that will be emphasised below for rock art studies.

Morelli's method has been criticised recently for its underlying late-nineteenth century paradigm, which is considered too conjectural (Ginzburg 1983) and supportive of an imperialist view of art, resulting in a very narrow appreciation of the artefact that belies the use of other approaches (Elsner 1990). The inherent problem of connoisseurship is well illustrated by the history of the *Portrait of a musician* painted by Leonardo da Vinci around 1485 (Marani 2000: 160–165). The work was first documented as being by da Vinci in 1672 and re-confirmed in 1796. Its authorship was questioned and refuted by Morelli in 1890 and again by the da Vinci scholar Müntz in 1900. After restoration of the



Figure 3. Holmes examining the minutia of severed ears. From 1893 Strand Magazine illustration by Sidney Paget (web open access).

painting in 1905 it was again credited to Leonardo although contradictory opinions were still expressed by eminent scholars. X-rays of the painting taken in the 1980's have compounded the problem as different pigments have been detected in different areas of the work suggesting to some that it is a collaborative work. Marani points out the role of prevailing art theories as filters through which scholars have viewed the work, and also the role of technology, as many conclusions were based on reproductions rather than the work itself. In the end, Marani, after dismissing others for their subjective opinions, argues for da Vinci's authorship on 'stylistic' grounds. A further example of the problem of connoisseurship is provided by Bernard Berenson, who initially dismissed a claim that the portrait *La Belle Ferronniere* (c. 1497) is a work by da Vinci, suggesting that it was painted instead by Giovanni Boltraffio who worked for a time in da Vinci's studio. Some 40 years later, however, Berenson recanted his dismissal (Marani 2000: 178), presumably using the same analytical techniques but with greater insight into da Vinci's manner (see also Bambach 2003: 42–43).

In a more recent application of the Morellian method, Alexander Perrig (1930–) suspected that most of the drawings attributed to Michelangelo were the products of his pupils or artist friends. Perrig does not reference Morelli as an influence, but his approach applied a similar objectivity through which he attempted to attain a yet finer level of expertise. Perrig begins his study by describing what a drawing is and the different ways one can be produced (setting the parameters). For example, when describing the attribute of 'hatching' Perrig examines the subtle aspects of line density, their strength, direction, shape, composition and distribution, which will vary between different artists (Perrig 1991: 21–28). The other attributes he considers are: drawing as a product of movement, the contour, the surface of the sheet, and originals and copies. As a basis for compiling his baseline data, Perrig states,

In order to become acquainted with Michelangelo's way of drawing, one must first gather together those drawings whose authenticity is warranted by any external evidence — no matter what the evidence is (Perrig 1991: 7–8).

Clearly for the vast majority of rock art, such a database could not be established so the full range of an artist's repertoire is unlikely to be recovered (but see below).

While Perrig's approach has been lauded for its objectivity, his results have been severely criticised for inconsistency and, in cases, for not following his own system (such as comparing drawings of different scales and purposes; Bambach 1997). Similarly, Gnann (2010), in disagreeing with Perrig on numerous attributions, also takes Perrig to task over two drawings that Perrig claimed do not follow 'in logical order'. Here, and relevant to rock art research, Gnann sees the drawings in question as parts of a set of preliminary sketches (Gnann 2010: 328–331); hence, works that do not appear to fit a prescribed or predetermined order, may in fact be contemporaneous.

In a discussion of drawings and their autographs, Petherbridge concluded the Morellian method was so severely flawed (unscientific) she considered it totally unreliable as the authorship of an artwork 'under scrutiny can finally be ratified only by the accumulation of learned opinions and the quotations of precedents' (Petherbridge 2011: 10).

Despite these criticisms, it is proposed below that the



Figure 4. Greek urn attributed by Beazley to the 'Berlin painter' (525–475 BCE) (Image supplied by Bildagentur für Kunst, Kultur und Geschichte, ©Antikensammlung, Staatliche Museen zu Berlin; photographer Johannes Laurentius, Berlin).

Morellian method has particular value in its application to a range of archaeological artefacts, particularly the many forms of rock art, when used in conjunction with other analytical methods, forensic techniques, and the archaeological findings from other aspects of the site, region or culture under study.

The Morellian method and archaeology

In essence, the use of the Morellian method in archaeology appears to be straightforward: the identification of an individual artist's work in any media through the repetition of certain idiosyncratic mannerisms, forms or shapes. However, Perrig's requirement that we start with the known products of a particular artist is, in all but a few cases, not achievable in rock art studies because of the age of the artworks and lack of any associated documentation. Instead it is suggested that we can only limit our study to finding the correlation of particular production aspects of two or more images (which will vary with different techniques and places).

Also, while the method may identify the work of an individual rock art artist through similarities of execution, it may not be possible to identify all works by that artist due to differences in execution that reflect a conscious decision on the part of the artist, such as a change in preferred technique. For example, late in his life Leonardo da Vinci changed from his 'diagnostic' left-handed straight-lined cross hatching to curved lines that emphasised the form of the object rather than just its shading (Bambach 2003: 535). In other situations, the community requirements for a particular image may require the artist to override personal traits in favour of a particular conventional schematised format. In addition, many rock artists may have produced only a single image. Consequently, the approach can only be used to identify positive associations between motifs *where suitable criteria are met*, and will not be appropriate in many other instances.

The initial use of the Morellian method in archaeology was by classical archaeologist and art historian John Beazley (1885–1970) who adapted the method to analyse the decoration on Greek Attic pottery (Beazley Archive 2012). By tracing and analysing over 1500 vases Beazley was able to systematise the classification of decoration according to the 'hand' of individual artists (e.g. Beazley 1963; Beazley Archive 2012), with more than eighty of these being assigned to one individual; whom Beazley designated the 'Berlin painter' (Fig. 4).

In recent years several studies in archaeology have used approaches similar to Morelli's method, although some appear to have been derived independently and without knowledge of Morelli's work. These studies have reportedly identified individual artisans through the distinctiveness of their artefact production (Roaf 1983; Carr 1995a, 1995b; Hill and Gunn 1977; Thomas et al. 2009; Frey 2013). In particular, the approach was used to identify the work of a range of individual Mesoamerican sculptors and artefact painters (e.g. Cohodas 1984; Kerr and Kerr 1988; Tate 1992; Stone

1995; Van Stone 2000). Tate not only aggregated individual sculptors to Mayan reliefs, but also the different scribes who laid out the designs for the sculptors to carve. In doing so she found that the stelae were usually the product of several artists working together (Tate 1992: 38). Stone (1995: 112–117) identified ten individual artists from the Mayan cave site of Naj Tunich from 94 'drawing units' (1995: 107; cf. motifs or motif clusters). This was done through looking for shared idiosyncrasies, particularly of the face and anatomy of anthropomorphous figures. She noted that such an analysis had two particular limits. The first was that paintings must share like elements (such as heads, feet or loin cloths), and the second was that the full range of styles practised by the individuals was unknown (1995: 112). While she gives both verbal and pictorial descriptions of each of the drawings she nominates, the examples she provides for some of the artists, such as for 'Artist 6' drawing 83 (1995: 114) is not fully convincing (Fig. 5). Regardless of the veracity of her conclusions, the method she applies is Morellian.

In Europe, Alexander Marshack, a research associate at the Peabody Museum of Archaeology and Ethnology, distinguished differences in the engraved markings on Palaeolithic bone artefacts by examining the minutiae of the manner in which the markings were made (Marshack 1977, 1991, 1992). Marshack held that the size of individual markings and the direction of their orientation should be consistent for each marker. He stressed that the technique was not aimed primarily at interpreting the notations, but used to understand the way of thinking involved (Marshack 1972: 39). Although Marshack's methods and his interpretations have been controversial (e.g. Elkins 1996 and comments), the basis of noting differences at the microscopic level has an obvious value for the determination of rock art artists. Using similar techniques, Bednarik (2006) through careful observation and data presentation clearly demonstrated that the two sets of grooves on a bone fragment from Oldisleben, Germany, were produced by different implements and could not have been the product of natural random agencies. In another example he demonstrated that at least five different tool points had been used in the production of a petroglyph panel in Nung-kol Cave, South Australia, and he reconstructed the cross-sections of two of them forensically (Bednarik 1994).

Also in Australia, Kim Akerman's examination of over 800 engraved pearl shells found that many were the product of recognisable, but unknown, individuals (Fig. 6):

the arrangement of the [geometric] design, the inclusion and nature of smaller interstitial elements and even qualities such as the breadth and depth of each engraved line, and its relative juxtaposition to adjacent lines that make up the total design element, may reveal the hand of an individual, but unknown



Figure 5. Anthropomorphous figures from Naj Tunich attributed to the same painter by Stone (1995). Images redrawn from Stone (1995: 115).

artist that can be identified in other shells (Akerman and Stanton 1994: 13).

It is also important to recognise that art production is not always limited to single individuals, and the cooperation of several artists is common in the contemporary Indigenous practice of bark and acrylic painting (e.g. Thomson 2003: 209; Green 1988: 43). We know of an example of collaborative painting practice in rock art, at Ngama in central Australia (Mountford 1968: 90), but think it highly likely that this method was used in the production of many of the large rock art images throughout Australia: such as the group of large polychrome barramundi at Nawarla Gabarnmang (Gunn et al. 2012). Petroglyphs on a small rock surface in Western Australia were made using a variety of vertical and oblique strokes, suggesting the panel was the work of more than one artist (Gunn and Webb 2003: 67–73). The technique, placement and alignment of the petroglyphs further suggested that at least three artists were involved, with two sitting opposite each other on each side of the panel. The motifs of the third artist were superimposed over those of the other two and were slightly less weathered, indicating their production was not contemporaneous with the earlier pair.

At Nawarla Gabarnmang, in western Arnhem Land, Australia, Gunn (2016) attempted to use the Morellian method to equate images on different rock panels to the same time period. He found a small white therian-



Figure 6. Pearl shells decorated by the same artist (Photo courtesy of Kim Akerman).

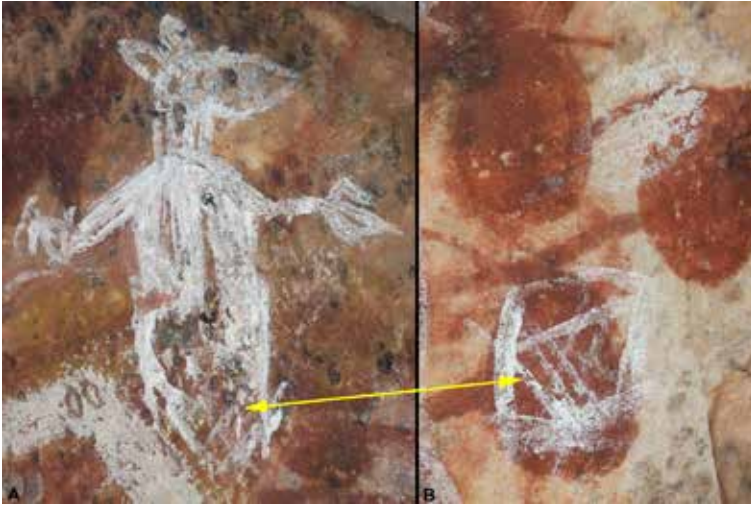


Figure 7. Two 'white stroke' paintings on different panels at Nawarla Gabarnmang attributed to the 'Linear painter A'.

thrope painted in an unusual and distinctive manner using short straight lines, some of which were applied in a cross-hatch pattern (Fig. 7A). He found the same cross-hatch patterning on a rectangular design on an adjacent panel (Fig. 7B). Both paintings are in the same white colour and are in a similar state of preservation and are the only paintings within the shelter that have this particular manner of infill. Consequently, it was concluded that the two images were produced by the same artist, who was termed 'Linear painter A' (see Gunn 2016). These two paintings were then used to provide a key to associate the layers from the respective Harris Matrices of each of the two panels to the same chronological period.

Elsewhere within the shelter two similar female anthropomorphs occur on adjacent panels (motifs A-66 and A-99; Fig. 8). The two figures are both in profile facing to the right, with oval-shaped heads, mouths

slightly open, arched backs and upraised arms. They are of almost identical height (90 cm and 91 cm respectively). Unlike other female anthropomorphs here, this pair is painted with a white silhouette with a black, rather than red, outline and pattern infill, although this black pigment now has largely deteriorated. Motif A-66 is better preserved than motif A-99 due to the water-damage of the latter. The two motifs are not identical: there are differences in the shape of the back and breasts; motif A-66 has a pubic covering but motif A-99 does not; while motif A-99 also has red linear infill and motif A-66 does not. These differences between the two anthropomorphs (motifs A-66 and A-99) are seen as the incidental variations of the different paintings rather than as a basis for disputing their common authorship. Another difference is that while motif A-66 occurs as a single figure,

motif A-99 occurs within a group of fauna ('crocodile', 'bream' and 'turtle') all of which are painted in a similar manner: white silhouette with black outline (Fig. 9). Superimposition indicates that this group of motifs are not all contemporaneous. Differences in preservation of the images indicate that the artist, here designated as the 'Joyful painter', returned to this panel on more than one occasion.

In another instance, also at Nawarla Gabarnmang, female sex symbols have been painted on both a ceiling panel and on one of the shelter's supporting pillars (Fig. 10). These are very similar in shape, colour, line-work and preservation and are considered to be by the same painter designated as the 'Pillar painter'. Other female symbols within this shelter are very different as they use both red and white pigment and have a different overall shape. Of interest is the repetition of the 'Pillar painter' symbols in a shelter some 30 km to the north-west.



Figure 8. Photo-tracing of two female figures from adjacent panels at Nawarla Gabarnmang that are attributed to the 'Joyful painter'.

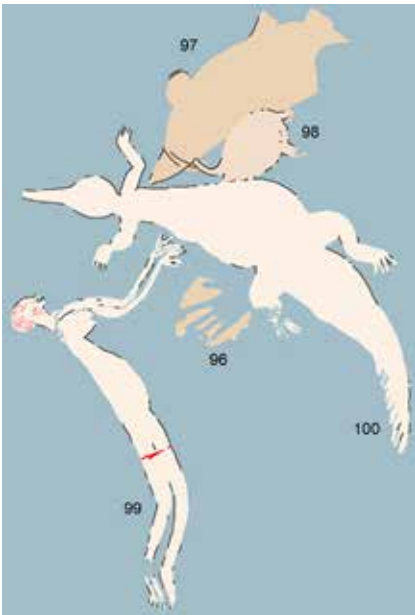


Figure 9. Aggregate of motifs by the 'Joyful painter' on Panel A6. Motifs 99 and 100 are contemporaneous, as are motifs 96 and 97. Motif 98 overlies motif 97 and underlies motif 100.

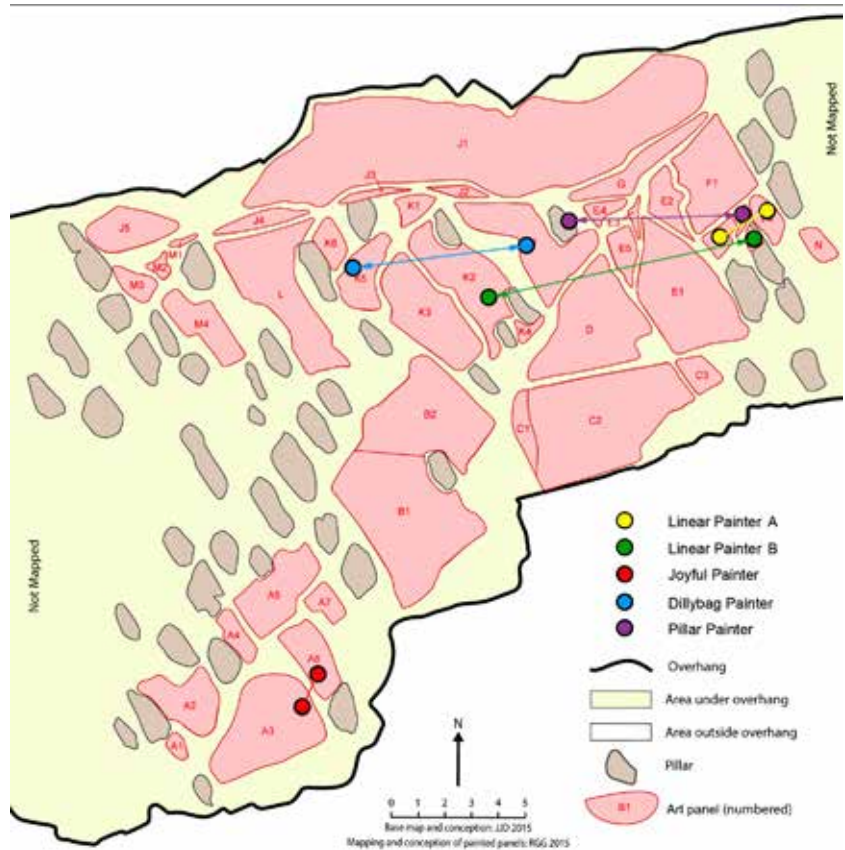


Figure 10. Position of motifs correlated by the Morellian method at Nawarla Gabarnmang.

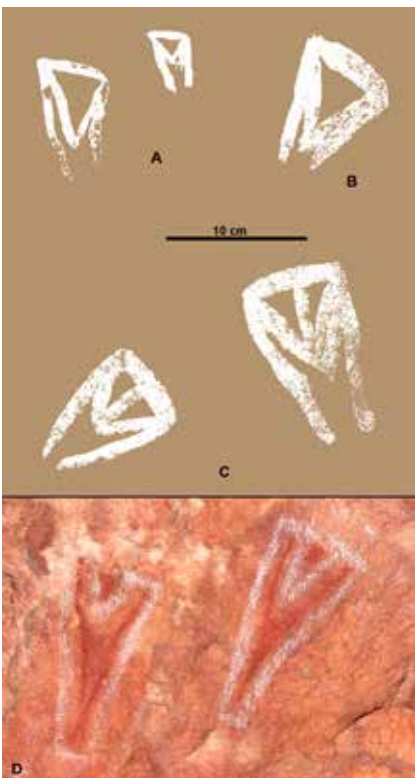


Figure 11. Apparent female sex symbols. A: Nawarla Gabarnmang (ceiling motifs F-165 and F-166). B: Nawarla Gabarnmang (the clearer of the motifs on Pillar 31). C: Site ARN-072/Y (30 km north-west of Nawarla Gabarnmang). D: Nawarla Gabarnmang (Pillar 28).

Plotting the locations of these and other motifs, equated through the Morellian method onto a ceiling plan of the Nawarla Gabarnmang shelter (Fig. 11), allows the personal space of the artist to be, at least partially, defined. In the case of the 'Pillar painter', the method also indicates the painter's space within the broader landscape, similar to that recorded for the painter Najombolmi by Haskovec and Sullivan (1989: 57) on the basis of oral testimony.

A further use of the Morellian method is that it enables the work of different artists to be differentiated when, superficially, the motifs look alike. For example, another panel at Nawarla Gabarnmang contains two adjacent polychrome x-ray images of 'Saratoga fish' (motifs D-60 and D-65; Fig. 12). The two paintings utilise a similar overall design form and similar colour scheme, but whereas one is highlighted in red, the other is in yellow. On closer inspection there are distinct differences in the shape of the head and the length of the pelvic fins. The line work of motif D-60 is more broken and its width more uneven than that of D-65, and it deviates in places from the margins of the solid areas it is enclosing. This suggests that motif D-60 was applied with less care than that of D-65. Taken together these finer points suggest different artists for the two motifs. In addition, as the pelvic fins of motif D-65 are superimposed over the tail of motif D-60, the less-careful painting was the earlier of the two. This difference in age is also apparent in the brighter pigments of motif D-65. Overall, given the proximity of the two paintings, it is likely that the second artist used the format of motif D-60 as a guide for the later painting, which was undertaken with more care. Such motifs, therefore, require the identification of attribute differences, rather than just similarities, and an alternative explanation must then be sought to explain the similarities.

The Morellian method can be used to distinguish the works of two different artists that most probably worked contemporaneously and

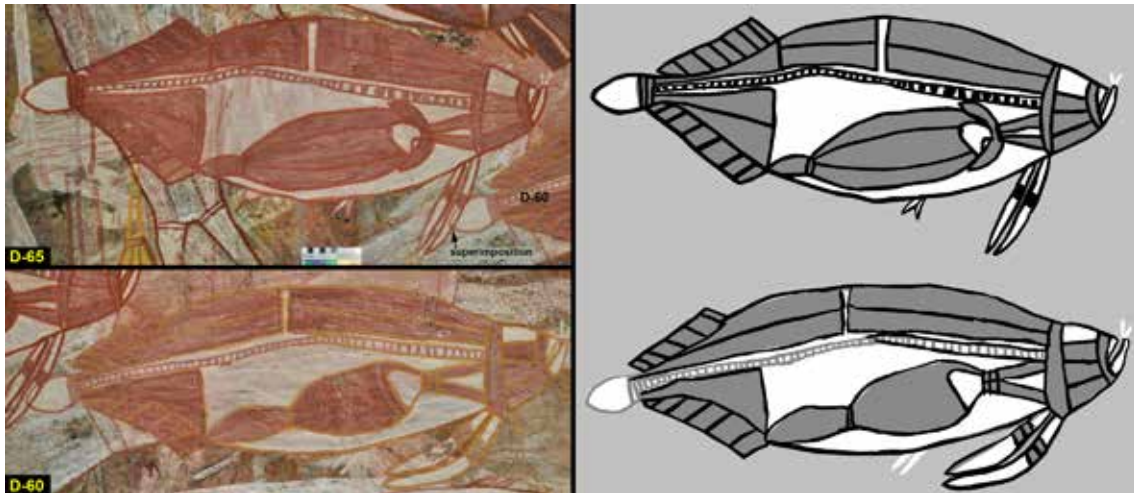


Figure 12. Two 'Saratoga' paintings from the one panel at Nawarla Gabarnmang by different artists.

either in close collaboration with each other, or by one painter with reference to that of another's early work. For example, two white female figures (motifs F-120 and F-121) have similar poses, orientation and states of preservation, and are positioned at opposite corners of panel F1 (Fig. 13). Given these similarities, and as there is no conflict with their positions within the Harris Matrix, the motifs appear to be contemporaneous. However, there are subtle differences in their overall shapes (such as the depictions of the hands, the relative sizes of the heads to their bodies, the different widths of the torso) that suggest they were probably not painted by the same artist. (The presence of a protruding tongue on motif F-121 and its absence on motif F-120 is not seen as a Morellian difference, but one that is more likely to relate to different thematic concepts.)

As well as relying on visual clues or cues, it is now possible to extend the Morellian method through the use of contemporary archaeological techniques, such as identifying similar pigment chemistries (through XRF or other), or obtaining similar absolute dates

(radiocarbon or other). These and other archaeometric techniques may improve the validation of meaningful motif cross-correlations showing that they are either contemporaneous or are within a broader unified period (cf. Clottes 1997; Huntley et al. 2011; Barker et al. in press).

In undertaking such analyses, Chippindale and Taçon (1993: 39) further stress the importance of studying the various motif traits individually, in order to notice the presence of any covariance; the presence of a range of particular traits, or attributes, on different motifs, rather than relying on one or two lines of evidence, is taken as a sign of a positive correlation. Such an all-inclusive, or cabling, approach is also advocated by Swart (2004: 16) and is further reiterated here as being essential in rock art studies, as the Morellian method should be just one component in the line of an argument.

Following the identification of apparently related motifs through the Morellian method, the Harris Matrix (Harris 1989) can then be used to provide an additional



Figure 13. Motifs F-120 and F-121 at Nawarla Gabarnmang and their respective locations on panel F1.

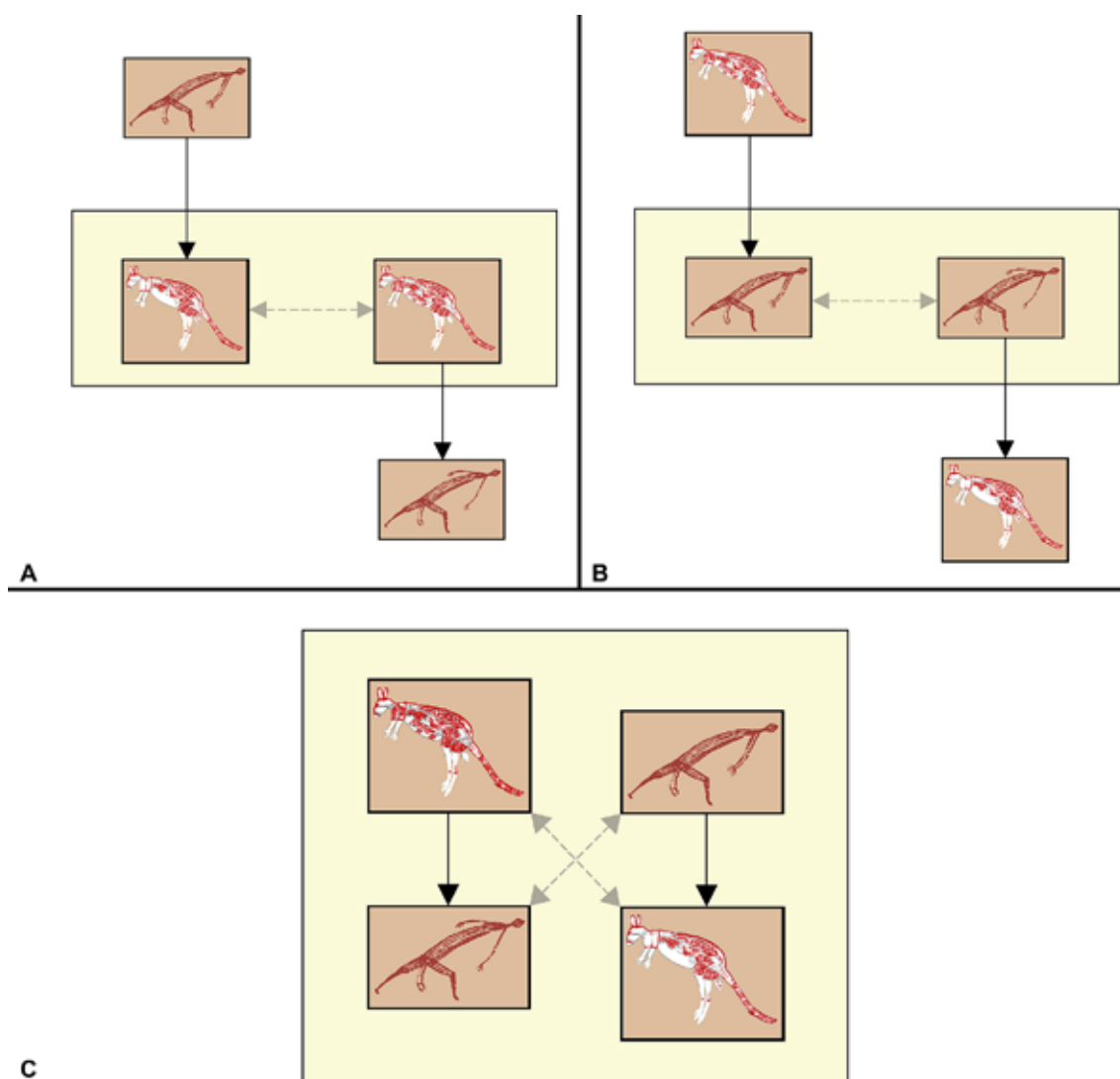


Figure 14. Interpreting motif sequence inversions.

check. For the identification of similar attributes to be produced by the same artist (on the same or different panels), the motifs must be within a common position within the Matrix; they must fall on equitable layers if they are to be considered contemporaneous. Such identified motifs, on the same or different panels, can testify to a common timeline within a panel or across different panels (within the one shelter or a number of widely dispersed shelters). Other attributes can be equated, to a lesser degree, by common stylistic or technical attributes as long as they do not contradict the law of stratigraphical succession: their positions within their respective Harris Matrices. Where contradictions do occur (i.e. appear in incongruous positions within the Matrix), then these need to be described and interpreted. For example, if a macropod (M1) overlies an anthropomorph (A1), but elsewhere a second macropod (M2) with similar attribute to M1 underlies a second anthropomorph (A2; that has similar attributes to A1), then there are three probable interpretations:

- A distinct layer of macropods ($M1=M2$) separating two layers of anthropomorphs ($A1 \neq A2$) (Fig. 14A),
- A distinct layer of anthropomorphs ($A1=A2$) sep-

arating two layers of macropods ($M1 \neq M2$) (Fig. 14B), or

- A mixed single layer composed of macropods and anthropomorphs ($M1=M2=A1=A2$) (Fig. 14C).

Given the similarity of attributes of the two sets of motifs, a fourth interpretation that none are equitable (with each motif occurring on a separate layer) is unlikely.

The choice of one interpretation over another will depend on assessing the relative preservation of each motif. If all are similarly preserved, then the third interpretation is the most likely.

Allocating identified layers or phases to specific chronological periods is an additional step that can only be achieved when the layers can be pegged to motifs or features that have been firmly dated. Such dates, age ranges, or age maxima or minima, can be derived from a variety of archaeometric sources, such as radiocarbon dating, geological events, and motifs related to specific historic events or environmental changes. Additional support can then be derived from probable or tentative dates obtained from secondary sources (Ward and Tuniz 2000; David et al. 2013).

Limitations of the Morellian method

As with any method, Morelli's does have limitations when applied to rock art. These include those already mentioned above that apply to fine art connoisseurship. The criticism by Petherbridge, that the Morellian method was totally unreliable as the authorship of an artwork 'under scrutiny can finally be ratified only by the accumulation of learned opinions and the quotations of precedents' (Petherbridge 2011: 10), is not particularly relevant for rock art studies at this point in time. There have been so few detailed regional studies done in Australia that the distinction between local stylised norms and artistic individuality cannot be identified. This is not to say that a point in time will not exist where 'the accumulation of learned opinions' will make it possible to quote from precedents, and when that time comes it will be a great day for the study of Australian rock art.

The most common criticism levelled against the Morellian method relates to the overly dogmatic and one-sided approach adopted by its creator, with some suspecting that his art-science was 'nothing more than a rhetorical strategy designed to invest his attributions with authority' (Uglove 2014: 3), but this criticism should be understood in context. In the late nineteenth century, connoisseurial authority had become crucially important in the discourse on sixteenth century Italian art, but it was also a field dominated by a select few authors. It is argued that Morelli used his Russian pseudonym, Ivan Lermolieff, in order to publish some particularly offensive comments about other art historians with whom he strongly disagreed (Uglove 2014: 5). Close reading of his original text reveals that he used irony to achieve a playful aesthetic distance in the critique of his contemporaries 'to discipline "a silly, inflated, know-it-all-knowledge"' (Uglove quoting Kierkegaard 1989(1841): 256–257).

By explaining his method and providing clear illustrations (see Fig. 1), it appeared as though Morelli was also seeking to democratise an elite practice (Briefel 2006: 56). As Shiff makes clear, 'an academic discipline's stability depends in part on its capacity to separate itself from related fields by claiming certain methods and concerns as if they were trade secrets' (Shiff 1988: 25). In this way, Morelli's can be understood as a political as well as art historical project. Morelli's project was also personal as much as it was political. Pictures became puzzles; artists became friends and critics, enemies. Therefore, to take the Morellian method out of one context and apply it to another (from Giorgione to Nawarla Gabarnmang) not only performs a rather radical decontextualisation, but also limits and reduces the 'double nature of Morelli's method' (Uglove 2014: 8). This is not necessarily a bad thing — Uglove argues such limitations already occurred when his original text was translated from German to English — and it does not detract from the potential of the Morellian method to act in combination with other techniques to the betterment of our understanding of rock art.

A final limitation with Morelli concerns his insis-

tence on 'an evolutionist history of painting based on the psychology of race' (Uglove 2014: 3). As a student, Morelli studied the work of Georges Cuvier (1769–1832) especially the zoologist's 'principle of correlation of parts' (Jaynie Anderson cited in Uglove fn. 24, p. 11), which seems unusual given this was a principle concerned with the connection between an organ's function and its practical use for an organism to survive. Cuvier's *Instructive note on the researches to be carried out relative to the anatomical differences between the diverse races of man* (1800) guided the expedition to Australia by Nicolas Baudin (1779–1842). Cuvier encouraged the expedition to seek out the places where the dead are kept: 'When they can, by any means, lay their hands on a corpse, they ought to note carefully everything pertaining to the individual' (Cuvier, quoted in Jones 1988: 37).

At the time, Cuvier's work on comparative anatomy was highly influential amongst those involved in the fledgling science of anthropology, as well as being a model for the Morellian method. On the Baudin expedition, his ideas may well have had a determining effect on the importance placed on gathering evidence of material culture. It is not too much of a stretch to claim that Cuvier's fascination with graves facilitated the first European encounter with Aboriginal art in Tasmania. What is relevant for this section on the limits of the Morellian method is the extent to which Morelli adopted Cuvier's views on racial categorisation, as three 'races' — white, yellow and black — according to his perception of the beauty or ugliness of their skulls and the quality of their civilisations. Unsurprisingly for the times, Cuvier placed Caucasians at the top with the skull shape he considered the most beautiful, and the Ethiopians at the bottom (Isaac 2004: 105). Key concerns of evolution and 'race-thinking' in relation to Aboriginal art have been outlined elsewhere (Lowish 2015).

Putting these limitations and qualifications aside, it is interesting to consider the benefits of cultivating rock art connoisseurship. Certainly, the kind of dedicated and methodological charting of rock art in specific regions, such as the voluminous and beautiful works published by Mike Donaldson (2009, 2012a, 2012b, 2013), only increases the aesthetic appreciation and value of the more spectacular and 'picture-like' examples of rock art in Australia. Such quality resources can also help to enable the researcher to become familiar with range of works from a particular area — knowledge of the work is essential before attempting to apply the Morellian method. Equally important, the rock art connoisseur should have an aptitude for seeing and appreciating; such talents must be acquired over time, the ability to see is a skill; the eye must be trained.

Other avenues from art history

Beyond Morelli, there are other art historians whose work approaches archaeology.

Moritz Thausing (1838–1884) used a strict empirical method not simply to identify the 'hand' of an artist, but to underpin scientific art historical scholarship. Like

Morelli, he called upon the discipline of art history to sever itself from aesthetics to become a more rigorous empirical field of the human sciences. Thausing argued that archaeology had the most to offer art history, in terms of shared interest in the ancient world. With archaeology, Thausing states, '[art history] shared the two-fold nature of its sources [visual and textual], a method, and an ultimate goal ... art historians are the archaeologists of the visual!' (quoted in Gubser 2006: 110). For him, the two disciplines comprise facets of the same endeavour, excepting that 'Art history could both expand and deepen the insights of archaeological enquiry' (Gubser 2006: 110).

Thausing was the second chair in art history at the University of Vienna in 1873 and director of the Albertina museum. In 1871 he was among the team of art historians who convened in Dresden to determine which of two versions of Hans Holbein the younger's 'Meyer Madonna' was the autograph work; this became one of the important events in nineteenth-century art history when many methodical approaches were employed to determine authenticity (Sorenson 2010: n.p.). Thausing's chance encounter with Morelli, at the Albertina museum, is heralded as one of the major events in the development of the Vienna School of Art History (Gubser 2006: 107). Many of Thausing's subsequent articles reflected Morelli's methodology in practice.

While Thausing's view of the artist, as 'the man-of-action hero', places a little too much emphasis on individualism for the rock art palette, his view of art history was largely free of aesthetic evaluation; in his 1873 work on methodology, he wrote, 'I can truly imagine a better art history in which the word "beautiful" does not ever appear' (Thausing quoted in Sorenson 2010: n.p.).

Thausing became an ardent follower of the Morellian method, as he applied the empirical methods of natural science to the study of artworks. Morelli sought to identify the formal and stylistic tendencies of an artist by observing often neglected details. Other avenues to explore in the continuing correlation between archaeology and art history with regards to the study of rock art include the development of style since Morelli's time. As James Ackerman remarks, 'style is an indispensable historical tool; it is more essential to the history of art than to any other historical discipline' (Ackerman 1963: 164).

Conclusion

In addition to accurate dating, the sequencing of Australian Aboriginal rock art is a major research issue that will not be easily resolved. The recognition of similar attributes to equate different motifs, usually under the rubric of 'style', has long been used, and continues to be applied, in rock art research worldwide. Although it has its shortcomings, the Morellian method provides a more rigorous and empirical methodology that makes it possible to identify individual traits in specific images and justify the reasons for their selection. The approach advocated by Morelli cannot provide a

definitive common attribution to two or more motifs, but it does provide the basis for a hypothesis that can be evaluated on formal criteria. While forensic similarities do not necessarily imply common authorship, when used carefully and in conjunction with other techniques such as the Harris Matrix or archaeological forensic techniques, it provides a valuable tool for rock art research, particularly where so much debate continues over the use of 'style' as a chronological indicator (cf. Fiorio 2014: 158). The Morellian method contributes a strict and practical method that can be used to further analyse and assess rock art complexes of comparable age and in a broader area, to determine spatial and temporal patterns in rock art. In addition, the approach has the potential to suggest the possible movements of an individual artist across a landscape; thus providing a glimpse of the individual and his/her artistic pre-occupations within a past landscape.

As quantum physicist Janet Conrad said, 'a detective is not always a scientist, but a scientist is always a detective' (quoted in Jayawardhana 2014: 115). The study of rock art is more than just archaeology and science; it involves investigating a very all-encompassing human activity.

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