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Pleistocene Engravings from Wonderwerk Cave, South Africa

Robert G. BEDNARIK and Peter B. BEAUMONT

Abstract. *Confirmed Pleistocene palaeoart from Africa remains rare, but there are a small number of engraved and painted portable objects from various sites in southern Africa. Some of these are stratigraphically attributable to the Middle Stone Age, while Wonderwerk Cave has also produced plaques relating to the prior Fauresmith technocomplex. We here present observations and interpretations of the hominin modification traces on two finds from that site and also consider their find contexts.*

Introduction

The savannas of sub-Saharan Africa contain a rich rock art heritage, as is shown by the over 10 000 known localities in its quarter portion south of the Zambezi River (Deacon & Deacon 1999), but, despite that, only a dozen or so localities have as yet produced palaeoart, mainly in portable form, that is of certain Pleistocene age. Five of those finds, at Chifubwa Shelter in Zambia (Clark 1958), Matupi Cave in Zaire (Van Noten 1977), Apollo 11 Cave in Namibia (Wendt 1972, 1974, 1976; Miller *et al.* 1992, 1999), Border Cave in South Africa (Beaumont *et al.* 1978) and Pomongwe Cave in Zimbabwe (Cooke 1963, Walker 1987), date between ~46 and 11 ka ago and are best referred to the Later Stone Age. Six others, Nswatugi Cave in Zimbabwe (Walker 1987), Klein Kliphuis Shelter (Mackay & Welz 2008), Howieson's Poort Shelter (Stapleton & Hewitt 1928), Hollow Rock Shelter (Evans 1994), Blombos Cave (Henshilwood 2002, 2009), and Major Unit 2 at Wonderwerk Cave (Beaumont & Vogel 2006), all in South Africa, range from <152-55 ka ago, and refer to the Middle Stone Age. Still earlier are three slabs with cupules on them from ~200-180-ka-old Sangoan strata at Site 8-B-11 on Sai Island in northern Sudan (Van Peer *et al.* 2003), arguably beyond the savannas, and the engraved plaques from >276 ka-old Major Unit 3 at Wonderwerk Cave, which presently represent the earliest firmly dated palaeoart from Africa.

The 12-13 Pleistocene art sites for sub-Saharan Africa are certainly a meagre tally, relative to the numbers that have been documented in smaller Europe or Australia (Bednarik 1995), but they do, nevertheless, provide a record of regular palaeoart production that extends back to about 100 ka. Less continuity is presently evidenced by earlier finds; namely the Sangoan cupules at Sai Island and the c. 140 ka MSA and >276 ka Fauresmith occurrences at Wonderwerk Cave. We here provide a microscopic analysis of two previously recorded items from the latter site (Mitchell 2002; Beaumont & Vogel 2006), and also consider their find contexts.

The Wonderwerk Middle Stone Age plaque

The stone fragment derives from Major Unit 2, in square O 120 of Excavation 5 (Fig. 1), and has an age of c. 70 ka, based on the date of 73 ± 5 ka for a lower nearby spit (Beaumont & Vogel 2006), further constrained by associated lithics that lack segments, which would have been present if the assemblage dated to 65

± 5 ka BP (Jacobs *et al.* 2008). It measures maximally about 48.6mm by 38.5mm, and has a thickness of 14.5mm, is of variable petrological composition, but essentially a low-grade haematite of reddish colour, with a hardness of ~6 on Mohs scale. The extensive lattices of lines were therefore most probably engraved by quartz or chert, although we have made no attempt at traceological analysis (Bednarik 1992), due to the presence of adhering sediment material in the grooves. This consist of firmly lodged light-coloured fine sand and silt, possibly held in place by carbonate, which also still covers part of facet F1. For ease of analysis the seven surface areas of the fragment were numbered as shown in Figure 2. All except facet F7 bear anthropic markings. A notable aspect of the numerous engraved lines is that all the prominent grooves are deeply notched at their point of commencement, usually beginning on the margin of the adjacent facet, and then diverging into streamer-like or fan arrangements (Fig. 3). In the absence of traceological evidence it is not clear whether this is an intentional or an incidental feature of the marking strategy, but the excellent control apparent in the manipulation of the stone tools does suggest intentionality of design. It seems assured that spacings of markings are 'deliberate', as is the repeated application of the tool point in many cases, and as also suggested by the continuation of most lines right to the opposing facet margin. The first 'fan' of facet F1 is noteworthy as it comprises seven lines, which in some cases separate and later re-join (Fig. 4). This again emphasises deliberateness of design. No line appears to continue on another facet, so each facet of the object was regarded as a separate entity, and the markings refer to given spatial constraints, even emphasising these.

Fig. 1. The Middle Stone Age stone plaque from Wonderwerk Cave.

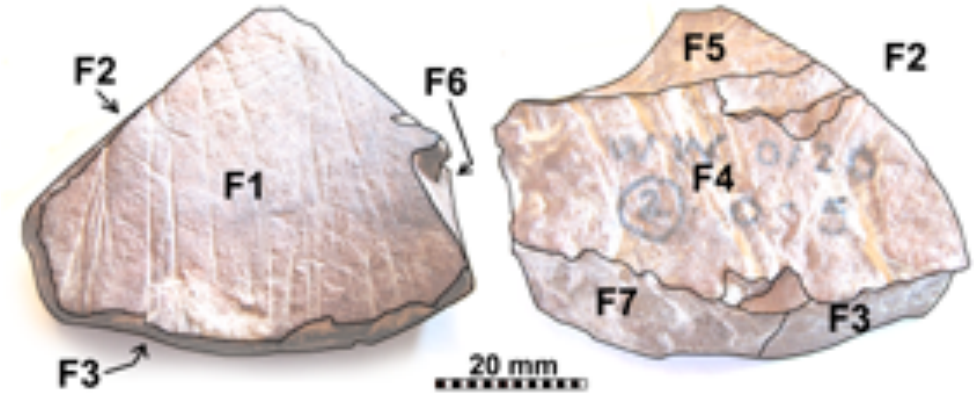

Fig. 2. The MSA stone plaque, showing numbering of the seven facets. F1 to F6 are covered by engraved lines.

Fig. 3. Partial view of edge of facet F1, MSA stone plaque.

Fig. 4. Fan-like arrangement of convergent lines of facet F1 of MSA plaque.

Because many lines are clearly the result of multiple tool applications, even full cleaning of the grooves could only convey striation data of the last tool application. Such cleaning is likely to result in the identification of multiple use of the same tool points. The grooves on facet 2 are more narrow than those on facet F1 (Fig. 5), measuring as little as 60 to 90 microns, whereas those on facet F4 are exceptionally

wide, up to 960 microns. Like those on facet F1, the prominent lines on facet F2 also wrap around the facet edge (Fig. 6). A very thin accretionary coating covers the specimen's surface, very probably a carbonate, which would be easily removable to provide full traceological detail. The relatively fine line work on facet F5, which forms part of the 'underside', seems to consist of singly drawn grooves forming convergent sets and appears to reflect the triangular shape of the facet. Facet F3, by contrast, has less structural patterning, and there are not many grooves, but the major ones are still anchored to the facet edges. Facet F6 features only a distinct pair of sub-parallel lines.

Fig. 5. Facets F1 (top) and F2, showing density of engravings.

Fig. 6. Partial view of facet F2 of the Wonderwerk MSA plaque.

Overall, this specimen demonstrates great precision and competence in the application of stone tool points to a very hard, small object, which was eventually decorated over nearly its entire surface. The object represents a considerable labour investment on the part of the maker, the markings form repeated patterning involving mainly convergent lines sets and sets of parallel lines, but the edge treatment and the distinctive anchoring to edges is also a dominant factor.

The Wonderwerk Fauresmith plaque

This considerably older decorated stone object consists of an angular slab of banded ironstone, derived from upslope iron-rich cryptocrystalline silicate strata of the sort which cap the local hillcrests (Eriksson *et al.* 2006). It was excavated from spit 45-50 cm of Major Unit 3 in square BB 149 of Excavation 6 (Fig. 7), and has an age of >276 ka B.P. based on dates of 276 and 278 ±26 ka for the surface reaches of that level (Beaumont & Vogel 2006). The flattish manuport is primarily formed by two subparallel planes 41-45mm apart, and one of its five margins, corresponding with five fracture facets (with some small subsidiary facets among them), shows breakage subsequent to the grooves being engraved. This is evident from the truncation of one of the seven remaining lines. The decorated surface is flattish, of coarse surface morphology, especially the raised 'upper' third of it (Fig. 8). The remaining, major part of the panel is slightly concave, separated from the raised upper part by a scarp, and it constitutes the engraved area. The seven grooves are numbered 1 to 7, from top to bottom as depicted in Figure 8. Line 7 is truncated by a fracture and Line 6 is in part so close to the fracture's edge that it could not have been effectively executed subsequent to the fracture event. The edge formed by the fracture and the decorated panel also shows little subsequent damage, whereas all the other margins of the panel are extensively worn, with impact flaking and crushing almost continuous. The rounding of these other edges is well visible macroscopically, while that of the bottom, most recent fracture is only clearly visible at 10× magnification. Therefore it is evident that the plaque was longer at the time of engraving.

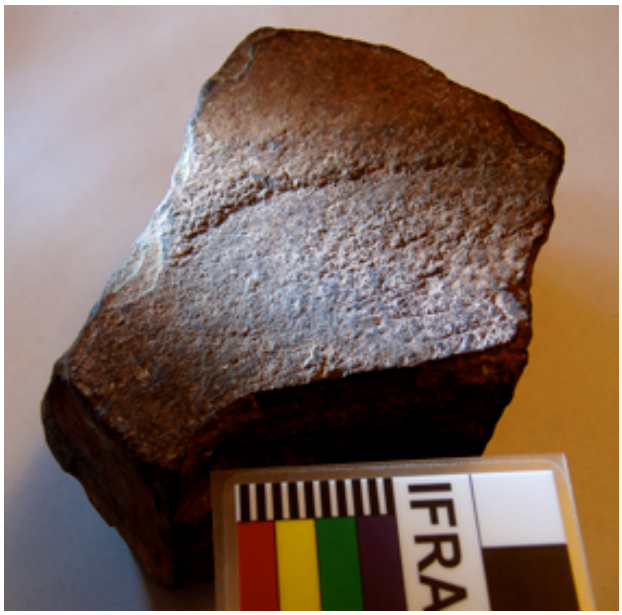

Fig. 7. The Fauresmith stone plaque from Wonderwerk Cave.

Fig. 8. The engraved surface of the Fauresmith plaque.

Line 1 commences on the elevated scarp where it is poorly visible because of the subsequently deposited precipitates (carbonates?). As it continues on the lower surface it shows signs of impact where the stone tool's point bounced, then continues shallow until crossing a faint rise in the surface where it is more distinct. It then becomes again gradually weaker, petering out until reaching a distinct stop. At that point the tool was raised and a new groove begun adjacent to the first, about 360 microns from it initially, but diverging from it until, about 1mm further, the distance between the two is 600 microns (Fig. 9). For the first 500 microns this new groove is very deep but as it continues, now maintaining the direction of the initial groove, it becomes gradually fainter and is even interrupted for 1mm, after which it continues again deeply. Following one more small break it continues alternatively shallow and deep, but always without a clear indication of the tool point's cross-section. Upon reaching the scarp again it stops. There is no indication that the tool was reapplied to any part of the groove, i.e. both parts of Line 1 were single tool applications.

Fig. 9. Details of Lines 1 and 2 on the Fauresmith plaque, showing reapplication of tool point in two locations.

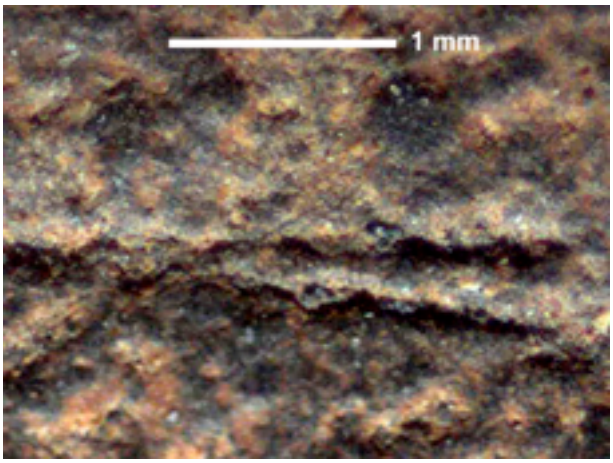

Fig. 10. Microphotograph of reapplication detail in Line 2, Fauresmith plaque.

Line 2 begins on the scarp, at the edge of a distinctive flake scar, which it appears to postdate, extending slightly into its black and polished area. The groove traverses the rise prominently, although badly weathered here, and as it continues down the slope onto the level area it becomes quite distinct, cutting through minor rises in its course, but is filled with precipitate. In one location, a dense cluster of crystals forces the tool to the surface. A few millimetres further the groove stops at another rise impeding the progress of the cutting tool. Here the tool was raised and reapplied (Fig. 9), alongside the first groove and 400 microns from it (Fig. 10). It continues for 1.9mm, approaching the first groove until it becomes superimposed over it. For the remainder of its course, the groove is largely filled with a black precipitate (manganese?) before it ends at a prominent flake scar.

Line 3 begins faintly on the down-slope of the scarp delineating the flat area of the panel, but then becomes quite deep, cutting over minor rises and in one case channelling cleanly through a cluster of crystals. Here, the shape of the tool point can be determined from the groove section. A few millimetres further the groove peters out well before reaching the end of the area available.

Line 4 appears to commence right at the edge of the panel and it is unclear whether it extended beyond it. This area is heavily coated with shiny black precipitate. It then continues rather deeply over several millimetres, but peters out at a rise and nearly disappears, only to reappear in two surface pits. It then slices through a prominent crystalline rise where it forms a canyon-like feature in which a rounded quartz grain of 140 microns diameter is lodged. Here, the groove reaches its maximal depth, in the order of 500 microns. On the following rise it is largely clear of accretion and can be measured reliably. The cross-section of the tool point was somewhat rounded, non-symmetrical, and 100 microns wide, and the lack of visible striations may indicate that its surface was smooth. The line then continues relatively deeply and there is one more passage offering good indications of the tool point's section. Again the greenish floor is occasionally exposed, although much of it is concealed by the deposits that are either dark or light coloured, and by consolidated sediment. This line does not peter out towards the end, but stops abruptly in a depression. It seems to have been executed with more pressure than the previous grooves.

Line 5 does not begin at the edge of the panel, but it is unclear whether it begins near the edge, or at the edge of a micro-flake scar. It is possible that the micro-flake was detached by the engraving action. The groove is then very clear for some millimetres but peters out, skipping over surface rises and then disappearing completely at a prominent rise. Two distinct impact points of the engraving tool follow, and then a distinct cut through a green crystalline rise. Here, the groove is almost as deeply incised as in parts of the previous line. From there onwards, the tool was drawn very evenly over the surface until the groove suddenly stops. It appears to have been made by a narrower tool point, or the tool had been rotated to offer a different section, but as there is considerable precipitate present this is far from clear.

Line 6 begins at the same flake scar as the previous groove but is very corroded at its start. However, just above it there appears to be a subsidiary parallel line, 4.5mm long and about 1mm distant. Line 6 is largely filled with precipitates, often completely, even where it transects a very prominent cluster of crystalline exposures. It eventually fades out at a rise.

Line 7 commences only about 1mm from Line 6, progressively converging from it. For the first 4mm it runs parallel with the most recent fracture edge, only a few hundred microns from it, then sweeping across until it is truncated by the left margin. This line irrefutably predates the lower fracture edge. There is again significant infill of both very dark and light-coloured accretionary mineral matter.

Discussion and conclusions

An interesting aspect of the engraved stones from Wonderwerk is how well they match the transition between marking strategies of Modes 2 (Earlier Stone Age) and Mode 3 (Middle Stone Age) attributions (Bednarik 1986). The deep commencement and, often, ending of more prominent lines on the Middle Stone Age plaque has resulted in distinctive notches at those points, which wrap around the edges of the stone. This feature suggests that those markings could be conceptually related to edge notching, a frequent feature of the Mode 3 tradition, and one well represented in the Middle Stone Age sample from southern Africa. It also brings to mind the distinctive 'spacer marks' along the edge of the Micoquian-linked Oldisleben 1 object, which has been taken to represent edge markings to achieve even spacing of the engraved lines (Bednarik 2006). There are also distinct similarities between the Wonderwerk and Blombos engravings, with the divergent line fan motif common to both possibly being the structural template for the lozenge form recorded from the latter locality (Henshilwood *et al.* 2009).

Regarding context, the Middle Stone Age engraved stone came from a 40-cm-deep white ash stratum, containing artefacts largely based on chert and heavily heat damaged, with multiple dates suggesting this level formed very slowly (Beaumont & Vogel 2006), likely as a result of many brief visits, during one of which the decorated items were lost or discarded. No human bones were found in the debris there, but broadly coeval is the Border Cave 5 burial containing an isolated modern human mandible, which has been directly dated to ~74 ka (Grün *et al.* 2005), but with a subsequent Bayesian analysis suggesting that it may be marginally younger (Millard 2006).

As for the Fauresmith plaque, this came from the dark cave rear, at the mouth of a sediment-blocked unexcavated tunnel leading further into the mountain, where it

occurred in a sandy stratum also containing small unutilised exotic quartz crystals and chalcedony pebbles from sources 20-45 km away (Beaumont & Vogel 2006; Chazan & Horwitz 2009). A possible engraver of this palaeoart item was *Homo helmei*, a late form of archaic *Homo sapiens*, that was, at the Florisbad type locality, found associated with Fauresmith lithics (Beaumont & Vogel 2006) and directly dated to 260 ka (Grün *et al.* 1996), which may well be a minimum age (Beaumont & Vogel 2006).

From these findings it is likely that subcontinental palaeoart ranges back to before the advent of modern humans, as is also the case further north in Africa, where the ~200-180-ka-old cupules at Sai Island occur with Sangoan lithics comparable to those found with the <190-ka-old *Homo helmei* skull from Singa (McDermott *et al.* 1996; Van Peer *et al.* 2003). Furthermore, the Middle Stone Age at Wonderwerk extends back to c. 250 ka (Beaumont & Vogel 2006), whereas the comparable Nubian Complex lithics from Sai Island postdate 152 ka (Van Peer *et al.* 2003).

Finally, the engraved Fauresmith slabs, from the dark rear of Wonderwerk at 140 m in, are of great antiquity, about three times older than the earliest such objects at Blombos (Henshilwood *et al.* 2009), and, in fact, it could be the second oldest known application of engraved lines to a portable stone plaque, after the incised Bilzingsleben objects (Bednarik 1995, 2003) (Fig. 11). Given that, at Wonderwerk, only minimal amounts of water ever enter its rear half (Beaumont & Vogel 2006), thereby severely impeding the dissolution of introduced ironstone slabs, it may be that the many unexcavated metres of stratified deposit below the Fauresmith finds there could provide further evidence bearing on the very beginnings of palaeoart (Beaumont 1992).

Fig. 11. Engraved object 1 from the Bilzingsleben collection, on forest elephant bone.

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