

What is Cultural Modernity? A General View and a South African Perspective from Rose Cottage Cave

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Storage of symbolic information outside the human brain is accepted here as the first undisputed evidence for cultural modernity. In the hunter-gatherer context of the Stone Age this storage could include artwork, rapidly changing artefact styles and organized spatial layout of campsites. Modern human behaviour in this context is distinguished by a symbolic use of space and material culture to define social relationships, including significant groupings based on attributes such as kinship, gender, age or skill. Symbolism maintains, negotiates, legitimizes and transmits such relationships. It is argued here that artefacts are not inherently imbued with symbolism and that modern human culture cannot be automatically inferred from inventories of archaeologically recovered material culture. Evidence for the out-of-brain storage of symbolism in southern African sites first appears in the final phase of the Middle Stone Age at about 40,000 years ago.

The South African Middle Stone Age (MSA) has been catapulted into the global archaeological spotlight, partly because some of the earliest remains of modern people have been discovered in South Africa (Thackeray 1992, 385). These are thought to predate remains from Israel dated to 115,000 BP (Schwarcz *et al.* 1988) but, as might be expected, controversy surrounds the interpretation of some of the African material. Rightmire (1989) and others (Bräuer & Singer 1996; Grine *et al.* 1998; Pearson *et al.* 1998) consider the Klasies River Mouth specimens to be fully within the range of modern humans, even though some archaic postcranial features remain (Pearson & Grine 1997). Wolpoff & Caspari (1990; 1996), on the other hand, argue that archaic features are still prominent. Some proponents of the 'Replacement' and the 'Out of Africa' hypotheses imply that modern humans from Africa arrived in Europe and displaced European Neanderthals; others, such as Neves *et al.* (1999) suggest that modern humans evolved in Africa around 120,000 BP then spread to the Middle East. Certain morphological studies (Holliday 1997) do indeed suggest that there was significant gene flow from Africa to Europe in the early Upper Palaeolithic but other results cast doubts

on this interpretation. Genetic studies by Hey and Harris distinguish two human populations dating at least to 200,000 BP: one group of modern Africans and the other of non-Africans (Pennisi 1999). Perhaps even more controversial than this debate over anatomical modernity is that over the origin of behavioural modernity. Sherratt (1999, 157) suggests that it is not yet possible to recognize the point at which biocultural parameters gave way to purely cultural ones; it is uncertain whether the change was completed early with anatomically modern humans in Africa, or whether it coincided with the later florescence of the Upper Palaeolithic in Europe. The issue needs to be seen in the light of the debate over cultural modernity in the European and Middle Eastern Palaeolithic.

The consensus view is that cultural modernity arrived rapidly in Europe. Artefacts believed by many archaeologists to herald modern behaviour appeared at about 40,000 BP in the Upper Palaeolithic, at approximately the same time that anatomically modern humans reached Europe (Klein 1994). Stringer & Gamble (1993, 177, 203) argue that the onset of symbolic behaviour can be compared to the flick of a switch — a creative explosion — while Bar-Yosef

(1998) calls it a revolution. These authors claim that an artistic burgeoning was coupled with an expansion in the range, style and raw materials of artefacts: long, slender blades, bone, antler, ivory artefacts, jewellery, ornaments and artworks appeared in the Aurignacian industry (Stringer & Gamble 1993, 179). Organizational complexity and deliberate structure are also associated with many Upper Palaeolithic camp sites, a characteristic that is missing from the Middle Palaeolithic camp sites occupied by Neanderthals (Mellars 1991; 1996a, 311; Farizy & David 1992; Kolen 1999).

A competing hypothesis that G.A. Clark (1999) calls the 'demographic compression model' sees change as gradual, with a sharp increase in evidence for symbolism, in the form of artefacts such as sculpture, engraving and ornaments, occurring only after 20,000 BP in Western Europe (Lindley & Clark 1990; Clark 1997, 38) claims that early Upper Palaeolithic bone and antler industries do not appear as developed or complex as those of the late Upper Palaeolithic, and that most of the cave art also dates to the late Upper Palaeolithic. He suggests that the clinal picture of change suggests gradual *in situ* development of these technologies, and of cave art, during the course of the Upper Palaeolithic and he argues that the industries were not suddenly imported from elsewhere. McBrearty & Brooks (2000, 454) also believe that the model of a revolution is 'fatally flawed' on the African continent, and refer to it as 'the revolution that wasn't'.

Further disagreement centres on whether modern behaviour made its first appearance in the Middle Palaeolithic. It is true that if we were to rely on a presence/absence list of those attributes that some archaeologists consider to incorporate symbolism, and therefore modernity, such as advanced lithic technology, we should have to conclude that Neanderthals were modern notwithstanding the biological evidence to the contrary (Holliday 1997; Stringer 1997; Turbón *et al.* 1997). Several 'advanced' Middle Palaeolithic industries are associated with Neanderthals (Foley & Lahr 1997, 6–8) who are said to have carefully planned their knapping strategy because they collected stone from distant sources (although not as frequently as moderns). Some Neanderthal sites, such as Arcy-sur-cure, are even said to contain worked bone and ornaments (Hublin *et al.* 1996) although recent research using microscopy (Villa & d'Errico 1999) concludes that bone and ivory tools are not present in Middle Palaeolithic sites in Western Europe. Klein (1994, 11) believes that Neanderthals were true hunters of large mammals,

without being as effective as 'Moderns' and Bar-Yosef (1994) suggests that true hunting developed during Mousterian times, but that Middle Palaeolithic people had smaller territories and were less mobile than their successors. Lithic assemblages associated with Neanderthals in the Levant appear to have had higher point frequencies than those of early modern humans, suggesting that Neanderthals used 'intercept' hunting on the steppes more than their modern neighbours (Lieberman & Shea 1994; Shea 1998).

Burial of the dead is accepted by many researchers as an indicator of cultural modernity, but the issue of deliberate Middle Palaeolithic burials, particularly those with grave goods, is disputed. Most Neanderthal burials originally thought to have been associated with grave goods have not stood up to careful scrutiny; the famous Shanidar IV 'Flower Burial', for example, is more likely the result of flower heads introduced through rodent action than the deliberate placement by mourners (Sommer 1999). In Israel, in Middle Palaeolithic levels at Qafzeh and Skhul, human skeletons together with a large deer antler and boar's jaw were thought to be deliberate burials with grave goods (Mellars 1991, 64; Bar-Yosef & Meignen 1992). Recently, however, the evidence for Middle Palaeolithic burials from Qafzeh, Saint-Césaire, Kebara, Amud and Dederiyeh has been challenged on the grounds of special depositional circumstances (Gargett 1999). Claims for the burial of an anatomically modern child, dated about 55,000 BP, at Taramsa Hill, in Egypt, are therefore of particular interest (Vermeersch *et al.* 1998).

The modernity debate is considerably complicated by Middle Eastern evidence suggesting that Neanderthals and modern humans may have co-existed for at least 50–60,000 years (Mellars 1991, 71). This co-existence has convinced some researchers (e.g. Karavanic & Smith 1998) that Neanderthals became acculturated through contact with modern people. As may be expected, this issue is also controversial and d'Errico *et al.* (1998, S21) believe that Neanderthals elaborated, used and transmitted autonomous codes for themselves. Bar-Yosef (1994), too, concludes that there is no clear difference between the behaviour of Neanderthals and Middle Palaeolithic modern humans in Southwest Asia.

Since no Neanderthals have been discovered in Africa, the African situation is quite different from that in Europe or Asia, and Pleistocene technological and behavioural changes there cannot be attributed to population replacement. Klein (1994) predicts that, since anatomically modern humans emerged first in Africa, the earliest archaeological evidence for fully

modern behaviour might also occur there. In 1992 he proposed that cultural modernity could be recognized through behaviour that includes true hunting, the recognition of seasonality and the production of artwork, blades and bone tools. Parts of this interpretation of modernity are fraught with problems (whether viewed in Europe or Africa), and I shall deal with these shortly.

There are certainly developmental trends in African technology that are out of synchrony with those in Europe. Blade production, and at some sites even bladelet production, begins early in the MSA of Africa, most notably within the Howiesons Poort Industry of South Africa where a precocious backed blade tradition is thought to date between approximately 80,000 and 60,000 BP (J. Deacon 1995, 119), possibly centring on a date of about 70,000 BP (Deacon 1992). The Howiesons Poort Industry is anomalous not only for its early appearance, which Vishnyatsky (1994, 134) calls 'running ahead of time', but because it is replaced by MSA industries that are similar to those of pre-Howiesons Poort. The presence of the Howiesons Poort Industry has been used to argue for early cultural modernity in Africa (H.J. Deacon 1995; Deacon & Wurz 1996; Wurz 1999). Yet, if the Howiesons Poort backed blade production was an important marker of modern human behaviour it is difficult to explain why it should have lasted for more than 20,000 years and then have been replaced by 'pre-modern' technology. Furthermore, blade replication experiments by Winter (2000) have shown that Howiesons Poort blades are unlikely to have been produced by the sophisticated punch technique that was suggested by Wurz (1997).

People practising an MSA technology in Africa occasionally manufactured bone tools. Indeed, there is some evidence that the earliest bone-working in the world may have come from Africa. A single worked bone point and a piece of notched bone was found in the Howiesons Poort layer of Klasies River Mouth (Singer & Wymer 1982), and more recently, a few worked bone points were found at Blombos Cave with an MSA 'Stillbay' Industry that may be as old as 80,000 BP (Henshilwood & Sealy 1997). Further north, in Zaire, barbed points and fishing implements have been recovered from Katanda MSA sites said to be of even greater antiquity (Brooks *et al.* 1995; Yellen *et al.* 1995) although some researchers question the reliability of the early date (Feathers 1996, 33). Worked bone is, however, either absent or extremely rare in MSA sites, even in those like Klasies River Mouth, Die Kelders, Cave of Hearths, Bushman Rock Shelter, Strathalan, Border Cave and Florisbad

where organic preservation is good. At Strathalan Cave, where grass and twigs have survived intact for 29,000 years, there are no ornaments or bone tools (Opperman 1996). Excavations at a KwaZulu-Natal site, Sibudu Cave, have also not produced any ornaments or worked bone pieces even in the organic-rich, recent MSA levels that are dated more recent than 42,000 BP (Wadley in prep.).

Probably all archaeologists are agreed that the presence of art and personal ornaments represents symbolic and therefore culturally modern behaviour. Early ostrich eggshell beads have been reported from some East African and southern African sites. Dates of between 37,000 and 40,000 BP have been obtained for ostrich eggshell beads from Enkapune ya Muto, Kenya (Ambrose 1998, 379). At White Paintings Shelter in Botswana, Robbins (1999, 11) found ostrich eggshell beads dated to 26,460±300 BP. Unfortunately some of the South African MSA beads, for example those from Bushman Rock Shelter and Cave of Hearths, are not reliably dated (Wadley 1993). Hilary Deacon (1995, 123) also points out that the two beads found in the 42,000 BP level OLP at Boomplaas need independent dating before their provenance can be accepted. The early date for the Kenyan beads does, however, suggest that the date for the Boomplaas beads is within an acceptable range. Border Cave is reported to have eggshell beads and worked bone at about 39,000 BP (Beaumont 1978). Engraved lines were found on an eggshell fragment from a Howiesons Poort layer in Diepkloof Cave in the Western Cape, and the level was dated older than 40,000 BP by AMS dating (Parkington 1998, 78). The only example of early painted artwork in southern Africa comes from Namibia where painted slabs from the final MSA level of Apollo 11 are said to date to about 27,000 BP (Wendt 1976). What is especially important about the paintings is that they are not merely iconic; one is an anthropomorphic image of a feline with human legs (Lewis-Williams 1984). This provides clear proof of symbolic thought and possibly also of shamanistic beliefs.

MSA art, ornaments and decorated items remain tantalizingly rare (Thackeray 1992, 421), notwithstanding the evidence to suggest that African jewellery originated at about 40,000 BP and that artwork dates back to about 27,000 BP. On the one hand, these MSA 'sports' can be viewed like those from the Middle Palaeolithic which, as Mellars (1996a, b) suggests, should not have symbolic meaning ascribed to them because they are so rare that they do not incorporate information flow and widely-shared cultural values. On the other hand, it is possible to claim that

repetitive patterning is not necessary; isolated instances are said to represent behaviour that may be more widespread than can be detected archaeologically (Duff *et al.* 1992, 214).

Hilary Deacon (1995, 128) maintains that it is inappropriate to apply eurocentric criteria when defining modern behaviour in the African context. He therefore discounts the importance of artwork, ornamentation and bone-working for an African definition of cultural modernity. For Deacon, modern behaviour in an African context comprises a nuclear family basis to foraging groups, with social mechanisms for aggregation and dispersal, spatial rules of cleanliness, colour symbolism and reciprocal exchange of artefacts, active hunting of all sizes of bovids, and management of plant food resources through burning of the veld (H.J. Deacon 1995, 129). Deacon believes that these forms of behaviour were present as early as 100,000 BP in southern Africa (H.J. Deacon 1995, 128–9). His evidence is drawn partly from the coastal site of Klasies River Mouth which was occupied for much of the MSA. Here the hob-sized hearths are said to be domestic cooking hearths and Deacon infers nuclear families from this evidence. The discrete circular hearths and discrete middens of bone and shell food waste that occur in both MSA and LSA (Late Stone Age) occupation levels encourage Deacon to think that people in both ages were living by the same rules of space and cleanliness. Furthermore, MSA people ranged more widely than ESA (Early Stone Age) people, suggesting to Deacon that MSA people had the social mechanisms for aggregation and dispersal. He also proposes that the presence of non-local rocks in the MSA Howiesons Poort Industry implies a system of exchange. He uses the presence of red ochre in the MSA as evidence for personal ornamentation and symbolic behaviour, a view that is shared by others (Knight *et al.* 1995). The issue of whether the Klasies River Mouth inhabitants were true hunters has been debated since Binford's (1984) suggestion that bone at the site was merely scavenged. In a recent taphonomic study of bone from Die Kelders Cave, Marean (1998, 113) has been able to demonstrate that scavenging was not the dominant exploitation strategy in the MSA. Active hunting unquestionably took place: at Klasies River Mouth Cave 1 the tip of a stone point, presumably a projectile point, was found embedded in the vertebra of a giant buffalo (Milo 1998). Studies of the Klasies River Mouth fauna seem to confirm that hominids here were the regular accumulators of bovids in all size classes and that they formed organized task groups for hunting (Milo

1998). This skill need not imply symbolic sophistication any more than understanding 'natural history', for example in the form of seasonal mobility (Mithen 1994). Even so, there is some evidence that MSA people may not have understood animal seasonality as well as LSA people. Klein's (1989, 540–42) study of faunal remains from the Klasies River Mouth MSA levels and from the Nelson Bay Cave, Elands Bay Cave and Die Kelders Cave LSA levels suggests that MSA people were unaware of the seasonal possibilities for hunting seals whereas LSA people took advantage of seal seasonality. In the LSA sites people timed their visits to coincide with the seal weaning season when newly weaned seals were particularly vulnerable (Klein 1989, 541).

I agree with Deacon that eurocentric criteria are not necessarily appropriate for the interpretation of the African past and I consider that his emphasis on the behavioural aspects of modernity is important. Cultural modernity needs to be defined in a way that focuses on behavioural issues first, and thereafter on material culture correlates. Nonetheless, both Thackeray (1992) and I feel less secure than he about the recognition of early symbolism or modern social behaviour from the evidence that he presents. Deacon's conclusions may be correct, but there are alternative explanations for his data.

First, the presence of pigments is cited as compelling evidence for modern symbolism, but pigment has many well-known secular functions. Ochre has medicinal qualities: it has an astringent effect, arrests haemorrhages and has antiseptic and deodorizing properties (Velo 1984, 674). Ochre can be used in the preparation of hides: it colours and protects leather from bacterial action (Sollas 1915; Keeley 1978; Audouin & Plisson 1982). It can also be smeared on the body as protection against cold, sun and insects, and it can be eaten (Pitsi pers. comm. and Wadley pers. observ.). At Rose Cottage Cave, plant and animal residues on MSA stone tools were heavily impregnated with ochre (Williamson 2000 and pers. comm.). This suggests that pigment may have been part of the extraction or processing of plant and animal products. At Sibudu Cave some MSA points and blades have heavy encrustations of ochre on their butts (Williamson pers. comm.) and the pigment may have been part of the mastic or binding materials with which these artefacts were hafted. Some European artefacts are also thought to have had pigment incorporated in their mastic (Allain & Rigaud 1986). Thus pigment is known to have several secular uses and it would seem unwise to assume ritual use simply from its presence. While it

cannot be proved that pigment was not used for ritual purposes in the MSA it is difficult, in the absence of supporting evidence, to be sure that it was.

Secondly, cooking fires are not the sole prerogative of nuclear families and, as has previously been observed, disposal of waste is not necessarily a modern trait, nor is it necessarily a human trait. Thirdly, even non-human primates aggregate and disperse (Boesch 1996), and it is not this practice *per se* that marks modernity. Rather, modernity is indicated when aggregations are manipulated to serve social ends, for example, to facilitate ritual, marriage negotiations and gift and information exchange (Wadley 1987). There is currently little evidence to show that this type of aggregation existed in the Howiesons Poort phase. Although Deacon believes that non-local rocks were used for gift exchange of the kind carried out in modern aggregations, the rocks may simply have been collected while people were foraging widely.

Clearly, in order to resolve the debate as to when cultural modernity began, what needs to be established is the point at which technology started to participate in the social lives of people. Before attempting to do this, however, it is useful to review current thought on the definition of cultural modernity.

Defining cultural modernity: a review of current thought

Some archaeologists insist that, in order to qualify as modern, Stone Age or Palaeolithic peoples' behaviour must be comparable with that of a wide range of hunter-gatherers observed in recent and historic times. While this position has some validity it is potentially dangerous and can apply only in the broadest, most generalized sense. Anything more than this would be an invidious, ahistorical approach insinuating that modern hunter-gatherers are fossilized Stone Age people. Looking at modern hunter-gatherers is, however, a salutary exercise because it demonstrates that it is quite wrong to claim that a 'set of essences' should be present before we can acknowledge cultural modernity. Modern hunter-gatherers may, for example, practise burial with grave goods, or have an artistic tradition, but not all do. Nevertheless, some archaeologists still seek a *set* of material culture items for the recognition of cultural modernity, although they accept extant hunter-gatherer behavioural variability. It is perhaps the expectation that the earliest modern cultures should share the same range of economic and social structures

and material culture as extant hunter-gatherers that has contributed to the fierce debate about the timing and definition of modern culture. More important, however, is the paradigmatic variability in archaeological thought.

Explanations for the rise of modernity fall into two broad divisions: those that emphasize biological change and environmental influences, and those that give primacy to social change. Klein and Gibson fit within the first division. Klein argues that it makes most sense for modern social behaviour to have originated together with anatomical modernity. He believes that the modern behavioural breakthrough, which allowed humans to manipulate culture as an adaptive mechanism, reflects 'the last in a long series of biologically based advances in human mental and cognitive capacity' (Klein 1992, 12).

Gibson (1996, 41) proposes that the critical search is for climatic, ecological or cultural factors that led to sporadic early inventions of Upper Palaeolithic tools and art forms. She concludes that the introduction of seasonal mobility by the 'Moderns' distinguished them from the 'Ancients'. A migratory lifestyle enabled the 'Moderns' to use their environment to best advantage, and paved the way for interactions such as long-distance trade and seasonal aggregations and dispersals (Gibson 1996, 42–3). Gibson's hypotheses are partly supported by those of Lieberman & Shea (1994) who infer that seasonal mobility differences are apparent between at least some modern and archaic human groups in the southern Levant. 'Ancients' are said to have been more residentially mobile (multi-seasonal) than 'Moderns' who practised circulating seasonal mobility (Lieberman & Shea 1994). The modern human pattern of circulating seasonal mobility would have required monitoring of resources in order to anticipate the point of diminishing returns (Lieberman & Shea 1994, 316). Notwithstanding this, the radiating mobility that 'Ancients' are said to have used (Lieberman 1993) can also be seen as a complex form of subsistence (Belfer-Cohen 1993). If Gibson, Lieberman and Shea are right that only 'Moderns' aggregated and dispersed and used circulating seasonal movements, this would have given them an advantage over the 'Ancients' during harsh periods when resources were especially scarce, because 'Moderns' had the mechanisms to disperse into smaller groups that required fewer resources for survival. Not all archaeologists, however, believe that Neanderthals lacked circulating seasonal strategies. Henry (1992) infers seasonally different occupations at Tor Sabiha and Tor Faraj in the Levant at about

65,000 years ago. Using Mithen's (1994; 1996) interpretation of cognitive development, it could be argued further that 'natural history' intelligence, and therefore an understanding of the benefits of seasonal mobility, could have been highly developed well before the appearance of cultural modernity. Since chimpanzees practise aggregation and dispersal for subsistence and mating strategies (Stanford 1995; Boesch 1996) it seems unlikely that early hominids would have lacked this mechanism.

To some extent Mithen's (1994) cognitive interpretation of the Middle to Upper Palaeolithic transition bridges the divide between biological and social explanations. He suggests that 'Ancients' had 'domain specific' intelligence that kept social and technical behaviour separate, whereas 'Moderns' were able to use 'generalized intelligence' (Mithen 1994; 1996). Generalized intelligence enables people to link aspects of social, technical and natural history intelligence to create new and sophisticated ways of thinking. Thus modern people are able to explore and exploit the nonsocial world using thought processes that originally evolved for social interaction (Mithen 1994, 35). Mithen uses the examples of people bargaining with nature (for example through prayer), and anthropomorphic thinking, but the social use of space would constitute an equally good example and the issue of spatial intelligence has been addressed by Brown (1993).

For many archaeologists the fundamental difference between modern and ancient behaviour is social (Stringer & Gamble 1993, 213; Soffer 1994). In this reading, the main difference distinguishing 'Moderns' from 'Ancients' is the practice of symbolically organized behaviour (Chase & Dibble 1987; Stringer & Gamble 1993, 207; Soffer 1994; Mellars 1996a,b; Wynn 1996). All modern cultures share an underlying similarity in that behaviour is largely symbolic, and in that individual cultures are identified and transmitted through the learning of these symbols (Chase & Dibble 1987, 264; Gamble 1998). Symbolic systems are complex and Terrence Deacon (1997, 379) claims that even a small, inflexible and inefficient symbol system is difficult to acquire. This is partly because there is an ordered descent from symbolic to indexical to iconic referencing (Deacon 1997, 74). An iconic reference 'presents something again'; for example, a picture of an eland depicts the living animal. An index is this and more: one thing becomes an index of another by seeming to 'point to' it (Deacon 1997, 77). Eland hoof prints in the sand can become an index for the animal through association. Symbols are constituted by relationships among

indices and, consequently, also among icons (Deacon 1997, 78) but, unlike icons and indices, symbols point arbitrarily to their referents. The word 'eland' has no natural link to the animal. In a further development, when an eland becomes a metaphor for a shaman, then cultural symbolism is in place.

Cultural modernity should not, however, be linked simplistically to the symbolic faculty. A compelling reason for caution is the outcome of language laboratory experiments carried out with non-human primates. These show some provocative instances when non-human primate behaviour can be interpreted as symbolic. Kanzi, the bonobo chimpanzee, is able to use lexigrams in what Savage-Rumbaugh & Lewin (1994) describe as a clearly symbolic way, although it could be argued that indexical referencing is a better description. Kanzi and the other chimpanzees in the Savage-Rumbaugh experiment can string words together to form sentences, and can compile new and meaningful sentences when provided with new lexigrams. Although Kanzi can be taught, with considerable effort, to decode and use lexigrams he would not have used them in the wild and he cannot discover them or transmit information about them to a wider ape community. The lesson is clear: we cannot look to hominid physical development to trace the origins of symbol use because the neurological capacity is already in place in non-human primates. The definition of modern behaviour depends not on the *capacity* for symbolic thought but rather on the *use* of symbolism to organize behaviour.

It is apparent also that modern language is not a prerequisite for symbol use. This point has long been made by Sperber (1974, 118) who shows that certain smells (such as incense) belong in the area of individual symbolism. Such a symbolic phenomenon as smell bypasses any form of coded communication and confirms the independence of symbolism from verbalization. Language, nonetheless, is not independent of symbolism. This apparent contradiction is deliberate: some linguists advocate that language is not the same thing as speech: speech is only a medium for language and it is not even the only one that humans use (Trask 1998, 70). Speech is what Tobias (1998, 72) refers to when he insists that *Homo habilis*, with its developed Broca's & Wernicke's areas, had the neural bases for talking. Vocal ability did not, when it first occurred, necessarily lead to language with its underlying symbolic nature. Speech (or *talking* as Davidson & Noble call it) emerged before language (Davidson & Noble 1998, 86), and words can serve indexical functions with minimum

symbolic content (Deacon 1997, 80).

The biomechanical and neural structures of speech are taken for granted when looking at modern language. Modern, syntactical language must also involve the interweaving of grammar, a symbolic (semiotic) ability, and knowledge of how to use language (pragmatics) (Wynn 1991, 192). While language serves many social functions, it also enables us to make sense of the world, to construct a mental picture of the world and to organize sensory experience (Trask 1998, 71). There is no reason to believe that all these components evolved as a unit (Wynn 1991, 192). Children, for example, are well able to communicate before they reach the stage of abstract thought (Henry 1992). Although it is a contentious issue, the concept of an evolving language conceptually fits well with Terrence Deacon's (1997) proposal that symbolic, syntactical language developed gradually rather than as a point of entry, an interpretation that supports, in part, Bickerton's (1996) idea of a protolanguage that lacked syntax.

The nature of language makes it impossible to recognize archaeologically. Circumstantial evidence is our only hope for recognizing language. Davidson & Noble (1998, 88) suggest that colonization of Australia and the Americas required delayed intentionality and planning abilities that only language would have permitted. Other researchers suggest that there may be a link between language development and tool-making behaviour (Steele *et al.* 1995), but this issue is by no means clear-cut. Wynn (1991) showed that the techniques of knapping can be easily demonstrated (rather than taught) by an artisan. Tool-making and tool-use are therefore organized and learnt in a simple way, with connecting actions that are learnt by rote and repetition, which is unlike the learning of a language and the construction of a sentence.

This does not mean, however, that because demonstration is rendered inadequate when style is introduced to tool-making language is always irrelevant to knapping. When cultural traditions become important to the imposition of style on artefacts then social rules must be taught. This is the type of learned transmission that Ingold (1996) refers to when he discusses the differences between demonstration and teaching. Execution, technique and practice can be demonstrated, but the transmission of self-conscious design (style), rules and theory requires teaching, and symbolic language is essential for teaching of theory (Ingold 1996, 195, 200). Symbolic language also enables temporally deep and spatially broad extensions of social relations (Byers 1999, 29).

Terrence Deacon (1997, 378) suggests that the first symbol-users probably carried on most of their social communication through call and display behaviours. Symbolic communication was likely to have been only a small part of social communication. This would certainly have been influenced by the fact that neurologically and semiotically symbolic abilities do not necessarily represent more efficient communication; rather, they represent a radical shift in the strategy of communication (Deacon 1997, 379), a shift that must have been socially driven. The challenge, of course, is to recognize such a communication change in the archaeological record and to resolve the chronology of these developments. Opinion is divided on whether cultural modernity appears as an 'event' (that is, a rapid arrival that may look like an event in the archaeological record), or as part of a process. Once behaviour became symbolically organized, modern traits probably progressed rapidly because the concept of using symbolism to organize behaviour can quickly be adopted in all forms of culture. Taking this viewpoint, Lee (1991, 209) suggests that evolution is change, not progress.

Recognizing cultural modernity in the archaeological record: an emphasis on symbolic storage

From the multiplicity of viewpoints on the origins of symbolism and the modern mind it is apparent that part of the cause for disagreement between researchers has been a lack of definitions for key concepts such as cultural modernity. Another problem is that some researchers use a 'shopping list' approach to cultural modernity that places a heavy emphasis on the presence or absence of prescribed classes of material culture rather than on the presence of modern social behaviour. This approach is theoretically flawed because there is no *a priori* reason for linking new techniques to symbolism. Artefacts are not automatically imbued with symbolism; that happens only when they are used to define or mediate social relationships. As Sperber (1974, 33) puts it, technical objects can only become symbolic through their motivation. Although some technological innovation may, indeed, have coincided with the first appearance of modern behaviour, the two cannot simplistically be linked, particularly when the artefacts concerned played a secular, economic role. Thus it is not the invention *per se* of lithic spearheads or bone points and awls that proclaims symbolism and modern behaviour, but rather the subsequent use of these artefacts for purposes such as the definition or nego-

tiation of individual or group identity. Modern behaviour is, then, about social organization and relationships that are expressed, negotiated, legitimized, maintained and transmitted through symbolism. Such behaviour may be recognized through the symbolic manipulation of space and material culture. A salient present-day example of how material culture can be exploited is provided by the athletic shoe industry where there has been an explosion of styles because the shoes have become social symbols as well as aids to athletic performance (Kuhn & Stiner 1998, 155). A social message is both stored and displayed in the shoes.

Donald (1991) proposes that symbolic storage external to the brain is the final of three stages of symbolic evolution. The first stage is symbol use (without symbol creation) and the second the construction of conceptual space using language. In the third stage, when symbolic storage takes place, material culture, for example athletic shoes, intervenes directly in social behaviour. When Donald first wrote about symbolic storage he was thinking specifically of writing, but with some adaptation his definitions can be used for the Stone Age. In a later publication (Donald 1998, 15), he suggests that external memory storage and the transition to 'symbolically-literate' societies began in the Upper Palaeolithic.

When Donald's model is employed it can be suggested that an early stage (mimetic) of symbol use may have occurred during the Acheulean. Wynn (1996, 273–4), using much older cognitive theory, concludes that the origins of symbolism are to be found in incipient style that is evident in bifaces of the late Acheulean. In his use of Piaget's model for the development of intelligence, Wynn suggests that the geometry of Acheulean tools exhibits a minimal level of operational thought. At the level of operational thought a modern child can use symbols, and Duff *et al.* (1992, 221) argue that a hominid that made stone tools also had some capacity to use symbols.

Donald's evolutionary model is contentious but it is useful to retain that part of the model that successfully defines cultural modernity in a way that allows it to be recognized archaeologically: the creation and storage of symbols outside the human brain. For Terrence Deacon, paintings and engravings are the first concrete evidence for the storage of symbolic information outside the human brain and they represent a shift in communicative strategy that also implies a change in social relationships (Deacon 1997, 374, 379). It may even be possible to recognize a hierarchical development in artwork. Depending on

the social context in which the image is used, an iconic representation of an animal may not be as complex symbolically as the image of an anthropomorphic creature, which is a symbol used by modern humans to conjure images that bridge tactile and imaginary worlds. This disputatious subject is, however, too large to be discussed here.

While artwork is the most obvious example of symbolic storage outside the human brain, other symbolic storage in the Stone Age context could include personal ornamentation such as jewellery, lithic style and the social use of space. Jewellery can be seen as style that could signify a form of cultural identity. Ornamentation provides information about its wearer; this information is a culture-specific code. It might be impossible for archaeologists to crack the code, but it is not difficult to recognize its symbolic content. The other two storage types are rather different; lithic style is an archaeological construct, even though archaeologists assume that emic factors are involved in the choice of artefact style. It can further be argued that campsite spatial patterns are accidental rather than deliberate storage. Nonetheless, both style and the social manipulation of space engage material culture with social behaviour in a way that must be interpreted as symbolic.

Active style is defined as repeated patterning that is spatially and temporally restricted (Sackett 1977; 1982; 1990). People invest active style in material culture that plays a role in social action, and style then takes on a symbolic role. Tool-making style therefore informs about cognitive development but, as may be expected, there are conflicting opinions about the potential for recognizing style in lithics. Chase (1991) claims that style remains an index that exists only in the mind of the archaeologist, but Wynn (1996; 1998) argues that the consistent use of style and the rapid turn-over of stylistic traits among artefacts provide tangible means of identifying modernity. He believes that by 30,000 years ago in Europe the shapes of lithic tools behaved in the volatile fashion typical of modern style in that new forms appeared rapidly, became popular, then died out (Wynn 1996, 279). Often the distinctive tools were limited in their geographic distribution and it seems that the style of artefacts acted as an index of social identity (Wynn 1996, 279). What is important, suggests Wynn, is that something of social complexity was being communicated, however crudely, through a technological medium.

Although there is no general agreement that active style or symbolism played an important role in Europe before the Upper Palaeolithic, it is some-

times suggested that the symmetrical handaxes of the Early Stone Age imply symbolic thought because there seems little functional reason for their aesthetically pleasing appearance (Foster 1980). While there may be evidence for a sense of aesthetics in the symmetry of artefacts in the Lower and Middle Palaeolithic, there is no evidence that this use was linked to symbolism before the Upper Palaeolithic (Chase & Dibble 1987, 280). Wynn (1996, 269) even counters the idea that symmetry was deliberate, saying that a biface can be produced without the concept of symmetry because the thinning and shaping of a biface was undertaken to impose a specific morphology, a form needed to produce a sharp cutting edge. For this reason, biface form does not represent active style. Bifaces are similar across huge distances and they existed for more than a million years, suggesting that they did not play the kind of role that modern material culture does (Wynn 1998, 80). Active style is also not apparent in Middle Palaeolithic technology (Chase & Dibble 1987, 271), which Dibble & Rolland (1992, 18) believe is driven by forms of raw material and by the intensity of utilization which alters the appearance of tool types. Similarly, in southern Africa the Howiesons Poort Industry seems to present a dramatic stylistic shift from the MSA tradition, but it lasts for over 20,000 years and consequently does not display the rapid turnover of style that characterizes more recent southern African industries. Of course, it must be remembered that the concept of a rapid turnover of style is relative: a turnover of several hundred or two thousand years is rapid when we are dealing with the MSA or LSA, but such a rate would, in today's terms, be considered stasis.

Gamble (1998) proposes that material culture displaying style is least used among the immediate household, relatives and friends where daily contact makes coding and stylistic transmission of information unnecessary (Gamble 1998, 433). It is among extended networks (with between 100–400 people) that symbolic or stylistic resources are most effectively used, and Gamble claims that Palaeolithic societies did not use symbolic resources until they had extended networks (Gamble 1998, 440). If this is correct, then the first social marking of aggregation with stylistic resources may date to the time when networks were introduced. Symbolic language should also have been present at this time because, as Byers (1999) suggests, it would have allowed geographically widespread relationships.

A self-conscious and deliberate use of space for social ends is also a culturally modern trait. Peoples'

use of space reflects their relationships with others and with their cultural environment. The nested circles of intimate, social and public space can be manipulated to create culturally-specific social messages. Further, a modern use of space in a hunter-gatherer context can involve significant groupings based on attributes such as kinship, gender, age, status or skill, and this use of space is symbolic. In the archaeological context it is theoretically problematic to make inferences about social groupings, particularly where that involves transferring patterns of behaviour observed in the recent past to people who lived in deep antiquity. Despite this caveat, and despite practical difficulties caused by occupational palimpsests, human disturbance and site formation processes (Mellars 1996a, 308; Gowlett 1997), useful studies can be made of changing spatial patterns without specifying the social groups involved. As Kolen (1999, 141) suggests, the 'mythical ordering of space' in dwelling places is characteristic of almost all modern humans.

In Europe, Middle Palaeolithic sites are said to lack evidence for the use of symbolism in the spatial layout of camp sites. Hearths were inconsistently placed during different, successive episodes of occupation in the same site, and there were no complex built hearths of the kind attributed to the Upper Palaeolithic (Stringer & Gamble 1993). It is, however, the positioning of artefactual and other debris that best demonstrates the unstructured nature of Middle Palaeolithic camp sites (Mellars 1996a, 309). Cave 16, in the Dordogne, a late Mousterian layer, contains hearths that are less complex than those associated with the Upper Palaeolithic, even though the Mousterian occupants seemed to understand the use of distinct woods for fuel (Rigaud *et al.* 1995). At Cave 15, Couche VIII, refuse deposits have redundant clusters with little of the variation exhibited in Upper Palaeolithic levels (Simek 1987). At Grotte Vaufray, the Mousterian occupation clusters are repetitively unstructured (Stringer & Gamble 1993, 157–8) although lithic flaking debitage and bone splinters tend to be closely associated with Mousterian hearths, suggesting that various stages of tool production and the processing of food took place together around hearths (Mellars 1996a, 310). Large bone fragments were sometimes on the margins of occupation areas (Mellars 1996a, 310), indicating that the main occupation areas were kept clear of at least some debris. The practice of moving materials outward from activity areas results in what Kolen (1999) describes as centrifugal living structures.

Internal organization is therefore present in

Middle Palaeolithic sites — some activities occurring in close proximity to hearths, other activities located primarily in more marginal areas — but similar patterns of use are present in ESA sites such as Olduvai and Koobi Fora, and even amongst some non-human primate groups (Mellars 1996a, 311). Indeed Pettitt (1997, 219) points out that Neanderthal organization of space seems to have been on such simple lines that it cannot be distinguished from that of carnivores that divide space into living and dumping zones. To qualify as modern, spatial patterning needs to be more complex than mere disposal of cumbersome waste and a coincidence between tools and food waste (Mellars 1996a, 313).

In Europe it is only in Upper Palaeolithic settlements that complexity can regularly be recognized in the recurrent patterning of spatial organization (Audouze 1987; Hahn 1987; Enloe *et al.* 1994; Audouze & Enloe 1997). Activity areas are sometimes marked by discrete concentrations of specific tool types (Audouze 1987). Main hearths are flanked by the remains of flint-knapping and game-processing activities, and refuse middens are separate. At Pincevent, auxiliary hearths were located at the periphery of occupation units and seem to have been used for craft activities rather than cooking (Audouze 1987, 188). Similar patterning is evidenced in Geissenklösterle Cave in Germany, where areas for chert-flaking, ivory-working, pendant manufacture, and hide-working could be distinguished (Hahn 1987, 258). At Le Flageolet 1 all three Upper Palaeolithic horizons feature a single hearth as the focus of deposition, with small and dispersed clusters of limited sets of artefact classes; variability characterizes the extensive activity areas (Simek 1987). The centralization of Upper Palaeolithic economic and social activities may reflect factors such as mutual cooperation and sharing in family units, or more generalized communication between people engaged in communal tasks (Mellars 1996a, 314).

Although this article has been limited to discussion of four types of out-of-brain symbolic storage this does not mean that these are the only types that existed. Future work may identify more. The four types of symbolic storage described here — art, personal ornamentation, style in lithics and the formal use of space — need not be linked in a package for modern symbolic behaviour to be recognized. Any of these behaviours alone is sufficient to confirm cultural modernity. Once people begin to store symbolism outside their brains they are modern; the frequencies of different classes of symbolic storage are irrelevant.

Rose Cottage Cave

Background

Rose Cottage Cave (Fig. 1), near Ladybrand in the eastern Free State, was excavated in the 1940s by Malan and in the early 1960s by Beaumont; the more recent excavations by Wadley have taken place since 1987 (Wadley 1997). It is a large cave that has been repeatedly occupied through the Middle and Later Stone Age. The deposit is more than 6 metres deep and occupation is thought to extend over more than 100,000 years.

The fine-grained dark-grey deposits, rich in organics, probably comprise decomposing animal and plant material discarded by the Stone Age occupants of the site. Smith's (1997, 138–42) study of the cave sediments from Late Pleistocene and Holocene layers has shown that the Rose Cottage sediments are overwhelmingly C_3 in nature, compared with sediments taken from outside the cave which are overwhelmingly C_4 and which reflect the grassland environment on the hillslope. The C_3 sediments in the cave must thus incorporate leaves for bedding, firewood and edible plants that were brought into the cave by its inhabitants. Some leaves may have blown into the cave, but the enormous boulder that almost entirely seals it, except for two entrances and a skylight, would have limited the amounts of windborne material. Sediment formation and site formation processes at Rose Cottage thus seem to have been predominantly anthropogenic, a factor which has important implications for spatial studies. No buried artwork has been found at the site and eggshell beads do not predate 12,000 BP. Reliance is therefore on lithic style and spatial patterns for evidence of behavioural modernity.

Style in lithics

Rose Cottage Cave is one of a handful of South African sites that contains Howiesons Poort and pre- and post-Howiesons Poort industries (Wadley & Harper 1989; Harper 1997). In addition, the site contains a final MSA in layer Ru, dated to about 28,000 BP (Table 1), a Transitional MSA/LSA Industry in layer G2, dated to about 20,600 BP, and a long LSA sequence (Wadley 1997). Harper (1997) has shown that there is continuity of some morphological traits between the Howiesons Poort and the pre- and post-Howiesons Poort lithic industries, and the change in technology from the MSA to the LSA also seems to have been a gradual process (Clark 2000). The Transitional MSA/LSA industry contains MSA retouched tools, such as knives, points, large sidescrapers,

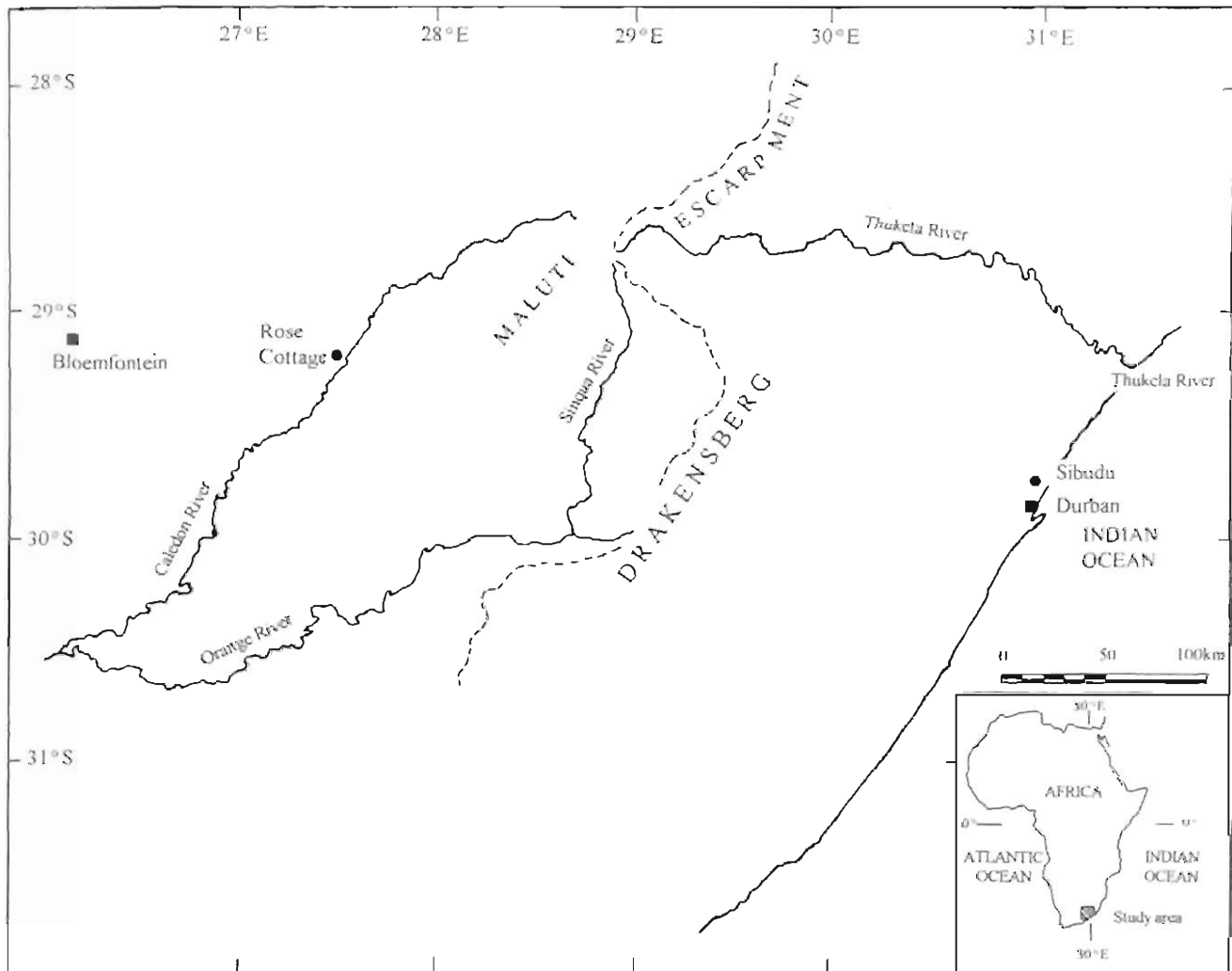


Figure 1. Geographical position of Rose Cottage Cave and Sibudu Cave.

denticulates and MSA radial cores, together with LSA methods of flake production in the form of bladelets and irregular bladelet cores.

Lithic classes are an archaeological construct that arguably may have had little meaning for the stone knappers. Nonetheless, tool classification by classes is not only a useful descriptive means but also a useful means of examining change through time, and of assessing whether a wide range of activities took place. When classes are rich it is likely that there is a representative sample of a wide range of activities. Thus the penultimate MSA layer Dc has a profile (Table 1) suggesting an occupation site at which a wide range of activities was carried out. Layer Dc is sandwiched between layer Dy (also called YD) dated to $30,800 \pm 200$ BP and layer Ru, which has a basal date of $28,800 \pm 450$ BP. The final MSA layer, Ru,

has a similar profile to that of Dc (Table 1), but seems to represent a far more substantial series of occupations.

Active style in Rose Cottage Cave lithics seems to have arrived before the appearance of the MSA/LSA Transitional Industry. The Dc layer has standardized, microlithic clear opaline retouched points of a type not present anywhere else in the cave, but these disappeared by about 28,000 BP in the final MSA layer, Ru, where standardized knives and a few stemmed points occur (Clark 2000). Such volatile stylistic replacement fits Wynn's expectations for cultural modernity. Clark's (2000) analysis of the chain of operations in lithic technology also shows that a bipolar technique of flaking was common in the MSA and MSA/LSA Transitional Industry layers, whereas the indirect punch technique is more likely to have been a feature of bladelet manufacture

in the LSA. At Sibudu Cave, lithic style seems to be represented earlier at 42,000 BP, when distinctive hollow-based points appear. These tool types were also found in the final MSA layers of Umhlatuzana Cave (Kaplan 1990), which is about 100 km northwest of Sibudu. To my knowledge, the hollow-based points do not occur elsewhere in southern Africa and represent a local style of short duration.

Spatial patterning

Large-scale excavations covering 32 m² have reached layers dated 31,000 BP and 20 distinct layers have been recognized between 31,000 BP and 500 BP. The spatial analysis of artefacts and debris has been conducted using Whallon's (1984) unconstrained clustering technique. This method produces density contours calculated from the percentages of items occurring in individual metre squares across the excavation grid.

In layer Dc, hearths are close together and 20 hearths with a mean inter-hearth distance of 0.4 m were excavated (Fig. 2). The combination of these hearths and several ash smears gives the layer a messy appearance. If successive visits are represented in Dc then the newcomers probably made fresh hearths rather than re-using existing ones. Such inconsistent placing of hearths is also a feature of the Middle Palaeolithic of Europe (Stringer & Gamble 1993) but, unlike the European sites, Rose Cottage has a particularly high density of hearths and artefacts. The deposit thickness varies between five and twenty-five centimetres and the excavated volume of deposit was 2.4 cubic metres (Table 1). More than 23,500 lithic pieces were dispersed across the floor in the area of the excavation. Knapping debris, in the form of chips, chunks, cores, and broken flakes and blades, is inextricably mixed with whole flakes and blades, retouched pieces and colouring material so that no discrete activity clusters can be detected. A slightly higher concentration of lithics occurs in the centre of the excavation (Fig. 2).

Refitting of lithic artefacts in layer Dc is under way. The exercise is daunting because of the size of the assemblage; nonetheless, items from widely-spaced squares have already been conjoined (Field & Winter pers. comm.) suggesting that the stratum has integrity. The refitting cannot prove that there were not multiple visits to the site, but it can give some idea of the spread of activities during a single occupation, and can also suggest connections between hearths or features such as pits. While it could be argued that some pieces were recycled during different, perhaps seasonal, occupations of the same

layer, it is apparent from excavating the powdery deposits of the site that dropped items nestle quickly and irrevocably from view. It is therefore most likely that serviceable flakes would have been selected for use at the time of their manufacture. Furthermore, the high density of lithics in Dc suggests that recycling may not have been a popular option.

Layer Ru, which immediately overlies layer Dc, also has a depth varying between five and twenty centimetres and has a similar scattered and unstructured spread of artefacts to that in Dc. The density of artefacts is, however, considerably greater than that in layer Dc because approximately 61,000 lithics occur in Ru in only 1.9 cubic metres of deposit (Table 1). The enormous density of lithics suggests that layer Ru represents multiple occupations. Two hundred and sixty-one formal tools separate into twenty-four classes and a wide range of activities must be represented by this distribution. No separate activity areas can be discerned but a smudge of artefactual material occurs between grouped or overlying hearths in the grid centre. Separate activity areas are also not apparent in the layer below Dc, layer Dy. This is especially significant because Dy has a low density of lithics compared to the other MSA layers (Table 1), and it may represent a short occupation (Allott 2000, 77). Most hearths, lithics and refitted lithics were recovered from two-thirds of the excavation grid in the western part of the cave. No refits were possible between this area and the remaining one-third of the excavation grid (Allott 2000, 77).

The unstructured spatial patterning of the Rose Cottage MSA is not alone in the southern African context. The c. 121,000 BP occupation floor at the open site of Florisbad had scattered bone and artefactual material around a single hearth (Kuman 1989). At Klasies River Shelter 1B, in MSA layers thought to date between 80,000 and 70,000 BP, shellfish were cooked and some shells were dumped away from the hearths. Apart from this, however, there was no observable structure to the location of artefacts or food waste (Henderson 1992). At Strathalan B, the 29,000 BP occupation (Opperman 1996) contained dispersed scatters of bone and lithic artefacts near hearths, and in grass concentrations that may represent the remains of sleeping areas. Although the evidence for MSA spatial patterning is not prolific in South Africa, what is available suggests unstructured camp organization with a clutter of artefacts and food waste usually in close association with hearths. Some evidence for refuse dumping is present but, apart from food processing or cooking, no special purpose activity areas can be recognized.

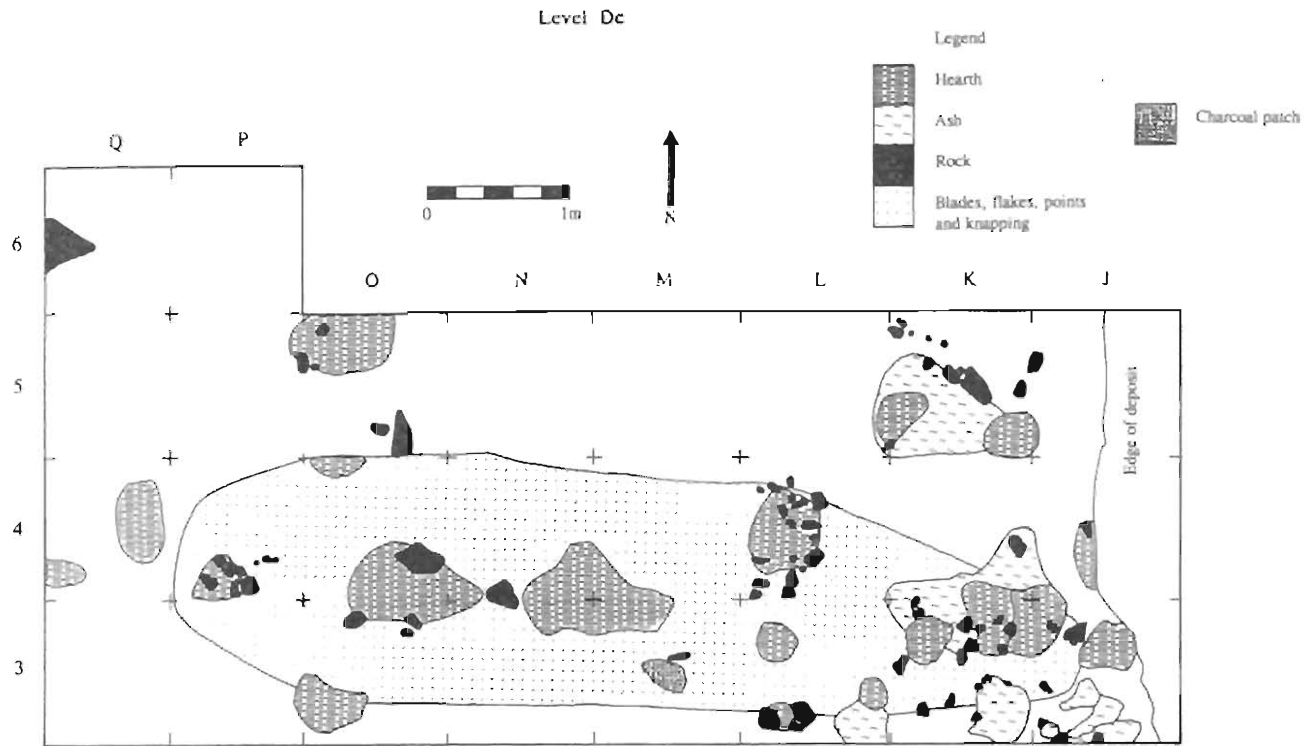


Figure 2. *Rose Cottage Cave: spatial distribution of features and artefacts in layer Dc.*

This is the same type of patterning that occurs in the Middle Palaeolithic where it is not considered modern (Mellars 1996a). It may not, of course, be wise to stress similarity between MSA and Middle Palaeolithic spatial patterns because two different hominids are responsible for their creation.

A change in the structure of space is apparent in Rose Cottage at about 20,600 years ago, in layer G2 containing the Transitional MSA/LSA Industry. Here there are fewer and more widely spaced hearths than in the MSA layers, and knapping debris and other artefacts occur in multiple clusters around the hearths. Colouring material lies around a single hearth. Layer G2 varies in thickness from five to twenty-five centimetres and contains about 23,000 lithics in a volume of 0.932 cubic metres of deposit (Table 1). This means that there are about 253 lithics to every 10,000 cc of deposit, a density that is far greater than that in layer Dc, but not as great as the density in Ru.

The next change in spatial patterns is evident between about 13,300 BP and 12,600 BP in the LSA layer DB. Notwithstanding the standard devia-

tions of the dates (Table 1) it appears that this layer represents a long time period during which there may have been several occupations. It contains c. 35,800 lithic pieces in a deposit that has a depth of between eight and twenty centimetres and a volume of 1.93 cubic metres (Table 1). This represents a high density of lithics: 185 lithics per 10,000 cc of deposit. Since the 88 formal tools are shared among 23 classes it would appear that a wide range of activities is represented.

Table 1. *Rose Cottage Cave: selected data from layers Dy, Dc, Ru, G2 and DB. All dates were obtained from charcoal.*

Layer	Date BP	Industry	f of lithics	f of formal tools	f of classes of formal tools	volume of deposit/ cubic metres
Dy	30,800±200	MSA	7659	74	14	2.70
Dc	—	MSA	23,531	273	23	2.40
Ru	28,800±450 27,800±1700 27,700±480	MSA	61,193	261	24	1.91
G2	20,600±250 19,600±220	MSA/LSA transition	23,644	132	19	0.932
DB	13,360±150 12,690±120	LSA	35,828	88	23	1.93

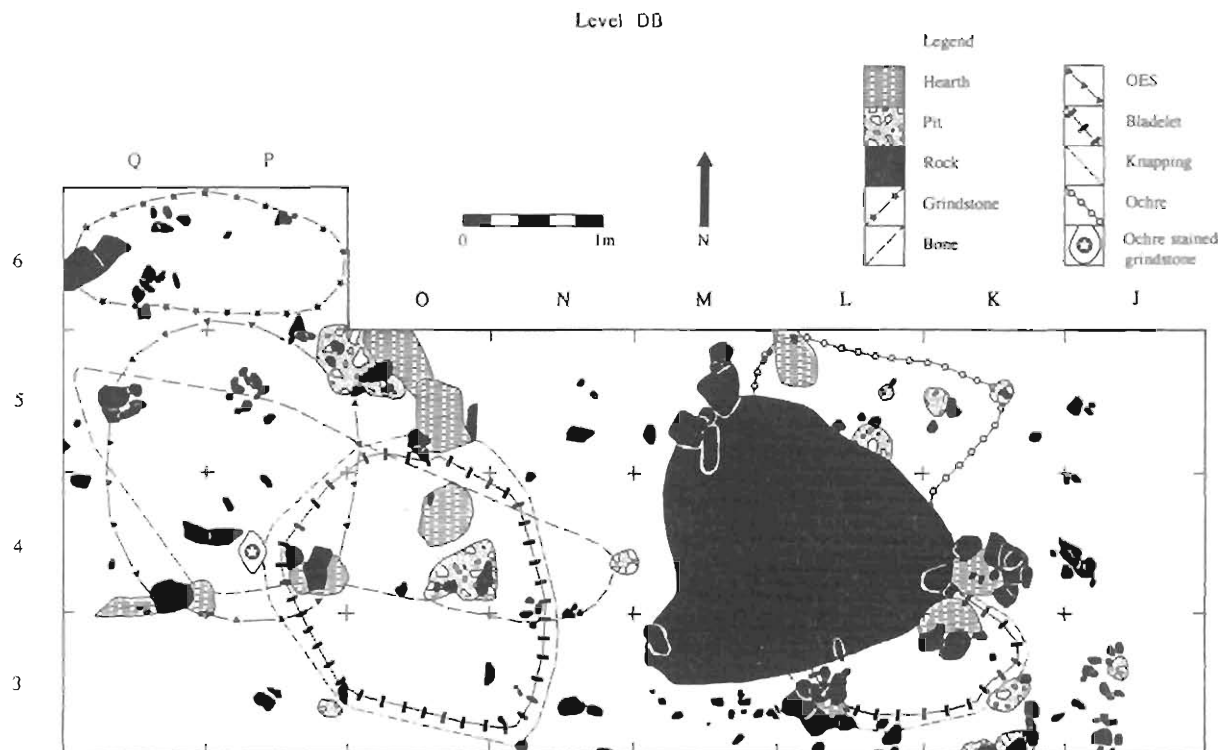


Figure 3. Rose Cottage Cave: spatial distribution of features, artefacts and bone in layer DB.

When the artefacts and debris from layer DB are plotted spatially, there is a tendency for some classes to be isolated from the main clusters, suggesting that some activities took place away from centralized activity areas (Wadley 1996). The segregated activities include grinding, the processing or use of colouring material, the use of backed tools, and the processing of bone. Sometimes these activities cluster around specific hearths (Fig. 3). The limited number of hearths, and their depth relative to earlier ones, suggests that people reused hearths from earlier occupations. What is perhaps particularly significant is that discrete patterns are observable even though the deposit is about the same thickness as deposits in the MSA layers described earlier, even though the layer is probably a palimpsest of occupations, even though the density of artefacts in DB is as high as that in some of the MSA layers, and even though there is no apparent difference in the way that the MSA and LSA sediments were formed. The most likely explanation for the changed pattern is therefore behavioural, though it would be difficult to interpret the type of social relationships indicated by the discrete activity areas.

The LSA pattern observed first in layer DB repeats itself throughout the Holocene. In some layers

there are discrete areas for activities as varied as ostrich eggshell bead manufacture, grinding of plant food or colouring material, and adzing and scraping (Ouzman & Wadley 1997; Wadley 2000). All 14 LSA layers above DB show a tendency to compartmentalize some activities, and all suggest a more complex use of space than was present in the MSA layers. Change rather than variation seems to be represented in the MSA and LSA spatial patterns; none of the MSA layers shows the type of variability evident in the LSA layers. The distinctions are analogous to those that Simek (1987) describes for the French Palaeolithic.

Other South African LSA sites where spatial analyses have been conducted also have special purpose activity areas. Amongst these sites are Dunefield midden, a large open camp in the western Cape (Parkington *et al.* 1992), Jubilee Shelter in the Magaliesberg (Wadley 1987) and Goergap Shelter in the Northern Province (Van der Ryst 1998).

In summary, the Rose Cottage Cave spatial patterning is consistently different in the MSA and LSA layers. In the MSA layers there are many tightly packed hearths while there are fewer, well-spaced hearths in the LSA layers. Furthermore, there are no specific knapping or other discernible activity areas

in the MSA layers whereas discrete clusters, in addition to overlapping clusters, are recognizable in the MSA/LSA transitional layers and in the LSA. These spatial differences occur notwithstanding that at least some of the LSA layers seem, like the MSA layers, to represent multiple occupations. It appears that when LSA people re-used the cave they took cognizance of the spatial arrangements of the previous occupants and, to some extent, re-used hearth areas and possibly even duplicated some activity areas. While recognizing that demographic factors and seasonal mobility could play a role in the shaping of such different spatial arrangements through time, I would argue that the time-related differences are more likely to be behavioural and that from about 20,600 BP space was being ordered for social purposes. Hence, in the LSA space was being manipulated to create social messages, a type of behaviour that is culturally modern.

Conclusions

A heated debate over the origins of cultural modernity has been enkindled by the lack of clear or consistent definitions for modern behaviour. The situation is inflamed by occasional confusion of material culture with social behaviour. This has sometimes resulted in techniques and the presence or absence of some classes of material culture being favoured over social behaviour in the cultural modernity equation. Researchers who embrace this approach claim that cultural modernity can be recognized from a 'shopping list' that includes worked bone and ochre crayons (colouring material). Material culture cannot *per se* stand for behaviour; material culture signals cultural modernity only when it is used to mediate social relationships, and when it can unproblematically be linked to symbolic meaning. Chase & Dibble argue persuasively that cultural modernity is about symbolically organized behaviour. Such behaviour is far more complex than the indexical referencing of which non-human primates are capable.

Not only is there a hierarchy from iconic and indexical to symbolic referencing (Deacon 1997), but from a developmental perspective there may also have been hierarchies of symbolic manipulation: symbol use, symbol creation and the storage of symbolism outside the human brain. From the archaeologist's viewpoint it is only when symbolism is stored outside the human brain that there is irrefutable evidence for cultural modernity. I argue that artwork, jewellery, artefact style and formal spatial patterning

fulfil this role. Anthropomorphic art, which combines reality with fantasy, fits perfectly Sperber's (1974, 4) criterion for symbolic activity: irrationality. Irrationality is easy to spot in an anthropomorphic image but is less easily recognized in images that superficially appear iconic, but are instead metaphors for complex religious ideas. Thus while it is possible to contend that there is a ranking of symbolic complexity from art that is iconic to art that incorporates symbolic referencing, the iconic appearance of some art may merely result from the viewer's inability to decode its meaning. Artwork is the most obvious example of symbolic storage outside the human brain yet it is not universally practised by hunter-gatherers and it cannot therefore be used as the sole criterion for modern symbolism and modern behaviour.

Personal style (archaeologically recognized in the form of jewellery) and lithic style may both have acted as indexes of social identity. Imposed, active style in stone tools is form that is culturally determined once the constraints such as those imposed by a particular rock type have been accounted for. A culturally modern artisan learning stone-knapping can be taught techniques, a sequence of reduction, and problem-solving. The knapper will furthermore be taught culturally specific theory for a chain of operations and it is this that gives rise to active style in the finished product. Such a process is probably different from that used by pre-modern artisans who demonstrated rather than taught technique. As Wynn has shown, the active use of style can be recognized archaeologically, first, with the appearance of regionally distinct tool forms that show standardization and, secondly, with the rapid appearance and replacement of these forms so that the lithic industries portray time-restricted patterning.

In addition to style, culturally modern people use space to signify their relationships within their cultural environment. A modern use of space encompasses groupings that take account of kinship, gender, age, status or skill. Rather like the use of style in artefacts, the use of space in a campsite requires communication of 'cultural theory'. A socially appropriate use of space needs to be taught using semantic and syntactical language.

The premise then is that pre-modern humans used indexical referencing and that they demonstrated technology. Indexical referencing, for example in the form of reading animal tracks, was almost certainly present by the time that MSA people became spear hunters; indeed, true hunting would have been difficult without this skill. Mithen (1994) inter-

prets spoor recognition as modern symbolic behaviour, but such behaviour could be defined as indexical referencing, which is not the same as the creation of symbols. Reading spoor is not a form of external storage of symbols because spoor is not created by humans; spoor is simply interpreted by humans. Reading spoor is, nonetheless, a form of referencing that seems to be a specifically human ability. Although bonobo males are said to drag branches on the ground to lead the whole group when it migrates through the forest (Ingmanson & Kano 1993, 6), the bonobos may follow the rustling noise rather than the visual stimulus.

In contrast to their pre-modern ancestors, culturally modern humans used language, created and stored symbols and taught rules and theory so that technology became a cultural manifestation. Although symbolic behaviour may well have been adopted rapidly when cognitive and social conditions became ripe for this change, it seems that the four elements of symbolic storage described here did not arrive as a 'package' in southern Africa. Personal and lithic style seem to be the first visible elements of symbolic storage and both seem to make their appearance in the final stages of the MSA at approximately 40,000 BP. The use of active style accelerates in Holocene assemblages.

Clark (2000) has been able to establish that the chain of knapping operations at Rose Cottage Cave was different in the final MSA from that in the MSA/LSA Transition and LSA assemblages. She observed similar patterning in several other southern African assemblages. It seems that MSA artisans prior to about 40,000 BP used a passive form of style that cannot be called symbolic. While many of the earlier MSA tools can be interpreted as standardized, they do not exhibit rapid turnover of style because tool types persist for millennia, and the industries are geographically widespread. On these grounds, active style cannot be claimed for the Howiesons Poort Industry, regardless of its apparently refined nature. Detailed technological studies of final MSA industries need to be undertaken elsewhere in Africa.

Personal style and lithic style seem to occur thousands of years earlier than formal spatial patterning in southern African sites. Lithic style was in place at Rose Cottage Cave, at about 30,000 BP and at Sibudu Cave at about 42,000 BP, yet spatial patterns were still unstructured with overprinted artefacts and cluttered hearths. This type of camp structure has not been considered modern when it has been found in the Middle Palaeolithic of Europe (Mellars 1996a). Camp structure is quite different in

the terminal Pleistocene and Holocene LSA layers where discrete activity areas sometimes occur in association with well-spaced hearths or away from hearths. The activity areas contain knapping debris, smashed and burnt bone, clusters of grindstones for plant food or ochre, clusters of tools such as bladelets, bone tool manufacturing debris and debris from the manufacture of eggshell ornaments. While all the LSA layers are marked by their variability, and all have some distinct activity areas, there are occasionally overlapping manufacturing or extractive areas that form a 'smudge' of activities, usually around a hearth. This is most likely to be the result of relatively lengthy occupation or the overprinting of occupations through time, and it is the type of pattern predicted by Brooks (1984) for repeated camp-site use by !Kung in the Kalahari. A different kind of smudging is found in the MSA layers; here the overlap can occur over an entire layer, and smudging is the rule rather than the exception.

LSA spatial patterning was unquestionably informed by social rules that persuaded people to perform certain activities in discrete areas, perhaps sometimes in groups that were defined by categories such as gender. No such rules are evident in the MSA layers, apart from those of basic cleanliness, which are apparent even in some ESA sites. The new data that I present here suggest that MSA and LSA people did not share the same spatial rules and that the symbolic use of space to order behaviour is a relatively late attribute. Although only a few other Stone Age sites in southern Africa have been studied spatially all the current information supports the Rose Cottage data.

In summary, the southern African data presented here imply that the four behavioural attributes of cultural modernity described do not make their appearance as a package deal. The Sibudu Cave and Rose Cottage Cave findings suggest that style in lithic technology may have made its appearance early. Reports of ostrich eggshell beads in MSA occupations elsewhere in southern Africa intimate that this form of symbolic storage may have appeared equally early. The symbolic use of space seems, however, to have appeared only several thousands of years later. The southern African evidence for art, the fourth element, is equivocal because all known artworks belong to the Holocene with the exception of painted slabs that may date to 27,000 BP from a single site, Apollo 11.

Some researchers argue that early symbolic behaviour and cultural modernity are represented by rare items of ground, notched or incised bone and

incised shell that occur at a few southern African sites in the Howiesons Poort phase, and possibly even in older contexts. I do not agree with this interpretation. Artefacts are not intrinsically endowed with symbolism and their mere presence cannot confer modern cultural status on their makers. It is only when technology begins to participate in the social and ideological realms of life that it takes on a symbolic role (Kuhn & Stiner 1998, 155–6). Using presently available evidence for the manipulation of material culture items for social and ideological purposes, I place the origin of cultural modernity in southern Africa at about 40,000 years ago.

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