Middens and moderns: shellfishing and the Middle Stone Age of the Western Cape, South Africa

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THIS PAPER DESCRIBES SOME EVIDENCE OF shellfish gathering from what are arguably among the earliest shell middens in human history. What makes this evidence interesting for scientists involved in explaining human evolutionary events is the fact that it may register a key moment in the emergence of our species. I describe the sites, list some of the archaeological remains, and speculate on the relationship between the evidence for systematic shellfish gathering and the appearance of hominid fossils that almost all palaeoanthropologists would call 'modern'. I have this word in inverted commas because I believe all our definitions of 'modern behaviour', and perhaps even 'modern humans', are self-serving and in need of substantial unpacking. Cynically, modern behaviour is defined as likely to be reflected in the kinds of archaeological remains (worked bone, some or other complex subsistence activity, marked ochre, burial) that we have in hand. It may be better to ask a less loaded question such as what is the history of one of these component behaviours, such as inter-tidal marine food acquisition. The gathering of sessile molluscs is, at first sight, hardly complex, but its nutritional advantages and correlates in the archaeological record might be of considerable significance.[1,2]

Introduction

First, what is a shell midden and what might the appearance of such things mean? By shell midden we imply an archaeological site with foodwaste visibly dominated by the shells discarded by shellfish gatherers. The fact that we can locate a concentration of such debris means that people in the past chose to discard shells in specific places, rather than scatter them generally across the nearshore landscape. From this we learn that the earliest such sites are not necessarily evidence for the earliest shellfish consumption, rather for the earliest localized discard. Nevertheless, we might consider this important. I will assume that the earliest shell middens do, indeed, mark a significant change in shellfish gathering behaviour, albeit one that needs careful scrutiny. Using observations from shell middens we can try to understand the technological, social, ecological and cognitive implications of this behaviour, and their evolutionary significance. The west coast of the Western Cape of South Africa represents an important opportunity because there are many shell middens from Holocene contexts and an increasing number of Late Pleistocene examples. We can compare shellfish gathering across time in the framework of a single, albeit evolving, coastal landscape.

Pleistocene shell middens along this coastline[3–7] are deeply buried until disturbed by some or other natural or industrial events. In the north, extensive mining and, further south, coastal resort development have added to the truncations of shoreline erosion in exposing such sites. The key landscape features are the dune plumes that reflect inland sand transport by strong southerly winds, sometimes for many tens of kilometres. Because the sand supply is greatest along the long sandy beaches, the location of these plumes is predictably from the southern ends of the log-spiral, half-heart-shaped beaches. After each episode of sand transport and deposition, there followed a period of soil formation in which calcium carbonate was concentrated in sub-surface calcrete horizons by pedogenesis. The cycle was then repeated as more sand was deposited and more calcrete formed. The harder calcrete horizons formed localized shelves under which lie unconsolidated sands. Particularly along the coast, where erosion causes truncations along the shore, the resultant cliffs offer many shelves and overhangs where animals or people can find shelter.

In the Saldanha Bay region and further south, the underlying quartz porphyry and diorite has been planed down to an undulating surface just a few metres above present sea level near the current shore. Where sands have draped across these undulations, and when cementation has taken place between higher standing pillars of bedrock, there are often small shelters scoured out below the calcrete. Both hyenas and humans can easily enlarge these shelters and insert themselves into the already ancient dune topography. My colleagues and I are convinced that at most of the locations we have found, the remains of such occupations are substantially later than the original dune formation. Dating such sites has to be a cautious enterprise. The rewards, however, are great, because the shelly sands have resulted in excellent preservation of bone, marine shell and ostrich eggshell.

What has emerged from field surveys over the past decade (Fig. 1) is that there are different kinds of faunal assemblages in the calcrete landscape, some of which are the result of human food gathering

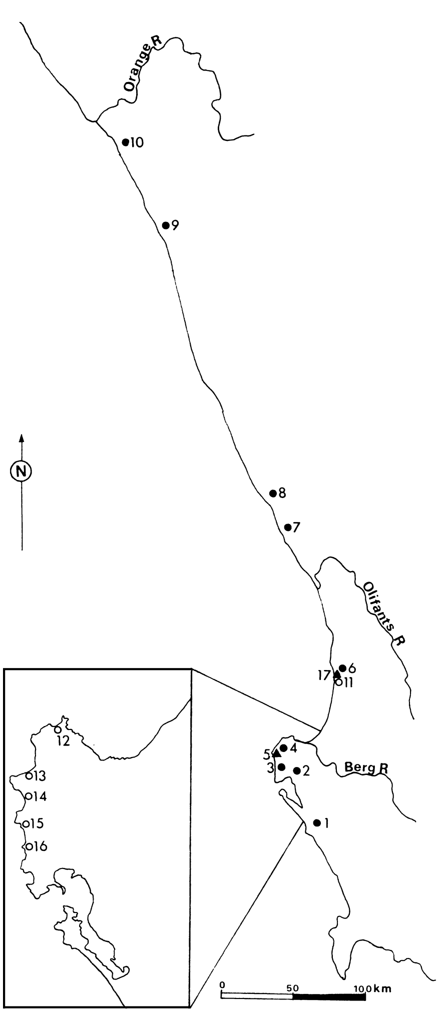

Fig. 1. The location of MSA, LSA and modern samples referred to in the text. Large black dots are MSA shell middens, small open circles are modern shellfish observations, and small triangles are LSA excavated shell middens. Numbers are as follows: 1, Ysterfontein; 2, Hoedjiespunt; 3, Sea Harvest; 4, Paternoster; 5, Paternoster; 6, Elands Bay; 7, Liebenberg's Bay; 8, Brand se Baai; 9, Swartlintjies; 10, Boegoeberg; 11, Elands Bay South; 12, Duiker Eiland; 13, Bekbaai; 14, Northwest Baai; 15, Perlemoen Baai; 16, Hospital Point; 17, Elands Bay Cave and Dunefield Midden.

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Table 1. Shellfish weights (in g) from MSA west coast shell middens.

Site*	Unit	*P. granatina*	*P. granularis*	*P. argenvillei*	*C. meridionalis*	Whelks	Barnacles	Total
YZFN	L and R	487.7	10.4	721.9	593.8	1.5	0	1828
YZFN	8/9 Hard	184.8	0.1	8	476.5	1.5	0.4	679
YZFN	CS8	93.3	4.3	56.1	134.7	0	0	290
YZFN	CS7	70.1	8	5.3	221.5	0.6	0.6	309
YZFN	CS2	67.3	0.8	180.3	171.8	0.1	0.1	426
YZFN	CS	183.6	0	288.3	558.4	0	0	1033
BSB5	Surface	3305.3	110.2	873.8	1787.5	0	2	6152
HDP3	SS E	116.7	6.3	69	382.5	9.6	10.9	601
HDP3	SS I	1909.3	311	391.8	3123.6	33.9	48.3	5920
HDP3	SS F	580.2	193.2	7.6	1285.8	2.4	13.8	2141
HDP3	SS G	688.3	203.5	216.7	1638.9	4.8	33.2	2870
HDP3	SS H	1083	368.8	108	2092.6	20.2	28.3	3738
HDP3	SS D	74.5	0	84.9	241.2	0.5	24.5	426

*Samples from Ysterfontein (YZFN) and Hoedjiespunt (HDP3) come from different excavated levels. BSB5 is the acronym for a surface sample from Brand se Baai.

and consumption, others the accumulations of hyenas or owls. This is reminiscent of the taphonomic complexities of the australopithecine sites, though the Cape stratigraphies seem more simple. Even more interestingly, the stone tool assemblages from the human occupations are Middle Stone Age (MSA) in character and unquestionably associated with marine shell collections. Along the south coast of the Western Cape a similar association appears but in the form of deep, stratified shell middens in rock shelters and caves. At sites such as those at Klasies River mouth[8,9] and (more cautiously) Die Kelders,[10] hominid remains associated with shellfish and MSA artefacts are described as modern. This means that this particular archive contains evidence that relates directly to the behaviour of the earliest members of our own species, to the origins of systematic shellfish gathering and is, therefore, of more than local interest.

Although clearly pre-Holocene, these west coast Middle Stone Age shell middens are still poorly dated. At Boegoeberg two the ostrich eggshell from the *in situ* archaeological occupation has been dated at more than 50 000 years (R.G. Klein, Stanford University, pers. comm.). Brand se baai, Elands Bay 17, Ysterfontein and HDP2 have no associated dating as yet. At HDP1[12–14] the archaeological occupations are tentatively dated to about 110 000 to 120 000 years.[7] (J. Feathers, University of Washington, Seattle, pers. comm.) The shell midden at HDP3 is probably the same age as HDP1 and is similarly located in the local stratigraphy (R. Grün, Australian National University, pers. comm.). Grine and Klein[4] noted that the ostrich eggshell at Sea Harvest, presumed to be associated with the shellfish and MSA tools, is beyond conventional radiocarbon dating. Although this pattern is far from definitive, it is best interpreted as reflecting regular use of marine shellfish at the last high stand of the sea level before the Holocene, which could have been Marine Isotope Stage 3 or part of Marine Isotope Stage 5.

Discussion

In the relatively small excavated or surface samples we have from Pleistocene west coast shell middens, stone tools are few in number, except at HDP1 and YZFN1. At all of the sites referred to here, however, the assemblages are undoubtedly MSA, but have none of the distinctive tool forms of the Howiesons Poort or Still Bay assemblage types. Most flakes are rather larger than we would expect in a Later Stone Age (LSA) assemblage and some platforms are faceted as in MSA ones. Radial cores are present, but irregular forms dominate. Silcrete is seemingly the preferred raw material, though quartz is common too. Retouched pieces are mostly made from silcrete. The most common 'formal' types are denticulate and notched artefacts, though these are variable in shape. The stone tool assemblage from HDP3 includes one partly bifacial point. It is difficult to relate these assemblages to Volman's[14] chrono-typological scheme. More explicitly, it is still difficult to establish their age in relation to the Howiesons Poort and Still Bay stages. Ongoing excavations at Diepkloof will soon provide the most appropriate regional stratigraphic framework for these assemblages.

Ochre is common at all of these MSA shell middens. In one occupation deposit at the site of HDP1, C. Poggenpoel uncovered a smear of finely powdered ochre associated with larger striated and bevelled pieces that had clearly been ground to produce pigment. Whatever the significance of these pieces, people were bringing colouring materials to the shoreline and using them at the same time as the collections of shellfish were being made.

The shellfish samples are generally good and illustrate some striking patterning. First, the MSA shellfish assemblages contain negligible amounts of barnacles, crayfish or whelks, which are all regular and sometimes abundant components of west coast LSA assemblages. In fact, evident from Table 1, though somewhat variable from site to site, is the extremely low diversity of MSA shell middens, which are dominated by two genera, *Patella* and *Choromytilus.* A survey of over 200 weighed, counted and measured samples from Elands Bay Cave (numbers available on request) shows no late or middle Holocene samples with as low a combined weight of whelks and barnacles as is general in the MSA samples. At the very least, MSA shellfish samples are among the least diverse known from the LSA, comparable to those of the terminal Pleistocene. As far as I am aware, no crayfish mandibles have been recovered from the MSA sites, whereas at Elands Bay Cave alone more than ten thousand have been measured from Holocene excavated units. It is extremely unlikely that these organisms did not exist at the time of the MSA collections.

Moreover, the limpet assemblages are dominated by the large species *Patella granatina* and, to a lesser extent, *Patella argenvillei,* with many fewer of the smaller *Patella granularis* (also evident in Table 1). This last species lives higher up the shore than the other two and should have been easily available. Whereas *Patella argenvillei* generally outnumbers and outweighs *Patella granularis* in the MSA samples, the reverse is always the case in LSA samples from this part of the west coast. *Patella argenvillei* is a species that lives at the infra-tidal fringe and presents a narrower window of opportunity for would-be gatherers.

The mean sizes of *Patella granatina* and *Patella granularis* (and perhaps *Patella argenvillei*) are substantially greater in the MSA samples than in almost all samples

Table 2. Mean limpet sizes (in mm) from MSA, LSA and modern samples.

	Patella granatina			*Patella granularis*		
	Mean	s.d.	*n*	Mean	s.d.	*n*
MSA sites						
HDP1	69.7	8.9	20	46.3	7.7	46
HDP3	66.5	8.3	28	46.6	7.5	63
Sea Harvest	68.9		75	51		5
Sea Harvest	67.1	9.1	8			
Boegoeberg	65	6.6	120	49	8.9	18
YZFN	67.9	8	106	45.1	6.6	16
YZFN	67.4	12.5	17			
YZFN	72.2	8.7	9			
YZFN	71.1	7	14			
YZFN	65.2	6.1	14			
LSA sites						
EBC	57	8.2	99	38	4.1	77
EBC	53	8.7	77	39	6.6	44
EBC	58	9	185	38	4.8	70
EBC	50	11.1	21	38	6.5	30
EBC	53	6.7	457	41	4.2	365
Paternoster	57.7	7.2	410	38.8	5.5	247
Paternoster	47.9	9.2	391	36.9	5.4	696
Paternoster	46.9	8	1126	36.6	5	1573
Paternoster	49.7	9.1	1018	35.9	4.6	1733
Paternoster	50.7	8.7	855	36.2	4.5	1408
Paternoster	50.9	9.7	289	36.1	5	435
DFM	60.18		28	38.67		23
DFM	57.93		53	38.7		42
DFM	60.31		63	38.79		26
DFM	57.67		20	39.6		14
DFM	58.18		31	39.2		44
Modern samples						
Elands Bay South	74.7	3	55	47.5	3.6	70
Bekbaai	75.8	5.3	27	49.9	6.4	37
Duiker Eiland	76.5	6.2	38	41.1	12.8	55
Northwest baai	78.1	6.1	34	48.9	4.4	57
Hospital Point	74.3	5.1	46	52.6	4.3	61
Perlemoen baai	73.7	6.9	46	50.5	4.2	78

*The Elands Bay Cave (EBC) and Paternoster samples are from different excavated levels, those from Dunefield Midden (DFM) are from different excavated squares. Acronyms for MSA sites are Hoedjiespunt (HDP1 and HDP3, two neighbouring localities) and Ysterfontein (YZFN, samples from different excavated squares).

Table 3. *Choromytilus* band width measurements (in mm) from MSA and LSA samples. Band widths are correlated with mussel valve maximum dimension.

	Choromytilus meridionalis		
	Mean	s.d.	*n*
Elands Bay Cave*			
Early Holocene			
CRAY	6.66	0.75	100
GNOM	6.33	1.15	100
ELFO	6.91	1.41	100
MARO	6.74	1.46	98
Late mid-Holocene			
SHAK	8.44	1.84	45
SOYI	8.45	1.69	100
CHOW	8.2	1.75	100
NYER	8.51	1.87	100
Late Holocene			
SITH	9.55	1.41	84
IANS	8.95	2.08	39
KEKA	9.18	1.69	54
AMIN	9.1	1.73	34
Dunefield Midden†			
Late Holocene			
ELA 78	9.22	1.26	61
ELA 79	9.37	1.25	27
ELA 86	9.2	1.54	94
ELA 87	8.89	1.71	44
Middle Stone Age sites‡			
HDP3 F	7.04	1.13	52
HDP3 G	7.25	1.07	81
HDP3 H	6.93	1.04	107
YZFN L23	7.99	1.61	122
YZFN L24	8.03	1.45	134
YZFN L25	8.04	1.41	197
YZFN K25	7.19	1.42	231
BSB5	6.85	1.1	141

*Elands Bay Cave samples come from different excavated stratigraphic units (acronyms used).

†Dunefield Midden samples from different excavated squares.

‡Acronyms for MSA sites are Hoedjiespunt (HDP3, different squares) and Ysterfontein (YZFN, different squares) and Brand se Baai (BSB5).

from LSA shell middens along the Cape west coast (Table 2). By contrast, the shells of the black mussel, *Choromytilus meridionalis,* are rather small by comparison with later end Holocene (but not early Holocene) archaeological samples (Table 3). High barnacle weights seem to be associated with large black mussel sizes at Elands Bay Cave and other Verlorenvlei LSA sites. Finally, there is an observation more difficult to quantify. It appears that a higher percentage of shells in MSA shell middens is less fragmented, and therefore measurable, than in equivalent LSA situations.

The difference in limpet sizes between LSA and MSA shell middens is particularly striking (Table 2). All the MSA means for *Patella granatina* are effectively above 65 mm, and all those for P. *granularis* are greater than 45 mm. In a sample of 102 *P. granatina* and 99 *P. granularis,* mean sizes from LSA shell middens from along the Cape west coast only three *P. granatina* means are above 65 mm (but not above 66 mm) and only one *Patella granularis* mean more than 45 mm (but not above 47 mm). The MSA sample of means is significantly different from this pattern. The LSA site of Dunefield Midden (DFM)[15], where we have excavated over 850 square metres of contiguous midden, allows another perspective on limpet size variation. Where sample sizes are reasonable at DFM, only 8 of the 517 *Patella granatina* metre-square means are above 65 mm, and only 7 of 487 *Patella granularis* metre-square means are above 45 mm. Once again the consistently large MSA means stand out. They compare well with the mean sizes obtained by ourselves when we measured small samples of large individuals from the present unexploited shoreline[16] (Table 2).

The sizes of the mussels in MSA and LSA sites (Table 3) need to be viewed against the contrast between the distributions and densities of limpet and mussel populations. Unlike the limpets, a large proportion of mussels live below the inter-tidal zone. Individuals settle in the inter-tidal but grow to maximum size primarily in the sub-tidal zone, where massive populations exist. Large barnacles are found living on the shells of these sub-tidal large mussels. Even medium-sized individuals in the inter-tidal grow in dense patches that are two orders of magnitude more productive than the scattered limpet populations. Mussel sizes that are smaller in the MSA than in the LSA probably reflect easily gathered inter-tidal individuals.

I am sure there will be considerable discussion over the significance and meaning of these observations. It seems to me that the observations are consistent with the idea that MSA people made substantially less use of the shellfish populations along this coast than their LSA descendants, presumably because people were fewer in number or visited the shore less often or for shorter periods[6,17] or for all of these reasons. This allowed people to be much more selective about what they collected, had a less substantial impact on local shellfish populations, and meant that shells occur as more isolated finds in the sandy midden matrix in MSA sites. The issue is primarily one of supply and demand. People requiring small amounts of shellfish meat can satisfy their demands by collecting the few large individuals that have survived to 'old age', whereas people with higher demands need to collect many of the smaller, younger individuals. The mean size of individual from archaeological samples obviously reflects this contrast. At the LSA site of DFM we have processed two tonnes of shells, clearly a substantial demand on local shellfish populations from sites that reflect a small number of short visits. My suggestion is that MSA people were far less demanding, the implication being that there were regular differences in coastal exploitation strategies.

The alternative explanation for the contrast between LSA and MSA shellfish sizes might be that it reflects differences in inter-tidal conditions between the two periods. Limpets have been shown to grow more slowly and mussels more quickly on exposed shorelines, with the reverse the case in sheltered bays. Water temperature and turbidity may well have an influence on the available sizes of limpets.[18] Although isotope studies of MSA shells might in future support this alternative, I doubt that the great contrast between the two sets of observations is environmental. Both LSA and MSA sites come from a range of shoreline contexts and there is no obvious pattern of difference in this respect. Aside from the sizes, the lower diversity of MSA shellfish assemblages, with fewer whelks and crustaceans, implies a more restricted interest, or a narrower definition of 'food', on the part of earlier shellfish gatherers. Observations from the late Holocene site of DFM show that in LSA sites the first collections of a visit can result in mean shell sizes somewhat like the MSA ones, whereas later collections contain smaller individuals as larger shellfish become harder to find. Unless these spatial patterns are exposed and explored, which has usually not been the case in small excavations, mean LSA limpet sizes are always far smaller than MSA ones.

The faunal remains that are associated with the MSA shellfish are extremely interesting, although much more analysis is required. Most common among them are the bones of tortoises, those of small mammals such as the dassie and dune mole rat, and abundant ostrich eggshell fragments. The bones of large game are very rare, though the samples are small. This association is remarkably similar to that of the terminal Pleistocene at Elands Bay Cave, where too it reflects a focus on slow-moving or sessile organisms. The temptation is to see a major role for women in the accumulation of these mixes of eggs, limpets and tortoises. The contrast with the big-game hunting image of MSA people presented by some analyses of the Klasies River fauna is stark and should be examined further. At the moment the south coast pattern is dominated by cave and rock shelter evidence, which may be as much taphonomically as behaviourally meaningful. More regional surveys are needed, and probably less big cave hunting!

How, then, can we explain the distribution of small, ephemeral nearshore shell heaps from along the west coast of the Cape? What might their implication be for hominid evolution? A major problem is the nature of this record. Is the absence of any earlier association of stone tools and shellfish real, or an artefact of poor preservation, evidence of absence or absence of evidence? Mining operations are presumably not archaeologically biased and have so far produced not a shred of evidence for ESA artefacts associated with shellfish remains. Earlier shoreline features are uncovered by such large-scale earth-moving but have not revealed associations of artefacts and shellfish food-waste. So far, then, localized shellfish accumulations occur first with MSA artefacts and hominid remains described as modern in contexts assumed to date to Marine Isotope Stages 3–5. Of some interest is the fact that this appears to happen in the two mediterranean ecosystems at either end of the African continent, but not with the same hominid.[19–22]

Although implicitly in most cases, archaeologists working in Africa appear to believe that shellfishing is one of the reflections of 'becoming modern'. Is it not more likely that becoming modern depended on the collection of shellfish? It is well documented that the long-chain polyunsaturated fatty acids needed to build effective brains are far more easily obtained in the marine food chain than in the terrestrial one.[1,2,23,24] It is also established that most of these are needed *in utero* or during the first year of life. Because humans are inefficient at lengthening and desaturating shorter chain precursors, these long-chain derivatives need to be provided through the maternal diet. Fatty shellfish, not to mention other washed-up marine organisms, would obviously have been far easier for pregnant or nursing women to acquire than the brains of wildebeest. How ironic if people became modern the hard way and then began to focus on the very limpets, ostrich eggs and tortoises that would have enabled them to do it more easily!

The inter-tidal presents both challenge and reward. The challenge is to understand the complex, inter-related daily and monthly cycles that repetitively expose and cover a rich supply of food, the reward is an accessible source of protein, vitamins, minerals and fats essential for brain development and available in immobile organisms. What might link the dietary advantages with the morphological changes is a radical shift in settlement strategy that caused people to reorganize their shellfishing around temporary bases located next to productive shorelines. Certainly we need to distinguish the beginnings of the localization of disposal from the earliest collection of shellfish. It is likely that the MSA shell middens along the west coast of South Africa reflect some combination of a shift in settlement strategy, an emphasis on shellfish collection and, perhaps, a spurt in hominid evolutionary change. We have much to discover from them, not least some of the causal changes involved.

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How some archaeologists recognize culturally modern behaviour

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THERE IS A GREAT DEAL OF DEBATE OVER the nature and timing of culturally modern behaviour and well respected archaeologists do not necessarily agree with each other; their interpretations depend, of course, on their personal definitions of modern behaviour. I first describe a popular archaeological view of how to recognize cultural modernity, then I present my own perspective.

No Neanderthals have been discovered in Africa and technological and Middle Stone Age (MSA) cultural changes here were not caused by the kind of population replacement apparent in Europe. In this respect Africa's cultural evolution is quite different from that in Europe. In Africa (and also in the Near East) anatomical modernity appears to antedate behavioural modernity.[1] Since anatomically modern humans emerged first in Africa, there is a good chance that the earliest archaeological evidence for fully modern behaviour might also occur here,[2] although we do not yet know to what extent cultural development was homogeneous across the vast continent of Africa.

Several archaeologists suggest a 'shopping list' of items or behaviours that can be attributed to cultural modernity, for example the production of stone blades and backed blades, bone tools, true hunting and art. I begin by examining the first four items on this list.

Blade and backed blade production began earlier in Africa than in Europe. Blade production in Europe started in the Upper Palaeolithic, after about 40 000 BP and backed tools appeared in the Gravettian Industry between about 27 000 and 21 000 BP.[3] Backed tools made on blades emerged much earlier in central Africa, at about 300 000 BP,[4] but they did not become common or standardized until the Howiesons Poort phase of the MSA in South Africa. The Howiesons Poort phase, which is dated to between about 80 000 and 60 000 years ago,[5,6] is both preceded and replaced by MSA industries that are very similar to each other. The presence of the Howiesons Poort Industry has been used by some archaeologists to argue for early cultural modernity in Africa.[7,8] Yet, if this technology was an important marker of modernity, it seems odd that it should last for so long and then be replaced by 'pre-modern' methods. Thus the introduction of backed blade technology does not seem to be a reliable indicator of modern behaviour.

There is some evidence to suggest that the earliest ground-bone work in the world may have come from Africa, although worked bone is generally rare in the MSA and is even absent in MSA sites such as Strathalan Cave, where organic preservation is good.[9] In Congo, barbed points, thought to be fishing implements, have been recovered from Katanda MSA sites said to be older than 80 000 years,[10] although some researchers question the reliability of the early date.[11] Further south, a similar barbed bone implement was found in White Paintings Shelter, Botswana, at the Middle Stone Age /Later Stone Age interface.[12] At Klasies River Mouth, Eastern Cape Province, both a single worked bone point and a piece of notched bone were found in the Howiesons Poort Industry.[13] At Sibudu, KwaZulu-Natal, there is a piece of bone with ten deliberate notches dated by accelerator mass spectrometry (AMS) to 28 889 ± 70 years ago (GrA-19670), yet there is no worked bone in older layers in which bone and seeds are well preserved. At Blombos Cave, Western Cape, worked bone points, bone awls and an incised bone were found in a layer dated approximately 70 000 years ago.[14] Early bone points have also been found at Border Cave[15] and even the bone point tip found in Boomplaas Cave, Eastern Cape, in a layer lying between others dated 32 000 and 21 000 BP is unusually early.[16] Bone points are likely to be parts of projectiles that suggest true hunting, although some Later Stone Age (LSA) points seem to have been used as pins to fasten garments or shrouds.[17] There is, however, more convincing evidence for hunting from the MSA of Klasies River Mouth, where the tip of a stone point, presumably a broken projectile head, was found embedded in the vertebra of a giant buffalo.[18] Thus true hunting is unquestionably part of the behavioural repertoire of MSA people. This competence need not, however, imply symbolic sophistication; Mithen[19] has, for example, convincingly argued that understanding how to exploit 'natural history' is an early cognitive ability achieved prior to the development of anatomically modern humans. Furthermore, Neanderthals, who are not considered cognitively modern, seem also to have been competent hunters.[20]

How then can we assess the 'shopping list' data mentioned thus far? In my opinion this can only be done from a theoretical viewpoint. The use of a list on which technological items feature prominently is theoretically flawed. There is no intrinsic link between new techniques

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