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Discussion Forum

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During recent decades, studies of the Middle Stone Age (MSA) have moved from relative obscurity to become a central focus of international research in Stone Age archaeology and paleoanthropology. The MSA dates between *c*. 300 and 30 ka BP and is characterised by the evolution of anatomically and culturally modern humans in Africa. Here we comment briefly on the general state of research on the MSA of southern Africa. We draw on recent publications and meetings including an international workshop entitled: *Contextualizing technological change and cultural evolution in the MSA of southern Africa*, which was held in September 2014 in Tübingen to address new developments in the study of the MSA (Conard *et al*. 2014).

Based on current research, it is fitting to ask what new directions could be followed in research on the MSA. First, it is becoming increasing clear that, what we refer to here as the 'Synthetic Model' for the cultural chronology of the MSA, proposed by many scholars including Jacobs, Henshilwood and others (Jacobs *et al*. 2008; Henshilwood 2012), requires revision. This model, which represented a major breakthrough, came into clear focus in recent years and argued that the Still Bay (SB) and Howiesons Poort (HP) represented well-defined cultural entities and periods of exceptional innovation. The Synthetic Model was significantly based on results from excavations at sites including Blombos, Diepkloof, Sibudu, Hollow Rock Shelter and Apollo 11, as well as on Jacobs' optically stimulated luminescence dates from MSA sites across southern Africa. Building on these observations many researchers argued that the SB and HP represented well-dated episodes corresponding to *c*. 75–71 ka BP and 65–59 ka BP respectively (Fig. 1).

This synthesis of what had previously been rather unstructured information met considerable support in the archaeological community, since it fit expectations and perhaps also the longing for order and clarity in what had previously been a complicated and uncertain cultural sequence. The Synthetic Model had implications for many ideas under discussion related to the nature and tempo of cultural change and innovation during the MSA. The model, if valid, would also have major implications for our understanding of the relationships between environmental change, cultural change and population dynamics. Additionally, it had bearing on topics including claims for causal relationships between the Toba volcanic super-eruption, population bottlenecks and the spread of modern humans out of Africa (e.g. Mellars 2006; Mellars *et al*. 2013). This work also led colleagues, including Lombard (Lombard & Parsons 2011), Conard (2008; Conard *et al*. 2012), Porraz (Porraz *et al*. 2013a) and Will (Will *et al*. 2014), to question the hypothesis that the SB and HP represented periods of exceptional cultural innovation, and perhaps even the epicenter for the evolution of cultural modernity and behavioural patterns and populations that would later spread across the entire Old World.

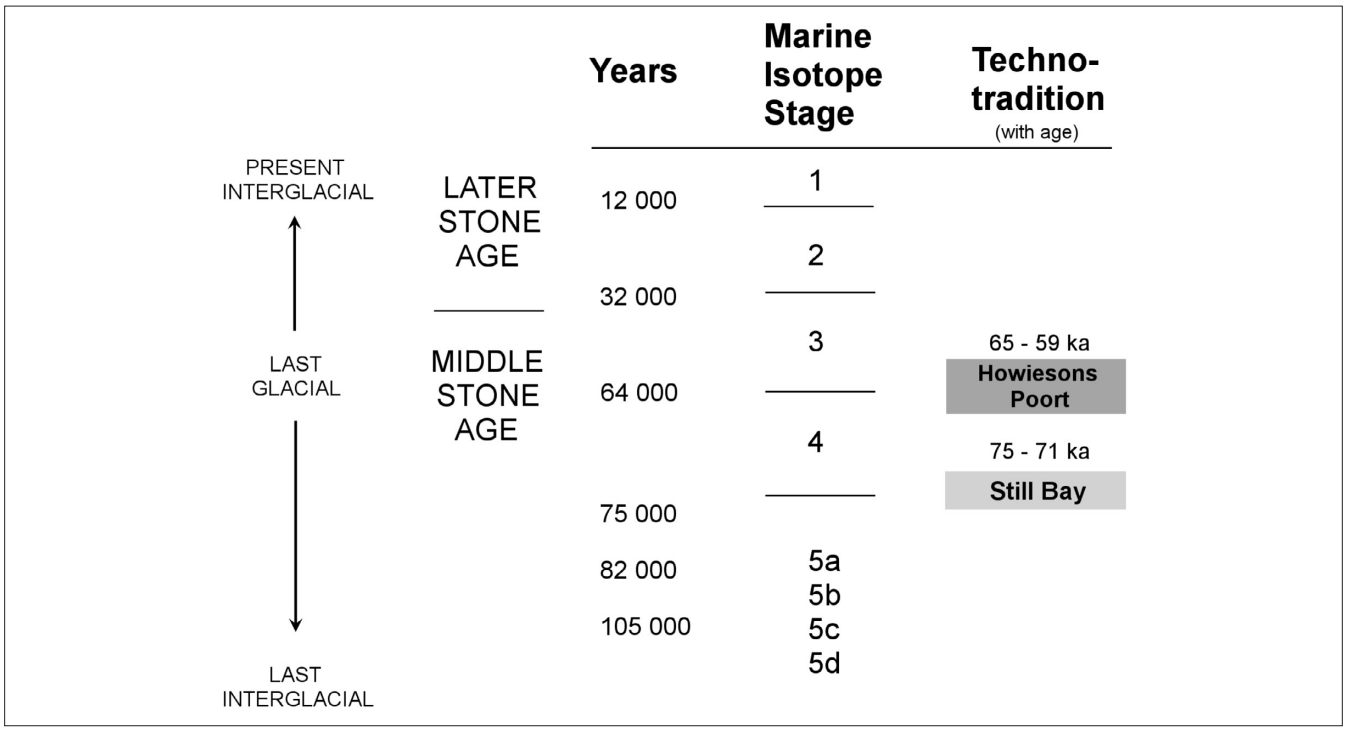

FIG. 1. *Graphic representation of the 'Synthetic Model' for the cultural chronostratigraphy of the Middle Stone Age in southern Africa (after Henshilwood 2012).*

In recent years this model has come under considerable criticism. First, problems in reproducing the radiometric dates at Diepkloof raised questions about the model's chronology (Tribolo *et al.* 2013). The sequence at Diepkloof also demonstrated that the HP is less well focused in time and instead represents a multi-stage period of cultural and technological development, rather than a homogeneous episode (Porraz *et al*. 2008, 2013b). The work at Diepkloof raised a range of questions and indicated that the HP was not a uniform spatial and temporal phenomenon. This point is underlined by results from Rose Cottage Cave (Soriano *et al*. 2007), Klein Kliphuis (MacKay 2011), Klasies River Mouth (Wurz 2002; Villa *et al*. 2010), and Klipdrift (Henshilwood *et al*. 2014). Furthermore, initial results suggest similarities between the later parts of the HP sequences at Diepkloof and Klipdrift, again implying that the HP reflects a period of considerable cultural change rather than a monolithic golden age of sorts. The early phases of the HP are still less well described, with results from Pinnacle Point PP5/6 showing features of an early HP dating to *ca*. 71 ka BP (Brown *et al*. 2012), which predates the expected age of the HP based on the expectations provided by the Synthetic Model.

At the same time questions are emerging about the SB. A critical look at Apollo 11 raised issues about the definition of the SB and to what extent any assemblage with a few bifacial artefacts can be considered to belong to this cultural entity. Meanwhile excavations at Sibudu have continued beneath the horizons Wadley defined as 'pre-Still Bay' and which Jacobs dated to greater than 77 ka BP (Wadley 2007). To the surprise of the current excavation team, the deepest stratigraphic units at Sibudu: Adam, Annie, Bart and Bea, all yielded abundant evidence for bifacial technology and assemblages that, based on all available arguments, must be placed within the SB complex rather than belonging to the 'pre-Still Bay' (Conard *et al*. 2014). Obviously, these observations are in no way a criticism of Wadley's outstanding work at Sibudu, since her excavation stopped in the overlying stratigraphic unit, BS (Brown Sand).

Another signature found in the deepest layers so far excavated at Sibudu, is the presence of bifacial points with serrated edges produced by fine pressure flaking. Here and at the neighbouring site of Umhlatuzana (Lombard *et al*. 2010) in KwaZulu-Natal, serrated edges are common and may represent a distinctive variant of the SB that warrants more systematic study. We also note that the available dates for the serrated complexes at these sites are dissimilar and require confirmation. Although similar serrated edges are documented on scrapers at Ysterfontein (Avery *et al*. 2008) in still earlier assemblages, serrated bifacial points are unknown in the many published assemblages from the Western and Southern Cape coasts (Minichillo 2005; Villa *et al*. 2009; Högberg & Larsson 2011; Porraz *et al*. 2013b). At the Tübingen meeting Archer and Porraz also discussed the possibility of distinctive regional patterns in the shape of SB bifaces. Although, due the rarity of observations from well-stratified contexts, variation within and between SB assemblages has not yet been adequately studied, observations discussed at the meeting indicate that the SB also includes considerable spatial, chronological and functional variation, challenging the definition and our understanding of this bifacial manifestation.

These observations raise serious questions about the validity of the Synthetic Model, and while debate continues about specific answers to them, new interpretations are gradually coming into focus. First, researchers would profit from viewing technologies, such as the manufacture and use of bifacial points and segments, as dynamic functional adaptations that are mediated through learned behaviour and cultural transmission, rather than as strict chronocultural markers or *fossils directeurs*. The new results from Sibudu and Diepkloof demonstrate that previous models for the SB and HP were too simplistic. MSA bifacial technology in South Africa is not bracketed between *c*. 75–71 ka BP, nor is backed-blade technology restricted to the period between *c*. 65–59 ka BP.

Additionally, the impact of raw materials is universally acknowledged as a source of variability, but rarely addressed systematically. Discussions at the Tübingen meeting highlighted recent advances made in studying the properties of South African lithic raw materials from technological and functional perspectives (e.g. Wadley & Kempson 2011). In this regard, Porraz and Mackay argued that the West Coast represents one of the best places to discuss the role of lithic raw materials and their availability in the context of functional interpretations and territorial organisation during the MSA.

Other researchers, including members of the *Role of Culture in Early Expansions of Humans* (ROCEEH) team in Tübingen, point out the need to integrate larger datasets, such as archaeofauna and archaeoflora, to facilitate diachronic and interregional comparisons. Interestingly, thus far studies have not shown a clear causal connection or even coincidental relationships between climatic and technological change (Clark & Kandel 2013).

From east to west and north to south, South Africa is defined by a mosaic of ecological niches and topographic settings. This fact alone makes it likely that researchers will encounter great regional variation in the archaeological record of the MSA. Since the time of Goodwin and Van Riet Lowe researchers have successively refined and elaborated on models for cultural evolution and chronostratigraphy in southern Africa (e.g. Conard *et al*. 2012; Lombard *et al*. 2012). Models have benefitted from new excavations and lithic studies, and from studies of other classes of cultural materials. Yet, while great attention has been given to symbolic artefacts over the last two decades, few technological studies have been published.

We are currently working to develop new ways of explaining the chronostratigraphic and cultural variability during the MSA and are hopeful that work such as that presented at the workshop in Tübingen will help to correct weaknesses in current views and to define a path that will provide a more refined understanding of cultural evolution during the MSA. Here we also acknowledge Parkington's (1980), Shea's (2014), as well as Brew's (1946) classic critique of archaeological taxonomy, and stress that, while we have addressed a number of taxonomic issues, we hope that our comments help to illuminate spatial and temporal variability rather than mask it.

Finally, the concerns discussed in Tübingen are not unique to the MSA of southern Africa. Pargeter and Brandt led a one-day workshop on Late Pleistocene industries in Africa on the Sunday before the Pan-African Congress in Johannesburg in July 2014. Here, colleagues delivered short presentations, and the participants engaged in hands-on study and discussion of collections researchers brought with them. We would welcome more such initiatives and invite colleagues to examine the collections from Diepkloof, Sibudu and other sites to try to improve communication and understanding of spatial and temporal trends in the evolution of technology during the MSA. Since there is no substitution for the first-hand study of artefacts and discussion, we hope to organise such a meeting on the West Coast as a next step forward in the near future.

When one looks beyond the last decades of highly productive research in southern Africa, one sees similar issues being addressed around the world. We noticed this at the recent congress of the *Union International de Sciences Préhistoriques et Protohistoriques* (UISPP) in Burgos, Spain, where many aspects of the archaeological record of the Old World were the subject

of lively debate. In sessions on the Middle Palaeolithic and MSA, researchers working in other regions faced the same problems as scholars working in South Africa. For example, debate continues on how best to organise the cultural sequence in vast regions including North Africa and Arabia as more and better quality data accumulate (Armitage *et al*. 2011; Scerri 2012). For many years the classic sequences of southern France and the Levant, like the South African record, have provided powerful insights into technological variation. Nevertheless, researchers need to examine critically the spatial range of regional systems and develop new models to explain the variation inside and outside what are often intuitively considered to be core areas for our understanding of the Stone Age. The problems we are facing in southern Africa are in many respects similar to those in other areas, and in each case we can observe how a combination of the local history of research, new data and at times strong personalities and vibrant archaeological communities drive research forward.

There are no simple ways to answer the questions of spatial and temporal variation in cultural sequences. At the UISPP congress, researchers considered the case of the Gravettian of the European Upper Palaeolithic, which is currently accepted as a broadly defined cultural taxonomic unit despite the fact that in some regions the archetypal Gravette points are missing. In sessions on smaller entities such as the bifacial groups of the Late Middle Palaeolithic, including the Mousterian of Acheulean Tradition (MTA), the *bouts-coupés* and the *Keilmesser/Pradnik,* groups examined potential unifying technological elements that link them. Clearly depending on the questions asked, researchers need to shift between different spatial, temporal and demographic scales (Conard 2001). These debates underline the question of where we stand concerning general entities like the SB and HP. The SB and HP reflect large entities defined by bifacial pieces for the SB, by the use of fine-grained rock, and the production of blades and backed pieces for the HP. These simplistic labels and indicators are no longer adequate for our research needs, and we have entered a phase in which researchers are identifying more internal variability that captures the nature and diversity of the technology used by hunters and gatherers of the MSA.

The SB and HP are two original South African technological manifestations, both associated with behavioural innovations that challenge our evolutionary models and interpretations. By defining them, researchers try to identify their origins, their nature, and their significance. But this requires a dynamic approach, according importance to the high-resolution spatial and temporal variation that reveals the cadence and rate of cultural change. Recent work on the pre-SB to SB (Porraz *et al*. 2014) and on the HP to post-HP successions (Wurz 2002; Soriano *et al*. 2007; Mackay 2011; Porraz *et al*. 2013b) provides new archaeological data to identify regional differences and to infer causal relationships. Cultural taxonomy should not be regarded as a static tool, but as a way to qualify and quantify degrees of change. With these goals in mind the South African record and the nature of the deposits offer a unique opportunity to address cultural changes and adaptations at a high resolution.

In light of the international meetings on the MSA in 2014, we can see a clear shift from the dominance of the Synthetic Model toward a more strongly contextualised assessment of cultural evolution and local and interregional adaptations during the MSA. While it is too early to see the answers to the many new questions that are beginning to be articulated, the study of the southern African MSA is healthy and vibrant and in many respects in a strong position to continue to play a leading role in African Stone Age archaeology.

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