PERIODS OF GLOBALIZATION OVER 'THE SOUTHERN ROUTE' IN HUMAN EVOLUTION (AFRICA, SOUTHWEST ASIA, SOUTH ASIA, SOUTHEAST ASIA AND SAHUL AND THE FAR EAST): A META-REVIEW OF ARCHAEOLOGY AND EVIDENCE FOR SYMBOLIC BEHAVIOR

As a contribution to "The 9th Roundtable on Remnant Languages of South Asia, South East Asia and Sahul Land" sponsored by the Association for the Study of Language in Prehistory with the support of the Harvard University Asia Center, I was asked to review and summarize archaeology that might substantiate a *Homo sapiens sapiens* out-of-Africa dispersal on the Southern Route to Southeast Asia and Sahul.

Although my primary interest is in the evolution of art, symbol and language over the past two to three million years, I was, perhaps, assigned this task because I am not an academic or professional archaeologist and might gather and synthesize the data with a refreshing naiveté. The challenge was daunting and as comprehensive as I have attempted to be in this study, I fully acknowledge its limitations in advance.

Method. First I conducted a basic literature search of research articles, books and websites. Since I'm an intuitive, holistic, and visual thinker, I then catalogued the results of this search into Microsoft Word tables. I did tables by region for Africa, Southwestern Asia ('Near East' or 'Middle East'), South Asia, South East Asia and Australia (Sunda and Sahul), and the Far East (China, Korea, Japan). For each region I listed selected archaeological sites by name and location, dating techniques (14C, TL, OSL, U-series, AAR, etc.) and dates by key strata; stone tool industry and characteristic tools; hominid fossils; and some characteristic fauna and note on environmental setting. The tables are organized by major time periods, such as Oldowan, Middle Acheulian, Middle Paleolithic/Middle Stone Age; these time periods are inescapably a mix of so-called tool modes and time periods.

In anticipation of future *Mother Tongue* conferences and because of my own special interest, I also noted evidence for symbolic behavior (palaeoart) for each period. For purposes of this review I define symbolic behavior by examples, after McBrearty and Brooks (2000) and Bednarik (2003, 1992), including:

- Regional tool styles;
- Self-adornment (perforated objects, beads, pendants, ornaments);
- Use of pigment;
- Incised, serrated or notched objects (bone, eggshell, ochre, stone, wood);
- Collection/manuporting of exotic objects (crystals, fossils, shells, non-local stone with 'aesthetic qualities');

- Geometric artifacts (circular and discoid objects, spheroids, rhomboids, triangles, etc.);
- Stone arrangements (heaps of stones, cairns, geoglyphs);
- Image and representation (engravings, petroglyphs, painted or sculpted anthropomorphic, zoomorphic or abstract figurations and other 'rock art'),
- Mortuary practices (bone modification, cannibalism, deposition, burials with or without grave goods, ochre, ritual objects)
- Gesture, mime and dance forms (although these are only identifiable by circumstantial evidence: 'dance floors', footprints, etc.)
- 'Marking traditions', geometric 'signs', circumstantial evidence for language

This does not preclude the intentional transformation of everyday 'utilitarian' behaviors into symbolic behaviors, such as underground mining, seafaring and even tool-making itself and its tools, which can acquire symbolic value in trade, status display, and ritual (e.g., Hampton 1999).

With the aim of comprehensiveness in the review of evidence for symbolic behavior or palaeoart I first reviewed and incorporated into the master tables items mentioned in two key inventories, Bednarik (2003, 1992) and McBrearty and Brooks (2000).

Obviously for no site selected to include in the database can I do more than sketch a capsule summary for the purpose of this overall meta-review. Inevitably, some source references are secondary; I have attempted to indicate the primary source by author and date as well as the secondary source. Finally, given the focus of the task, I did not develop databases for Europe or northern Asia, nor North or South America. I believe this actually had a good result, a view of human cultural and physical evolution from its source, Africa, rather than a chronologically late and hence seriously limited Euro-centric perspective. I leave for the future synchronizing in these other regions.

I do not confine the database to the debate on the timing and route of *Homo sapiens sapiens* dispersal from Africa. I believe that the current state of the archaeological evidence shows that there are waves of innovation of technological and symbolic behavior—and presumably global language—throughout the course of human evolution and in this paper I intend to contribute to that debate as well. Thus, I examine the entire span of the archaeology of human evolution from Pre-Oldowan to Upper Paleolithic (Later Stone Age) periods across the Southern Route. By recognizing earlier technological diffusions and convergent evolutions, I believe we can gain a better understanding of and develop more insightful hypotheses for Middle Paleolithic and later *Homo sapiens sapiens* 'dispersals' and innovations.

Once I developed tables by region, I then compared the tables across regions to detect dispersal routes, if any, during the course of human evolution. In looking for patterns and trends I assume neither diffusion of technology (or hominin species) out-of-Africa nor multi-regional co-evolution (convergent evolution). I wanted to see what would be substantiated by the database itself. If the site dating and technology shows a gradient over time, then we may hypothesize diffusion in the direction of the gradient. If there no gradient seems evident, then the likely hypothesis would be multi-regional convergent evolution. This study does not depend

upon either assumption and it does not begin by accepting any current position on the timing of out-of-Africa dispersals. The aim is to hue as closely as possible to the evidence.

Results. The extent of the database for review is indicated by region (number of archaeological loci [includes individual sites, but also sites with multiple assemblages, strata, sub-loci], number of source references, total pages):

- Africa (225,233, 85)
- Southwestern Asia (142, 126, 46)
- South Asia (Pakistan, India, Sri Lanka) (71, 43, 18)
- South East Asia and Australia (68, 73, 25)
- East Asia (China, Korea, Japan) (45, 52, 17)

Total: 551 archaeological loci
527 source references
191 pages of tables and references in the master-matrix

The total of references do not include all materials reviewed; some sites had insufficient dating to warrant inclusion and some documents had not relevant or redundant data so not incorporated into bibliography.

The complete Master Database tables for all regions with full bibliography are posted online at *OriginsNet.org/publications*. Only cross-region patterns and trends and a Synoptic summary of the master databases is presented herein.

Discussion by Period of Cultural Evolution. For the purposes of bringing some sort of order to the mass of data reviewed, I will summarize findings by time periods that correspond to distinctive technological modes *in Africa*. In other words, for example, when I refer to 'Middle Acheulian' sites, I mean sites that occur across regions in roughly the same time period as African Middle Acheulian sites, whether or not they have stone assemblages that exactly match those classified as 'African Middle Acheulian' stone industry.

Early-Oldowan (~2.0 to 2.6 Ma). Early Oldowan' (sometimes labeled 'Omo Oldowan' or 'Omo Tradition' or 'Pre-Oldowan') is a Lower or Early Paleolithic stone assemblage characterized by bipolar reduction, cores and flakes, flakes not retouched, and not yet standardized tool forms. Some authors do not consider these early stone tool assemblages as having an industry distinct from the later 'Classic' Oldowan industries, but my review suggests that Early Oldowan and 'Classic' Oldowan assemblages are sufficiently distinct and the definitions used to distinguish them appropriate. At the same time, one can acknowledge significant variability of technical skill represented across sites.

Although the evidence is sparse, some of this variability might be related to the apparent finding that some evidence of stone tools seems to be associated with Australopithecine fossils and other evidence with *Homo* fossils. In the light of current reports reviewed, I suggest that this early stage of Oldowan technology reflects two contemporaneous cultural traditions, one associated with *Australopithecus* and one with *Homo*, and the former I will term 'Pre-

Oldowan'—even if it is not 'pre'—and the latter 'Early Oldowan'. Although the evidence is very sparse—indeed, but one object, the Makapansgat manuport—symbolic behavior also seems to support this Pre-Oldowan/Early-Oldowan distinction as a valid designation for two distinct, though temporally overlapping, cultural traditions.

The earliest (and only—but we may anticipate more to come) evidence for 'Pre-Oldowan' occurs at Bouri, Ethiopia, 2.45-2.50 Ma (million years ago) *(HJ1999)*, which has cutmarked bones and bone shaft hammerstone breakage, but no cores or flakes, which may have been manuported away from the site, and this site is associated with *Australopithecus garhi (HJ1999)*.

While there is no evidence yet for Early Oldowan symbolic behavior/palaeoart, there is evidence for one Pre-Oldowan palaeoart object, the Makapansgat, South Africa, natural (not artificially modified), manuported red jasperite cobble, 'figurine of many-faces', associated with *Australopithecus africanus,* which seems accepted as the earliest example of palaeoart in the world *(DR1974; BR1998; BR2003).*

Early Oldowan sites span ~2.0 to 2.6 Ma and are found in Ethiopia, Kenya, Zaire, Malawi, possibly South Africa, and are associated with *Homo sp. indet*., *Homo habilis* and *Homo rudolfensis*. The earliest site is Ounda Gona, Ethiopia, 2.53 to 2.58 Ma *(SS2003, SD2005)*.

Several Asian sites have been proposed as sites for Early Oldowan dispersal out-of-Africa by *Homo habilis/rudolfensis*, including Yiron, Israel; Riwat, Pakistan; and Renzidong, China. My review indicates that there is currently no consensus on the artifactuality, dating, and/or tool industry classifications at these sites. This is currently the position of Ciochon with respect to Renzidong (*personal communication 2006*). There are apparently no hominid remains associated with these sites. Until new evidence, it appears that the Early Oldowan—like its contemporaneous partner, the Pre-Oldowan—originated in Africa but did not disperse into Southern Asia.

'Classic' Oldowan (~1.4-2.0 Ma). Classic Oldowan industries are characterized by bipolar and direct percussion, cores and flakes plus choppers, discoids, spheroids, and standardized small tools, including scrapers on flakes or fragments, rare burins and protobifaces, utilized unmodified flakes; and rare worked bone. They are first evident in East Africa sites, including Koobi Fora, Turkana Basin, Kenya and Olduvai Gorge, Tanzania. At Koobi Fora Oldowan industries are found in and just below the KBS Tuff dated 1.88-1.95 Ma *(IW2000, TI1988)* and are associated with *Homo rudolfensis* and at later occupations *Homo habilis (IW2000, TI1988; TN1985)*. Around the same time Oldowan assemblages are found at Olduvai Gorge, Tanzania beginning in Bed I, dating between Tuff IF 1.75 Ma and Tuff IA 1.98 Ma *(WR1991)* where they are associated with *Homo habilis (WJ1982)*. Subsequently the Classic Oldowan occurs in Ethiopia and South Africa.

Outside of Africa, Classic Oldowan industries occur at Dmanisi, Kura River Basin, Georgia, where multiple dating techniques give an age of ~1.7-1.8 Ma *(LH2005)*. The Oldowan assemblages are associated with hominid remains variously designated as closer to *Homo rudolfensis* than *ergaster*, and an intermediate name, *Homo georgicus*, has been proposed

(LM2006, LH2005). At a later date Classic Oldowan tools occur at Pabbi Hills, Upper Siwilak Formation, Pakistan, dating from 1.2-1.4 Ma to 'older dates' *(DR1998)*. No sites have yet been found in SE Asia, but they may assumed to be there, and older dates in South Asia as well, since Classic Oldowan sites are found in China, the earliest sites being those in the Nihewan Basin, northern China, and of these the oldest appears to be Majuangou at ~1.32 to 1.66 Ma *(ZR2004)*. No hominid remains have been found associated with these Oldowan assemblages. An earlier site at Longgupo may have a few tools but its hominid remains previously thought to be *Homo* have been argued recently to be *Lufengpithecus* ape fossils *(ED1997; HM2002)*

Based on these sites and dates, there appears to be a clear time gradient from Africa to China and we may posit a 'Southern Route' dispersal of Classic Oldowan industries from East Africa (~1.9 Ma) through Southwest Asia (~1.8 Ma) through Pakistan (>1.4 Ma) across South Asia and into China (~1.6 Ma).

With future fossil evidence these Asian sites will probably also be found to be associated with *Homo habilis* or *rudolfensis*, rather than *Homo erectus* as some have proposed, especially given the recently lowered dating in Africa for earliest evidence of *erectus* to 1.65 Ma with the revised dating of Area 123, Koobi Fora *(GP2006)*.

Potential evidence for symbolic behavior in the Classic Oldowan is sparse. Several objects are suggested and if the interpretations are confirmed, these would be the earliest evidence in the world of intentionally worked products of symbolic behavior. There are two items from Olduvai FLK North, Upper Bed I, ~1.75 Ma. One is an artificially pecked phonolite cobble, with cortex fully removed, pecked with four pits in a line and an encircling groove that results in a shape vaguely like a 'baboon-head' *(LM1971, LM1976; BR2003)*.

The other is a 'pitted anvil', a conical shape block, ~10 cm. in diameter, steeply flaked (high backed) all around its flat base, with a deep 9 mm pecked depression in its center *(LM1971, LM1976)*. It is described as an 'apparent cupule' *(BR2003)*; although similar objects at Gesher Benot Ya'aqov, Israel, while determined not to be the result of bipolar reduction, are presumed to be anvils for nutcracking *(GN2002)*. Similarly 'pitted anvils' have been found at the Classic Oldowan site of Gombore I, Melka-Kontouré, Ethiopia, ~1.6-1.7 Ma *(GN2002)*.

I would add a third object from site FxJj1, Koobi Fora, ~1.88 Ma. This is a curated, flaked pebble core; the four flakes accidentally generated an inner, nicely symmetrical, rhomboid shape *(HJ1992)*. If indeed symbolic, all three objects seem to belong to a single metaphorical complex.

Finally, at the site of Sterkfontein Cave, South Africa, Stw53 *Homo habilis* remains *(MJ2003; CD2006)* are reported to have stone tool cutmarks, the earliest evidence of 'post-mortem manipulation of hominid carcasses' *(PT2000)*.

Developed Oldowan (~1.2-1.7 Ma). Developed Oldowan stone technology is similar to Classic Oldowan but with a reduced percentage of core-choppers, discoids, polyhedrons and heavy-duty scrapers; more refined light-duty scrapers, denticulates, burins, the first appearance of awls and edge-trimmed flakes. Working of bone tools continues. In later phases of the

Developed Oldowan a few crude bifaces may appear, at least where there is influence of contemporaneous Early Acheulian as in Africa.

The Developed Oldowan is documented in Africa from about 1.7 to about 1.0 Ma. Earliest evidence for the Developed Oldowan industries occurs at its type-site, Olduvai Gorge, Middle Bed II, ~1.5-1.66 Ma *(MR2005)*. At Koobi Fora the Karari industry occurs between 1.55±0.03 and 1.70±0.03 Ma *(IW2000; SN1993)*. From East Africa the Developed Oldowan appears to spread over time to Uganda, Ethiopia, and South Africa.

In southern Asia the Developed Oldowan occurs in the earliest layers of the Li-cycle at Ubeidiya, Israel, ~1.60-1.65 Ma *(BM2006)*.

A continuation of Developed Oldowan dispersal across Southern Asia seems to occur, but the evidence is not as strong as the evidence for Classic Oldowan diffusion. This is due in part to sparseness of sites and the vagueness of classification presented in archaeological reports, which do not clearly differentiate between Oldowan and Developed Oldowan assemblages. For instance Pabbi Hills at 1.2-1.4 Ma would fit a time gradient, but it is not clear if assemblages during this time period are 'Oldowan' or 'Developed Oldowan'. A high percentage of light-duty tools at Xiaochangliang, China, ~1.36 Ma *(ZR2001)* and 'points' at Xihoudu, China, ~1.27 Ma *(ZR2003; WQ2000)* suggest that with a more fine-tuned classification both sites could be classified as Developed Oldowan.

In East Africa the Developed Oldowan is associated with *Homo ergaster/Homo erectus*. There are no hominid fossils in South Asia for this time period, but *Homo erectus* does occur in South East Asia at Perning and Sangiran, Solo River, Java. Perning *erectus* fossils were dated (Ar/Ar) to ~1.8 Ma and Sangiran fossils to ~1.66 Ma *(SC1994; DVJ1994)* but challenged by doubts about Perning (Mojokerto 1) provenience *(HO2006)* and paleomagnetism suggesting ~1.1 Ma *(HM2002, 1993)*. Recent (Ar/Ar) datings at Sangiran suggest *Homo erectus* fossils belong to the timeframe ~1.0 to ~1.5 Ma (LR2001) and Sangiran tools—shell tools, small flake tools—may occur as early as ~1.6 Ma (WH2006; SR2006). These initial reports of Sangiran stone assemblages do not classify them by typology, but what is described appears comparable to the Oldowan or Developed Oldowan of Africa.

If these Asian stone assemblages are comparable to the African Developed Oldowan—and not just very late examples of Classic Oldowan—then there is a case for diffusion of Developed Oldowan technology from East Africa (~1.65 Ma) through Southwest Asia (~1.6 Ma) through Pakistan (~1.4 Ma) and across Southeast Asia (~1.1-1.5 Ma) and into China (~1.3 Ma). However, the opposite hypothesis, that these Asian assemblages are independent, multi-regional innovations building on their indigenous Classic Oldowan roots is not ruled out. Furthermore, if new dating of *Homo erectus* and/or Developed Oldowan in Southeast Asia were to approach 1.6 Ma or even older, then the time gradient evaporates and the hypothesis of a multi-regional convergent evolution of the Developed Oldowan, and even *Homo erectus* would appear more supported.

Given the data reviewed to date, it appears that there might have been a rapid expansion of *Homo erectus* bearing a Developed Oldowan technology out-of-Africa and across all of

southern Asia. Yet if this were so, why, is it the case, as I will show next, that *Homo erectus* does not appear to have carried the Early Acheulian also out-of-Africa, especially if one believes that the Acheulian was a definitive innovation of *Homo erectus*?

As with the Classic Oldowan there is sparse evidence for symbolic behavior during the Developed Oldowan period, but two themes seem to persist. There are a few reports of Developed Oldowan 'pitted anvils': Olduvai Gorge, FLK North Sandy Conglomerate, Middle Bed II, ~1.5-1.66 Ma *(LM1971)*; which, as in the earlier cases from Olduvai FLK North and Melka-Kontouré, is could be a 'cupule' *(BR2003)* or nutcracker *(GN2002*) and which it is remains for science to determine. In addition, two lumps of non-local (manuported) red welded tuff at site BK, Olduvai Gorge, Upper Bed II, ~1.48 Ma, which could have been used for pigment colorants *(HR1976; LL1958; OK1981; BR2003)*.

The earliest sites mentioned above for the three Oldowan periods are summarized in the following table:

EARLY OLDOWAN				
AFRICA	**SOUTHWEST ASIA**	**SOUTH ASIA**	**SE ASIA & SAHUL**	**EAST ASIA**
Ounda Gona, Ethiop.				
~2.5 Ma				
CLASSIC OLDOWAN				
Koobi For a, Kenya	Dmanisi, Gerogia	Pabbi Hills, Pakistan		Majuangou, China
~1.9 Ma	~1.8 Ma	>1.4 Ma		~1.6 Ma
DEVELOPED OLDOWAN				
Karari, Kenya	Ubeidiya, Israel	Pabbi Hills, Pakistan	Sangiran, Java	Xiaochangliang, China
~1.65 Ma	~1.6 Ma	~1.2-1.4 Ma	~1.1-1.5 Ma	~1.36 Ma

Early Acheulian (~1.0-1.7 Ma). The Early Acheulian represents a major new innovation in stone knapping, the production of flake blanks, which are, in turn, used as cores for flaking more useable flakes. Products include crude 'handaxes' with sinuous edges and large flake scars, trihedral picks, rare cleavers. The Early Acheulian has a large component of flakes; chopper, polyhedron, spheroid, heavy-duty scrapers. There is an absence of Levallois or other prepared core reduction techniques.

It occurs in a timeframe overlapping the Developed Oldowan, about 1.7 to about 1.0 Ma. The earliest Early Acheulian sites occur in East Africa, at Olduvai Gorge Middle Bed II, ~1.5-1.66 Ma and Peninj, Tanzania, ~1.4-1.7 Ma. Subsequently it is widespread in Africa from Ethiopia to South Africa and Morocco. At Konso-Gardula, Ethiopia it is associated with *Homo erectus* fossils.

There is an apparent diffusion of Early Acheulian technology from Africa (~1.7 Ma) through Southwest Asia (~1.2-1.6 Ma) to India (~1.0 Ma). On the other hand, to date there appear to be no clearly diagnostic Early Acheulian industries east of India. Sparse sites in this time period in SE Asia, such as Sangiran, and China, such as Gongwangling, Lantian, and

Donggutuo, Nihewan Basin, China have stone assemblages that are not clearly diagnostic and vaguely suggest continuation of Developed Oldowan technology.

Candidates for symbolic behavior in the Early Acheulian are again sparse and of the same kind as in the Developed and Classic Oldowan, possible 'cupule' stones and colorant. At Site 8E, Gadeb, Ethiopia, 0.7 to ~1.5 Ma *(WM1979),* excavation revealed four well-made ovate obsidian 'handaxes', for which the only known source for that obsidian was ~100 kilometers away; eleven (11) 'rounded cobbles with pits' like those found in earlier Oldowan sites at Olduvai and Melka-Kontouré and hypothesized as either cupules or nutcrackers. In addition there were several pieces of red basalt, which when rubbed yielded red pigment, but there was no direct evidence of their being rubbed *(CJ1979; OK1981)*. I mention the obsidian handaxes, as they suggest that already in the Early Acheulian 'handaxes' may have had a symbolic value.

In the 1940's, considering the then absence of data for Acheulian handaxes in East and Southeast Asia, Hallam Movius postulated that the 'chopper and chopping tool complex' of the Far East reflected its position as culturally backward. This assumed diffusion barrier became known as 'Movius' Line'. If we were to use such terminology, the absence of Early Acheulian technology east of India, if it holds, would best be called a 'Movius Line'. However, there is sufficient archaeology evidence now to show that there is no such line for the Middle Acheulian.

Middle Acheulian (~500 ka to 1 Ma). Middle Acheulian tool technology (~500 ka to ~1 Ma) is characterized by standardization of blank shape and reduction techniques (e.g., Kombewa, Victoria West in Africa); more regularized handaxe shapes (cordiform, amydaloid, lanceolate, oval), cleavers with bits made using a single flat surface scar, trihedral picks, and flake tools (mostly denticulates, notches, scrapers). Some assemblages have only core-choppers and flakes and these may be interpreted as different technological traditions, for example, persistence of Developed Oldowan, or just different 'function' assemblages within the same tradition.

During the Middle Acheulian sites across Southern Asia are more frequent and there is strong substantiation for a diffusion of Middle Acheulian technology out-of-Africa all the way to the Far East.

There is a fairly evident time gradient west to east, from Africa (~1 Ma) through Southwest Asia (~900 ka) through—or around coastal—India (~780 ka), reaching China (~800 ka). Diagnostic Middle Acheulian assemblages have not yet been found in SE Asia, but there are sites in the ~800 ka time range. These core-and-flake assemblages may represent persisting Developed Oldowan or a Middle Acheulian core-and-flake small tool sub-facies. The requirement of watercraft to reach Flores ~800 ka suggests a culture at least as evolved as the Middle Acheulian. Across the 'Southern Route' *Homo erectus* appears to be the innovator of the Middle Acheulian technological wave from Africa to East Asia.

Reports of symbolic behavior appear to take a quantum jump with the Middle Acheulian. Foremost is the quartzite, naturally anthropomorphic figurine, modified with grooves to emphasize 'arms', 'legs', 'head', with traces of red, black, and white paint pigment (iron and manganese). It is the earliest evidence in the world of applied coloring material, and shows workmanship comparable to the Later Acheulian figurine from Berekhat Ram Israel *(BR2001, BR2003).*

The apparent collection of exotic quartz crystals is reported at four Middle Acheulian sites from the Levant to China:

- Gesher Benot Ya'aqov, Israel, ~750-780 ka *(GN2000),* where angular quartz crystals occur in the same deposit as two naturally perforated 'bead-like' crinoid fossils natural to site *(GN1991*)
- 16R Dune, Thar Desert, Rajasthan, >390±50 ka *(MS1992, JH2005)* quartz crystal manuports *(PSo2001*)
- Singi Talav, Didwana, Thar Desert, Rajasthan, >390 ka *(CP2004);* 6 quartz crystals, no use-wear, too small for tool manufacture, non-local *(BR2003, BR1993; JH2005)*
- Zhoukoudian Cave, China Locality 1, Layers 5-10, 600-800 ka *(BN2004),* Upper 8,Quartz Horizon 2: ~20 quartz crystals, 1 perfect fully faceted, probably from 7 kilometers away and spheroids *(BL1985; BR1991)*.

While the use of red pigment is a hypothesis for several Developed Oldowan and Early Acheulian sites noted earlier, the case is convincing at the Middle Acheulian site of Hunsgi II/V, Hunsgi Valley, Karnataka, India, >350 ka for related sites in Valley *(NN2003)*, with its report of both ochre nodules and hematite with wear facets and striations, evidence for 'pigment crayons' *(BR1990; BR1993; BR1994)*.

Finally, following on earlier sites with 'pitted anvils', Gesher Benot Ya'aqov has yielded 46 pitted cores, blocks and slabs, which, in the light of the extensive record for the collection of edible nuts, including varieties that would require hammer and anvil to crack open their shells, are presumed to have been used for cracking nuts *(GN2002)* although their appears as yet no convincing science to disprove the hypothesis that they actually are 'cupules', a form of symbolic behavior.

I leave aside for now the voluminous debate over whether or not some bifaces may have been employed in symbolic behavior. I have written elsewhere (posted on OriginsNet.org) a hypothesis for how, during the Middle Acheulian, complementary biface shapes, such as 'handaxe' and 'cleaver', could have been used to symbolize the deepest spiritual notions of complementarity, tension of opposites, birth and death, and so on.

Later Acheulian ('Upper Acheulian') (~200-650 ka). Later Acheulian tool technology is characterized by bifaces that are more symmetrical and refined than in the Middle Acheulian, with well-made, sometimes beautiful, cordiform, amygdaloid, and ovate handaxes. In some assemblages ovates dominate. There is greater use of soft hammer; increase use of Levallois technique, but some sites no Levallois; disappearance of core-choppers; and often the length of handaxes decrease*s*. Denticulates, notches, and scrapers continue. In Africa late sites, contemporaneous with Final Acheulian, may have stone assemblages that contain a few blades. In China there are apparently points at some sites in this period, and if so, these predate African points, which do not seem to occur until the Final Acheulian.

Evidence for Later Acheulian assemblages seems to appear first in Africa at Bodo, Ethiopia, dated by multiple methods to between 0.55±0.03 Ma and 0.64±0.03 Ma, and at the

same site occurs fossils of *Homo rhodesiensis* (or *Homo heidelbergensis*) *(CJ1994)*. Later Acheulian appears in Southwestern Asia first at Berekhat Ram, Israel, which has an Ar/Ar integrated age of 470±8 ka *(FG1983)* and is considered the earliest evidence of Levallois prepared core reduction in the Levant *(BO1994, BO1998)*. Later Acheulian sites in India dated by U-series are beyond the limits of that technique. It seems first evident in Karnataka at sites in the Hunsgi-Baichbal Valley, such as Sadab, 290 ka, and Teggihalli, 287 ka and >350 ka *(MS1992*). In this time period, the few sites discovered in Southeast Asia, in Myanmar, Vietnam and the Philippines, seem to evidence only continuation of Developed Oldowan core-and-flake industries. However, in East Asia something like a Later Acheulian, appears at Zhoukoudian Locality 1 Layers 2-4, ~400-500 ka, with cleavers, flakes and points and evidence of the use of cooking fire *(SG2001; BN2004; LJ1998; BL1986)*; and Kommonmoru, North Korea, 400-600 ka, which has picks and handaxes *(BK1992)* may also be considered Later Acheulian.

Later Acheulian period hominin fossils from Africa (Bodo; Olduvai Gorge; Kapthurin; Ndutu; Elandsfontein; Cave of Hearths; Hoedjiespunt; Salé; Sidi Abderrahmen; Wadi Dagadlé), to India (Hathnora), to South East Asia (Tham Khuyen Cave) to China (Nanjing; Yunxian; Chenjiayao; Zhoukoudian 2-4; Longtandong) are apparently all about equally evolved though assigned a variety of species designations—*Homo heidelbergensis* or *Homo rhodesiensis* or 'evolved' *Homo erectus.*

If these dates and tool classifications hold, then there appears to be a slight time gradient for the diffusion of Later Acheulian from Africa (~500-600 ka) through Southwestern Asia (~470 ka) to western coast of India (~300 ka) apparently reaching China and Korea (~400-500 ka). The gradient is not strong and one might count sites such as Zhoukoudian 2-4 as a convergent innovation building on indigenous Middle Acheulian. Further, one might consider Zhoukoudian 2-4 more advanced than sites in Africa, at least in evidencing points prior to their appearance in Africa, which did not occur until the Final Acheulian.

The Narmada Crossing. Evidence suggests that there was a well-established late Later Acheulian South Asian transcontinental Narmada Crossing, from Gujarat (Umrethi, ~190 ka; Kaldevanhalli-I, Karnataka, ~170 ka), following the Narmada River through Madhya Pradesh (sites such as Bhimbetka; Daraki-Chattan; Hathnora *heidelbergensis* site, ~200-300 ka; Maihar) towards its source, and crossing overland to rivers such as the Chambal, Betwa and Son (many sites around ~200 ka) down to the Ganges and thence eastward, or, the reverse. There may have been a movement of people and trade in both directions. Better dating of sites is needed to confirm one or the other hypothesis. In either case, whether diffusion or exchange, the major rock art site of Bhimbetka is positioned right at the center of the Narmada Crossing.

As was the case for the Middle Acheulian period, there are a sparse number of excavated sites in Southeast Asia, so it is not really possible to type the industry mode. For example, Upper Irrawaddy appears to evidence a persistence of Developed Oldowan type industries. However, given East Asian sites that may be characterized as Later Acheulian, one need not posit a 'Movius Line' for the Later Acheulian in Southeast Asia. Again, these may be functional facies and we can anticipate Later Acheulian industries yet to be discovered.

With respect to symbolic behavior, the Later Acheulian seems to evidence another quantum leap in frequency and sophistication. Most remarkable is the now well-known Berekhat

Ram stone 'female' figurine, the natural anthropomorphic shape of which was enhanced with artificial grooves *(GN1986, GN1995; MA1996, MA1997, DF2000*). At the site of Erfoud, eastern Morocco, a manuport cuttlefish fossil, naturally shaped, with no evidence of working, has the 'life-size shape of a penis' was found in association with Later Acheulian bifaces (Fiedler, 1984) *(BR2002)*.

At Wonderwerk Cave, South Africa, in Later Acheulian assemblages dated by U-series to ~350 ka, 2 ironstone slabs bear engraved sub-parallel lines; there are abundant ochre fragments at every level; and exotic quartz crystals, small 'pretty' colored river pebbles *(BJ1992; BR2003; BR1993)*. Here we see continuation of the Middle Acheulian tradition of collecting quartz crystals and other exotic stones and red ochre for pigment. Wonderwork Cave itself is a site of extensive ochre mining from Acheulian to recent times.

These earliest known African petroglyph engravings may be compared to an emergent Later Acheulian petroglyph tradition in India evident at the UNESCO World Heritage site of Bhimbetka, near the Narmada River, Raisen District, Madhya Pradesh. In Auditorium Cave at the lower Later Acheulian level of Wakankar Trench II, site III F-24, a boulder is engraved with one cupule and one undulating groove, which just touches it. The Later Acheulian levels underlie a Final Acheulian layer, which recently obtained a preliminary OSL dating 106±20 ka; the Acheulian Levels will be much older than that date *(BR2005)*. Nearby Chief's Rock, which stands at the crossing of two perpendicular corridors, is engraved with nine (9) cupules and bears marks of red pigment *(BR2005, KG1996)*. Microerosion technique applied to these cupules indicates that their age is well in excess of 100 ka and they were likely made during the Later Acheulian *(BR2005)*.

A Later Acheulian cupule-making tradition also seems to occur at Daraki-Chattan Cave, Madhya Pradesh, where Acheulian levels revealed exfoliated slabs bearing cupules and the hammerstones used for their engraving and also one hematite nodule; the cave walls are covered with more than 500 cupules and 2 engraved grooves *(BR2005, KG1996)*.

The Bhimbetka Wakankar Trench Acheulian also yielded a flaked chalcedony stone disc. It is similar to a stone disc found in the Acheulian level at the site of Maihar, Satna, Madhya Pradesh *(BR1992; BR1993)*. Compare the site of El Greifa E, Fezzan, Libya, U-series date ~ 200 ka, with Late Acheulian and three (3) fragments of ostrich eggshell disc beads *(BR1997)*. [Note: based on its late date, this site might be considered Final Acheulian.]

Finally, cutmarks on the Bodo *rhodesiensis* skull appear to indicate 'intentional postmortem defleshing' *(WT1986)* and we may hypothesize some sort of Later Acheulian mortuary ritual. Perhaps this continues or builds on a practice on-going since the Classic Oldowan period, recalling cutmarks on *Homo habilis* remains at Sterkfontein Cave, South Africa, noted earlier.

Final Acheulian (~150 to 300 ka). Just as the Developed Oldowan was contemporaneous with the Early Acheulian innovation, so the Final Acheulian is contemporaneous with the Middle Paleolithic/Middle Stone Age. Final Acheulian tool technology is characterized by multiple reduction strategies, Acheulian bifaces, sometimes made on Levallois flakes, Levallois and disc

cores; variable presence of handaxes, cleavers as well as points and blades. In Africa it has been called 'Final Acheulian' or 'Intermediate' with regional variants, including the Kapthurin, Sangoan and Fauresmith and in the Levant the Mugharan Tradition, and similarly in India.

Early African sites are GnJh15 at Kapthurin Formation, Kenya, around >284±12 ka *(TC2006; MS2005; DA2002; MS2000)*; Garba III, Melka-Kontouré, Ethiopia, ~250 ka, with Final Acheulian and remains of 'earliest' *archaic Homo sapiens (MJ2001)*; and at Bir Tarfawi and Bir Sahara East, southwestern Egypt, ~250-320 ka (OIS9) *(SB1995)*. The Final Acheulian appears in the Levant at Tabun Cave, Mt. Carmel, Israel, Layer E, Level XIII, Yabrudian (TL mean) 302±27 ka, and Level XI, Acheulo-Yabrudian and Amudian (TL mean) 264±28 ka, with even earlier ESR dates *(MN2003, 1995,1994, BO199, VH1998)*. Final Acheulian is reported from India at sites in Maharashtra, Bori, Kukdi River, Nevasa, Pravara Basin and Yedurwadi, Krishna Basin, each dated U-series ~200 ka *(BR200*as well as Bhimbetka, Madhya Pradesh, where the Final Acheulian 'Intermediate' Layer, with 'Eastern Micoquian-like' bifaces now has a preliminary OSL date, 106±20K *(BR2005)*.

Based on its dates I have allocated the remarkable report of Acheulian artifacts at Luonan Basin, China to this Final Acheulian time period. The report describes 50 open-air sites with handaxes, cleavers, and trihedral picks as well as flake tools including 'points' *(WS1998),* (TL) 182.8±9.1 ka to 251.05±12.5 ka (*WS2005*). The open-air sites appear to continue typical Later Acheulian found at nearby Longyadong Cave, but with more points, but at this time period the cave has only the small tools and no bifaces. Wang observes that 'this dichotomy is not explained by any current theory of hominid behavior' *(WS1998, WS2006)*. Perhaps it is that the bifaces occur especially at habitation/work sites, while caves may have a different purpose, perhaps for ritual, initiation, deposition of the dead, and so on. (As an aside, I wonder to what extent our knowledge of Southeast Asian and East Asian Paleolithic sites is skewed due to a bias toward cave sites and how much this has contributed to the illusion of the 'Movius Line'.)

Across regions there does not appear to be a strong time gradient for the Final Acheulian. Dates for Levantine Southwest Asia (~300 ka or earlier) are actually older than dates in Africa (~285 ka). On the one hand, one might infer a diffusion of Final Acheulian type industries from—if we strictly adhere to the evidence—the Levant spreading to Africa and also to India, Gujarat and Maharashtra (~200 ka) and into the Narmada valley (at least by ~100 ka) and to China (~250 ka). Within limits of the database there is no evidence for Final Acheulian sites in Southeast Asia, although Thailand does show an *archaic Homo sapiens* (~130-170 ka). On the other hand, one might infer convergent innovation building on Later Acheulian across regions. Either way, we cannot posit a 'Movius Line' for this time period.

Within the limits of this review, earliest reported Early, Middle, Late and Final Acheulian sites are summarized in the following table.

EARLY ACHEULIAN				
Olduvai, Tanzania	Ubeidiya, Israel	Isampur, India		
~1.5-1.7 Ma	~1.2-1.6 Ma	~1.0 Ma		
MIDDLE ACHEULIAN				
Olorgesailie, Kenya	Bizat Ruhama, Israel	Attirampakkam, India		Bose, China
~990 ka	~850-900 ka	~780 ka		~803 ka
LATE ACHEULIAN				
Bodo, Ethiopia	Berekhat Ram, Israel	Sadab, Hunsgi, India		Zhoukoudian, China
~550-640 ka	~470 ka	~290 ka		~400-500 ka
(Well-established Narmada Crossing by ~200 ka)				
FINAL ACHEULIAN				
Kapthurin, Kenya	Tabun, E, Israel	Bori, India		Luonan, China
~>285 ka	~300 ka	~200 ka		~250 ka

With respect to symbolic behavior, the Final Acheulian, at least in Africa, seems to continue Later Acheulian 'ochre' and 'cupule' themes:

- GnJh15, Kapthurin, Kenya, around >284±12 ka, 74 pieces red ochre (totaling more than 5 kg) pulverized and chunks and grindstones *(TC2006; MS2005; DA2002; MS2000)*
- Blind River Mouth, South Africa, Fauresmith, large grindstone incised with checkerboard crisscross lines *(LP1933)*
- Sai Island, Nile River, northern Sudan, Site 8-B-11, Sangoan, (OSL) L5 and L6, between 182±20 ka and 223±19 ka, Level 6, dense concentration of red and yellow ochre lumps, some with ground surfaces; sandstone slab, top pecked flat, grinding hollow with 7 cupules; several chert pebbles with red/yellow ochre adhering, one with black inclusions, 'symbolic'; Level 5: stone circle with 2 more slabs with depressions *(VPP2003)*

as well as continuing mortuary ritual, earlier noted from Later Acheulian (Bodo) and Classic Oldowan (Sterkfontein):

- Herto, Upper Herto Member, Ethiopia, (Ar/Ar on underlying and overlying tuffs) 154±7 to 160±2 ka, *Homo sapiens idaltu* between Bodo, Kabwe *rhodesiensis* and *Homo sapiens sapiens (WT2003)* [that is, *archaic Homo sapiens*]; all three individuals bear defleshing cutmarks and scrape marks, the juvenile polishing (not processing for food), which is 'indicative of mortuary practice' *(CJ2003)*

While the database does not show comparable symbolic behavior evidence outside of Africa, it is highly likely that sooner or later such will be identified.

Early Middle Paleolithic (Early Middle Stone Age) (~150 to 300 ka). Just as the Early Acheulian innovation was contemporaneous with the Developed Oldowan, so the Middle Paleolithic (Middle Stone Age) is contemporaneous with the Final Acheulian.

First appearing in Africa and Southwestern Asia, Early Middle Paleolithic/Middle Stone Age tool technology is characterized by elongated or large, relatively thick, blades and point blanks flaked from radial, single or opposed platform cores, recurrent and some Levallois, with minimal preparation of striking platform; retouched points—many elongated, prismatic blades, endscrapers and burins common; no backed microliths; evidence of hafting points and blades (tangs, grooves, mastic); intra-regional point styles suggesting diverse cultural traditions; and use of color pigments, which becomes extensive by Mid-MSA/MP. This technological innovation is associated with *archaic Homo sapiens*, such as *Homo helmei* in Africa.

Middle Stone Age industries appear to originate in East Africa or South Africa around 280 ka and perhaps earlier. Although reports reviewed do not indicate precise dating, EMSA is first reported in Africa at Olorgesailie, Kenya Locality B and G, Olkesiteti Formation, in strata dating between ~220 to 340 ka *(BA 2005)*. It occurs at Florisbad, South Africa, where fossil *Homo helmei* dates (ESR) 259±35 ka in levels with Early MSA tools, OSL dated to 281±73; 279±47 ka *(GR1996, RR1997, KK1999)*; Twin Rivers Kopje, Zambia with Lupemban industry, (U-series) A-block, ~265 ka and F-block, 140-200 ka *(BLP2002)*; Koimilot, Kapthurin Formation, Kenya (Ar/Ar) ~200-250 ka *(TC2006)*; and Taramsa 1, Upper Egypt, (OSL) ~210 ka *(VVP1998)*. It seems to first occur in the Levant at the Levantine Middle Paleolithic type site for 'Tabun D Mousterian' industries, Tabun Cave, Israel, Layer D, (TL) 256±26 ka *(MN2003)* although (ESR LU) 203±26 ka *(GR2000)*. Middle Paleolithic sites occur in South Asia later at around 150 ka, first at 16R Dune, Didwana, Thar Desert, Rajasthan, (Th/U) 150±10 ka and 144±12 ka (MS1992, JH2005) and is well established at hundreds of sites in the Kaladgi Basin, Karnataka during the period 100 ka to 50 ka *(PM2003)*. Middle Paleolithic is reported in South East Asia by around 130 ka.

Although *archaic Homo sapiens* appears in China at Dali, (Useries) 209±23 ka, and perhaps earlier at Zhoukoudian New Cave, perhaps as early as 270 ka, and innovation of radial core multiple reduction strategies occurs at Zhoukoudian by at least around 120 ka, apparently such methods were not used to produce points or blades, though points are noted for China at much earlier periods. This may reflect limits of my review or the status of research.

Thus, there does appear to be an Early Middle Paleolithic time gradient from Africa (~280-300 ka) through Southwest Asia (~260 ka) that spreads to India (~150 ka) and Southeast Asia (~130 ka). The China discrepancy is interesting in the light of genetic theories suggesting an early Homo clade disperses from Africa across Southern Asia but does not reach China. But future archaeology might show that Early MP technologies do indeed reach China.

With respect to symbolic behavior during the Early MP/MSA, there are reports of use of ochre, specularite and other pigment colorants.

- Twin Rivers, Zambia, (U-series) A-block, ~265 ka and F-block, 140-200 ka *(BLP2002)*. At Lupemban levels in A and F-blocks 306 specularite, hematite, limonite, manganese dioxide pieces, some with evident striations for powder; brown, red, yellow, pink, purple, blue-black pigments; huge quantity and a pestle stone with hematite stain on working surface suggests some sort of ritual or symbolic use *(BLpig2002; CJ2001)*
- Hayonim Cave, Israel, Lower E (TL) ~200 ka *(VH1998),* Tabun D, several flints retained red ochre on retouched edge (BO1995, 1997)
- Border Cave, South Africa, Strata 4-6 'MSA1' or 'Early MSA', (TL) ~165-180 ka (ESR) ~80-227 ka (OIS5-6), ochre pieces all levels; ostrich eggshell beads *(BP1978; WI1999).*

In addition, I located one report of an incised wooden object.

- Florisbad, South Africa, Peat I unit, (OSL) 281±73; 279±47 ka *(GR1996, RR1997, KK1999)*, curved wooden implement with longitudinal parallel incisions ('cutmarks') on one end *(BM2003; BRe2003; BR1992)*.

Mid-Middle Paleolithic (Mid-Middle Stone Age) (~60 to 150 ka). This is the key time period for *Homo sapiens sapiens* out-of-Africa hypotheses. The Mid-MSA/MP technological mode appears in Africa around 150 ka and fades into the Late-Middle Paleolithic (Late MSA), which, in Africa, marks the emergence of the Later Stone Age (Upper Paleolithic) technology mode around 60 ka. I acknowledge this 60 ka lower boundary for the Mid-MSA as somewhat arbitrary; it is for purposes of simplification but also perhaps—at least from the limited perspective of my review—more fitting than, for instance, a 50 ka boundary as some would argue. In palaeoclimate terms, Mid-MSA assemblages appear to correlate pretty much with Oxygen Isotope Stage (OIS) 4 (~59-74 ka) and OIS 5 (~74-130 ka).

In discussing out-of-Africa theory some argue that dispersion occurred because of the extreme aridity of an African dry spell that occurred 60-20 ka, with populations heading out to escape the stress of this arid phase. I believe the data suggests just the opposite: a wave of *Homo sapiens sapiens* dispersed during the wet phase that preceded the arid phase. This inference seems to me much more plausible than an arid phase dispersal, for then there would be insufficient water, game animals or plant foods for survival on top of the stress of dispersal into new landscapes and biozones. During the arid phase in North Africa post 60-ka it is seems more the actual case that people headed for the nearest waterine landscape and hunkered down for the long haul; sites decline inland and increase around ocean, rivers, or south toward a more vegetated central Africa.

Furthermore, *sapiens sapiens* reached Australia by ~55 ka and carrying an Early MP or 'regional variant' Mid-MP industry. A Late-MP or UP dispersal hypothesis does not match the requisite time of Australian arrival nor the technological level of the earliest Australian sites.

Mid-Middle Paleolithic (Mid-Middle Stone Age) tool technology is characterized in African and Southwest Asia, and we might say, across the 'Southern Route' by the continuation of Early MP/MSA production of blanks by multiple reduction methods (single, double, multiple

platforms, radial disc cores, Kombewa), sometimes ovoid and large flakes, regional variants of specialized prepared core techniques (e.g., Levallois, Nubian) and specialized point, blade or scraper styles (e.g., African Nazlet Khater, Aterian, Pre-Aurignacian, North African Mousterian, Ethiopian MSA, Kenya Rift MSA, Mumba Industry, Final Lupemban, Katanda MSA, Bambatan, Pietersburg, MSA-IV, Howiesons Poort, Stillbay; Levantine Nahr Ibrahim, Denticulate or 'Typical' Mousterian, Mousterian of Acheulian Tradition, Tabun C and so on. As noted these Mid-MSA/MP industries appear exclusively associated with a modern (or 'early modern') *Homo sapiens,* i.e., *Homo sapiens sapiens* and, if the designation holds, *Homo floresiensis*.

Mid-MSA stone tool technology seems first to occur in Africa at Mumba Shelter, Tanzania, Levels VIA and VIB and there it is associated with *Homo sapiens sapiens* (~130 ka) *(MM1987; MS2000)*. The earliest well-dated 'anatomically modern human' is earlier, Omo Kibish, Ethiopia (~195 ka), but associated tools are not diagnostic *(MI2005*). Subsequent key sites are Buri Peninsula on the Red Sea Coast, Eritrea (~125 ka), with an 'Early MSA' associated with bifaces *(WR2000)*, suggesting a kind of Mousterian of Acheulian Tradition. There are a number of 'Early Nubian' industry sites around this time, such as Bir Tarfawi and Bir Sahara, Egypt (~100 to ~125 ka) (VPP1998; SB1995; MN1999), Taramsa I, Upper Egypt (~120 ka) *(VVP 1998)*; and Sai Island, Nile, Sudan (OIS5) *(VPP2003)*. 'Mousterian K' ('Denticulate or Typical Mousterian') occurs at Nazlet Khater, Lower Nile, Egypt (~110 ka) *(VPP1998)* and an intriguing 'Aduma industry' with micro-Levallois and micro-Aduma reduction occurs at sites in the Aduma area, Middle Awash, Ethiopia (~80-100 ka) *(YJ2005)*. Mid-MSA stone assemblages appear in a similar time frame further south in Africa, for instance at Mumbwa Caves, Zambia (OIS5e) *(BLP2002; BL1995)*; Klasies River Mouth, South Africa, 'MSA I and MSA II', (~100-128 ka) *(GR2005; ES2005; SR1982; DH1989, 2001)*; Florisbad, South Africa (~121 ka) *(GR1996, RR1997, KK1999)*; Blombos Cave, South Africa (~100 ka or more) *(JZ2006; TC2006)*; and continues on at a large number of sites across Africa until around 60 ka.

A Mid-MP regional variant occurs in the Levant, the Tabun C industry. The re-dating of the C level at Tabun Cave, the type site, formerly though to be OIS5, puts the lowest level at the extreme of ~250 ka, although a distillation of the diverse datings suggests something more like between ~130 to <200 ka *(MN2003; GR2000)*. This might make Tabun C older than any Mid-MP in Africa and suggests either (a) an origin for the Mid-MSA in the Levant; (b) given the Omo Kibish date, perhaps an absence of discoveries of Mid-MSA in Africa prior to Mumba Shelter; (c) co-innovation of Mid-MP in Africa and the Levant; and/or (d) the possibility that the Tabun C datings are all too high and the date should be closer to the low end of the dating, i.e., back to OIS5e, which still does not rule out co-evolution of Mid-MP in Africa and the Levant.

Tabun C occurs at Hayonim Cave, Israel, around ~150 ka *(VH1998)*. (Perhaps this is closer to the true dates for Tabun Cave C.) *Homo sapiens sapiens* in combination with Tabun C industries occurs at Skhul (~100-130 ka) *(GR2005; MN1994, MN1995, VH1998)* and Qafzeh (~85-100 ka) *(MN1994, MN1995, VH1998)*. Mousterian of Acheulian Tradition occurs at Har Karkom, Negev *(AE2006)* and Wadi Arah, Bir Khasfa, southern Oman *(RJI2004b)* although these assemblages are not securely dated. Another Mid-MP regional variant occurring in the Levant is the Aterian, at Bani Khatmah, Rub' al-Khali, Saudi Arabia *(PM2004; BA2006)* and at Har Karkom, Negev *(AE2006*). If there was an out-of-Africa passage along the coast of the Red

Sea and around Oman there was also one right out of Egypt through the Negev into the Levant and east. Arguments for an either/or are apparently not based on the evidence.

While Early-MP seems first reported in India ~150 ka and persists to ~75/100 ka, the Mid-MP occurs (does it 'arrive'?) in India ~75 ka, persisting to around 50 ka or later. Perhaps the industry type could be said to first occur at Patpara, Middle Son Valley, with its blade, flake blade, and scraper industry *(JH2005)*. It occurs at Samnapur, Narmada Valley, Madhya Pradesh, ~74±2 ka *(JH2005*) and Baghor Formation, Son Valley, also ~74±2 ka *(RB2005)*. It is at Jetpur, Hiran Valley, Saurashtra, Gujarat as late as ~60 ka *(JH2005)*. Given these reports, it appears that we have another case of a Narmada Crossing of India, parallel—though the database is sparse—to earlier evident Narmada Crossings of the Later Acheulian and the Final Acheulian.

Next we arrive at the stunning site of Liang Bua Cave, Flores, ~74 ka, with other loci at dated 74-95 ka and multi-method reduction, Kombewa flakes, points and blades, flakes reduced to cores, *façonnage*, and the mini-*Homo floresiensis (MM2007, MM2004)*. With its particular stone assemblage and modern *Homo sapiens*, Liang Bua appears to be very 'Mid-MP'.

Curiously, the subsequent entry of *Homo sapiens sapiens* into Australia is associated with a 'Core-and-Scraper Tradition', which would seem at first best classed as an Early MP industry. (I purposely do not refer to it as the so-called 'Australian Core Tool and Scraper Tradition' as new studies indicate that the 'horsehoof' cores are not tools but edge damaged bipolar cores.) However, given the stereotypical nature of these stone assemblages across multiple sites in this time period, the more it appears that this 'core-and-scraper' tradition might be better typed as a Southeast Asian-Australian 'regional variant' of the Mid-MP, one without blades or points.

The earliest best-dated site for Australia is Malakunanja II, Kakadu, Australia, ~52 ka *(RR1990; OJ2004)* with Core-and-Scraper Tradition tools *(RR1990; FJ1990)*. The neighboring site of Nauwalabila I, with a similar industry, has dates ~53 and ~60 ka, but these dates are questioned (*RR1990; BM2000*; *OJ2004)*. At Lake Mungo, Australia, ~43-45 ka *(BJ2003; GR2006)* at least two burials of *Homo sapiens sapiens* occur associated with Core-and-Scraper Tradition tools *(BJ1970; MJ1999);* LM1, a female, with evidence of cremation, hearths, faunal bones suggesting possible funeral feast, and LM3, male, with ochre burial *(MJ1999, FJ1990; BJ1970)*.

The Lake Mungo 'burials' are not that much different from Mid-MP 'burials' at Qafzeh, Skhul, and Border Cave ('burial', ochre, 'grave goods', perforated and un-perforated non-local shells, engraved stone). This lends credence to the notion that the Southeast Asian-Australian 'Core-and-Scraper Tradition' is a regional variant of a general Mid-MP cultural tradition.

Around the same time as the Mungo burials with Core-and-Scraper Tradition, another Mid-MP regional variant seems to occur at Devil's Lair, Australia, ~41-46 ka *(OJ2004)*. The Devil's Lair assemblage contains flakes, small tools, possibly adzes for hafting, split pointed bones, bone points, and resin on stone tools *(FJ1990)*. Thus, even though they do not appear to contain stone blades or stone points, these Australian sites attest to the presence of two Mid-MP regional variants in Australia during this time.

A third Sahul 'regional variant' of the Mid-MP has stone assemblages characterized by grooved and ungrooved 'waisted axes'. The first reported occurrence is Huon Peninsula, Papua New Guinea, ~47 ka or between ~44 and ~61 ka dated tephras *(GL1986, OJ2004)*.

East Asia reports *Homo sapiens sapiens* at Bailiandong Cave, China, ~160 ka *(SG2002)*; Tongtianyan Cave, Guangxi, south China (the 'Liujiang hominid'), ~111-139 ka *(SG2002)*; and Huanglong Cave, Yunxi, Hubei, China, ~103 ka, and in this latter case associated with an Early MP industry (scraper-based, no points or blades)*(WX2006)*, but again, like the Southeast Asia-Australia case, with a more refined analysis and more sites, this industry might be seen to be a Mid-MP regional variant.

Given these 'earliest' dates by region, there does appear to be a time gradient across regions West to East, with the caveat that Africa and Southwest Asia may have similar dating. There appears to be a wave (or waves) possibly originating in Africa (~195 Omo Kibish or ~130 Mumba Shelter) or Southwest Asia (~150-160 ka) especially if early Tabun Cave C ESR dates (~130-200 ka) are accepted. Mid-MP subsequently occurs in India (~100 ka), subsequently in Southeast Asia (Flores ~75 ka) and Australia ~55 ka. *Homo sapiens sapiens* appears in China (~150 ka) but apparently, given sparse evidence or limits of my review, using either an Early-MP or Mid-MP mode of stone technology; more finds are needed to rule out one or the other. *Homo sapiens sapiens* seems to occur in China (~150 ka) but apparently continues using an Early MP stone technology during the Mid-MP time period.

With respect to expressions of symbolic behavior (palaeoart), Mid-MP sites from Africa to Australia evidence a major intensification compared to prior Early-MP and earlier eras.

Previously thought to be an innovation of Upper Paleolithic/Later Stone Age, Mid-MP cultures provide the first clear evidence for the mortuary practice of 'burial' or, at least, deposition with ritual objects, such as ochre, animal bones, perforated shell beads and un-perforated non-local shells, and engraved stones.

- Skhul, Israel, ~100-130 ka *(GR2005, MN1994, MN1995, VH1998)*, (ESR U-series) ~100 to 130 ka, Tabun C, 4 'burials' *(BA1992)*, *Homo sapiens sapiens* with some archaic features; S5 burial with wild boar mandible; marine shells not related to food acquisition *(BO1995),* two shells are beads *(VM2006)*;
- Qafzeh, Israel, ~85-100 ka *(MN1994, MN1995, VH1998)*, 18 MNI *Homo sapiens sapiens*; Tabun C, 3-7 burials, 1 with large fallow deer antler over hands over upper chest, *(BO1993; BA1992)*; or not burials, rockfall *(GR1999)*; extensive ochre at every level (see section on ochre below) and near Q8 'burial' engraved stone plaquette (see section on engraving below);
- Klasies River Mouth, South Africa, (U-series, OSL, geostratig.) 'MSA I' OIS 5 ~115-128 ka, 'MSA II' 101±12 ka (*GR2005; ES2005; SR1982; DH1989, 2001),* MSA I, II, III *Homo sapiens sapiens (SR1982);* show cut and percussion marks and burning, 'indicates cannibalism' *(WT1987; DH2001),* which does not exclude it being a mortuary ritual;
- Border Cave, South Africa, Stratum 3 (AAR) bracketed >56 <100 ka and (ESR) dates in between, 58±2 to 76±4 ka (*GR2001*; *MG1999)*, 'MSA2' = Howiesons

Poort, BC3 infant skeleton, stained by red ochre, with perforated *Conus* shell in 'shallow grave'; higher level, *Conus* manuported 80 km *(GR2001; MS2000)*;
- Lake Mungo, Australia, ~43-45 ka *(BJ2003; GR2006)*, core-and-scraper tradition tools, at least two burials of *Homo sapiens sapiens (BJ1970; MJ1999);* LM1, a female, with evidence of cremation, hearths, burnt animal bones and fish bones, emu eggshell fragments, mussel shells, suggesting grave goods and/or funeral feast, and LM3, male, burial with ochre *(MJ1999, FJ1990; BJ1970).*

To which might be added this ritual for a game animal:

- Nahr Ibrahim (Asfurieh) Cave, Lebanon, ~80-92 ka, Tabun C and Tabun B *(TI2000)* —exact industry/stratum needs confirmation—fallow deer 'burial' with red ochre; bones gathered in pile, some still articulated, unbroken, and skull cap placed on top, in association with flints, unusually large number just above the skeleton, pieces of magnetic red ochre scattered in it *(SR1982, MA1990).*

Evidence for pigment use is widely reported. In addition to mortuary sites just noted, I cite only the following to show something of the chronological, geographic and quantitative extent:

- Florisbad, South Africa Unit F: (ESR) 121±6 (OSL) 138±31 ka *(GR1996, RR1997, KK1999),* large ochre grinding slabs *(MS2000)*;
- Mumbwa Caves, central Zambia, Basal MSA, OIS5e *(BLP2002; BL1995)*; 1 kg+ blocks of non-local hematite showing grinding or scraping *(BR2003)*;
- Qafzeh, Israel, ~85-100 ka—(see more details above under section on mortuary practices) —min. 84 ochre pieces at every level, 6 worked, specific hues selected and manuported 40 km, percentage associated with burial loci and levels *(HE2003)*; red ochre on working edges of some tools, 4 naturally perforated *Glycymeris* marine shells *(BO1993, BO1995, VM2006)*;
- Klasies River Mouth, South Africa, 'MSAI' ~115-128 ka and 'MSA II' 101±12 ka, MSAII-a and II-b, 180 red ochre pieces, >50% with wear facets, incisions to remove powder, 14 from MSAI; Cave 5:1 hematized shale 'crayon' *(SR1982, DH2001; WI1999)*;
- Porc Epic Cave, Dire Dawa, Ethiopia, occupied 61 to 77.5 ka, 'Late MSA' *(CJ1984),* mandibular fragment *H. helmei (MS2000)*, 298 fragments of ochre, at least 40 with clear wear facets from grinding *(CJ1984; CJ1988; MS2000; BR1992)*;
- Blombos Cave, South Africa, M1 and M2 (~OIS5a 75-85 ka), M3 (~OIS5c 95-105 ka): 8000 pieces of ochre, most worked by scraping and grinding, all three levels; M3, most utilized ochre of all levels *(HC1997, HC2001, HC2002; DF2001, DF2005; SM2004; HC2004)* dating *(JZ2006; TC2006)*;
- Apollo 11 Cave, Namibia, Level G, (AAR) ≥83 ka *(MG1999)*, Stillbay, pigment *(WW 1974; WW1976*);
- Ochre, specularite and other pigment pieces and powder, pigment stained grindstones, other evidence of pigment use is reported for these additional African Mid-MP sites (see Synoptic for details):

  - Pomongwe Cave, Zimbabwe;
  - Hollow Rock Shelter, South Africa;
  - Bambata Cave, Zimbabwe;
  - Olieboompoort, Transvaal, South Africa;
  - Border Cave, South Africa, HP Level;
  - Klasies River Mouth, South Africa, HP Level;
  - Apollo 11 Cave, Namibia, HP Level;
  - Cave of Hearths, South Africa, HP Level;
  - Howiesons Poort, South Africa, HP Level;
  - Boomplaas Cave, South Africa, HP Level;
  - Rose Cottage Cave, South Africa, MSA II and HP Levels
  - ≠Gi, Botswana, 'Bambatan', ~70-80 ka
  - Rhino Cave, Botswana (specularite mining)
  - Die Kelders Cave, South Africa 'Late MSA' at ~60-70 ka
- Malakunanja II, Kakadu, Australia, ~52 ka *(RR1990; OJ2004)*, core-and-scraper tradition tools *(RR1990; FJ1990)*, ground hematite, red and yellow ochres, grindstone*(RR1990; FJ1990)*;
- Nauwalabila I*,* Kakadu, Australia, core-and-scraper tradition tools, ~53 and ~60 ka, but these dates are questioned (*RR1990; BM2000*; *OJ2004)*, 1 kg piece of hematite bearing ground facets and striations—clear signs of scraping to produce powder paint *(FJ1990)*;
- Carpenter's Gap, Kimberley, Australia (calibrated AMS) max. 44 ka *(GR2002),* exfoliated rock fragment with red pigment painted on it in layer with ochre *(FJ1997)*.

Evidence for self-adornment (perforated objects, beads, pendants, ornaments):

- Four sites of Aterian tradition, generally dated to OIS5 ~74-130 ka or earlier:
  - Oued Djebanna, Algeria, perforated shell of *Arcularia gibbonsula (MS2000)*;
  - Taforalt Cave, Algeria, perforated marine shells from ~35km away *(Nick Barton, online*);
  - Seggédim, eastern Niger, 4 drilled quartzite flakes, probable pendants *(MS2000)*;
  - Grotte Zouhra, Morocco, bone pendant *(MS2000)*
- Blombos Cave, South Africa, MII(CF): 2 and MI: 39 *Nassarius* (tick) shell beads, perforated, with string wear, (~OIS5a 75-85 ka) *(HC1997, HC2001, HC2002; DF2001, DF2005; SM2004; HC2004)*;
- Cave of Hearths, South Africa - Bed 9, Howiesons Poort (~70 ka), broken circular ostrich eggshell pendant, 3 cm diameter, central perforation *(MS2000)*;
- Devil's Lair, Australia, ~41-46 ka *(OJ2004),* bird bone pendant, 3 bone beads, 1 naturally perforated flat marl pebble with 4 wear grooves, possibly as pendant *(FJ1990; BR2003; BR1997; FJ1990).*

Incised, serrated or notched objects (bone, eggshell, ochre, stone, wood):

- Klasies River Mouth, South Africa, 'MSAI' ~115-128 ka and 'MSA II' 101±12 ka, 1 bone fragment with 4 thin parallel grooves, 2 bone fragments with serrated edges *(SR1982)*;
- Blombos Cave, South Africa, M1 and M2 (~OIS5a 75-85 ka), M2: 21 worked bone tools; some bone tools with evenly spaced incisions; MI: Stillbay, 10+ bone tools; (see 'language' section below for additional incised ochre pieces) *(HC1997, HC2001, HC2002; DF2001, DF2005; SM2004; HC2004)*;
- Incised, serrated, or notched ochre pieces occur at African sites, such as Klasies River Mouth, South Africa; Hollow Rock Shelter, South Africa; Howiesons Poort, South Africa – H.P Level (see under 'language' section below);
- Apollo 11 Cave, Namibia, Level G (AAR) ≥83 ka *(MG1999)*, Stillbay, 2 notched bone fragments *(WW 1974, WW1976*);
- Apollo 11 Cave, Namibia, Level F (AAR) 63±6 and 69±7, Howiesons Poort, 3 ostrich eggshell fragments with incised crisscross lines; 2 notched bones *(WW 1974, WW1976*);
- Diepkloof Shelter, South Africa, H.P. Level, 71±8 ka *(VH2005)*; 2 ostrich eggshell fragments engraved with subparallel lines *(MS2000)*.

Collection/manuporting of exotic objects (crystals, fossils, shells, non-local stone with 'aesthetic qualities'):

- Qafzeh, Israel, ~85-100 ka, 4 naturally perforated *Glycymeris* marine shells *(BO1993, 1995, VM2006)*;
- Border Cave, South Africa, bracketed >56 <100 ka (details above), 'MSA2' = Howiesons Poort, *Conus* shell, manuported 80 km *(GR2001; MS2000)*;
- Other examples contained in sections below/above.

Geometric artifacts (circular and discoid objects, spheroids, rhomboids, triangles, etc.):

- (See under Stone Arrangements, below; and under Image and Representation the two sites, one Aterian and one M.A.T. from Har Karkom)

Stone arrangements (heaps of stones, cairns, geoglyphs):

- El Guettar, Tunisia, 'Mousterian with foliates, tanged points' '// Tabun C' *(GM1954)*; (14C) 47±4, 57±7 ka *(AN2006)* but moist phase fauna, which is dated to Libyan, East Sahara wet phases for Aterian = 65-90 ka or 120-155 ka *(SB1995);* in spring, pile 60 spheroids, 1 tanged point in base center of pile, elongated points near top, apex spheroid white cortex, flaked black one pole, red ochre other pole; triangle and lozenge plaques at base *(GM1954)*
- Windhoek, Namibia, no date but 'earliest' MSA, in pile 1.3 meters in diameter, 75 cm. high, 36 spheroids (35 of 'fine crystalline quartz', 1 of 'red sandstone') each weighting 600-1200 g, mostly 8-10 cm. diameter, all have notch 1.5 cm diameter and a 'few' mm. deep *(FG1954)*;

- Dar-es-Soltan I and II, Morocco, Aterian, (AAR) 60-70 ka *(RJ2004),* or Libyan Aterian 60-90 ka,'enigmatic heap of sandstone slabs, 1 meter diameter, 30 cm high' *(MS2000)*.

Image and representation (petroglyphs, painted or sculpted anthropomorphic, zoomorphic or abstract figurations and other 'rock art'):

- Mumbwa Caves, central Zambia, Basal MSA, OIS5e *(BLP2002; BL1995)*, probably natural, anthropomorphic piece *(BR2003)*;
- Rhino Cave, Tsodilo Hills, Botswana, (industry // ≠Gi) ~77 ka, ritual deposition' of finely made quartz and rock crystal, polished points, those with red color burnt white; rock wall of cupules and abraded grooves, engravers in MSA level, 'image of python' *(S. Coulson interviews on line)*;
- Har Karkom, central Negev, Israel HK190a, 190b and several other sites: Mousterian of Acheulian Tradition *(AE2006)*; rhomboid with engraved circle 'navel' figurine, 2 other possible 'female' figurines, fluid-shaped 'pick'; triangular nuclei with 'vulva' and possible zoomorphs *(JBH, OriginsNet.org online*);
- Har Karkom, central Negev, Israel, HK148b, Aterian, hut floor *(AE2006),* North and Northeast Africa dated OIS5 74-130 ka or earlier, around inside perimeter of hut floor zoomorphic, anthropomorphic and geometric figurines *(JBH, OriginsNet.org online*).

Language, geometric signs and other 'language-like' marking traditions:

- Qafzeh, Israel, ~85-100 ka—(see more details above under section on mortuary practices) —1/3rd meter away from Q8 burial, broken Levallois core (recurrent centripetal flaking), triangular flat surface, 'plaquette', incised with mostly parallel stroke marks truncated by accidental break or intentional snap; grinding between two sets of lines and associated ochre fragment with scrape marks on both faces *(HE1997*; *HE2003)*;
- Blombos Cave, South Africa, M1 and M2 (~OIS5a 75-85 ka), MI: Stillbay, 1 mandibular fragment engraved with '11 subparallel lines and 1 obliquely crossing line'; 2 geometrically engraved ochre pieces (1 with tri-line over row Xs 1 crosshatched) *(HC1997, HC2001, HC2002; DF2001, DF2005; SM2004; HC2004)*;
- Howiesons Poort, South Africa – H.P Level, 1 hematite fragment, ground trihedral base with 18 (3, 11, 4) notches along its three edges *(SP1928)*.

To see how the variety of symbolic behaviors that might occur at a single sight please see sites identified in the Synoptic tables.

From this review it would seem that Mid-MSA/MP *Homo sapiens sapiens* directly practiced or had evident capacity for virtually all the technological activities and symbolic behaviors that in the past were thought to be the province of LSA/UP *Homo sapiens sapiens* (see also MS2000).

Late-Middle Paleolithic (Late-Middle Stone Age) (~30 to 60 ka; OIS 3 ~24-59 ka; African dry spell 20-60 ka). This technology represents the final evolution of MSA/MP contemporaneous with Early LSA industries and there is apparently some cultural exchange among the makers of these distinct industries. In this regard the Late-MSA/MP is analogous to the earlier late-stage evolutions in the overall pattern of human cultural evolution, namely the Developed Oldowan, with Early Acheulian influence, and the Final Acheulian, with Early MSA/MP influence.

Late-Middle Paleolithic (Late-Middle Stone Age) tool technology is characterized in Africa by continuous Levallois for production of blades as in UP and thin flakes, or single, double platform or radial cores for flakes and blades; small flake tools with high % denticulates; notches, Tayac point, end- and sidescrapers; but absence of LSA geometrics and backed pieces like Howiesons Poort and no bifacial points like Stillbay *(KR2004)*. The Levantine variant, Tabun B, is characterized by a return to triangular blanks, removed from mainly unipolar convergent Levallois cores, broad-based Levallois points; short thin flakes and some blades; also radially prepared cores in upper contexts of Tabun B *(BO1995)*.

Again as with the Mid-MP, the earliest occurrence of Late MP technology appears to be Tabun Cave, Mt. Carmel, Israel, type-site for the Late Levallois Mousterian 'Tabun B' industry, (ESR, U-series) 104+33/-14 ka *(GR2000)*, which is associated with *Homo neanderthalis*. Setting aside this dating with its wide uncertainties, the next reported occurrences seem to be Taramsa 1, Upper Egypt (Conc. 28), (OSL) 55.5±3.7 ka, where it is associated with a *Homo sapiens sapiens* burial *(VPP1998)* and Kebara Cave – F, (TL) 48.3±3.5 ka to 61.6±3.6 ka (MN1994, VH1998) also associated with *Homo neanderthalis (BO1992; BO1993*).

Interestingly, the fact that *Homo neanderthalis* seems to be in the Levant with Tabun B technology while *Homo sapiens sapiens* is in Egypt with a different Late MP technology might imply that *sapiens* with Late MP in Africa were more confined to Africa than in earlier periods. In any event clearly each 'species' has the capacity to independently evolve Late MP industries.

Late MP technology seems to make an early appearance in India at sites in Attirampakkam, Tamil Nadu, (ESR) 45-50 ka *(BB2005, PSG2003, PS2003)*, a 'Late MP/UP' with knives, points and rare handaxes and cleavers *(PS2001)*. Around the same time, Late MP occurs at Bhimbetka III F-23, Madhya Pradesh, Layers 4-5 (EIP preliminary OSL) 45±8 ka *(BR2005)*, a 'middle to late phase of MP' with blade and flake-blade cores, blades, knives, and burins *(JH2005)* and Kalpi, Yamuna Valley, Ganga Plains, Uttar Pradesh, (TL) ~45 ka, an 'MP with choppers' *(CP2006)*. These sites alone suggest that perhaps Tamil Nadu ('the coastal route') remained strongly influenced by its Acheulian roots and thus a local convergent evolution of Late MP, while there was likely a Narmada Crossing, at least over to the Betwa River and down to the Yamuna near Kalpi and on to the Ganges and eastward. Or were these each local developments building on their Mid-MP base?

Sites reported for Southeast Asia in the Late MP period are sparse, but two that might be so classified appear to be Kota Tampan, Malaysia, (14C) ~31 ka *(OJ2004)*, which has assemblages of pebble cores, chopping tools, proto-bifaces, and flake tools such as knives

(WJ1982) and Tabon Cave, Philippines, Level III (14C) 23.2±1 ka to Level IV >30.1±1.1, with a core, scraper, denticulate tool kit associated 'robust' featured *Homo sapiens sapiens*, (U-series) 16.5±2 ka *(DEF2002)*.

A Little Note on Australia

Given the patterns and trends of human cultural evolution so far reviewed—including the repeated pattern since Oldowan times of paradigmatic changes in stone tool technologies that pass through Early, Middle and Late phases with the Early phase of the next paradigm overlapping more or less the Late phase of the previous paradigm—and if it is accepted that Mid-MP industries arrive in Southeast Asia around 75 ka and Australia around 55 ka or not long thereafter, then the questions arise: does Australia evidence a Late-MP phase? What would be the time boundary between Mid-MP and Late-MP in Australia? If we can distinguish or even hypothesize an Australian Late-MP, does the data suggest or require or do the patterns of cultural evolution become more clear if we make a vertical differentiation—like that in other regions across the Southern Route—between Late-MP and an overlapping Early-UP?

I believe the data, as limited as my database is and as sparse as the research base may be, provides some positive answers to each of these questions.

There are a few recent datings of Australian rock art that call for reorganizing the chronological sequencing of rock art 'styles'. New sites or new perspectives on old sites seem to tentatively suggest a need to re-think the notion that there is a 50,000 year stasis in Australian tool technology until the appearance of microlithic technologies about 5,000 years ago. (Does any hominin sit still for this long?)

I will make a very preliminary hypothesis, and one that inevitably is somewhat arbitrary. I call this 'cutting the Gordian knot' of Australian archaeology and rock art. First, I suggest that we posit a Mid-MP/Late-MP boundary at around 30/35 ka. Second, I suggest positing a vertical cut that differentiates Late-MP from Early-UP industries and rock art 'styles'. Third, following on these two 'cuts', I suggest labeling the 5 ka microlithic industries as characteristically 'Mid-UP', or what in previous overviews of Europe and African archaeology were generally labeled as 'UP/LSA'.

I think such a classificatory scheme would bring more clarity to Australian prehistory and show it to be not dissimilar from Late MP, Early UP and UP cultural evolution across the Southern Route and, indeed, across neighboring Europe and Northern Asia.

* * *

Keeping this Little Note on Australia in mind, while Australian archaeology is sometimes viewed as a long stasis followed by Holocene innovation of microlithic technology, I propose that Australia has its own 'Late-MP', which I suggest we posit as beginning roughly around 30 ka. I am not suggesting that a 'Late-MP' arrived from outside Australia but that a Late-MP actually appears to occur in Australia and it seems to be a local innovation of the earlier Mid-MP industries in Australia.

Perhaps we might begin with a site like Ngarrabullgan Cave Level 3, Queensland, (calibrated AMS): 36±2 ka *(GR2002)*, which has evidence of processing starchy grains and fibers; resin hafted woodworking and possible skin-working *(FR1997)* and Sandy Creek I Lower, Cape York, (14C calibrated) 34.4 ka, in which occurs quartz worked by split pebble core reduction and a ground-edge axe, waisted and grooved *(MJ1995)*. Other subsequent sites, which we might tentatively assign to 'Late-MP' might be Mandu Mandu; Sandy Creek II; Woodstock 65B; Mushroom Rock West; New Guinea II, Snowy River; and Kalate Egeanda Cave, Papua, which collectively show evidence for pigment use, rock art painting and petroglyphs (digital fluting, petroglyphs of cupules, circles, and lines), and shell beads. All of these symbolic behaviors were already well within the capacity of Mid-MP *Homo sapiens sapiens*. Perhaps we might also classify the remarkable Koonalda Cave, Nullarbor Plain, (14C calibrated) 16-27 ka *(GR2002)* as Late-MP, as it has an 'MP' flint quarry and extensive rock art, the type-site of the 'Koonalda style' *(WR1971)*. I am tempted to include in this Late-MP list burials such as Kow Swamp, (OSL) ~19-22 ka, and Lake Nitchie, (14C) 6.5-7.0 ka, with their 'robust' or 'archaic' *H. sapiens (FJ19990; FJ1983)*, or, on the other hand, one might considered these sites of a different order.

In East Asia, Late MP occurs in South Korea at Myoungo-ri, (est.) ~40-50 ka, 'Late MP' with bifaces, choppers, picks, points, denticulates, knives, notches *(BK1992)* and at sites in the Imjin-Hantan Basin, >29.4±1.9 ka. The latter is described as 'Late MP contemporaneous with UP' with choppers, handaxes, picks, notches, denticulates, backed knives, trapezoids, 'pseudo-prismatic cores', points and awls *(SC2004)*. Such Late MP sites are probably the work of *sapiens sapiens* given Ryonggok Cave, North Korea, (Useries) 46-48 ka *(NC2000)*, with five *Homo sapiens*, cranial capacity 1450 to 1650cc *(BK1992)*, the average of which actually matches that of *early H. sapiens sapiens* Skhul-Qafzeh and Cro-Magnon.

Overall the earliest Late MP sites identified appear to have something of a time gradient, perhaps earliest in Southwest Asia (~70/100 ka), or possibly later if the Tabun Cave B dates are too high, and if so at least ~60 ka, and in Africa (~55 ka), India (~45-50 ka), Southeast Asia (~30 ka). China (~40-50 ka) and Australia (~30-35 ka). Given that these regions have already seen a strong Mid-MP 'dispersal', that Africa and other regions in OIS3 are confronted with serious arid conditions, and that apparently Neanderthals are bearers of Tabun B Late MP in the Levant, the archaeological evidence seems to suggest that Late MP innovations are local to each region, convergent evolutions, the apparent time gradient of which simply reflects the time gradient of Mid-MP 'dispersal' of *Homo sapiens sapiens.*

It should be noted again that Africa as well as other regions along the Southern Route experienced arid climate during the period 20 ka to 60 ka that covers the entire period during which the Late-MP—as well as the contemporaneous UP—technologies emerged across the Southern Route. The difficulty of physical 'migration' during such a period would seem to preclude such movements and further support the view that EUP and Mid-UP technological and symbolic behavior innovations were independent and multi-regional.

The following table lists the earliest sites as mentioned in the preceding MP sections by region both for summary and for ready comparison of dates. Since the Early-UP, which will be discussed in the next section, is contemporaneous with the Late-MP I include it in this table.

EARLY-MP/EARLY-MSA				
Olorgesailie, Kenya	Tabun, D, Israel	16R Dune, India	(TW. Nakin, Thailand)	(Zhoukoudian, China)
~225-340 or ~280 ka	~260 ka	~150 ka	(~130-169 ka)	(~250)
MID-MP/MID-MSA				
(Omo Kibish, Ethiop.)	Tabun, C, Israel			
(~195 ka)	~130-200 ka			
Mumba, Tanzania	Hayonim, Israel	Patpara, India	Liang Bua, Flores	(Bailiandong, China)
~130	~150 ka	~100 ka	~75 & Austral. ~55 ka	(~<160 ka)
LATE-MP/LATE-MSA				
Taramsa, Egypt	Tabun, B, Israel	Attirampakkam, India	Sandy Creek I, Austrl.	Myoungo-ri, S. Korea
~55 ka	~70/100 or ~60 ka	~45-50 ka	~30 ka	~40-50 ka
EARLY-UP/EARLY-LSA				
White Paintings, Botswana	Boker Tachtit, Israel	Site 55, Pakistan	Leang Burung, South Sulawesi	Shiyu, China
~50/60 ka	~>45	~45 ka	~22-31 & Austr >28 ka	~32 ka
'MICROBLADE' MID-LATE-UP/MID-LATE-LSA (very limited review)				
Ntumot, Kenya	Ksar Akil, Lebanon (Aurignacian)	Patne, India	Mushroom Rock West Australia	Sokchang-ni, South Korea
~30-32 ka	~32 ka	~25 ka	~5 ka	~21 ka

With respect to evidence for symbolic behavior in the Late MP—and given that it is likely multi-regional—I will not attempt to summarize my review here. The Synoptic gives a full list of sites and artifacts I identified in my meta-review.

Upper Paleolithic (Later Stone Age) (~5 to 60 ka; OIS3 ~24-59 ka; African dry spell 20-60 ka). Early, Middle and Late Upper Paleolithic/Early, Middle and Late Later Stone Age tool industries are characterized by retouched blades and bladelets, scrapers on blades, small and microlithic tools; bone tools, soft hammer, and even more art than prior periods.

Earliest occurrences of Early Upper Paleolithic (Early Later Stone Age) in Africa include White Paintings Rock Shelter, Tsodilo Hills, Botswana, (OSL) 55.4±4.7 ka *(RR1997)* or 38-50 ka *(MS2000)*, classified as 'MSA/LSA'; Olduvai Gorge, Naisiusiu Beds, (ESR) 60±10 ka, (AMS) >42 ka, Early LSA 'Lemuta industry' *(AS2002)*; and Enkapune ya Muto Shelter (GtJi12), Kenya, MSA/LSA Endingi industry, (14C) 39.9±1.6 or ~37-40 ka or >50 ka; LSA Nasampolai industry, ~40-50 ka *(MS2000; AS2002; AS1998)*.

Perhaps later, or given the various datings, perhaps concurrently, the earliest EUP in the Levant is reported to be Boker Tachtit, Negev, Level 2, (14C) >45.49,46.93±2.42, 47.28±9 ka; *(MA1983)*. This industry has been termed the 'Bohunician Behavioral Package' that dispersed to central Europe Europe (~43-36 ka) and Karim Bom, Altai, Siberia (~43 ka) *(TG2003*). The Egyptian site of Taramsa 1 – Conc. 28 toolkit is referred to as Late MP and at the same time compared to Boker Tachtit EUP *(VPP1998)*, a typological comparison the value of which I am not in a position to judge, so I simply classify it for this review as Late MP. EUP occurs at Ksar Akil, Lebanon, (14C underlying EUP) 43.75±1.5 ka *(MA1983)* and Kebara Cave E, Mt. Carmel,

E -IV (AMS) 42.5±1.8 ka *(BO1992)*. EUP is reported from Har Karkom, Negev, the 'Karkomian', with extensive portable and standing stone rock art.

Virtually at the same time as it appears in the Levant, assemblages designated EUP appear in South Asia, the earliest report, Site 55, Pakistan, ~45 ka, with flake blades and microblades *(CP2006, JH2005)*. It occurs at Chandresal, Chambal Valley, Rajasthan, (14C) 38.9±0.7 ka, with blades, small and tanged points, and lunates *(KG1988)* and Bhimbetka III A-28 with a *Homo sapiens sapiens* burial *(KG1988)*. It seems to reach Sri Lanka at Fa Hien Cave, 31 ka; with geometric microliths and *Homo sapiens sapiens (JH2005)*. Considering these and other sites in our Synoptic there is obviously strong evidence for use of a Narmada Crossing, which by this time most probably went both ways. It occurs at Leang Burung, South Sulawesi, (14C) ~22-31 ka, with blade core and blades, with phytolith edge gloss *(GI1981; OJ2004)*.

As noted earlier, I suggest the hypothesis that we allow a 'UP' classification for some sites in Australia beginning around ~30 ka, when, as noted earlier, there appears to be the emergence of a contemporaneous Late MP. Thus the Australian situation is not so dissimilar when compared to the same kind of overlapping technology modes as occurs in other regions across the Southern Route. Blades occur at Mushroom Rock West, Cape York, lower level, (TL) 27-29 ka and blade and burin cores, scrapers, and adze, middle levels, (TL) 20.7±3 ka to 9.5±1.9 ka or (14C) ~10-15 ka *(MJc1995; MJa1995*). Blades and ground axe occur at Sandy Creek II, (AMS direct on painting, calibrated) 15-16 ka *(CN1995)*. I see no strong evidence to say either way whether we are seeing an Australian convergent innovation of EUP industries or some sort of diffusion.

However, I do think that an apparent sequencing of rock art in Australia supports the hypothesis that this Australian 'UP' is a convergent innovation. I suggest that rock art petroglyph styles designated 'Karake' and 'Panaramitee' reflect a symbolic evolution remarkably similar to that of geometric sign systems in Europe from Aurignacian to Magdalenian, even happening with similar timing. I leave aside for now the question how such an remarkable independent convergent evolution is to be understood.

The first absolute dated occurrence of 'Karake style' rock art is Malangine Cave, South Australia, (Useries minimum) ~28 ka *(BR1999)*. The 'Karake style' could be viewed, I think, as roughly contemporaneous with the 'Koonalda style' digital fluting petroglyphs. This 'Koonalda style' might be viewed as a parallel 'UP' tradition or, I very tentatively suggest, actually a Late-MP rock art tradition. Since Bednarik at Malangine has demonstrated that 'Karake' petroglyphs are superimposed on digital fluting, it follows that digital fluting at some sites will eventually be dated earlier than 30 ka during the Australian Mid-MP, which extends back to near 60 ka. This Karake-style and its contemporaries give way or evolve 'Panaramitee style' petroglyphs, which appear first around 15 ka. Earliest datings for Panaramitee style reviewed here appear to be Sandy Creek I and Early Man Shelter, both in Cape York, both with (14C calibrated) dates of 14.4 ka.

Similarly to South East Asia and Australia, UP industries seem first to appear in East Asia around the same time, ~30 ka. Examples are Shiyu Lower, Shanxi, China, (14C) 32 ka *(BR1991)*, which has an assemblage said to 'combine MP and UP features' *(BR1991)* and which I take to be EUP. At Hinatabayashi B, Nagano, Japan, ~30 ka**,** UP ground and polished tools

occur *(TNM)*. UP occurs at Zhoukoudian, Upper Cave, (AMS) ~24-29 ka *(BP2006)*, with a stunning status burial, *Homo sapiens sapiens (CD2003; WJ1982)*.

Over the 'Southern Route' it does appear that there is a mild time gradient West to East. EUP/ELSA industries and symbolic behavior seem first to occur in Africa (~50/60 ka), then Southwest Asia (~47), South Asia (~45 ka), Southeast Asia (~30 ka), Australia (~30 ka) and East Asia (~30 ka). However, considering the dates it appears possible that EUP may have diffused from Africa to Southwest Asia and then South Asia but the simultaneous dates for Southeast Asia, Australia and East Asia suggest that in these regions and, thus, possibly all regions EUP industries may reflect independent, multi-regional convergent innovations built on shared Mid-MP technologies and symbolic behavior.

Micro-Bladelet Mid- and Late-UP. As the focus of this meta-review has been the question of the occurrence of major 'waves' of globalization in modes of toolmaking and symbolic behavior and given the mass of research findings available on Upper Paleolithic sites across the regions, I gathered only highlights of a partial subset of sites. Keeping this limitation in mind, considering Mid-UP assemblages, especially those using microblade core reduction for bladelets and backed blades and bladelets, by region it appears that this specialized technology appears in Africa around 30 ka. Backed microliths occur at Enkapune ya Muto Shelter, Kenya, from the earliest EUP level almost ~50 ka *(AS1998)*, though if counted as EUP, then early microblades occur, for example, at Ntumot, Ntuka River, Kenya, (14C, AAR) ~30-32 ka *(AS2002)*.

Specialized microblade and bladelet industries appear in the Levantine Aurignacian at Ksar Akil, Lebanon, (14C) 32 ka *(CG1989)*. Roughly in the same Mid-UP timeframe, though starting somewhat earlier, is the Lagaman industry of the Sinai-Negev area, e.g., Abu Noshra II, southern Sinai, Egypt, (14C) 38-39 ka *(KS1999, GI1999)* and Qadesh Barnea, northeast Sinai, Egypt, (14C) 32-34 ka *(GI1993)*, which has a blade technology that generally lacks microblade core reduction and Aurignacian-type endscrapers and blades, and hence is sometimes classified as EUP. With apparently similar dates a fully microlithic 'Atlitian/UP Stage 5' industry appears at Ksar Akil, Lebanon, (AMS) ~31-32 ka *(MP1989)*, an industry type continuing until ~20 ka, giving way to the Early Kebaran Mesolithic/Epipaleolithic ~20-30 ka.

In India, at Patne, Maharashtra, EUP assemblages with blade cores, retouched and untrimmed blades, backed blades, and burins evolve with 'no sudden shift' to Late UP classic prismatic blade cores for blades, microlithic blade and bladelets, geometric lunates and triangles at (14C) 25.5 ka *(JH2005)*. This implies an indigenous independent evolution of such 'classic UP' technology.

Setting aside the early appearance of burin cores and microblades at Liang Bua Cave, Flores, (ESR+U-Series) 74+14/-12 ka *(MM2004; MM2007)*, which might be viewed as a precocious innovation, perhaps comparable to the backed blades of the African Howiesons Poort in a similar time range, my review does not identify other micro-blade sites for South East Asia

Microblade tool assemblages appear in Australia by ~5 ka, for example at Mushroom Rock West, Cape York, (14C calibrated) 4.5 ka or (TL) 8.6 ka *(MJc1995; MJa1995)*. Here as

perhaps as some sites in India suggest, 'classic' Late UP industries evolve from EUP and Mid-MP precursors.

Again given my limited review, early occurrences in East Asia include 'Aurignacian-like' microblades and scrapers on blades at Sokchang-ni, South Korea, (14C) 21ka *(BK1992)* and microblades and tanged points at Suyanggae, South Korea, (14C) 16-18 ka *(LY2000)*.

Thus Mid-UP (microblade) industries seem to first occur in Africa (~40-50 ka), Southwest Asia (~32 ka), South Asia (~25 ka), Southeast Asia (~30 ka), Southeast Asia (no data), Australia (~5-9 ka) and East Asia (~21 ka). These microlithic industries appear to occur across the 'Southern Route' about 10k years later than the emergence of EUP industries although this could reflect a dispersal at around ~40-50 ka it could just as well be convergent innovation in each region. This is the most likely hypothesis for Australia and perhaps also Southeast Asia. Also the contemporaneous dating for the Aurignacian and Atlitian in the Levant is further indication of a mosaic of multi-regional evolution.

Further, it should be noted, as I did for Late MP, that Africa as well as other regions along the Southern Route experienced arid climate during the period 20 ka to 60 ka that covers the entire period during which the EUP and Mid-UP technologies emerged across the Southern Route. The difficulty of physical 'migration' during such a period would seem to preclude such movements and further support the view that EUP and Mid-UP technological and symbolic behavior innovations were independent and multi-regional.

With respect to evidence for symbolic behavior during the UP/LSA this evidence is discussed extensively in the literature and I will not even attempt to summarize here. The Synoptic notes the sites that I was able to identify in my meta-review.

Conclusions. The combined table below gives an overview of the earliest sites—the ones with generally accepted dating, classification of stone assemblage, and hominid fossils—by period by region during the course of human evolution. Given the limits of the meta-review I offer several conclusions.

- There appears to be a general West to East time gradient for each of the 12 major periods of evolution.

- Based on archaeological data alone it is not prima facie evident from these gradients whether they reflect physical dispersal (migration), diffusion of technology and symbolic behavior, or independent, multi-regional innovations.

- Setting aside the separate question of physical migration (and speciation) it can be inferred from the review that during the course of human evolution there were at least three periods of 'globalized' (i.e., across the regions of the Southern Route) dispersal of technology and symbolic behavior:
    - Classic Oldowan
    - Middle Acheulian
    - Mid-Middle Paleolithic.

- Corollary 1: This implies globalization across the Southern Route of three of the major 'technological modes', Mode I (core and flake industries), Mode II (direct percussion of more formally shaped pieces), and Mode III (prepared core).

- Corollary 2: Giving the time gradients, it appears that the Classic Oldowan, Middle Acheulian and Mid-Middle Paleolithic reflect dispersal out-of-Africa, with the caveat that the Mid-MP just might have originated in and dispersed out of Southwest Asia.

- Corollary 3: This review does not strongly indicate if Mode IV (blade and burin) and Mode V (microliths) technologies spread across the Southern Route by exchange diffusion, multi-regional convergent innovation or migratory dispersal, but appears to not show any continuous dispersal from Africa (or SW Asia) to Sahul-Australia.

- Corollary 4: Across the Southern Route regions, the review suggests that the deep roots of symbolic behavior, including palaeoart and protolanguage grow out of Classic Oldowan, Middle Acheulian and Mid-Middle Paleolithic strata.

- Again with the caveat 'based on this meta-review', these are the archaeology-based dates for *Homo sapiens sapiens* dispersal of Mid-MP technology and symbolic behavior:

(Omo Kibish, Ethiopia)	Tabun, C, Israel		
(~195 ka)	~130-200 ka		
Mumba, Tanzania	Hayonim, Israel	Patpara, India	Liang Bua, Flores
~130	~150 ka	~100 ka	~75
			Australia ~55 ka

- *Homo sapiens sapiens* dispersed out-of-Africa (or Southwest Asia)—assuming that this is not a case of multi-regional convergent evolution sometime beginning around ~130-150 ka. (New archaeological discoveries might show that *Homo sapiens sapiens* left even earlier, closer to Omo Kibish at ~195 ka.)

- The earliest possible dates for Africa and Southwest Asia to India fall in the OIS 5 – OIS 6 (OIS5c 96 ka to end OIS6 190 ka) range, the more conservative dates of ~150 to ~100 fall squarely in the interglacial (OIS5e ~110-130 ka – with declining aridity beginning ~150 ka), which would have had the optimal moist climate to support both physical migration and social exchange.

- Corollary 5. Across Southern Route regions, Upper Paleolithic and especially Upper Paleolithic microblade industries like the Aurignacian appear to reflect, in whole or part, indigenous, convergent innovations that build on a shared multi-regional Mid-Middle Paleolithic base that has, as the review shows, an extensive capacity for symbolic behavior/palaeoart.

A table summarizing the meta-review of early archaeological site dating by region and time period follows. An Appendix: Synoptic Database For 'Southern Route' Globalizations Across Africa, Southwest Asia, South Asia, Se Asia, E Asia – is attached at end of this paper.

GLOBALIZATIONS ON THE SOUTHERN ROUTE – EARLIEST SITES BY REGION (Sites in parenthesis are hominid fossil sites which do not have associated stone assemblages or they are not diagnostic)				
EARLY OLDOWAN				
AFRICA	**SOUTHWEST ASIA**	**SOUTH ASIA**	**SE ASIA & SAHUL**	**EAST ASIA**
Ounda Gona, Ethiop.				
~2.5 Ma				
CLASSIC OLDOWAN				
Koobi For a, Kenya	Dmanisi, Gerogia	Pabbi Hills, Pakistan		Majuangou, China
~1.9 Ma	~1.8 Ma	>1.4 Ma		~1.6 Ma
DEVELOPED OLDOWAN				
Karari, Kenya	Ubeidiya, Israel	Pabbi Hills, Pakistan	Sangiran, Java	Xiaochangliang China
~1.65 Ma	~1.6 Ma	~1.2-1.4 Ma	~1.1-1.5 Ma	~1.36 Ma
EARLY ACHEULIAN				
Olduvai, Tanzania	Ubeidiya, Israel	Isampur, India		(GongwanglingChina)
~1.5-1.7 Ma	~1.2-1.6 Ma	~1.0 Ma		(~1.2 Ma)
MIDDLE ACHEULIAN				
Olorgesailie, Kenya	Bizat Ruhama, Israel	Attirampakkam, India		Bose, China
~990 ka	~850-900 ka	~780 ka		~803 ka
LATE ACHEULIAN				
Bodo, Ethiopia	Berekhat Ram, Israel	Sadab, Hunsgi, India		Zhoukoudian, China
~550-640 ka	~470 ka	~290 ka		~400-500 ka
(Well-established Narmada Crossing by ~200 ka)				
FINAL ACHEULIAN				
Kapthurin, Kenya	Tabun, E, Israel	Bori, India		Luonan, China
~>285 ka	~300 ka	~200 ka		~250 ka
EARLY-MP/EARLY-MSA				
Olorgesailie, Kenya	Tabun, D, Israel	16R Dune, India	(TW. Nakin, Thailand)	(Zhoukoudian, China)
~225-340 or ~280 ka	~260 ka	~150 ka	(~130-169 ka)	(~250)
MID-MP/MID-MSA				
(Omo Kibish, Ethiop.)	Tabun, C, Israel			
(~195 ka)	~130-200 ka			
Mumba, Tanzania	Hayonim, Israel	Patpara, India	Liang Bua, Flores	(Bailiandong, China)
~130	~150 ka	~100 ka	~75 & Austral. ~55 ka	(~<160 ka)
LATE-MP/LATE-MSA				
Taramsa, Egypt	Tabun, B, Israel	Attirampakkam, India	Sandy Creek I, Austrl.	Myoungo-ri, S. Korea
~55 ka	~70/100 or ~60 ka	~45-50 ka	~30 ka	~40-50 ka
EARLY-UP/EARLY-LSA				
White Paintings, Bots	Boker Tachtit, Israel	Site 55, Pakistan	L. Burung, S Sulawesi	Shiyu, China
~50/60 ka	~>45	~45 ka	22-31 & Austr >28 ka	~32 ka
'MICROBLADE' MID-LATE-UP/MID-LATE-LSA				
Ntumot, Kenya	Ksar Akil, Lebanon	Patne, India	Mushroom Rock West	Sokchang-ni, S Korea
~30-32 ka	~32 ka	~25 ka	~5 ka	~21 ka

Implications. These conclusions have implications for some current hypotheses about the timing of technological innovation, symbolic behavior and *Homo sapiens sapiens* 'out-of-Africa'. I will mention only a few.

- A view still widely held is that *Homo sapiens sapiens* first left Africa or Southwest Asia bearing an Upper Paleolithic technological and symbolic behavior 'package' by around 50 ka. When Australian sites were clearly dated to this time if not earlier, this hypothesis was raised to around 60 ka. Even this hypothesis could not fit the archaeological data that *Homo sapiens sapiens* arrives in Australia by ~55 ka if not earlier and arrives bearing a Mid-MP 'package'. Among other problems with this hypothesis is the 20-60 ka arid and hyperarid climate across the Southern Route during OIS3 which would not have supported a major dispersal (see Field and Lahr 2005).

- Field and Lahr (2005) use GIS-based analyses as support for the hypothesis that *Homo sapiens sapiens* dispersed from Africa not in OIS3, but OIS4 (59-74 ka). Did some population(s) disperse out-of-Africa (or, given the archaeological data, possibly out of Southwest Asia) during this time period carrying, as the authors suggest—and our meta-review confirms—a Mid-MP 'package' all the way to Australia. Our meta-review suggests that an OIS4 timing seems inconsistent with the arrival of Mid-MP type industries at Patpara, India ~100 ka, Liang Bua, Flores ~75 ka and Australia by ~55 ka. Patpara, India alone favors dispersal of Mid-MP during OIS5e (~111-130 ka).

- Recently in *Mother Tongue*, Bancel and Matthey de l'Etang (2004, 2002) and Matthey de l'Etang and Bancel (2002) reconstructed kinships system terms for Proto-Sapiens, which they suggest must be at least 50,000 years old. Bengston and Ruhlen (1994) offers additional etymologies for such a global language. Given the conclusions of my meta-review, I suggest that Proto-Sapiens or Global likely represents a global language that was part and parcel of the Mid-Middle Paleolithic 'package' that dispersed across the Southern Route around 120,000 years ago, well prior to any diffusion of Upper Paleolithic.

- If a primary *Homo sapiens sapiens* dispersal occurred during OIS5e, this has implications for current genetics-based hypotheses for 'out-of-Africa' dispersal. I leave it at that.

In invitation and challenge, Hal Fleming, the editor of *Mother Tongue*, asked: 'we can presume from the evidence that modern people left East African and the Levant as early as 125,000 years ago and if so we might find them in India at later dates, say 100,000 or so, or not, as the case may be. Then somehow they move through or alongside (coastwise) the great Sundaland expanse, at unknown dates, and finally arrive somewhere in Australia probably closer to 60,000 than anything else. What we most want is evidence from archeology that confirms or refutes these probabilities.' I believe this meta-review, by a long and winding road, confirms just that and more.

Selected References

(Full bibliographical references, which in the Synoptic Database and the narrative meta-review are given in italicized format, e.g., *(MS2000),* are found in the complete bibliography, which is posted as Supporting Online Materials at originsnet.org/publications.)

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McBrearty S, Brooks AS. (2000). The revolution that wasn't: a new interpretation of the origin of modern human behavior. *Journal of Human Evolution* 39:453-563. *(MS2000)*

Supporting Online Materials

(posted at: originsnet.org/publications)

A. Master databases of archaeological sites by region:
   1. Synopsis of the Paleolithic – Africa
   2. Synopsis of the Paleolithic – Southwestern Asia
   3. Synopsis of the Paleolithic – India
   4. Synopsis of the Paleolithic – Australia And Se Asia
   5. Synopsis of the Paleolithic – East Asia (China, Korea, Japan)

B. References. (Complete bibliographic references for the Master Database and referenced in this meta-review and Appendix: Synoptic Database)

Appendix: Synoptic Database For 'Southern Route' Globalizations Across Africa, Southwest Asia, South Asia, SE Asia, and E Asia (follows)