Behaviorally modern humans

Kleverson Castillo, in Prados Torreira, L. (2016): "Why is it necessary to include the Gender Perspective in Archaeological Museums? Some examples from Spanish Museums"

1

How do we recognize when people like us appear?

- Anatomy: skeletal evidence of hominins who look like us; shows up ~300, 000 years ago, earliest individuals are seen in Africa
- Behavior: when did people start acting like humans – *behaving in a modern way?*
  - Look at archaeological evidence!

2

The New/Emerging "Synthesis" for Modern Human Behavior ("new," for a quarter-century at least…)

- When we talk about modern human behavior (i.e, human culture) we need to think about both genetic capacities & when we can see it in the archaeological record
- We are defining "modern" culture in terms of a "package" (or set of traits/practices) and looking back – that is the strength of archaeology/paleoanthropology ("hindsight is 20/20"); of course, this *doesn't mean that things had to happen this way*, just that they did! Then, we can try to understand why and how these things evolved in these ways.
- Cultural capacities (and probably proto-forms of our own language capacities) were probably present in some populations in Africa by as early as 300 kya, if not earlier.
- Other "species" (e.g., Neanderthals, maybe other archaic humans) show evidence for some of this (but not the "full package").
- The "full package" is seen in Africa by around ~95 kya, and archaeological evidence for it comes and goes through time and space. By ~45-50 kya it is seen almost everywhere *Homo sapiens* were or were migrating to.
- Population density thresholds likely played a factor in when cultural behaviors were invented, spread locally, and maintained long enough to be seen archaeologically

3

Geological Epochs vs. lithic divisions

Pleistocene

Geological epoch (includes the Paleolithic)

- Early: ~1.8 Ma
- Middle: ~780 Ka
- Late: ~125 Ka
  - after ~50 Ka

Paleolithic

Lithic division known as the Old Stone Age

- Lower: Oldowan, Acheulean
- Middle: Mousterian
- Upper: Aurignacian, Châtelperronian, Gravettian, Solutrean, Magdalenian

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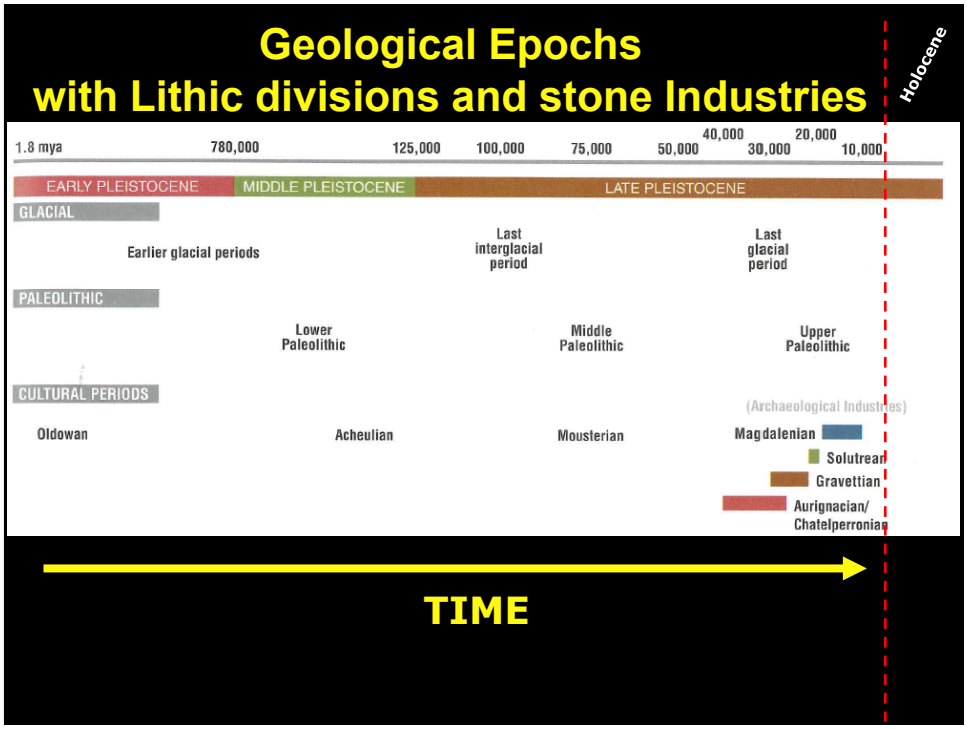
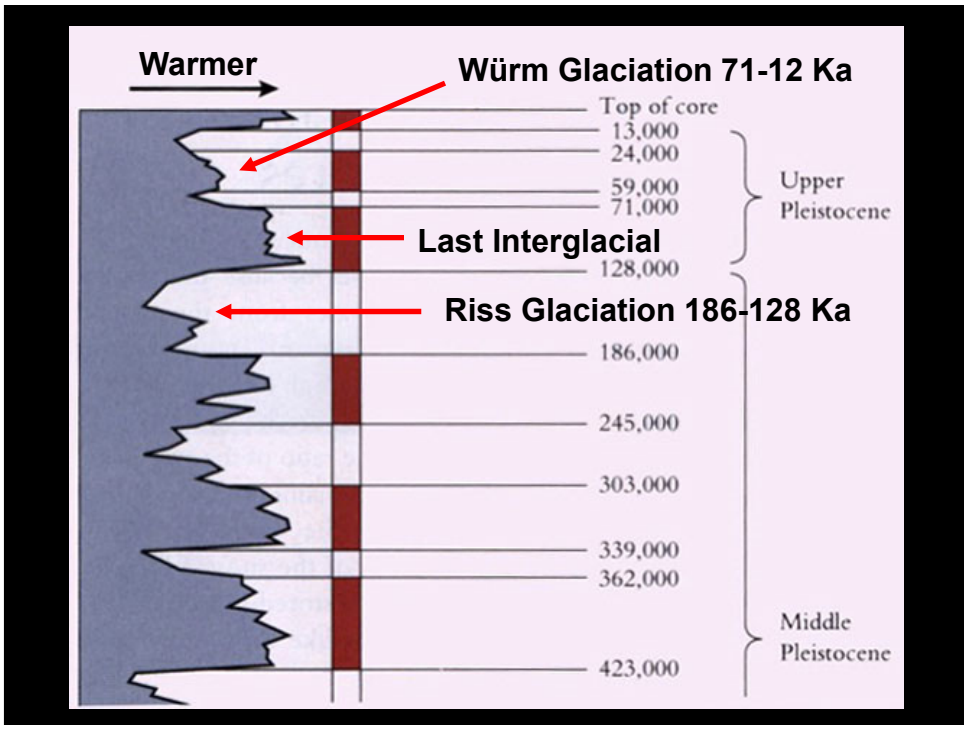

Geological Epochs
with Lithic divisions and stone Industries
Holocene
1.8 mya
780,000
125,000
100,000
75,000
50,000
40,000
30,000
20,000
10,000
EARLY PLEISTOCENE
MIDDLE PLEISTOCENE
LATE PLEISTOCENE
GLACIAL
Earlier glacial periods
Last interglacial period
Last glacial period
PALEOLITHIC
Lower Paleolithic
Middle Paleolithic
Upper Paleolithic
CULTURAL PERIODS
(Archaeological Industries)
Oldowan
Acheulian
Mousterian
Magdalenian
Solutrean
Gravettian
Aurignacian/ Chatelperronian
TIME

5


Warmer
Würm Glaciation 71-12 Ka
Top of core
13,000
24,000
59,000
71,000
Upper Pleistocene
Last Interglacial
128,000
Riss Glaciation 186-128 Ka
186,000
245,000
303,000
339,000
362,000
Middle Pleistocene
423,000

6

Upper Paleolithic (~50-10 Ka): Climate = cold, ice ages

TIME

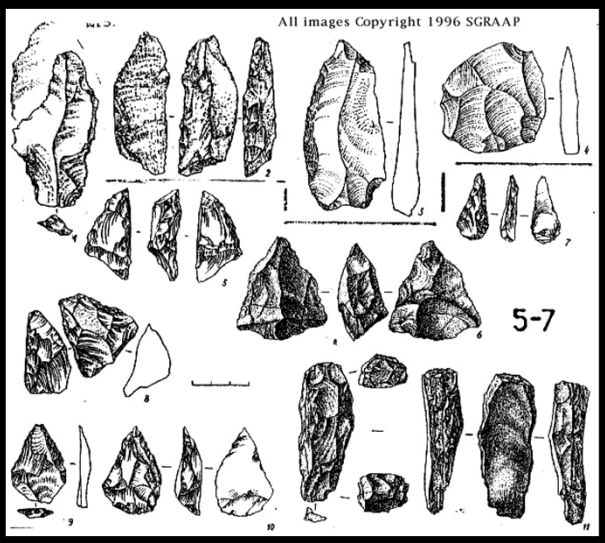
7

Archaeology

- Are 'types' of tools associated with 'types' of people?
  - Do physical and behavioral modernity go hand-in-hand?
  - Mousterian vs. Upper Paleolithic
- Is there continuity or discontinuity in the archaeological record?

8

Tool types: Mousterian
(Middle Paleolithic, 250-40 kya)



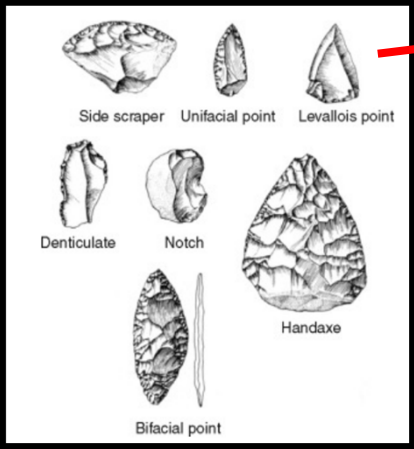
scraper

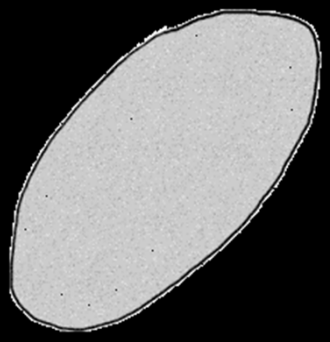
Levallois point

backed knife

9

Tool types: Mousterian

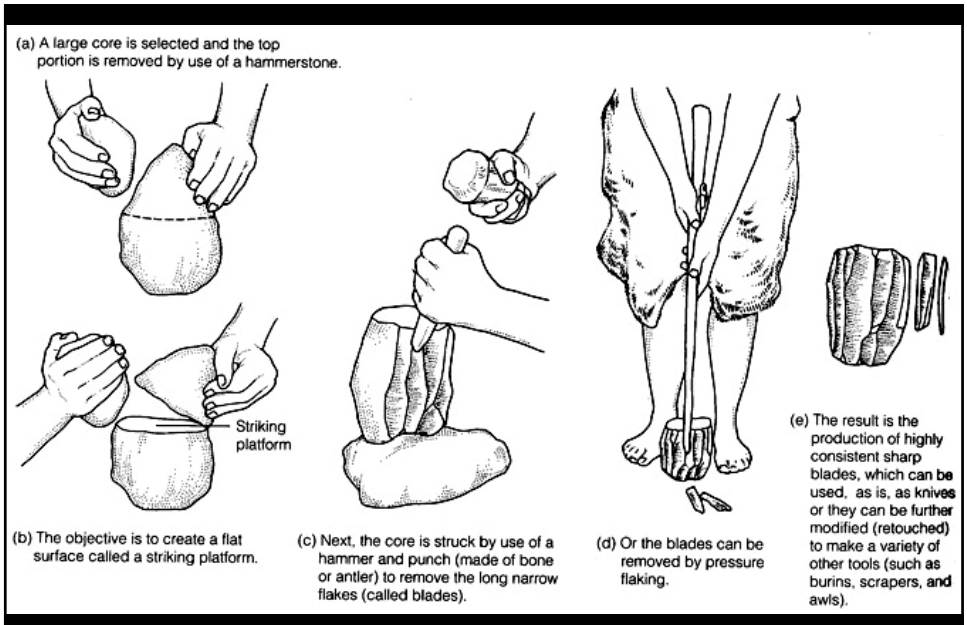




10

Upper Paleolithic blade production (post-50 kya)

11



Punch flaking & pressure flaking techniques

12

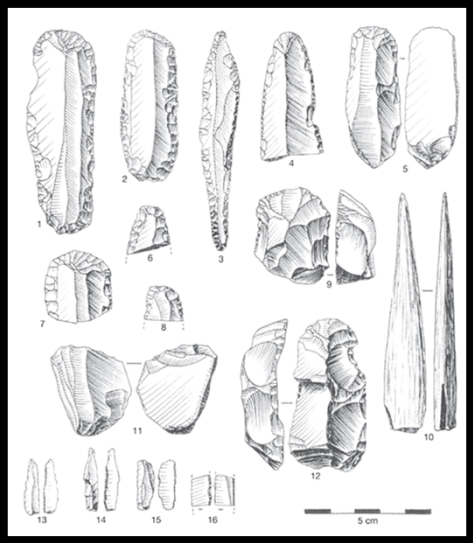
From Grotte des Fées, France

Tool types: Upper Paleolithic

retouched blades

core for bladelets

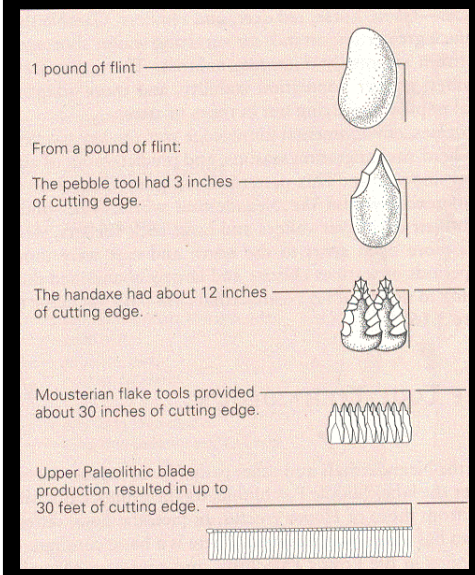
Bladelets (micro-liths)



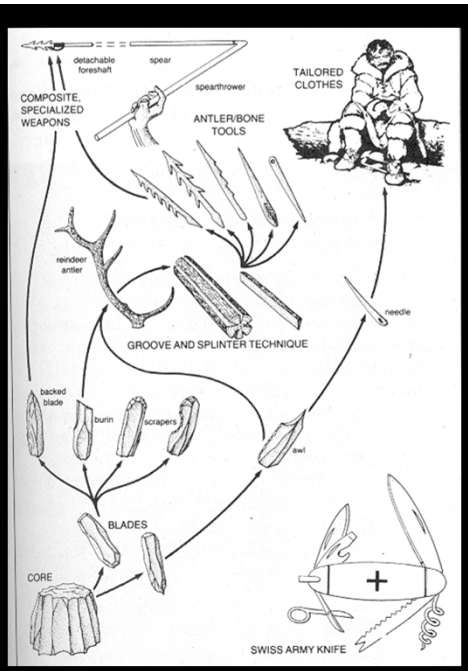
burins

split base bone point

13



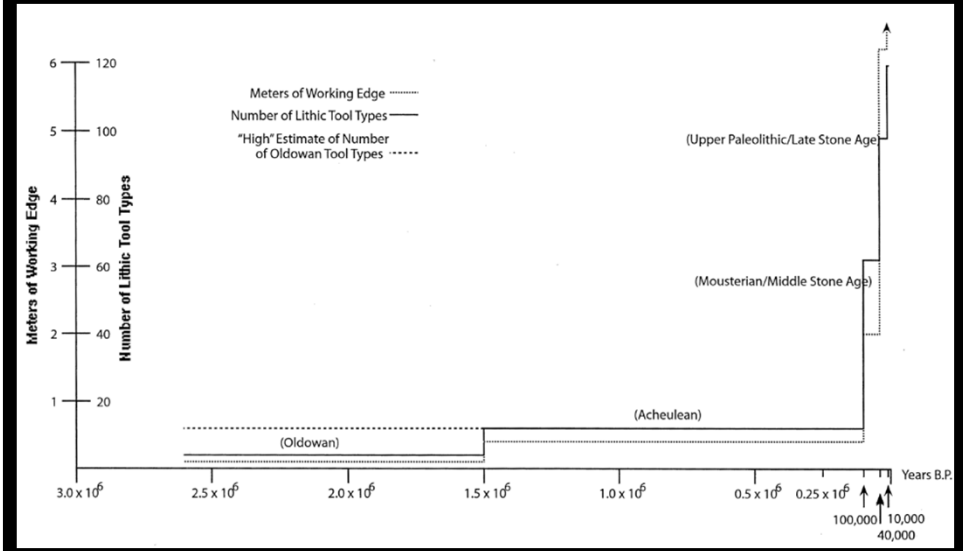
Efficiency of the Upper Paleolithic technique



What can you do with a blade?

14

General Trends in Functional Diversity & Efficiency in Stone Tools of the Pleistocene Epoch (per kg of raw material)



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Distances of Lithic Raw Material Movement & Models of Territory/Foraging Range Sizes

Tool Tradition/ ~Time Period	Maximum Distance	Foraging/Network Area
Oldowan	8-12 km	200-450 km^2
Acheulean	50-60 km	7,800-11,300 km^2
Mousterian/Middle Stone Age ("Mode 3")	100 km	31,000 km^2
Upper Paleolithic/ Late Stone Age	125-150 km Up to 300+ km**	50,000-70,000 km^2 282,000+ km^2

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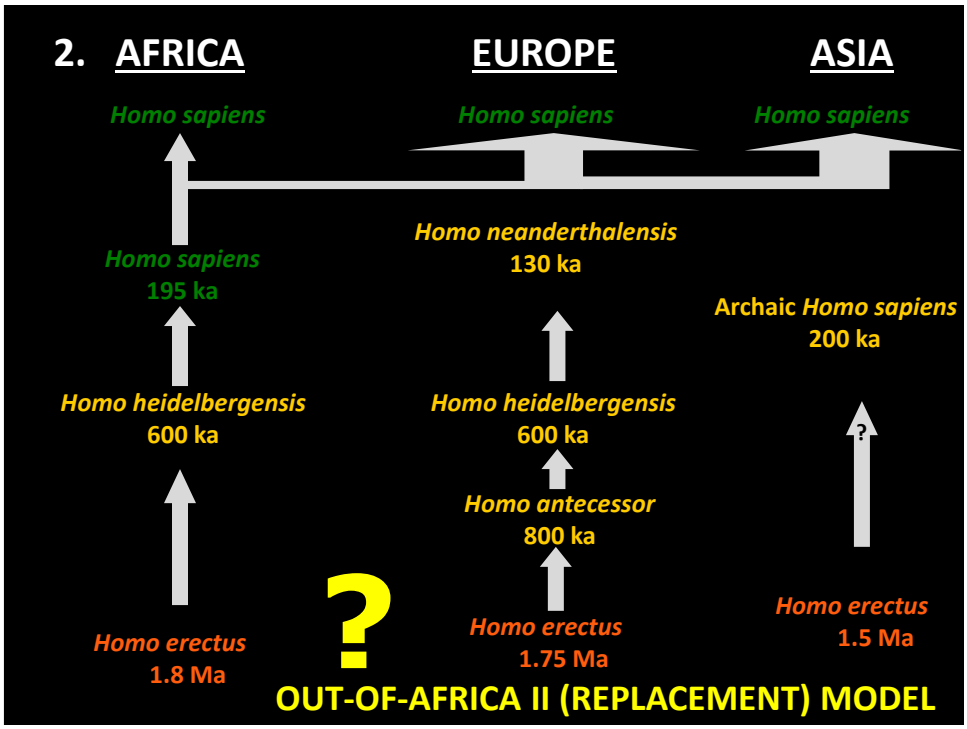
"Upper Paleolithic" Material Culture – "the full package"

- Abstract & realistic art and body decoration
  - threaded shell beads, teeth, egg shells, ochre, tattoo kits
- Microlithic stone tools (esp. blades & burins)
- Bone, antler, and ivory artifacts (functional tools and ritual)
- Grinding & pounding stone tools
- Improved hunting & trapping tools (spear throwers, bows, boomerangs, nets, etc.)
- Musical instruments (bone pipe flutes)
- Increase in long-distance transfer of raw materials

17



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from Smith & Ahern (2013)

to other regions. In the early 1980s, it could still be convincingly argued that modern humans appeared in various areas of the Old World at basically the same time, approximately between 35,000 and 45,000 years ago. Although there were certainly claims for an earlier

from Relethford (2008)

although the anatomy and dating was debated. More recently, the picture seems clearer, with evidence of early moderns in Africa at 160 000 years ago, classified by the discoverers as *H. sapiens idaltu* (White et al., 2003). In addition, modern humans from the Omo site in Ethiopia have recently been redated to 195 000 years ago (McDougall et al., 2005). Compared with these early dates, the first appearance of modern humans outside of Africa is later in time, with dates around 92 000 years ago in the Middle East, 60 000–40 000 years ago in Australia and 40 000–30 000 years ago in Europe. Given the fossil record as currently exists, it seems clear that

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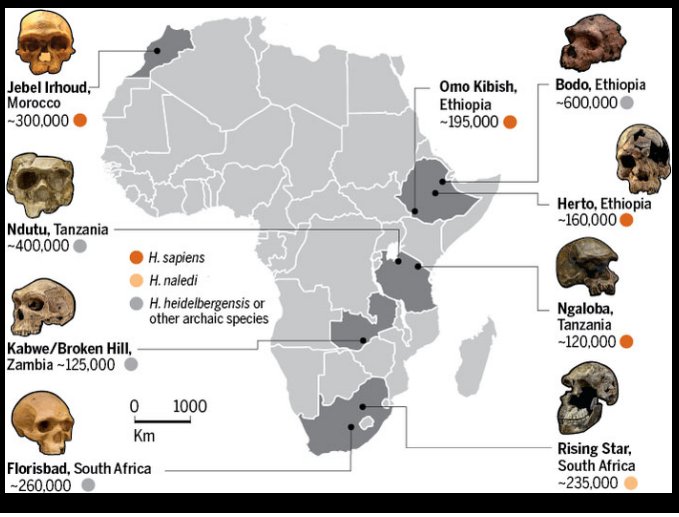
Fossil hominins 300-100 Ka in Africa



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The revolution that wasn't: a new interpretation of the origin of modern human behavior

Proponents of the model known as the "human revolution" claim that modern human behaviors arose suddenly, and nearly simultaneously, throughout the Old World ca. 40–50 ka. This fundamental behavioral shift is purported to signal a cognitive advance, a possible reorganization of the brain, and the origin of language. Because the earliest modern human fossils, *Homo sapiens sensu stricto*, are found in Africa and the adjacent region of the Levant at >100 ka, the "human revolution" model creates a time lag between the appearance of anatomical modernity and perceived behavioral modernity, and creates the impression that the earliest modern Africans were behaviorally primitive. This view of events stems from a profound Eurocentric bias and a failure to appreciate the depth and breadth of the African archaeological record. In fact, many of the components of the "human revolution" claimed to appear at 40–50 ka are found in the African Middle Stone Age tens of thousands of years earlier. These features include blade and microlithic technology, bone tools, increased geographic range, specialized hunting, the use of aquatic resources, long distance trade, systematic processing and use of pigment, and art and decoration. These items do not occur suddenly together as predicted by the "human revolution" model, but at sites that are widely separated in space and time. This suggests a gradual assembling of the package of modern human behaviors in Africa, and its later export to other regions of the Old World. The African Middle

Journal of Human Evolution (2000)

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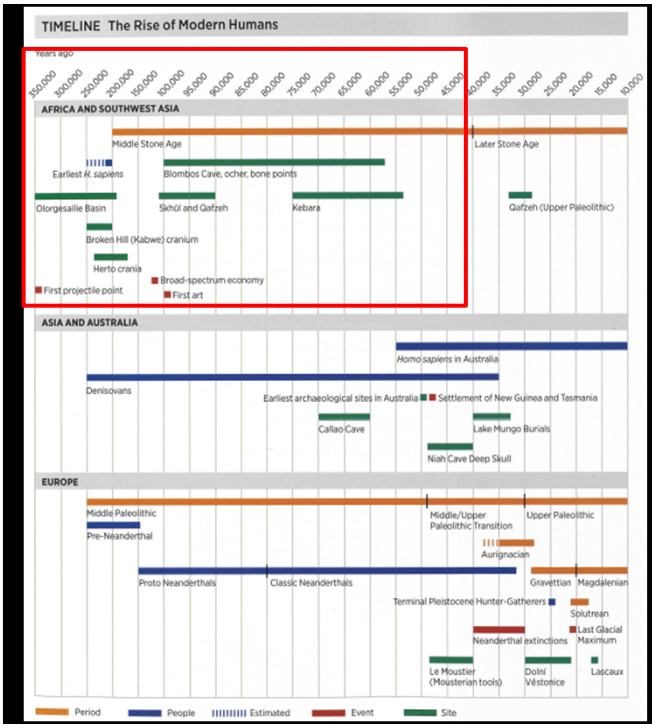

African Middle Stone Age

~300 – 30 ka

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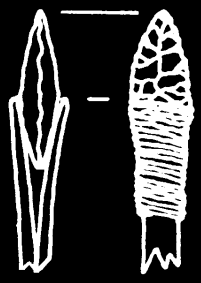
African Middle Stone Age (MSA) hunting technology

Stone points, Blombos Cave, South Africa (75 ka)



Hafted points

23

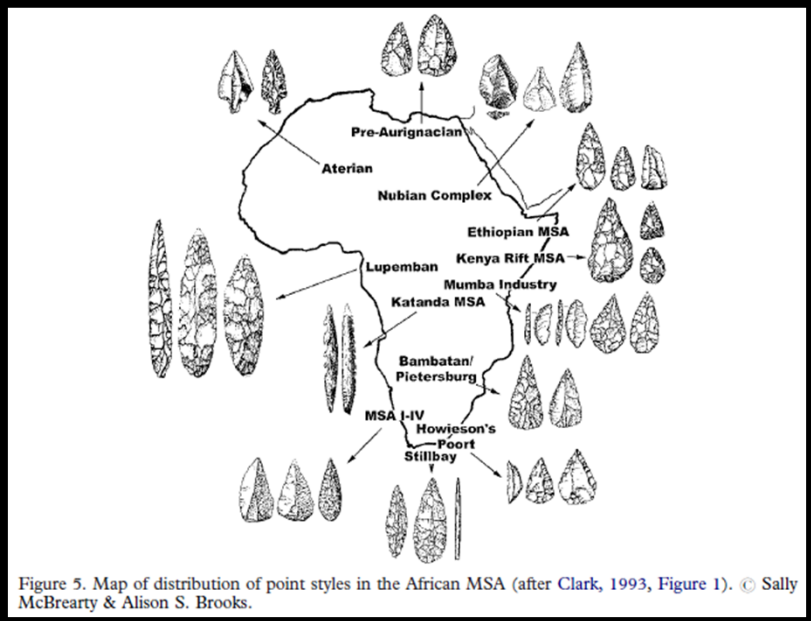


Figure 5. Map of distribution of point styles in the African MSA (after Clark, 1993, Figure 1). © Sally McBrearty & Alison S. Brooks.

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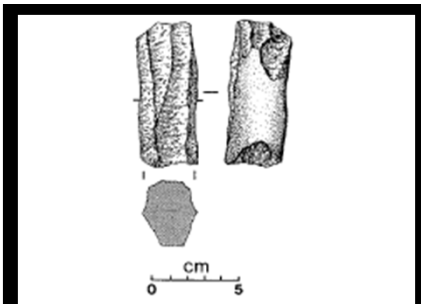

Figure 3. Semi-cylindrical core from site GnJh-03 in the Kapthurin Formation, Kenya. © Sally McBrearty.

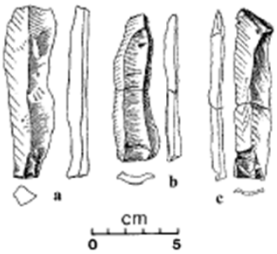

Figure 4. Blades from site GnJh-03 in the Kapthurin Formation, Kenya. Figure courtesy of Pierre-Jean Texier. C.N.R.S. Sophia Antipolis, France.

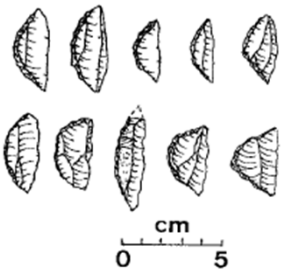

Figure 6. MSA geometric microliths; top row, Klasies River Howiesonspoort, after Wurz (1997); bottom row, Mumba Industry, Mumba Rock Shelter, level V, after Mehlman (1989). © Sally McBrearty.

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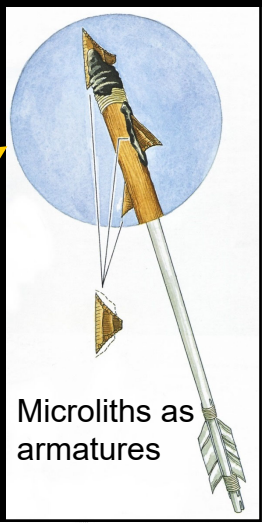
African Middle Stone Age (MSA) hunting technology

Bone harpoons, Katanda (80 ka)

Microliths, Mumba (65 ka)



Microliths as armatures

26

Origins of Upper Paleolithic symbolic culture (in Africa?)

Symbolic material culture appears in South African archaeological record ~70 Ka

- Ostrich shell beads
- Complex bone tools
- Perforated shell ornaments
- Abundant use of red ochre

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KEY SITE Blombos Cave and the Origins of Symbolism

Blombos Cave South Africa

red ochre "crayon" with engraved symbols

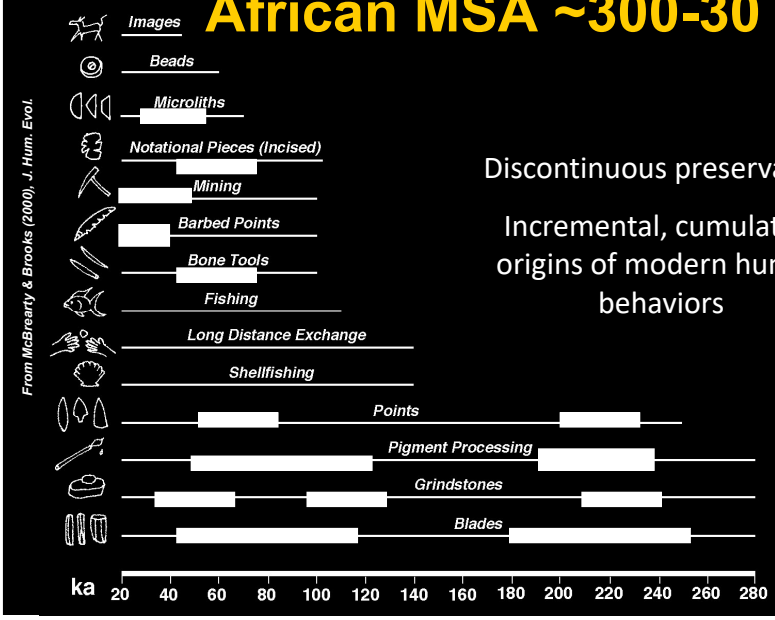
shell container for pigment mixing

28

Late MSA charcoal painting from Apollo 11 Rockshelter, Namibia

29

Behavioral innovations of the African MSA ~300-30 Ka



Discontinuous preservation

Incremental, cumulative origins of modern human behaviors

30

Tool types: Upper Paleolithic tools

- BLADES - more cutting surface & more efficient use of raw materials
- Tool kit was INCREDIBLY DIVERSE - knives, points, harpoons, needles
- Many materials used: wood, bone, antler & stone

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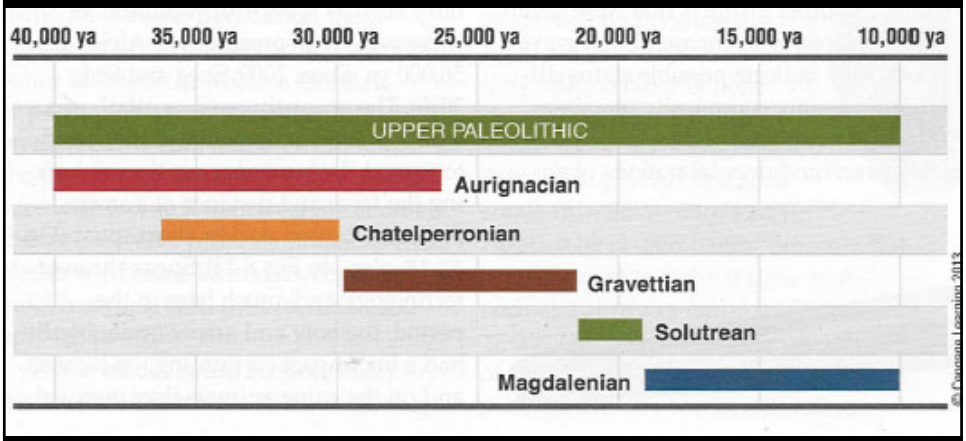
Archaeological stone tool industries in the European Upper Paleolithic



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Upper Paleolithic tools

- Aurignacian - 1st UP tool industry in Europe; ~40 ka; characterized by large blades & burins
- Gravettian - South France ~27 Ka; smaller, parallel-sided blades
- NOT associated with change in morphology or with shift in ecological conditions!

33

Upper Paleolithic tools

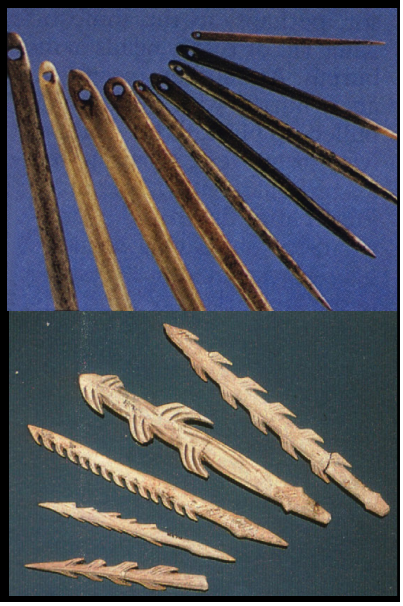
Solutrean (21 Ka) willow leaf points

34

Upper Paleolithic tools

Magdalenian tools:

- 16.5 Ka; characterized by lots of carved, decorated bone tools, including needles, awls, etc.
- LOTS of local variation - contrast this with CONSTANCY of Acheulean tool industry
- Raw materials transported LONG DISTANCES - either people were traveling long distances or were trading for these materials



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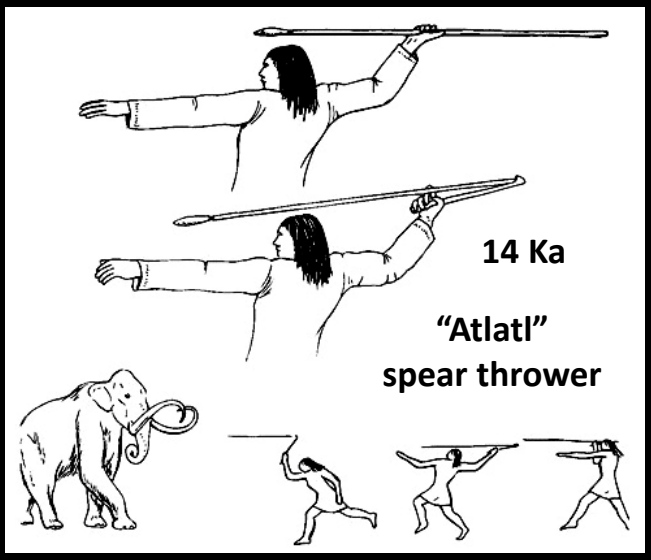
Magdalenian compound tools



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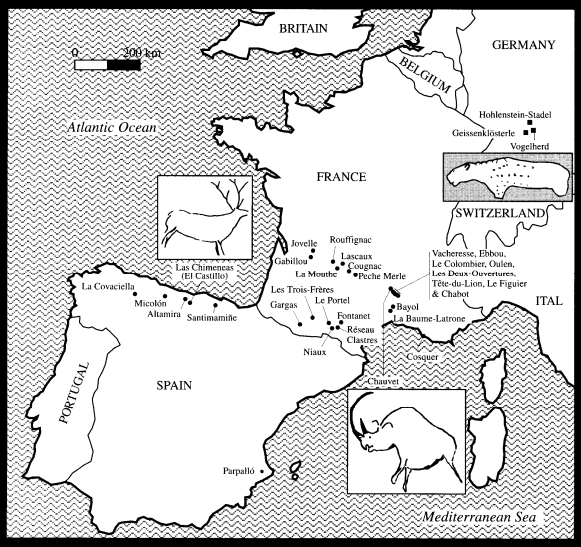
Symbolic behavior

- Upper Paleolithic humans (like humans earlier and elsewhere) clearly had capacity for symbolic behavior
- Practiced ritual burials
  - Example: Siberian site of Sungir, with jewelry, tools & sculpture found in burial site (dated to 15 Ka)

37

Symbolic behavior: Art

- Cave painting
- Evidence of personal adornment
- Carved figurines
- Musical instruments



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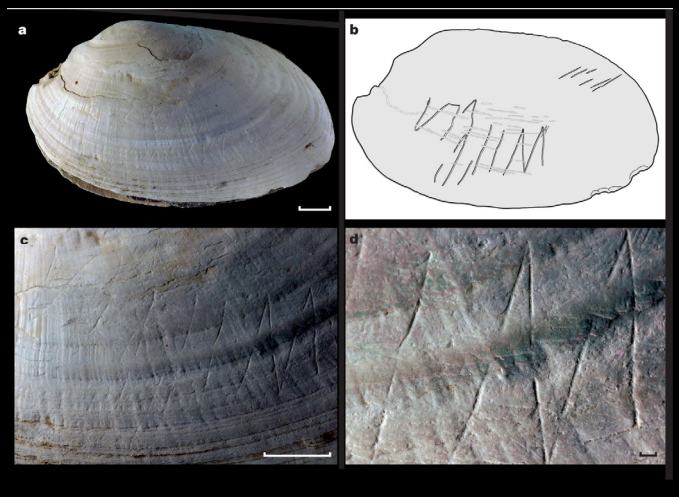
Homo erectus art?

- Pierced and engraved shell, Trinil, Java, ~500 Ka



Joordens et al. (2001)

39

Neanderthal art

- Engraved giant deer phalanx, 51 Ka, Germany

Leder et al. (2021)

40

Old figurative art

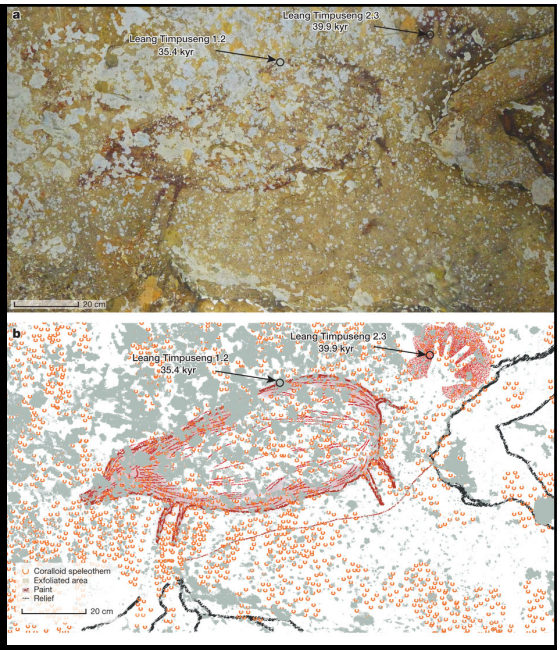
- Painting of wild cattle (three figures), Borneo, Indonesia, dated to at least 40 Ka

Aubert et al. (2018)

41

Old figurative art

- Hand stencil (39 Ka) and animal paintings (35 Ka) in Sulawesi, Indonesia – early figurative art
- Red disk (40 Ka) and hand stencils (37 Ka) from El Castillo, Spain



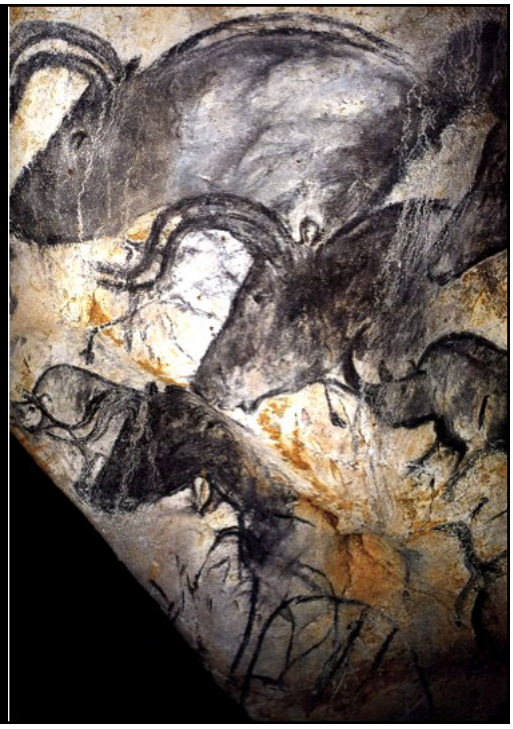
Aubert et al. (2014)

42

La Grotte Chauvet, SE France, 33 Ka

43

Chauvet,
SE France, 33 Ka



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Upper Paleolithich Personal adornment

- Ostrich eggshell and ivory beads
- Bone beads
- Tooth beads

45

Carved figurines – animals

35-40 Ka

46

Back to the Upper Paleolithic…

Musical instruments

- Flutes made from vulture bones, Vogelherd, Germany ~34 Ka

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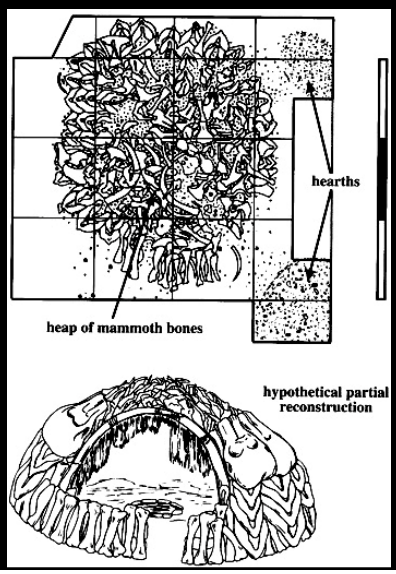
Subsistence: AMH vs Neandertals

- Exploited more prey types
  - large mammals, birds, fish
- Had more complex shelters
  - Mammoth bone hut (Ukraine, ~15 Ka)
- Evidence of sewn clothes



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Important! Upper Paleolithic ("European") art and the full cultural/behavioral "package" is just an example (pretty late) of the long-evolving symbolic and behavioral capabilities of humans, first displayed by MSA humans in Africa.

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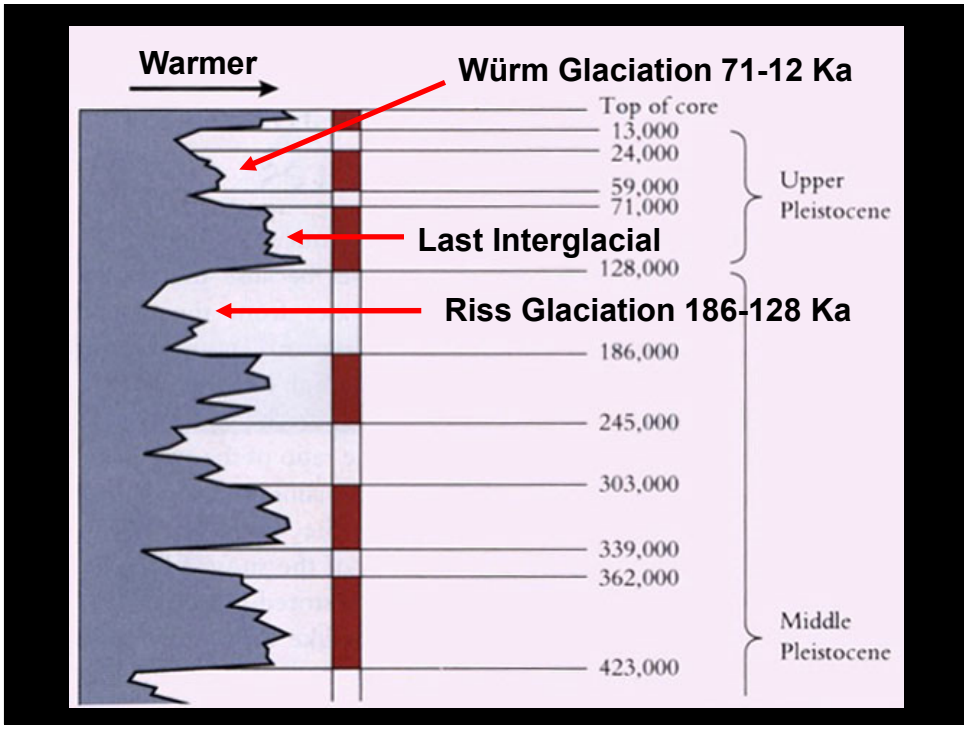
The fluorescence of behavioral "modernity" (i.e., what we normally think of as the practice of "culture" in some package) is seen archaeologically through time and across space in "flashes" until late in the Pleistocene, possibly signaling to us something about past demography and functional needs by early modern humans.

WHY?

50


Warmer
Würm Glaciation 71-12 Ka
Top of core
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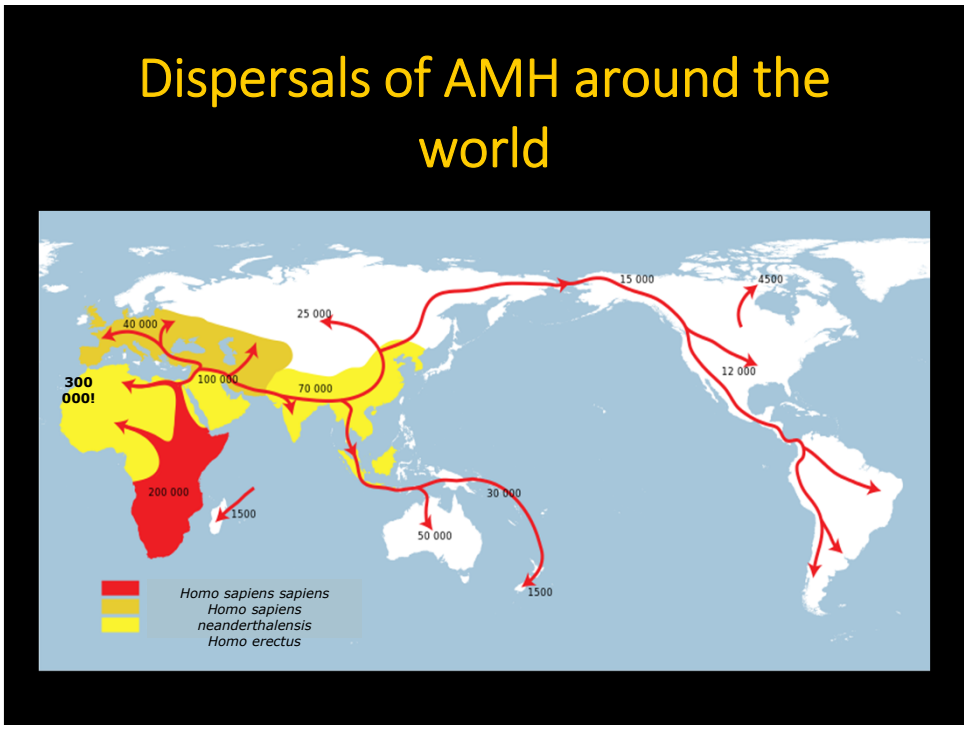
51


Dispersals of AMH around the world
40 000
25 000
15 000
4500
300 000!
100 000
70 000
12 000
200 000
1500
30 000
50 000
1500
Homo sapiens sapiens
Homo sapiens neanderthalensis
Homo erectus

52

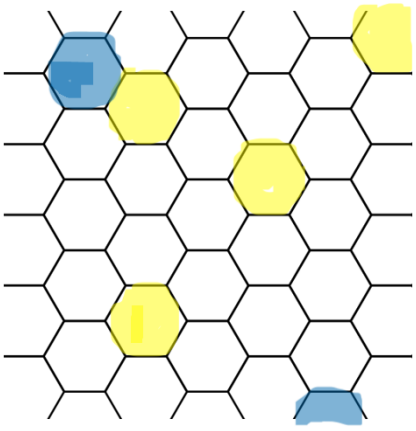
Upper Paleolithic (~50-10 Ka): Climate = cold, ice ages

TIME

53

Later Pleistocene Environment and Natural Resources
general features, esp. in last areas colonized (Australia, Siberia, the Americas):

(1) low resource density
(2) low diversity
(3) low predictability (asynchronous ripening/mast/herds)



54

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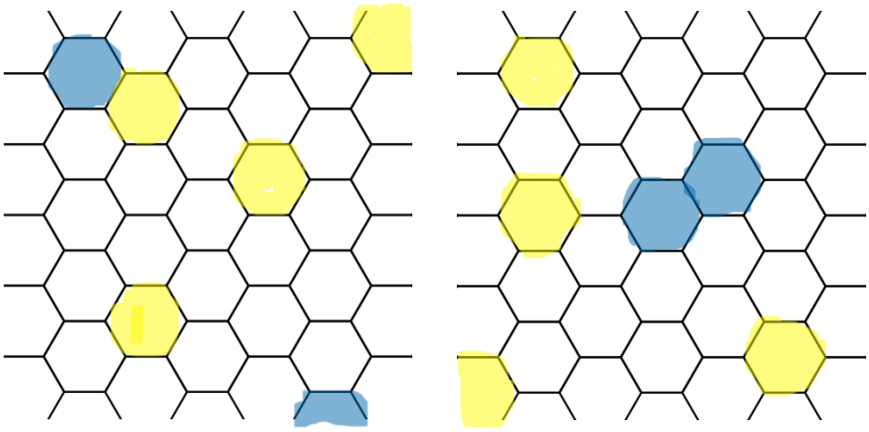

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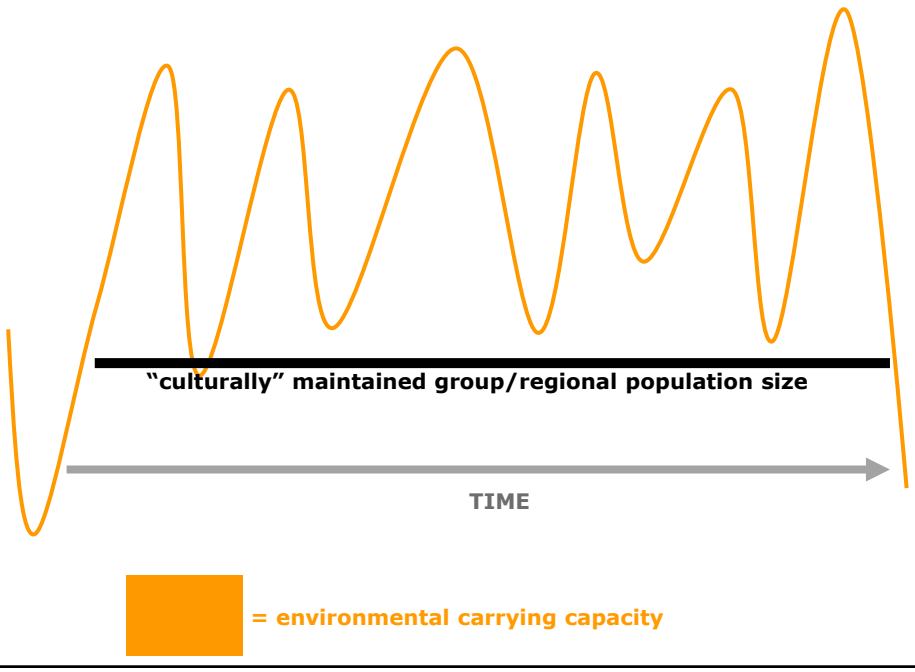

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Some common Hunter-Gatherer devices to maintain low populations and densities, known ethnographically:

*High mobility (very little sedentism)
*Enforced visiting of families in neighboring groups
*Enforced sharing (esp. of food resources)
*Shaming of boastful/arrogant individuals
*non-development of storage technologies/infrastructure
*High levels of interbirth spacing in years
*Incest taboos
*"Complicated" marriage partner rules (often) – limits mates
*Shunning/assassination of "free loaders," braggarts, murderers
*Infanticide (sometimes)
*many others…

All of these help to maintain population sizes and densities!

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Hunter-gatherer BANDS, as classically defined in ethnography:

- **Live primarily in BANDS – small-scale communities of 15-50 people, "related" via consanguinity ("blood" relations), affinal ties ("marriage"), fictive kinship, or other visiting dyadic partnerships (e.g., gift-giving or exchange relationships)**
- **Egalitarian social structures, as compared to hierarchical societies. Status differences may stem from age differences, gender roles, individual success in gathering, hunting, oratory skills, humor, etc. – i.e., status not pre-defined at birth, and status does not determine any additional right to food or resources and does not transfer to children**
- **Small "nuclear family" groups within bands are mobile – i.e., not sedentary**
- **Pulsed moments of aggregation: "many bands come together" for short periods of time within longer stretches of time of dispersed movements/settlement**

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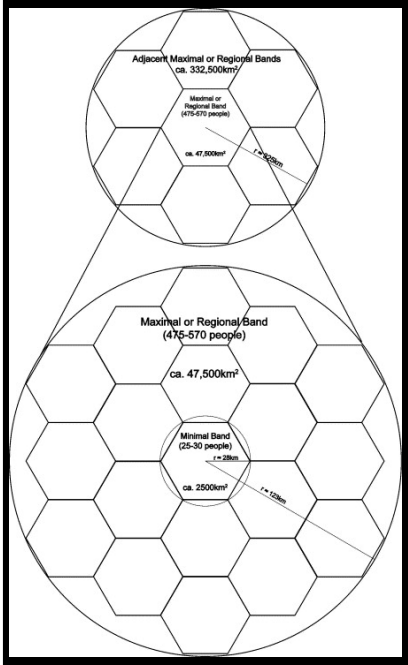

Hunter-gatherer aggregations & networks:

- Demographers have calculated the minimal # of individuals needed to create & maintain a viable breeding population and gene pool @ 500 people
- High mobility, egalitarian social rules, flexible "kinshipping" systems, gifting/exchange relations, all operate to ensure any given band's access to food resources in areas where wild resources fluctuate and do not become edible all at once.
- Also ensures sub-population survival in times of localized resource shortages

Idealized schematic showing networked relations among several neighboring bands across a landscape

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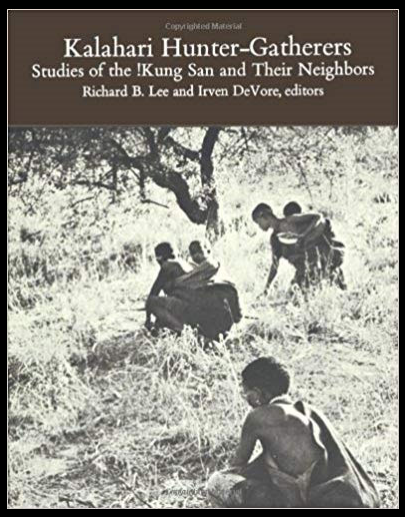
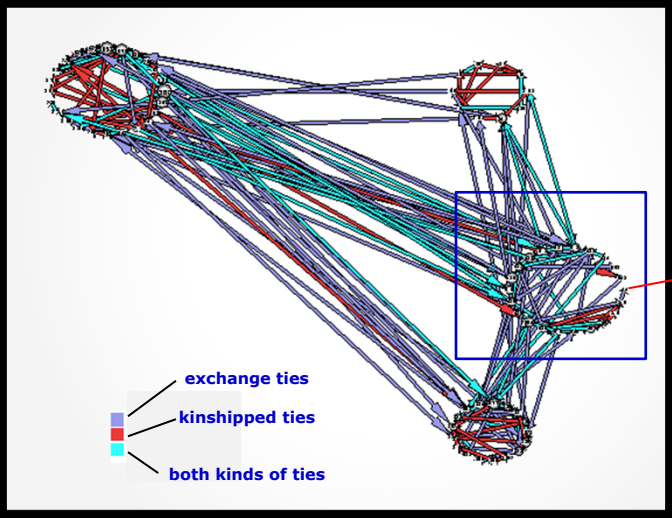
The Ju/'hoansi (!Kung San) of southern Africa



60

The Ju/'hoan networks – the ties that bind! (inner core of studied area)



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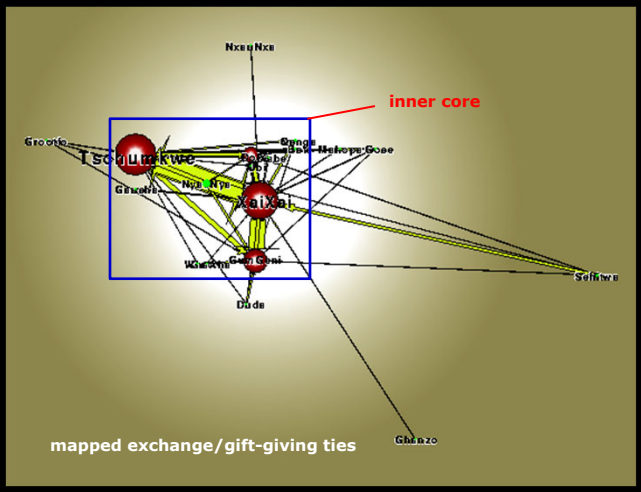
The Ju/'hoan networks – the ties that bind! (inner & outer core of studied area)



**These maps are static snapshots of dynamic relationships (living networks) created by sub-groups within local bands moving & visiting, establishing social relations, social memories, and future (egalitarian) expectations that could cut either way

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Polly Weissner (1998)

2. *Density.* The finding that the *hxaro* network is sparse is significant in that it contrasts with the density of kinship network, formed by three overlaid systems of kin classification that make it possible to classify a very wide range of people as kin, as demonstrated in Lee's (1986) superb analysis. However, classification does not specify obligations to kin beyond close family members and affines. From the !Kung viewpoint, then, people live in a dense web of kinship—*hxaro* simplifies by specifying which of this myriad of relations one is responsible for, whom one "holds." The sparse network of *hxaro* is thus a product not of a widely dispersed population and walking distances, as Schweizer suggests, but of intentional placement of obligations. Comparison of the *hxaro* network with webs of food sharing would almost certainly yield different densities. *Hxaro* builds sparse networks to allow people to redistribute themselves over the resources of the region; ties of food sharing create community among people living in one place—both residents and visitors—and are dense within a given location. In short, the !Kung kinship network is dense; *hxaro* is one way of placing more binding obligations.

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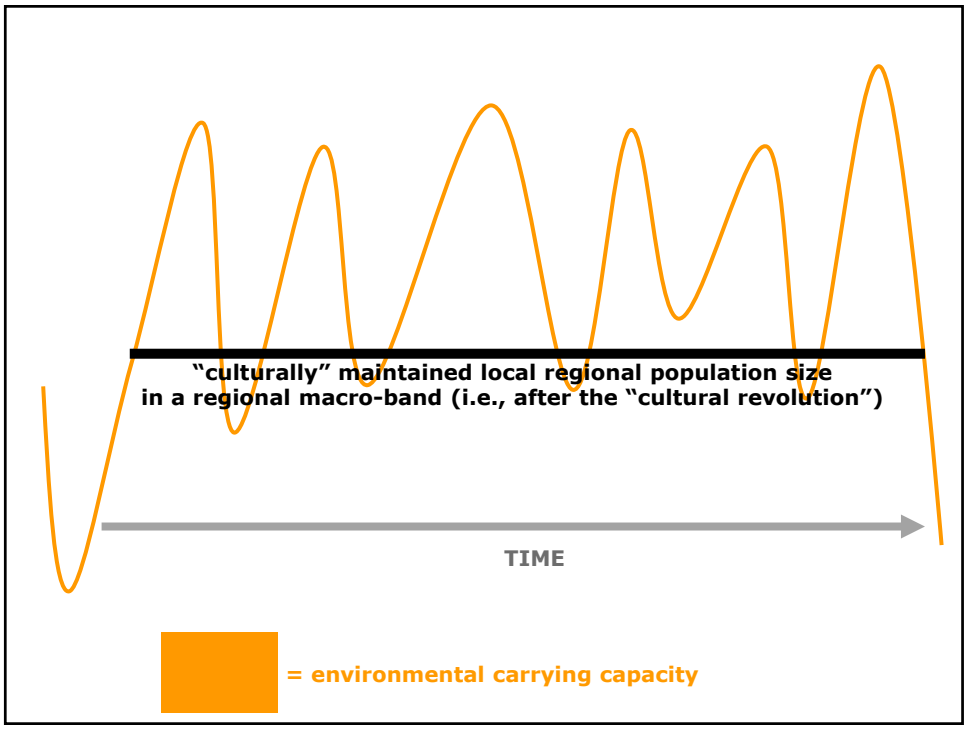

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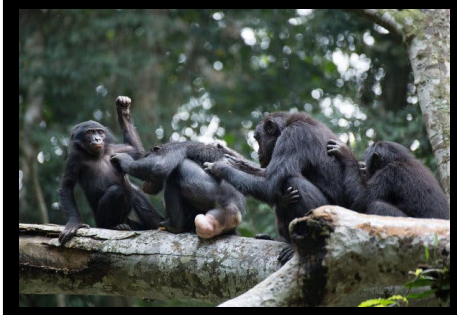

Early on, humans developed cognitive/cultural means for moving beyond limitations of primate & ape dominance hierarchies and "slow/difficult" in-migration processes.

This, in theory, helped early human groups maintain information on the broader landscape and real-time resource fluctuations, and "kinshipping" and rules of enforced egalitarianism ensured ease of population redistribution continuously, and especially in critical times.

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"No ape can appreciate the difference between holy water and distilled water, because there is none, chemically speaking."
-- Leslie A. White (c. 1950), cultural anthropologist

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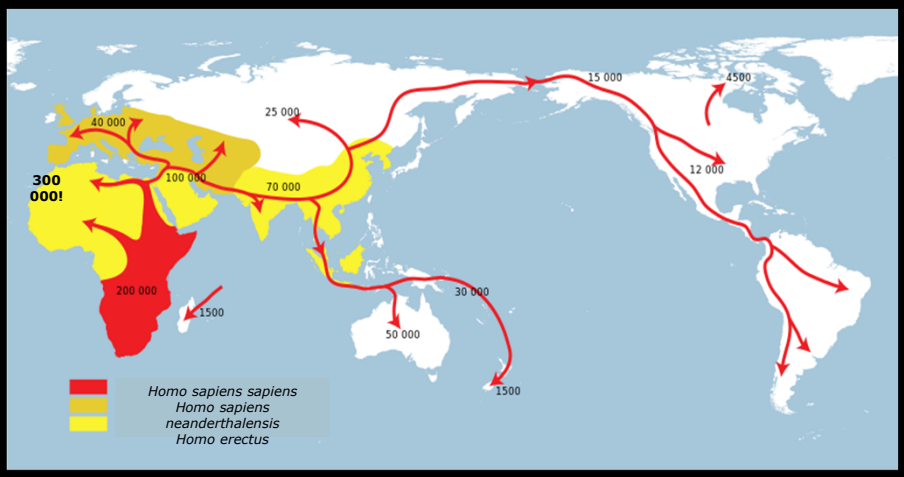
Dispersals of AMH around the world



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Late Pleistocene Demography and the Appearance of Modern Human Behavior

Adam Powell,[1,3] Stephen Shennan,[2,3] Mark G. Thomas[1,3]*

The origins of modern human behavior are marked by increased symbolic and technological complexity in the archaeological record. In western Eurasia this transition, the Upper Paleolithic, occurred about 45,000 years ago, but many of its features appear transiently in southern Africa about 45,000 years earlier. We show that demography is a major determinant in the maintenance of cultural complexity and that variation in regional subpopulation density and/or migratory activity results in spatial structuring of cultural skill accumulation. Genetic estimates of regional population size over time show that densities in early Upper Paleolithic Europe were similar to those in sub-Saharan Africa when modern behavior first appeared. Demographic factors can thus explain geographic variation in the timing of the first appearance of modern behavior without invoking increased cognitive capacity.

***Median population in Europe @ 45 kya – 2905, density ~3.2714 x 10^{-4}km^{-2}**

***The year this density modeled to have reached in sub-Saharan Africa - ~101 kya (followed by bottlenecks and rebounds)**

***Middle East and North Africa - ~40 kya**

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Things to think about:

***Development of new language capacities, syntax and esp. tense-modality systems, forming of clauses, "displacement" into future and past – "*mental time travel*"**

- ***This allows for identities/kinship categories which can come with culturally-made expectations, obligations, rights**
- ***This allows for knowledge of past information about environment to be remembered, and future planning to take place**
- ***Do we see this with creation of more complex tools, e.g., more Mousterian and Upper Paleolithic-style toolkits, composite technologies?**

***Certain pop. densities (locally/regionally) needed for innovations (similar to "mutations"), mimicking, learning, teaching, etc.**

- ***When pop. densities too low, this knowledge lost/not necessary**

***Direct oral transmission: stores knowledge for 3-5 generations, 60-125 yrs**

- ***ritual and myth shown to add to this "group" memory/storage of knowledge, extends group memory.**

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