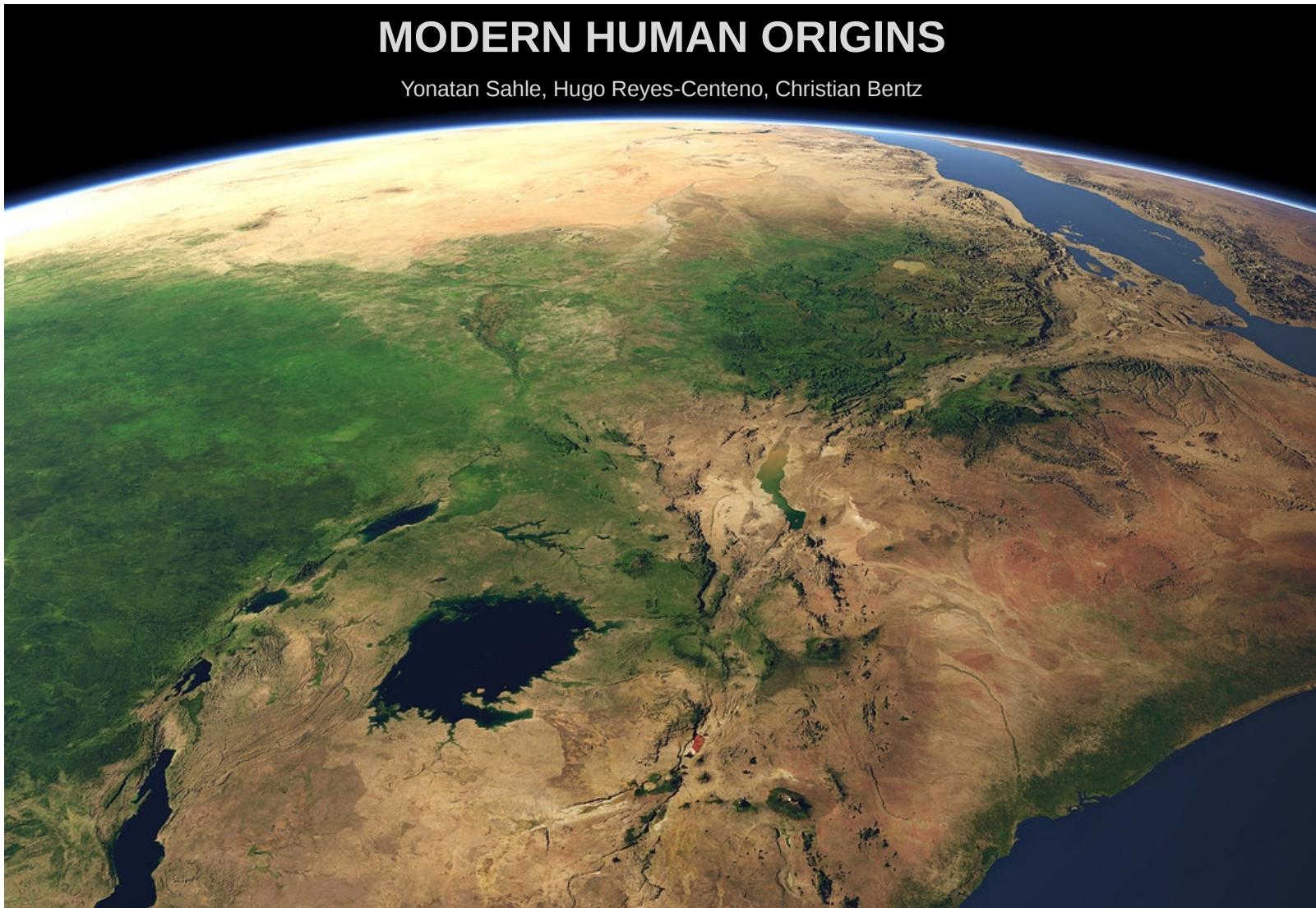




# MODERN HUMAN ORIGINS

Yonatan Sahle, Hugo Reyes-Centeno, Christian Bentz





## Archaeology at the dawn of modern humans

- Early-Middle Pleistocene archaeology
- The Middle Stone Age (Africa)
- The Middle Paleolithic(Eurasia)
- BBC Documentary (by Prof. Brian Cox)

Toth N, Schick K. 2015. Overview of Paleolithic Archaeology. In: W Henke, I Tattersall (eds.), *Handbook of Paleoanthropology*, Vol. 3, Heidelberg: Springer, p. 2441-2464.

Wadley L. 2013. Recognizing Complex Cognition through Innovative Technology in Stone Age and Paleolithic sites. Cambridge Archaeol J 23: 163-183.

Richter J. 2011. When did the Middle Paleolithic begin. In: NJ Conard, J Richter (eds.), *Neanderthal Lifeways, Subsistence and Technology: One Hundred Fifty Years of Neanderthal Study*, Vertebrate Paleobiology and Paleoanthropology series, p. 7-14.



## Archaeology at the dawn of modern humans

### □ Early-Middle Pleistocene archaeology

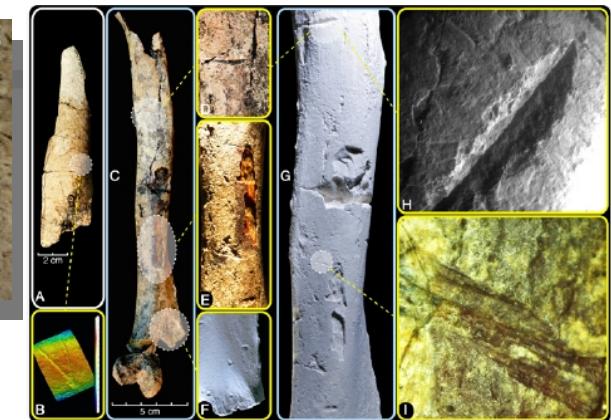
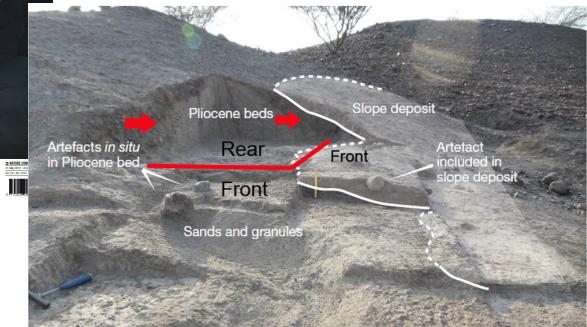
- The earliest tools: when, where, by whom?

- Lomekwi (3.3 Ma)

'crudely-worked tools'

- Dikika (3.4 Ma)

'butchery marks'





## Archaeology at the dawn of modern humans

### □ Early-Middle Pleistocene archaeology

- The earliest tools: when, where, by whom?

- Gona (2.6 Ma)

crudely-worked tools,  
multiple excavated sites

### 2.5-million-year-old stone tools from Gona, Ethiopia

S. Semaw\*, P. Renne†, J. W. K. Harris\*, C. S. Feibel\*,  
R. L. Bernor‡, N. Fesseha‡ & K. Mowbray\*

\* Department of Anthropology, Douglass Campus, Rutgers University,  
New Brunswick, New Jersey 08903, USA

† Berkeley Geochronology Center, 2455 Ridge Road, Berkeley,  
California 94709, USA

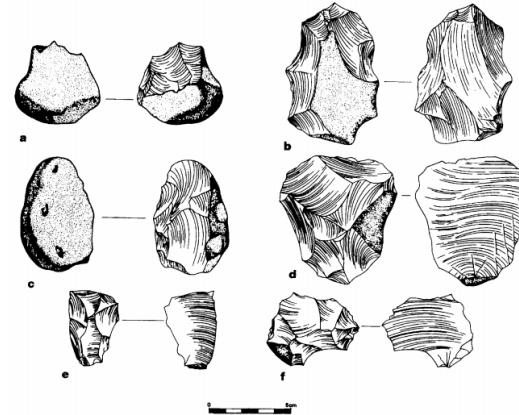


Figure 3 Sketches of a sample of the excavated Gona artefacts. Flaked pieces: a,

©Nature



## Archaeology at the dawn of modern humans

### How to recognize a stone artifact?



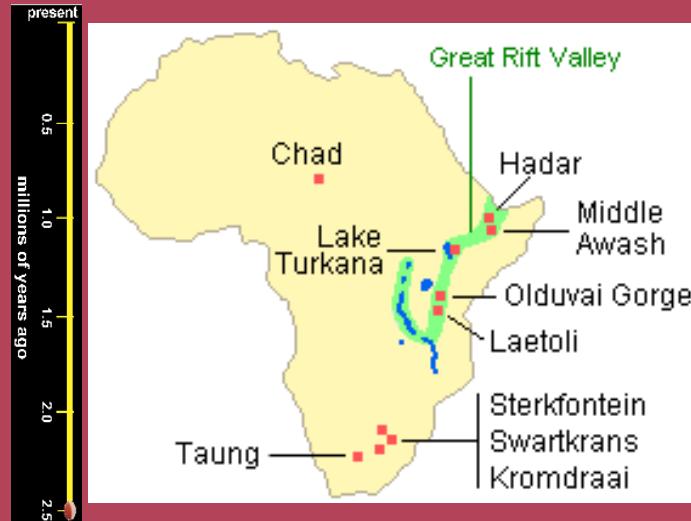
©Paleodirect



## Archaeology at the dawn of modern humans

### □ Early-Middle Pleistocene archaeology

- The earliest tools: when, where, by whom?



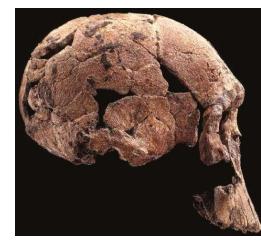
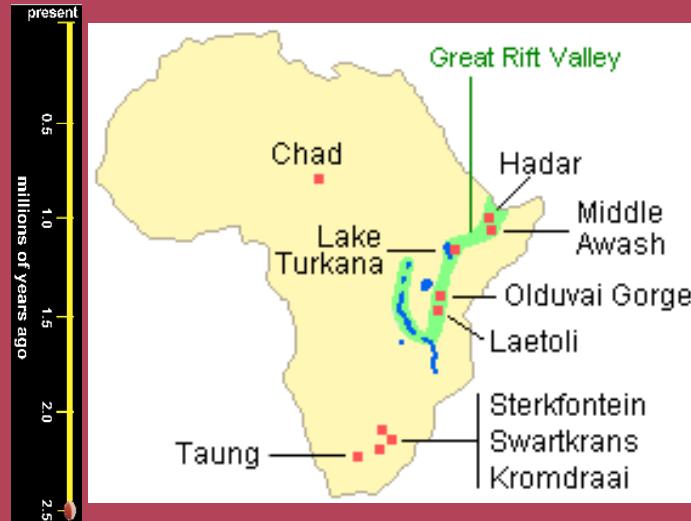
©Nature



## Archaeology at the dawn of modern humans

### □ Early-Middle Pleistocene archaeology

- The earliest tools: when, where, by whom?



early *Homo*



*Au. garhi*

Asfaw et al. (1999); Villmore et al. (2015)



## Archaeology at the dawn of modern humans

### □ Early-Middle Pleistocene archaeology

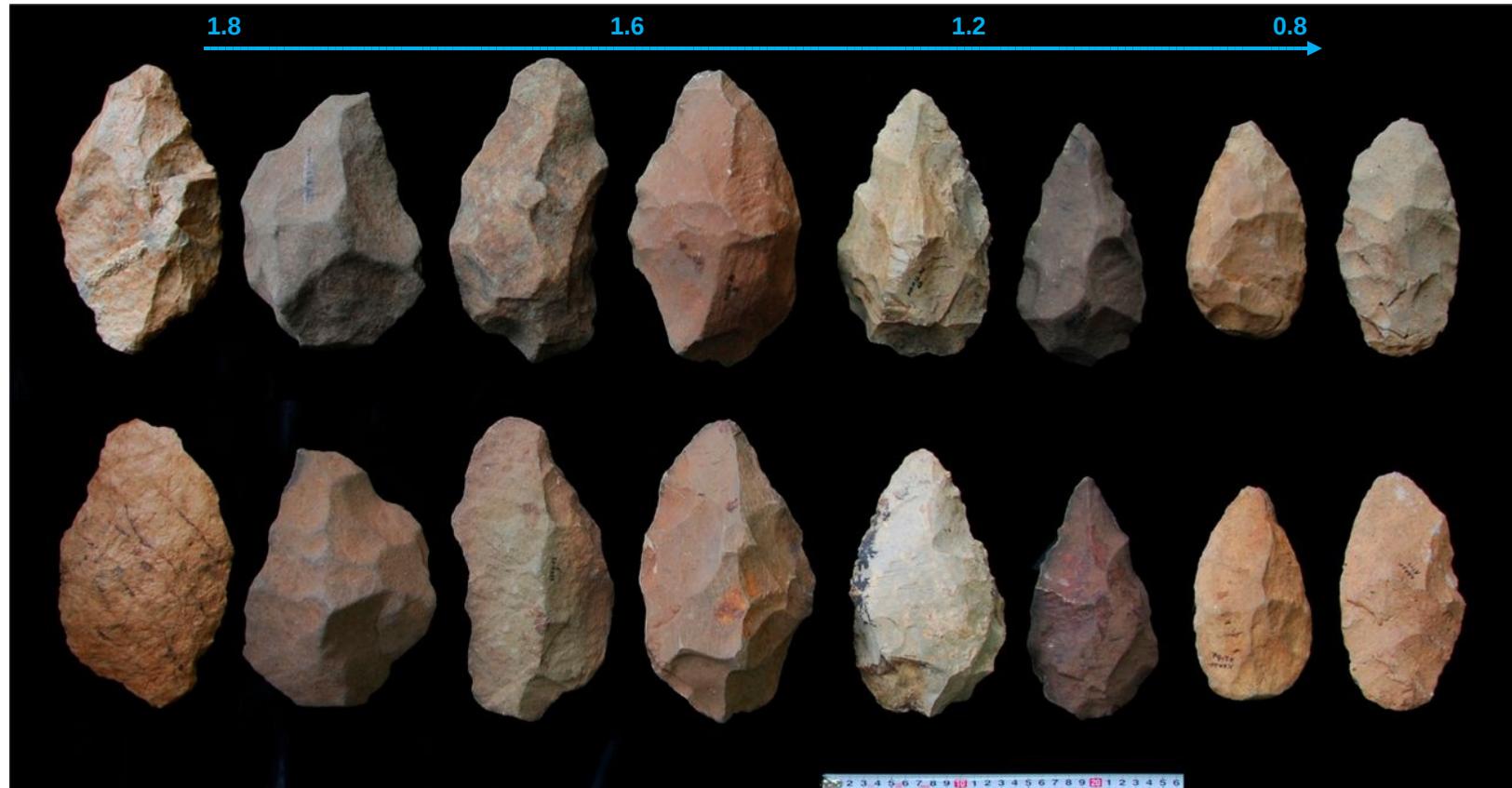
- The Acheulean: a new techno-complex



Beyene et al. (2013); Lepre et al. (2011)



## Archaeology at the dawn of modern humans



Beyene et al 2013



## Archaeology at the dawn of modern humans

### *Increased variability*



triangular



Cordiform



discoid



Amegdaloid



lanceolate



elliptical

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## Archaeology at the dawn of modern humans



Av. cutting edge= 20cm



©National Geographic Creative (David Brill)



## Archaeology at the dawn of modern humans

### □ Early-Middle Pleistocene archaeology

- The Acheulean: a new techno-complex





## Archaeology at the dawn of modern humans

### Enter the Middle Stone Age/Middle Paleolithic (MSA/MP):

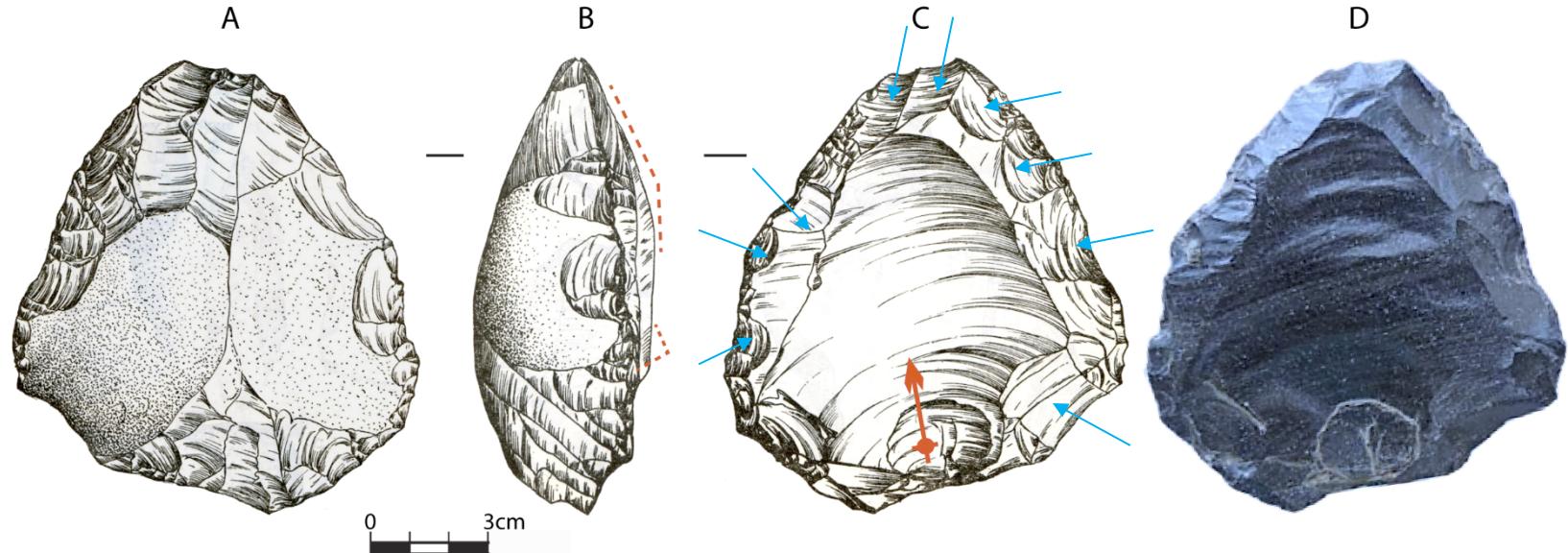
#### *Features:*

- tools predominantly on flakes
- Flakes from standardized methods (e.g., the Levallois)
- tool diversity
- regional identity (style, in addition to function)
- pointed artifacts and scrapers organic tools
- early hafting, ochre processing, etc



## Archaeology at the dawn of modern humans

### MSA/MP



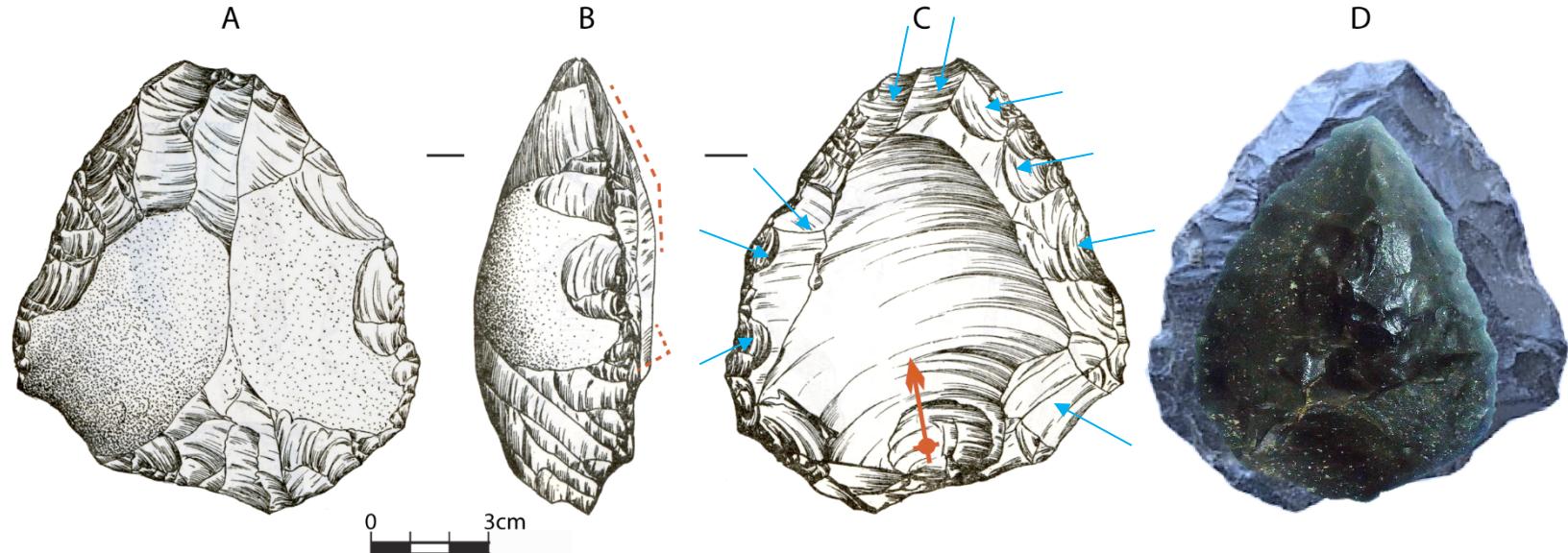
Levallois core (Wendorf & Schild 1974)

**Characteristics:** Prepared core technology (aka the Levallois); pointed pieces



## Archaeology at the dawn of modern humans

### A Levallois Core (280 kya)

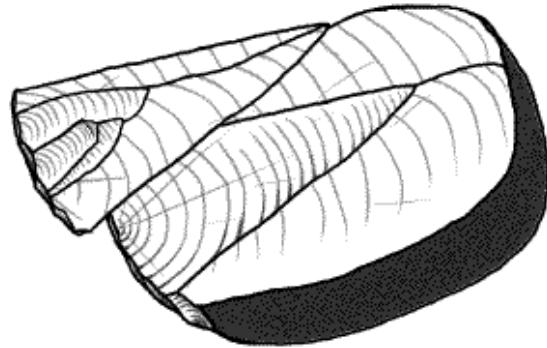


(Wendorf & Schild 1974)



## Archaeology at the dawn of modern humans

A spear point (280 kya)



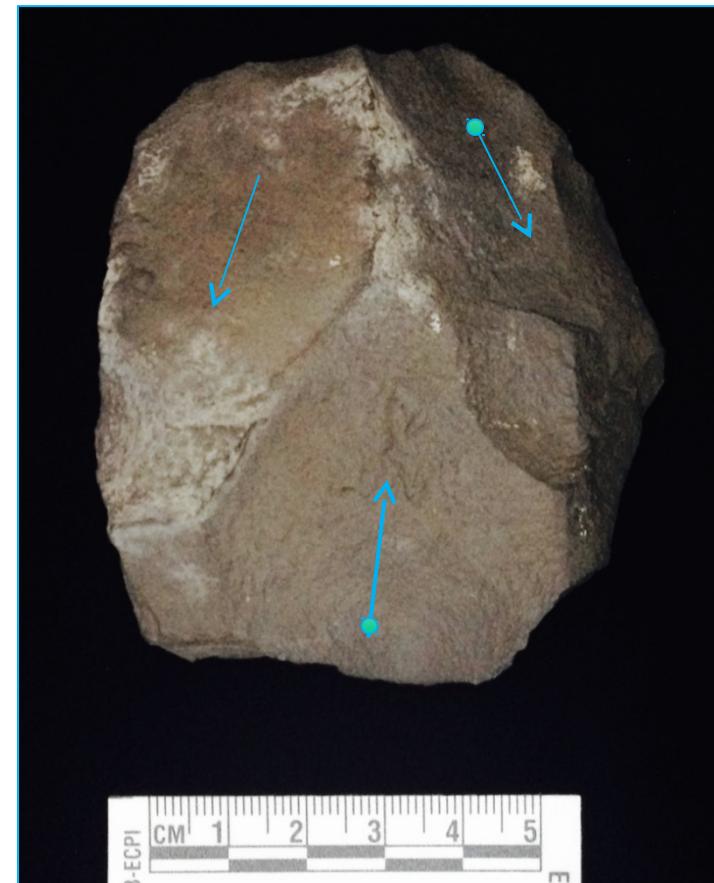
(Sahle et al. 2013)



## Archaeology at the dawn of modern humans



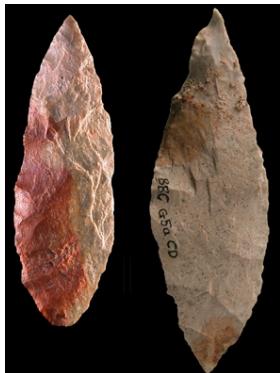
Levallois flakes (Left) and Preferential Levallois core (Nubian) all ©Y Sahle





## Archaeology at the dawn of modern humans

### More diversity: pointed pieces



Still Bay Point: Villa et al (2009)



Aterian (tanged) Point: Iovita (2011)



Classic, broad-base point: Brooks et al (2006)



Engraver/borer ©Paleodirect



## Archaeology at the dawn of modern humans

### More diversity: Scrapers



Steep, Moustierian Quina scrapers



Horse shoe scrapers

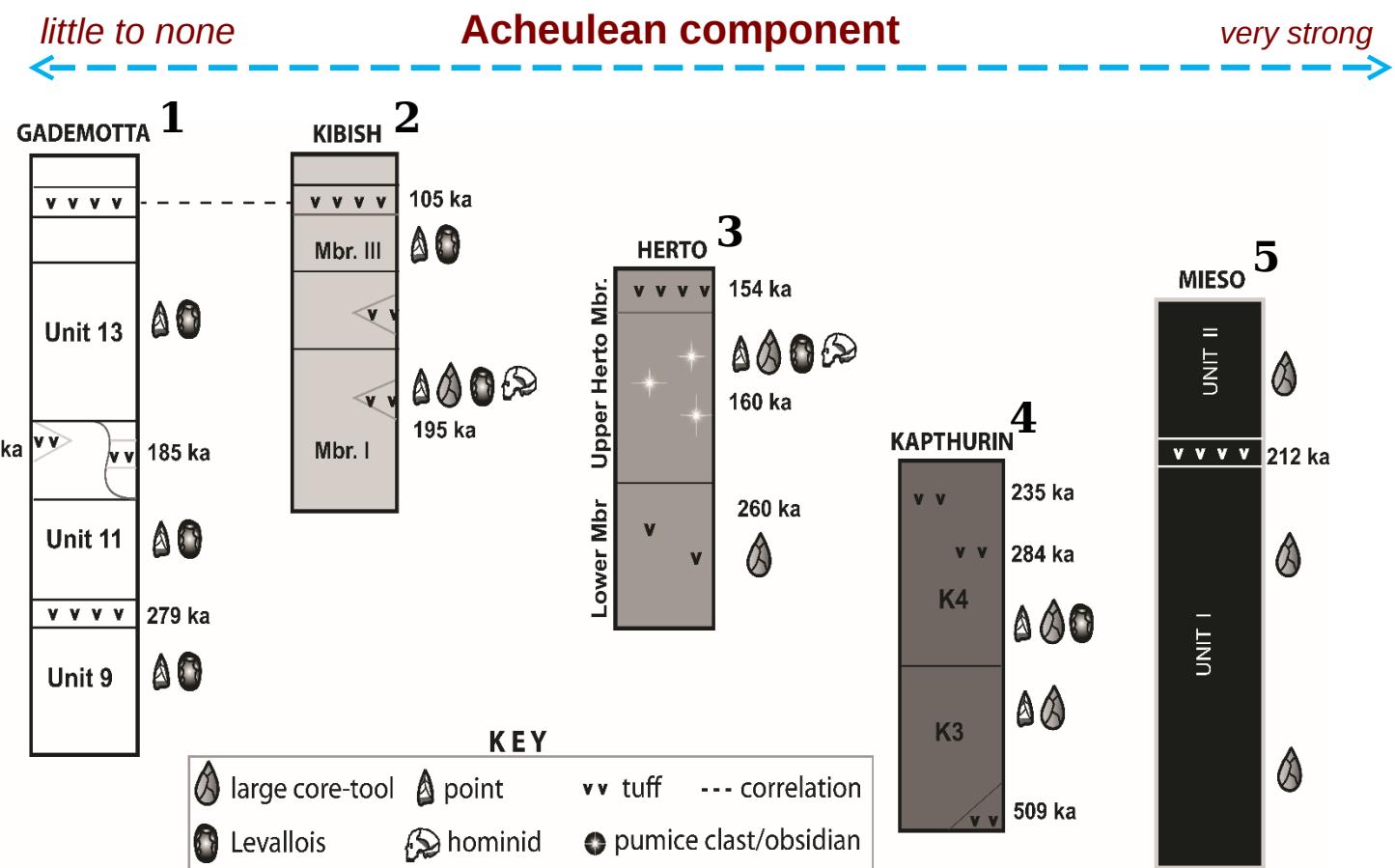
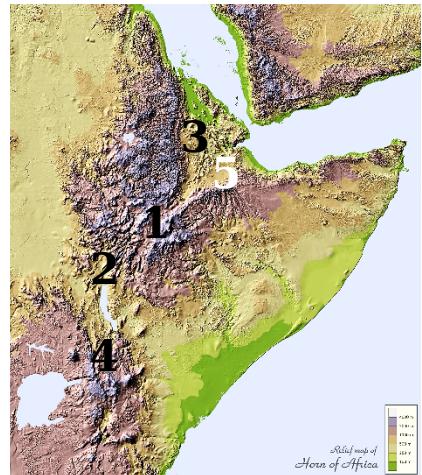


Bifacial scraper

All images here ©Paleodirect



## Archaeology at the dawn of modern humans

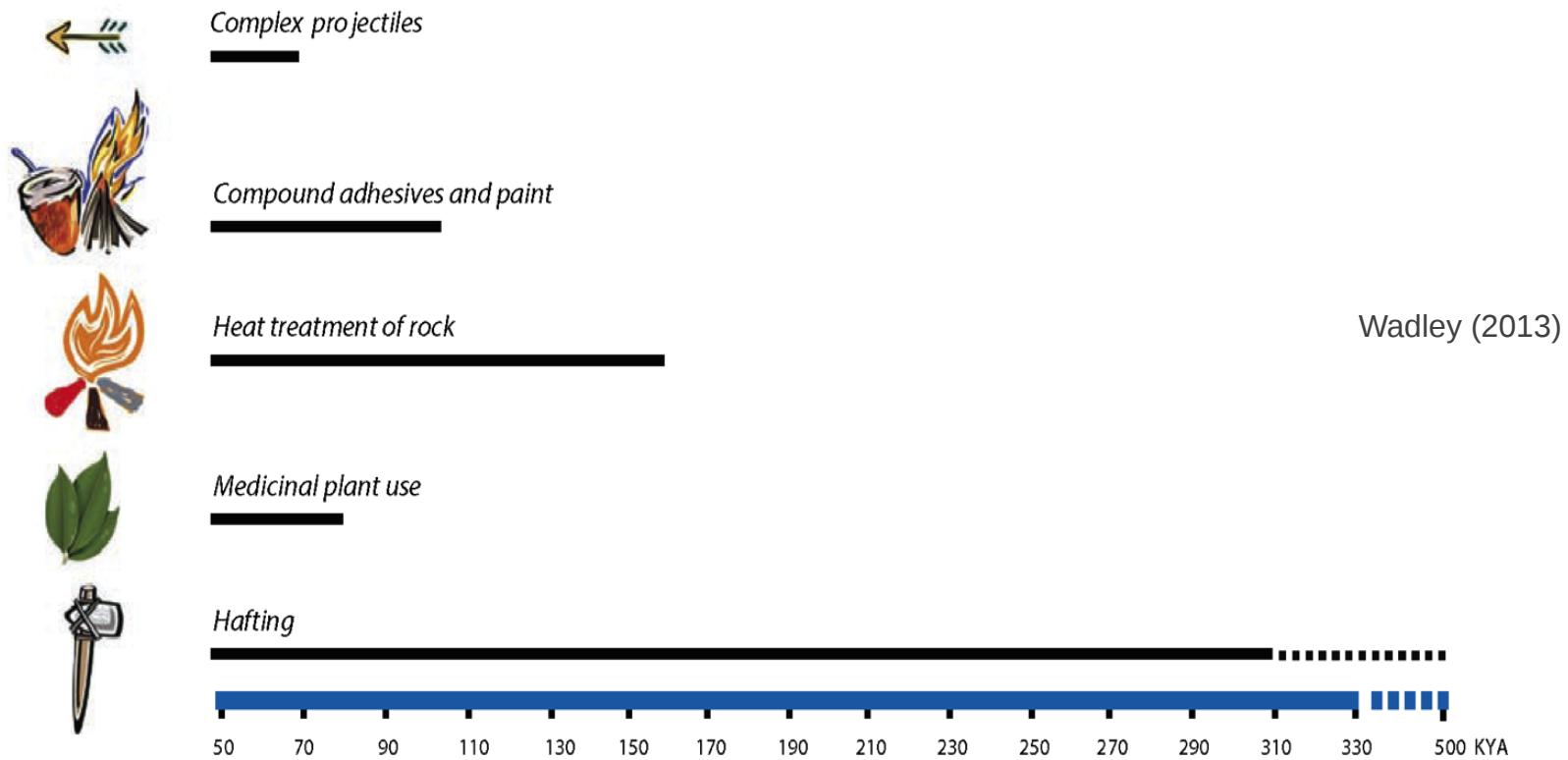


Sahle (2014) SAA



## Archaeology at the dawn of modern humans

### Complex technologies?





## Archaeology at the dawn of modern humans

### early hafting



0                  2 cm

Campitello Quarry (~200 kya) Plant glue used as a haft  
Roebroek & Villa (2011) PNAS

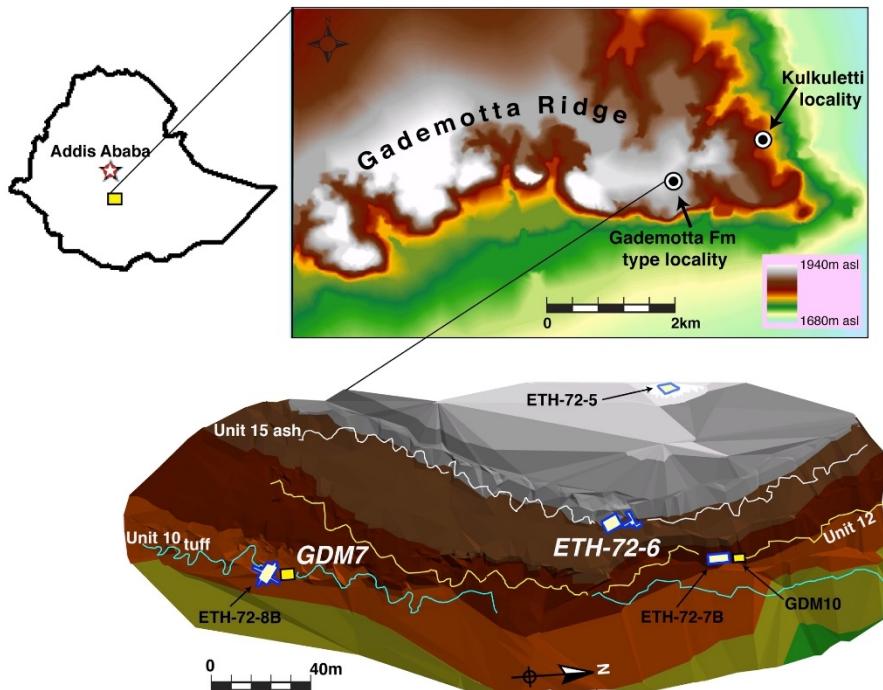


Kathu Pan (hafting at 500 ka?)  
Wilkins et al. (2012) PNAS

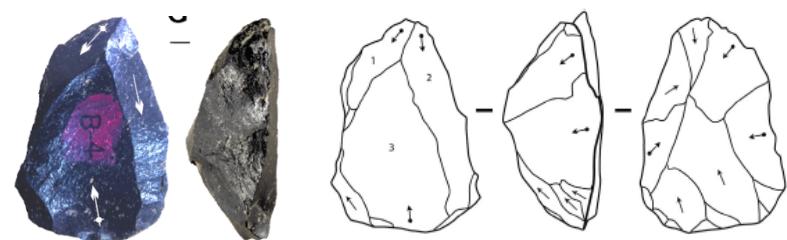


## Archaeology at the dawn of modern humans

### Hafting and simple projectiles: Gademotta, Ethiopia (>280 KYA)



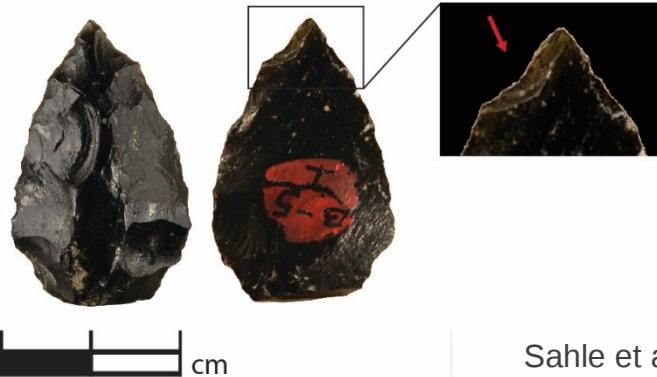
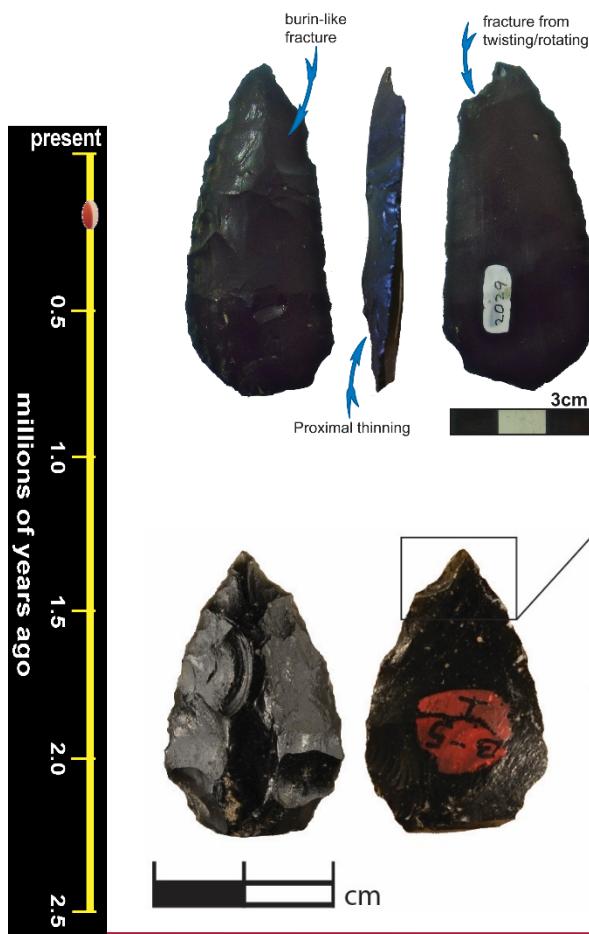
Sahle et al. (2013)



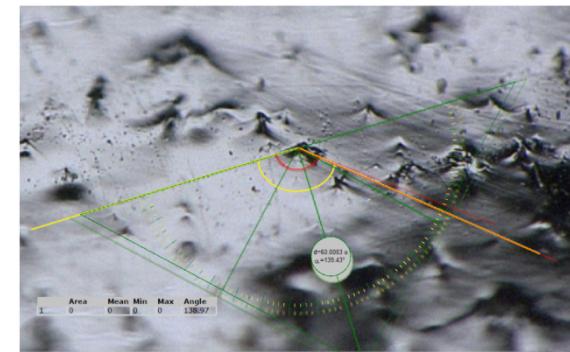
Levallois cores (Nubian type I preferential) Sahle (2013)



## Archaeology at the dawn of modern humans

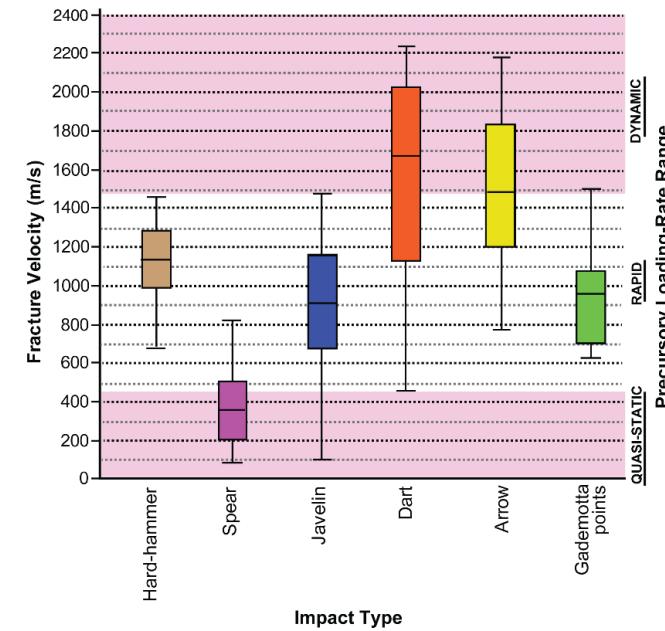
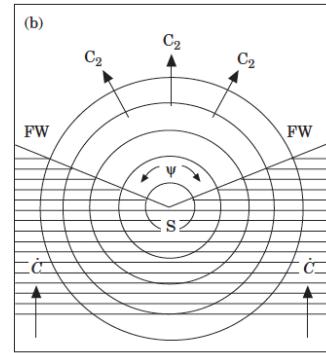


Sahle et al. (2013, 2014)





## Archaeology at the dawn of modern humans

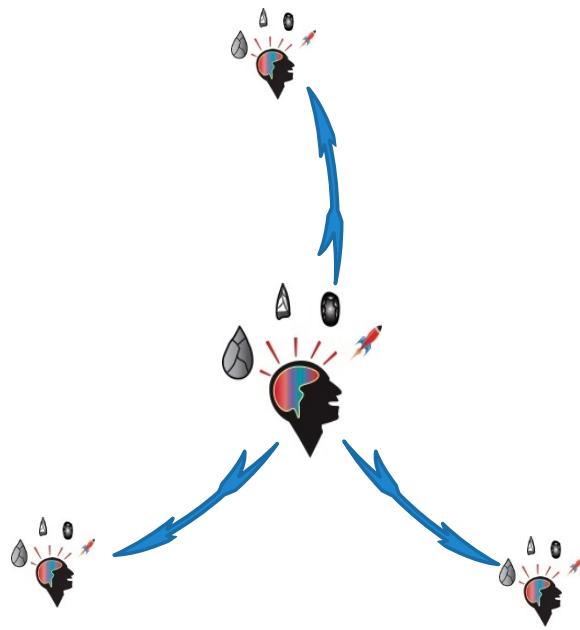


Sahle et al. (2013, 2014)

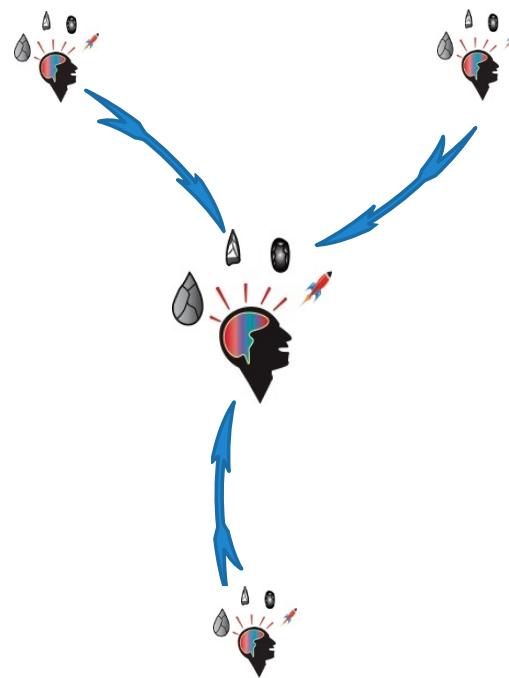


## Archaeology at the dawn of modern humans

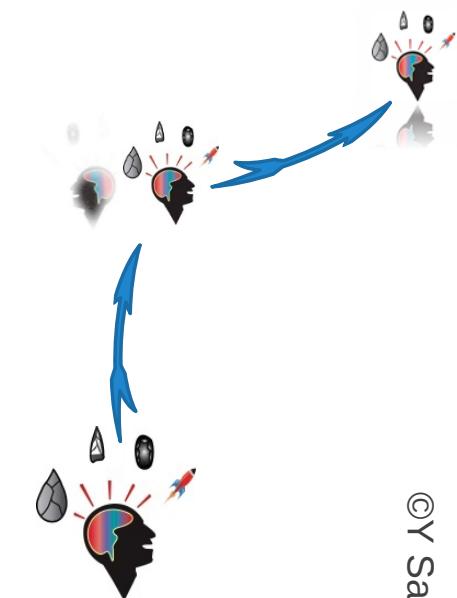
**Diffusion**



**Convergence**



**Idiosyncracy**

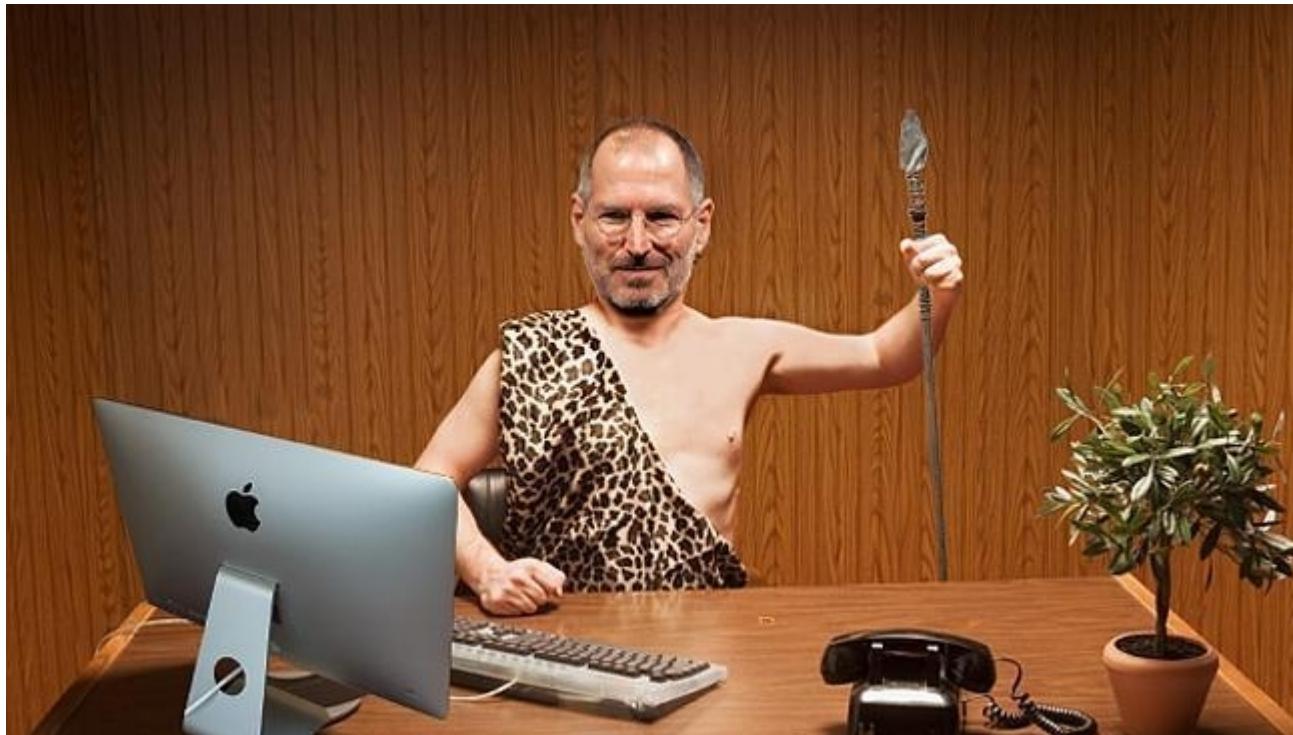


©Y Sahle



## Archaeology at the dawn of modern humans

How did it all start: A single genius or cumulative intelligence?



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