UNIVERSITY OF WASHINGTON

ARCHY 483
Analysis of Stone Artefacts

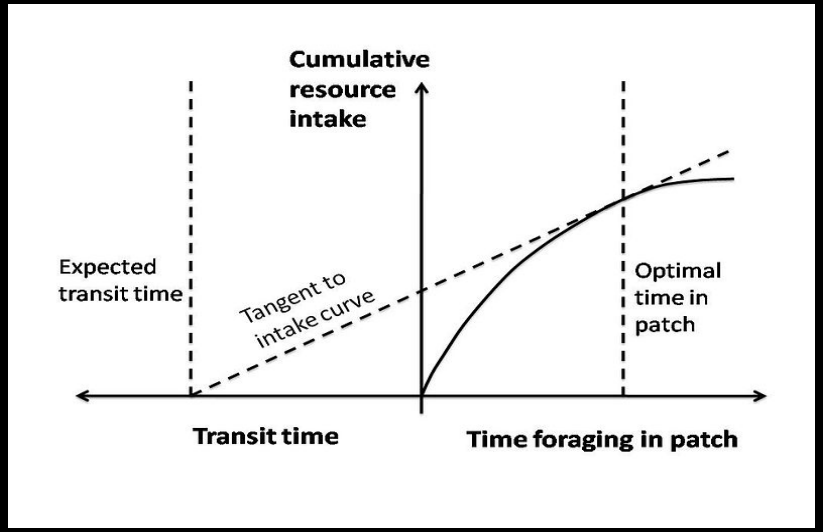
Spring 2019

Lecture 8

Middle Palaeolithic: Middle Stone Age, Mousterian, Levallois

Q1: What did Prentiss discover about the Sullivan and Rozen typology?

Q2: Sketch this, and add at least three labels on the axis and other lines



Q3: Steven Kuhn proposed a versatile approach to interpreting assemblages based on the provisioning of ____ and the provisioning of _____

Q1. Why is Nick Toth's classification system for the Olduwan better than Mary Leakey's?

Q1. Why is Nick Toth's classification system for the Olduwan better than Mary Leakey's?

Q2. What are the three main types of stone artefact that are found in Achuelean assemblages?

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Q2. What are the three main types of stone artefact that are found in Achuelean assemblages?

Q3. What two differences between handaxes found in East Africa and East Asia?

Experimental assemblage report: step 1

Publish | Edit | ⋮

The purpose of this assignment is to guide you in collecting the data efficiently and following best practices. This will help to make the Experimental Assemblage Report easier for you.

Here are the specific steps:

- **Identify the best practices for collecting data in a spreadsheet** by reading Broman, Karl W., and Kara H. Woo. "Data organization in spreadsheets." *The American Statistician* 72.1 (2018): 2-10. At this stage we want you to focus on following recommendations 2, 3, 6 and 7, so please pay careful attention to those. Make a note of these best practices and keep them in mind while you collect data from experimental assemblages.
- **Identify the stone artefact attributes** that are useful for identifying different reduction trajectories by reading Scerri, E. M., Gravina, B., Blinkhorn, J., & Delagnes, A. (2016). Can lithic attribute analyses identify discrete reduction trajectories? A quantitative study using refitted lithic sets. Journal of Archaeological Method and Theory, 23(2), 669-691 Starting from the set of variables recommended in this paper, discuss with your group members and choose a set of flake attributes (e.g. 5-10) that your group will use to collect data from the experimental assemblages. Write the names of these attributes as headings of the columns in a spreadsheet to prepare to collect data about these attributes.
- **Identify variables useful for recording retouch** by taking a look at your previous lab worksheet, consider for example if you want to collect the GIUR and index of invasiveness, and add headings to columns of your spreadsheet to prepare to collect those data.
- **Create one spreadsheet file on Google sheets** and:
  - Share access to the file with everyone in your group so everyone can read and edit it
  - create one sheet in this file called 'raw-data' with the columns labelled with the variables you have identified as important, and ready to collect data (we do not require any data in your spreadsheet at this stage) and
  - create a second sheet in this file called 'data-dictionary' with a data dictionary (see Broman and Woo 2017, above, to find out what this should look like)

Upload your spreadsheet file to Canvas as your submission to this assignment. Each member of the group must make their own individual submission to confirm that everyone has access to the sheet. The contents of the file submitted by for each member of the group should be identical: your file should be the same as the other members of your group.

To download your spreadsheet from Google sheets, look for the File menu in Google sheets and click: File -> Download as -> Microsoft Excel (.xlsx)

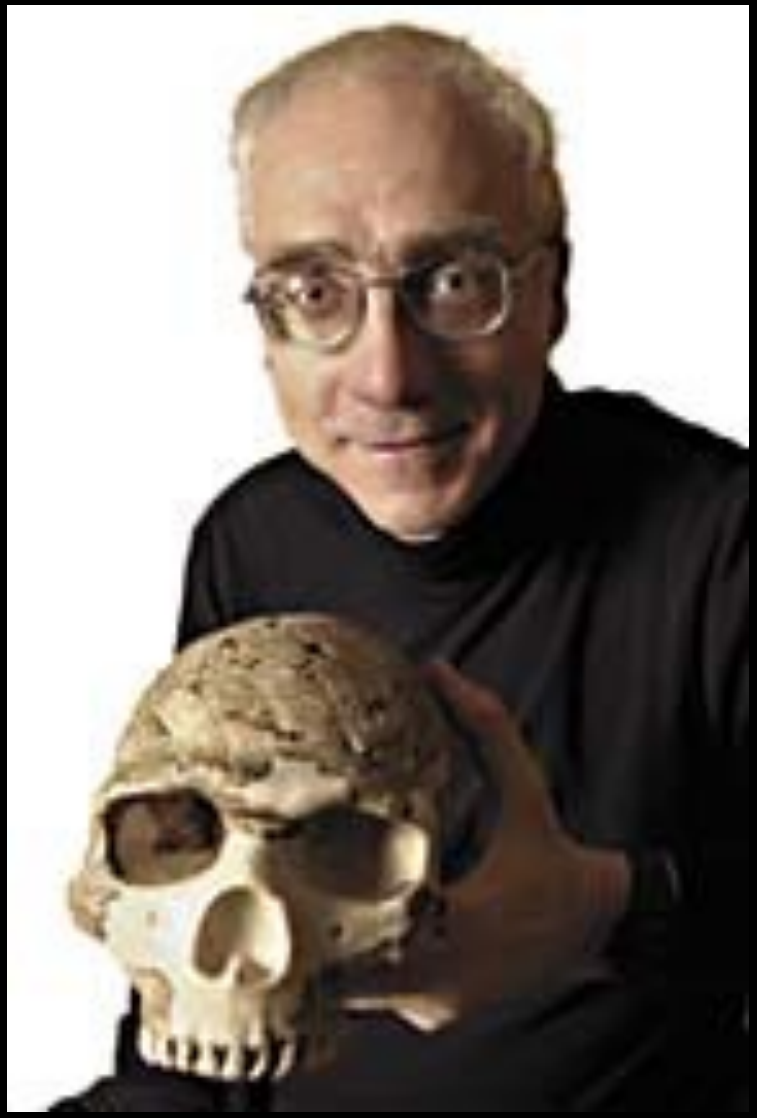
Middle Stone Age in Africa

Middle Palaeolithic in Europe

Middle Palaeolithic in Asia

Middle Stone Age

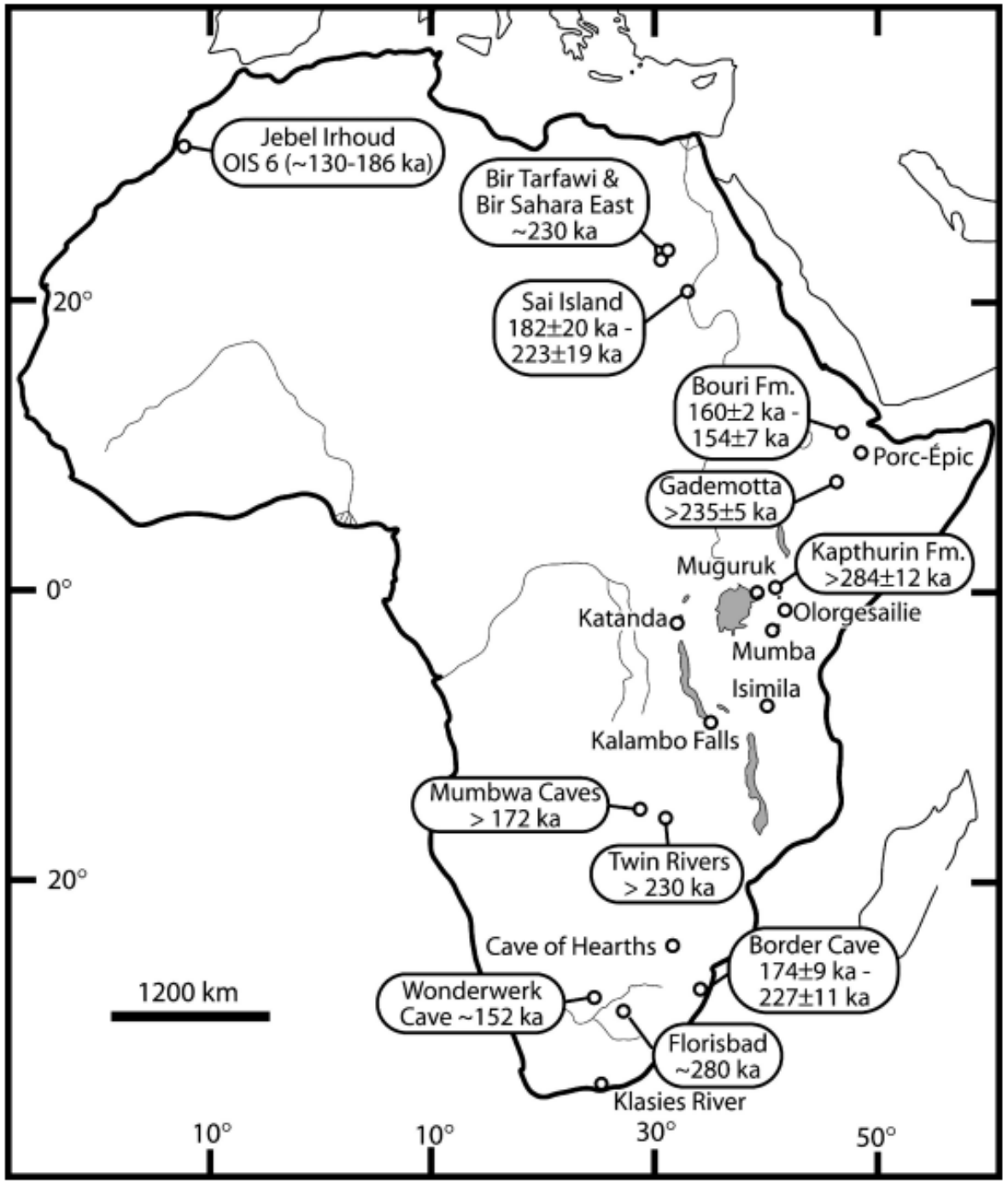
Richard Klein has argued that the Middle Stone Age of Africa is just like the Middle Paleolithic of Eurasia, a long and monotonous period of flake tools and stagnation, followed by a rapid revolutionary change to technological sophistication and economic and social complexity.

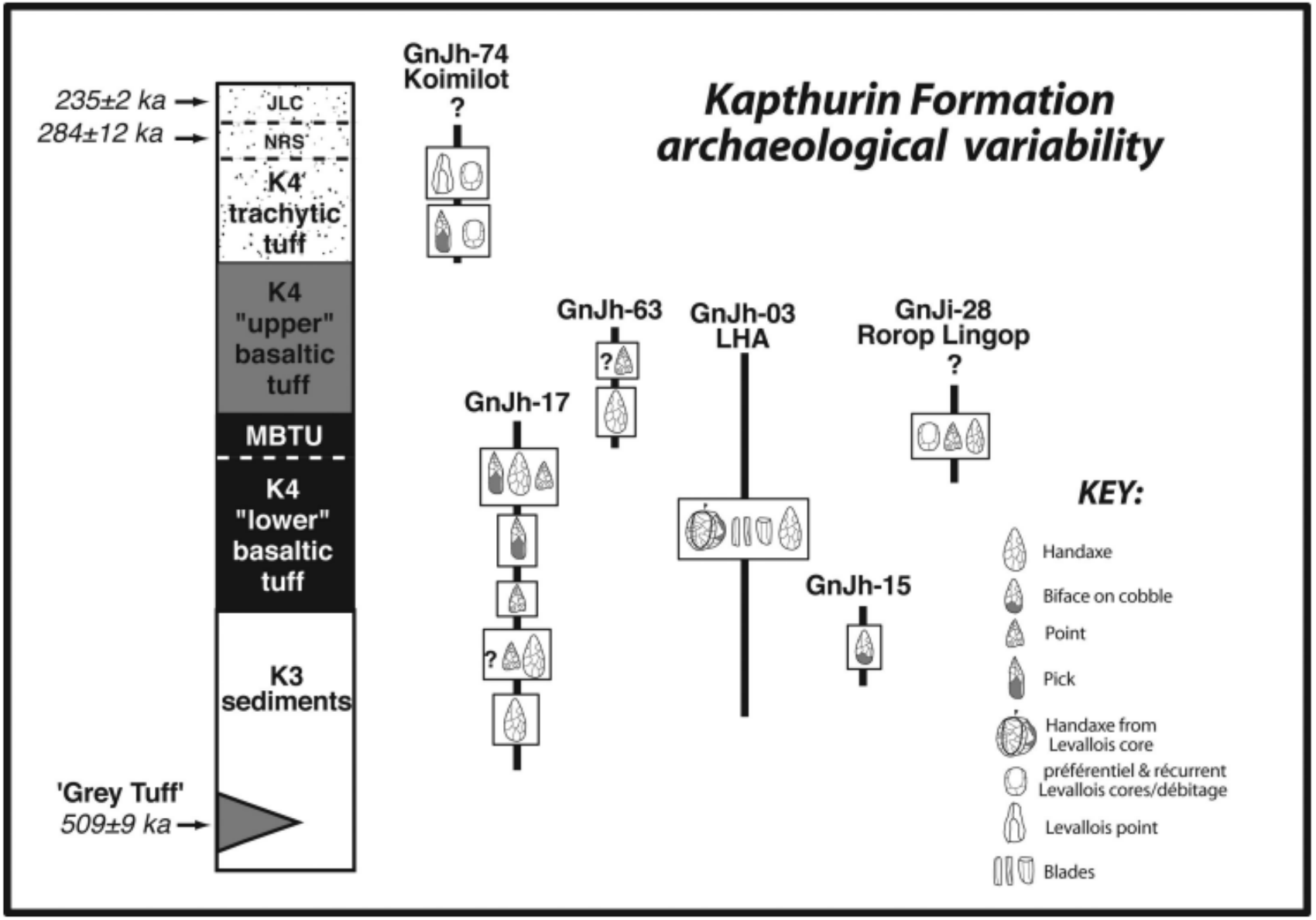


Disappearance of handaxes and cleavers

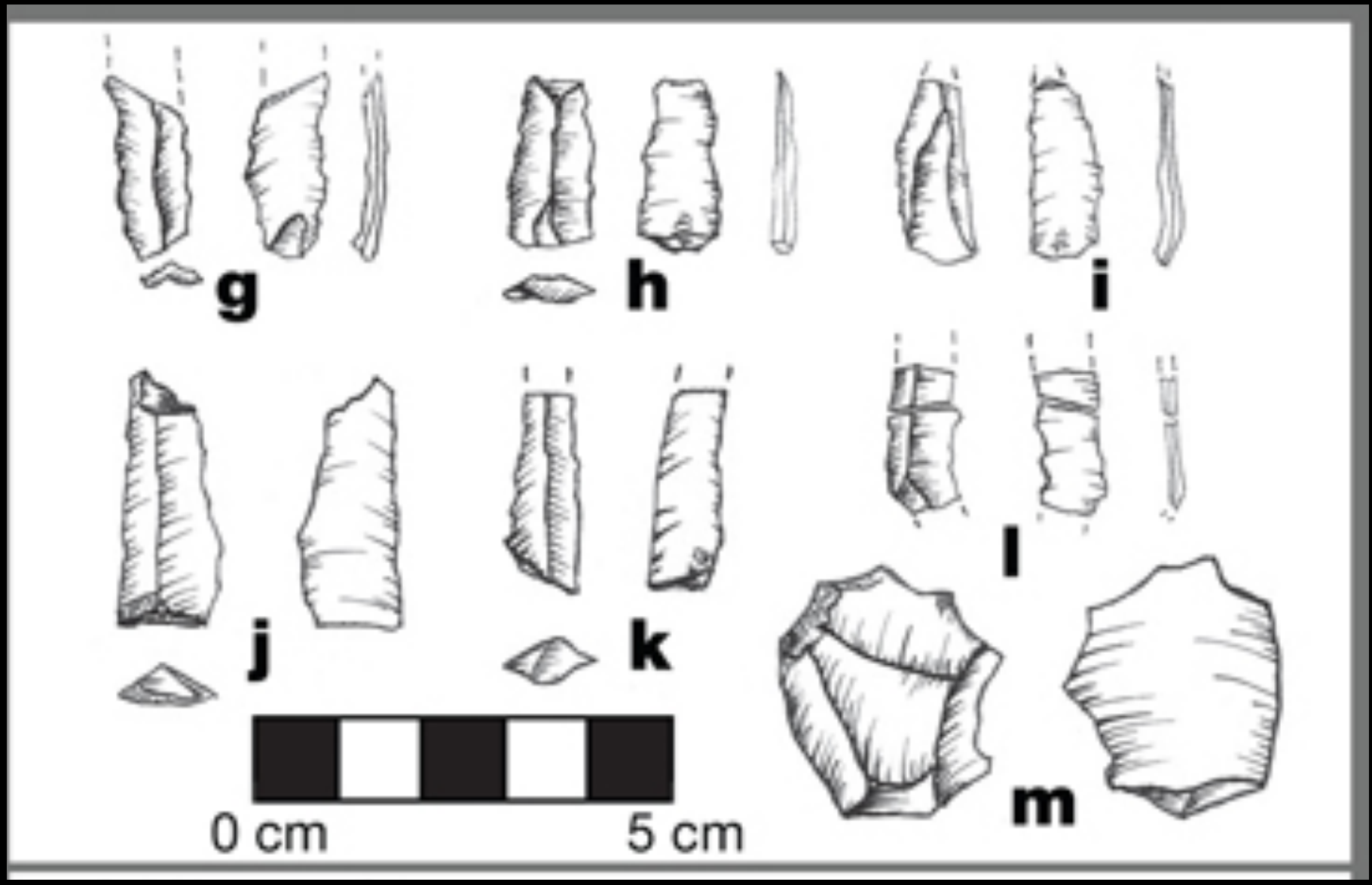
Appearance of points & blades

Refinement and increasing proportion of prepared cores (Levallois methods of flake production

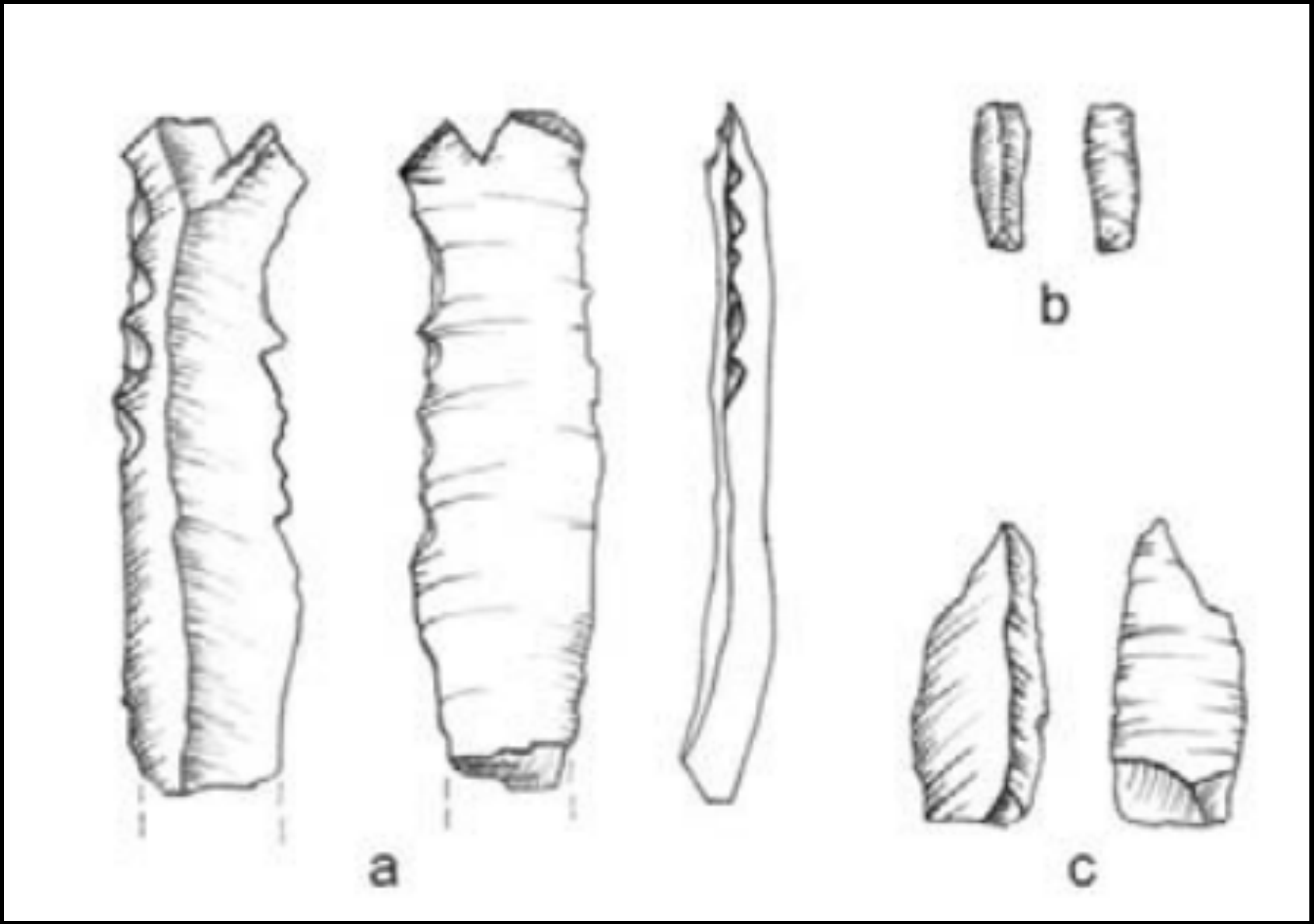

Jebel Irhoud
OIS 6 (~130-186 ka)
Bir Tarfawi &
Bir Sahara East
~230 ka
Sai Island
182±20 ka -
223±19 ka
Bouri Fm.
160±2 ka -
154±7 ka
Porc-Épic
Gademotta
>235±5 ka
Kapthurin Fm.
>284±12 ka
Muguruk
Katanda
Olorgesailie
Mumba
Isimila
Kalambo Falls
Mumbwa Caves
> 172 ka
Twin Rivers
> 230 ka
Cave of Hearths
Border Cave
174±9 ka -
227±11 ka
Wonderwerk
Cave ~152 ka
Florisbad
~280 ka
Klasies River
1200 km
20°
0°
20°
10°
10°
30°
50°



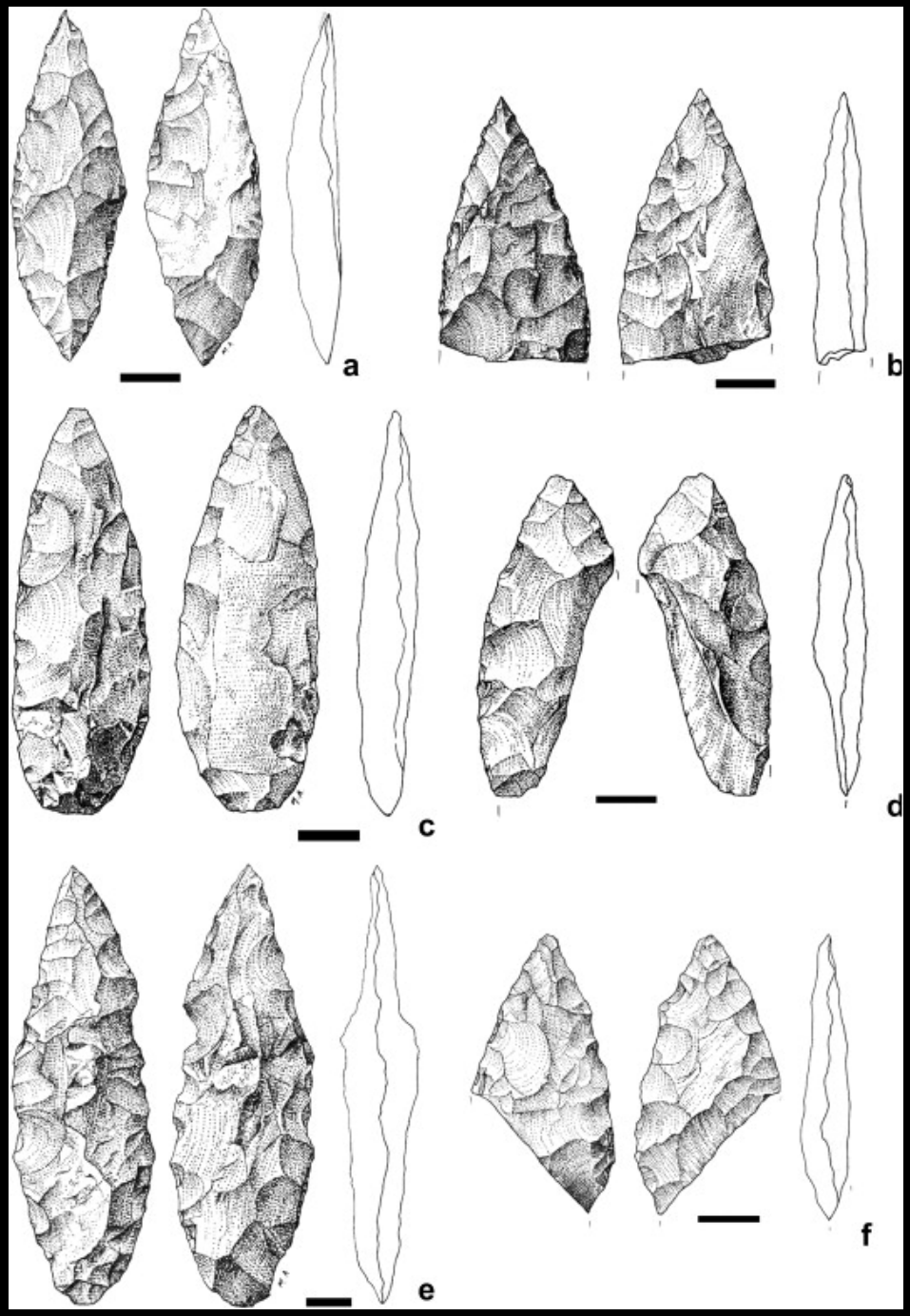
Acheulean-to-MSA transition: fundamental change is the end of LCTs and a shift to projectile point technology.

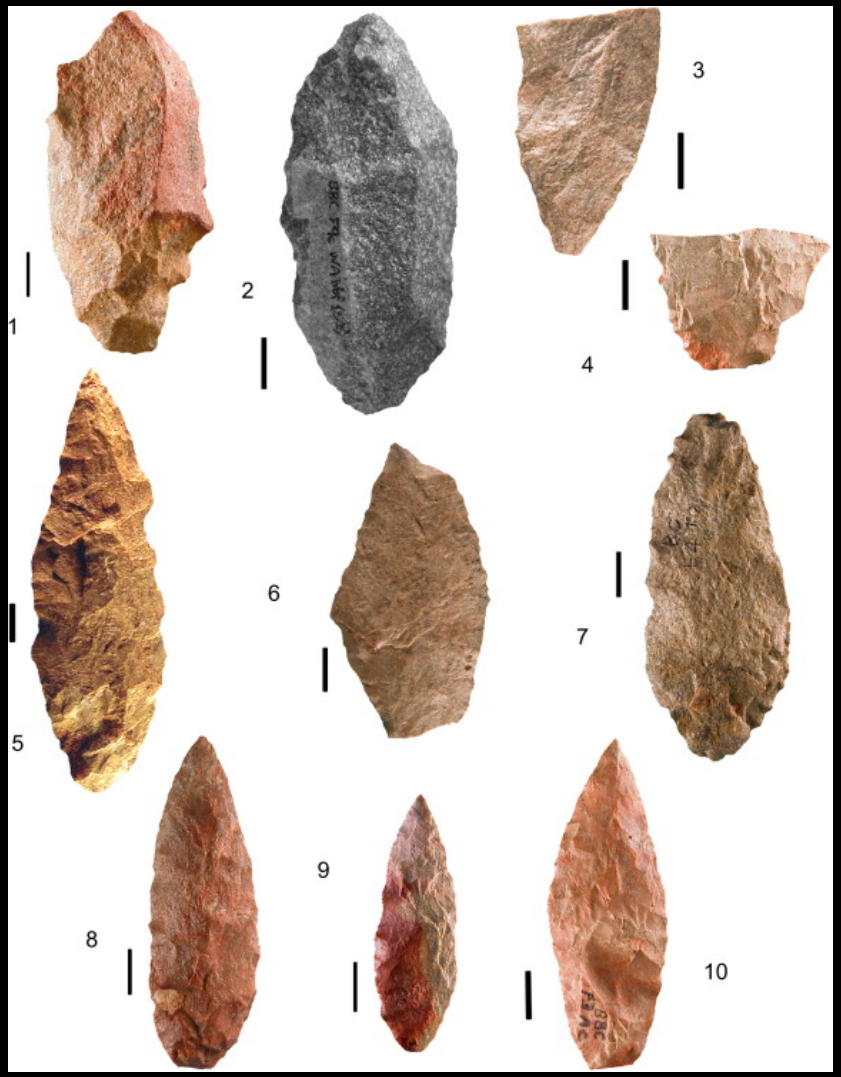


Pinnacle Point near Mossel Bay (South Africa)

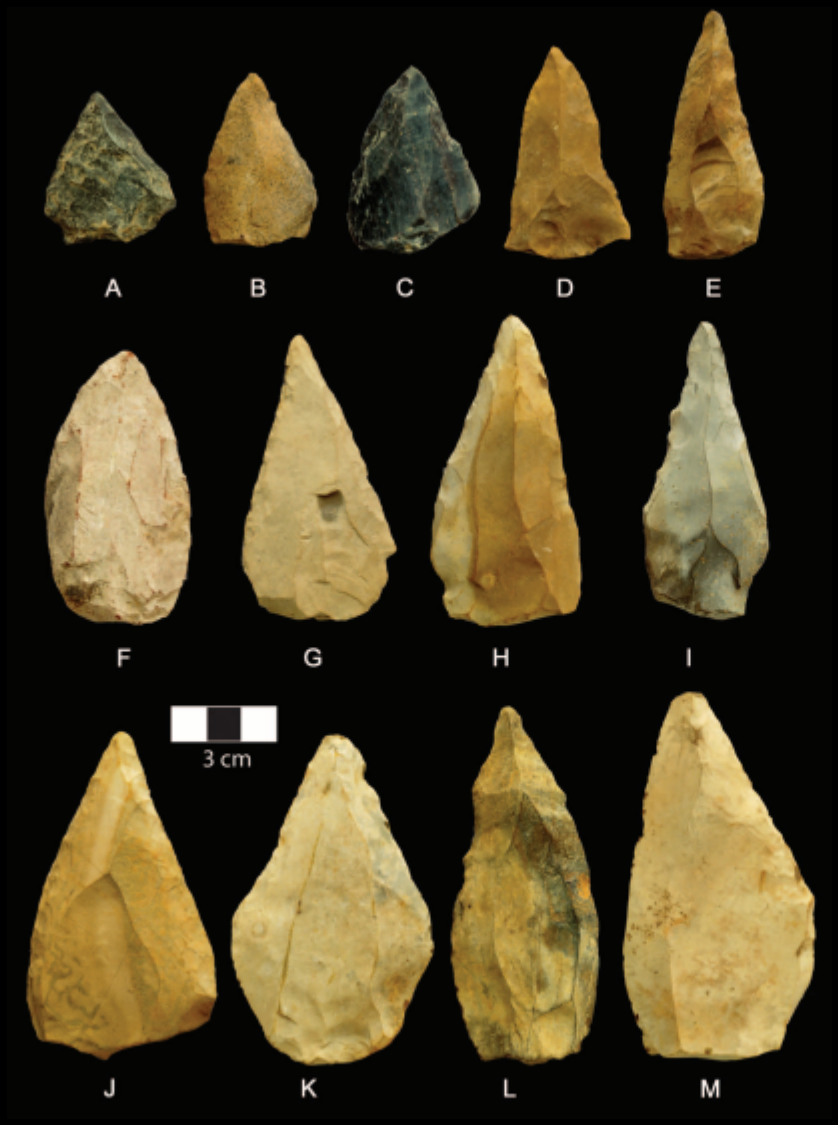


Pinnacle Point near Mossel Bay (South Africa)

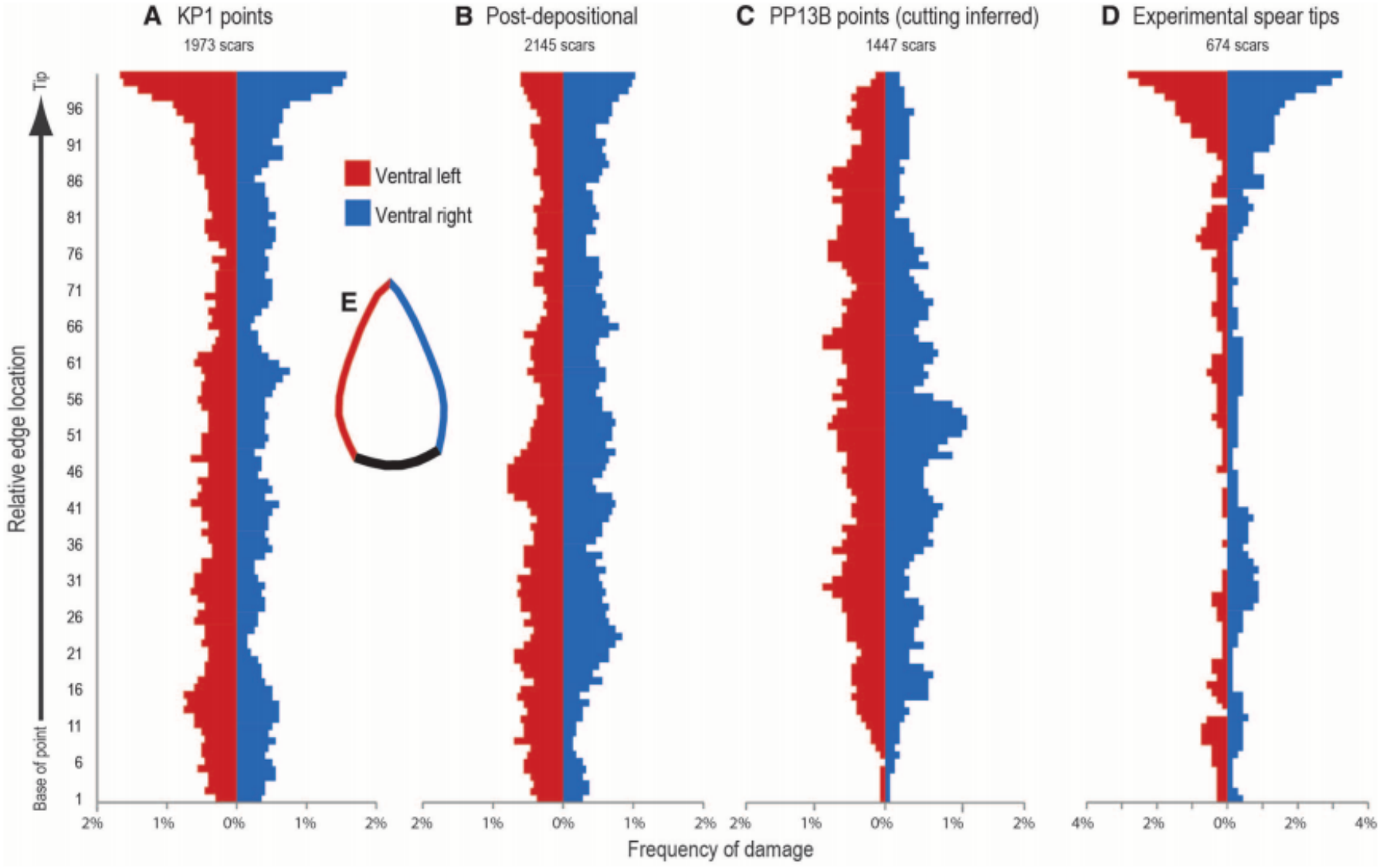


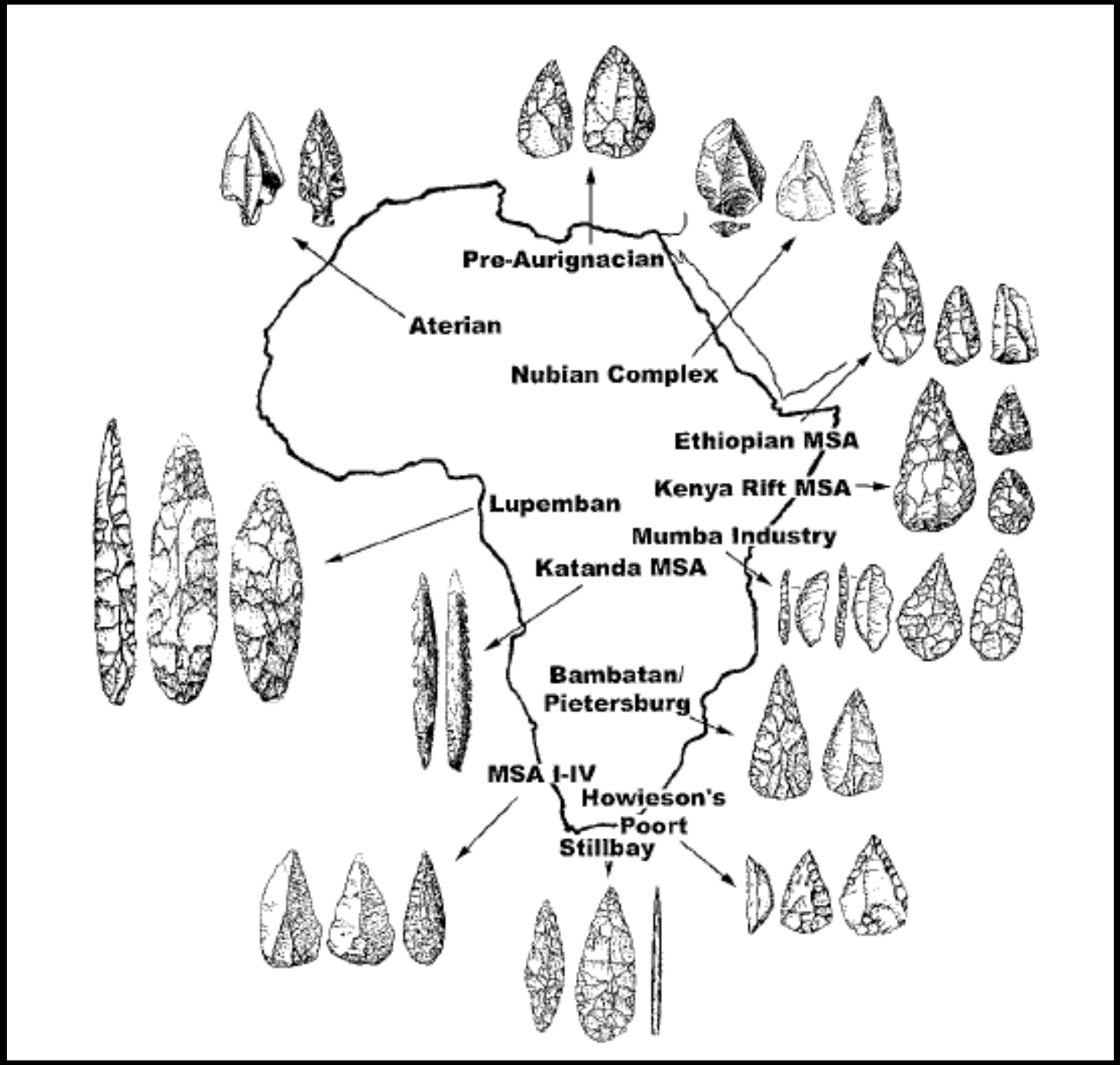


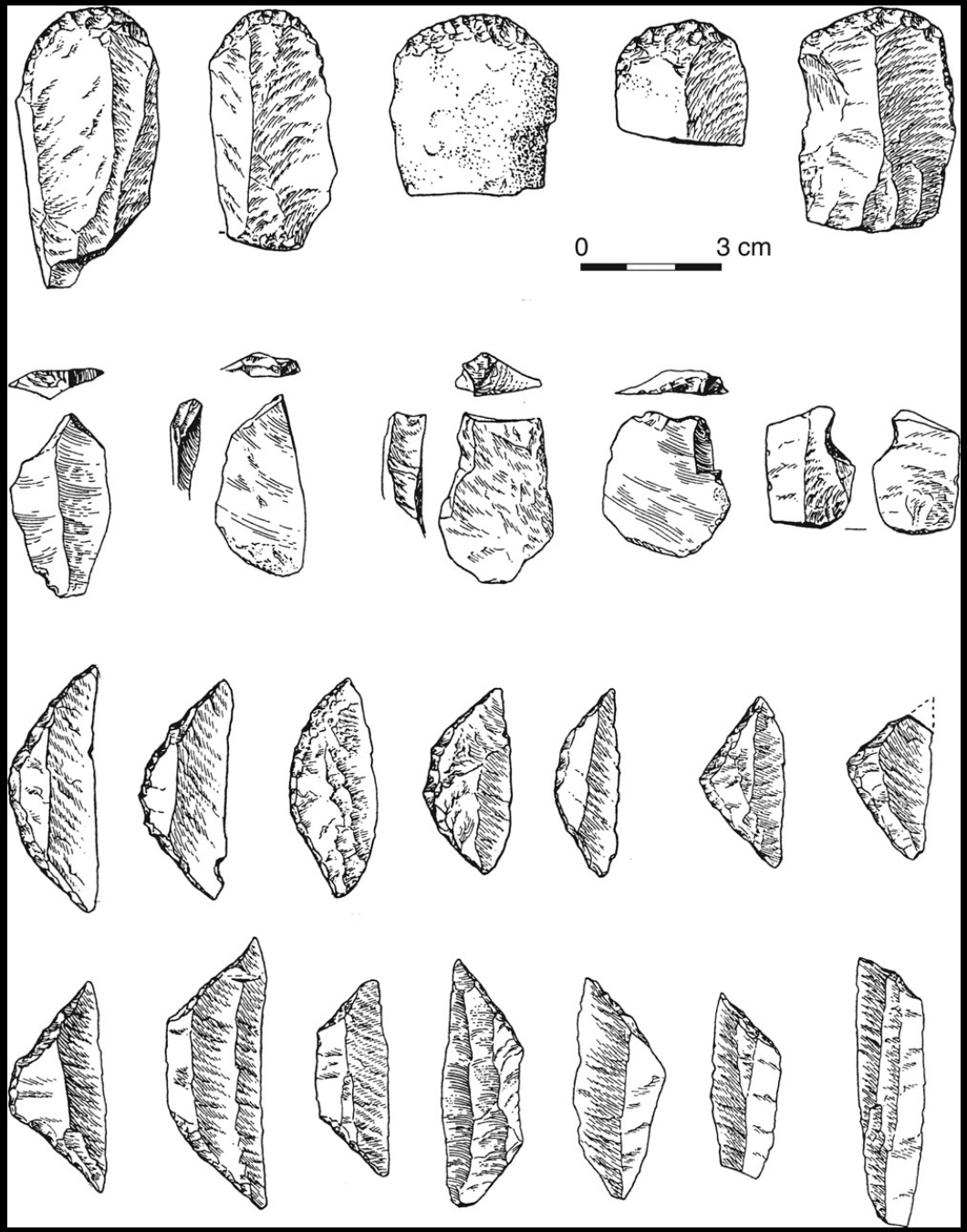
Still Bay points from Blombos, 75 ka



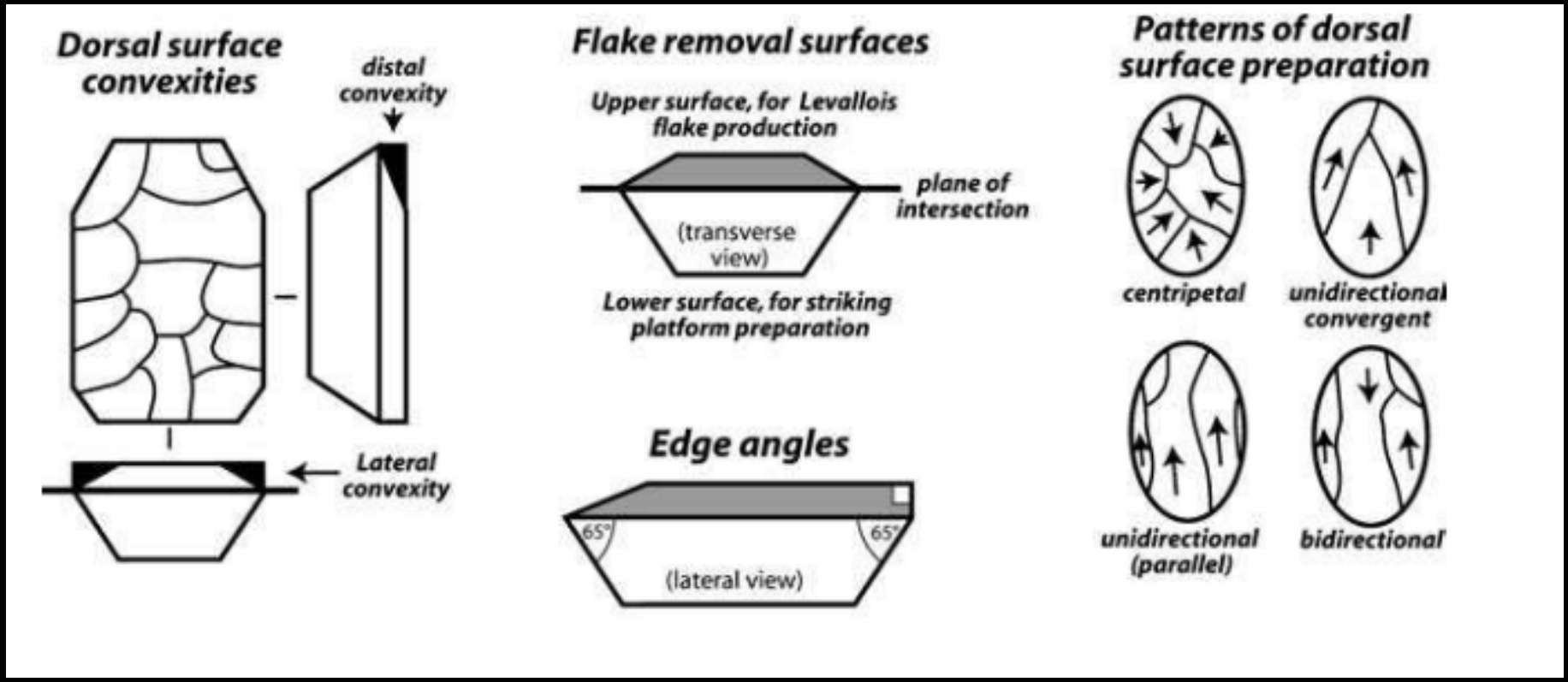
Fauresmith Industry, Kathu Pan 1 (KP1) in South Africa, 500 ka


A KP1 points
1973 scars
B Post-depositional
2145 scars
C PP13B points (cutting inferred)
1447 scars
D Experimental spear tips
674 scars
Ventral left
Ventral right
E
Tip
Base of point
Relative edge location
96
91
86
81
76
71
66
61
56
51
46
41
36
31
26
21
16
11
6
1
2% 1% 0% 1% 2%
2% 1% 0% 1% 2%
2% 1% 0% 1% 2%
4% 2% 0% 2% 4%
Frequency of damage


Pre-Aurignacian
Aterian
Nubian Complex
Ethiopian MSA
Kenya Rift MSA
Lupemban
Mumba Industry
Katanda MSA
Bambatan/
Pietersburg
MSA I-IV
Howieson's
Poort
Stillbay



Stone tools from the MSA Howiesons Poort levels at Klasies River (South Africa) dated to *ca.* 65,000 ka



Levallois cores are defined by their two asymmetric, opposed surfaces, one (the upper, or Levallois surface) dedicated for flake production, and the other for striking platform preparation

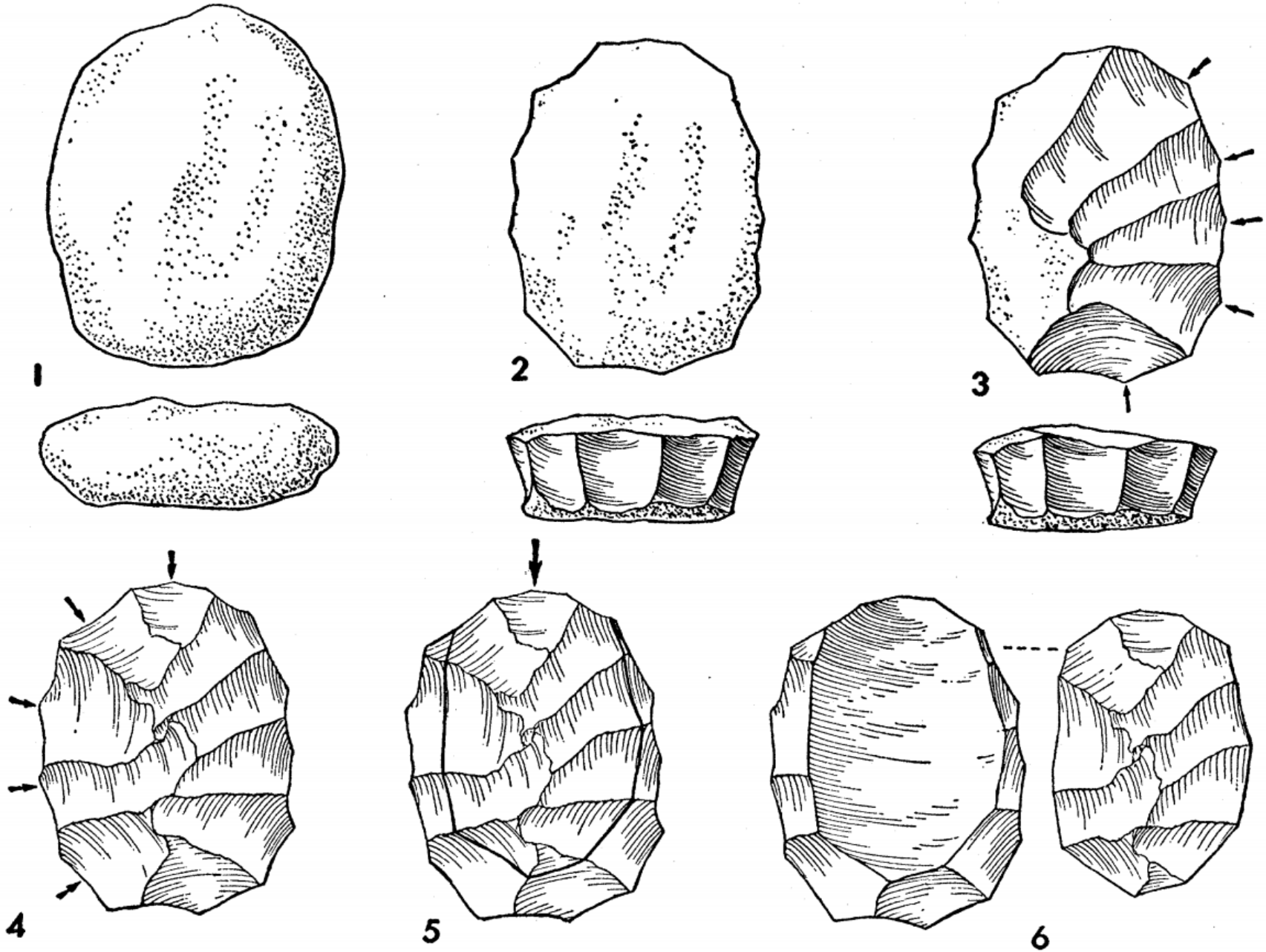
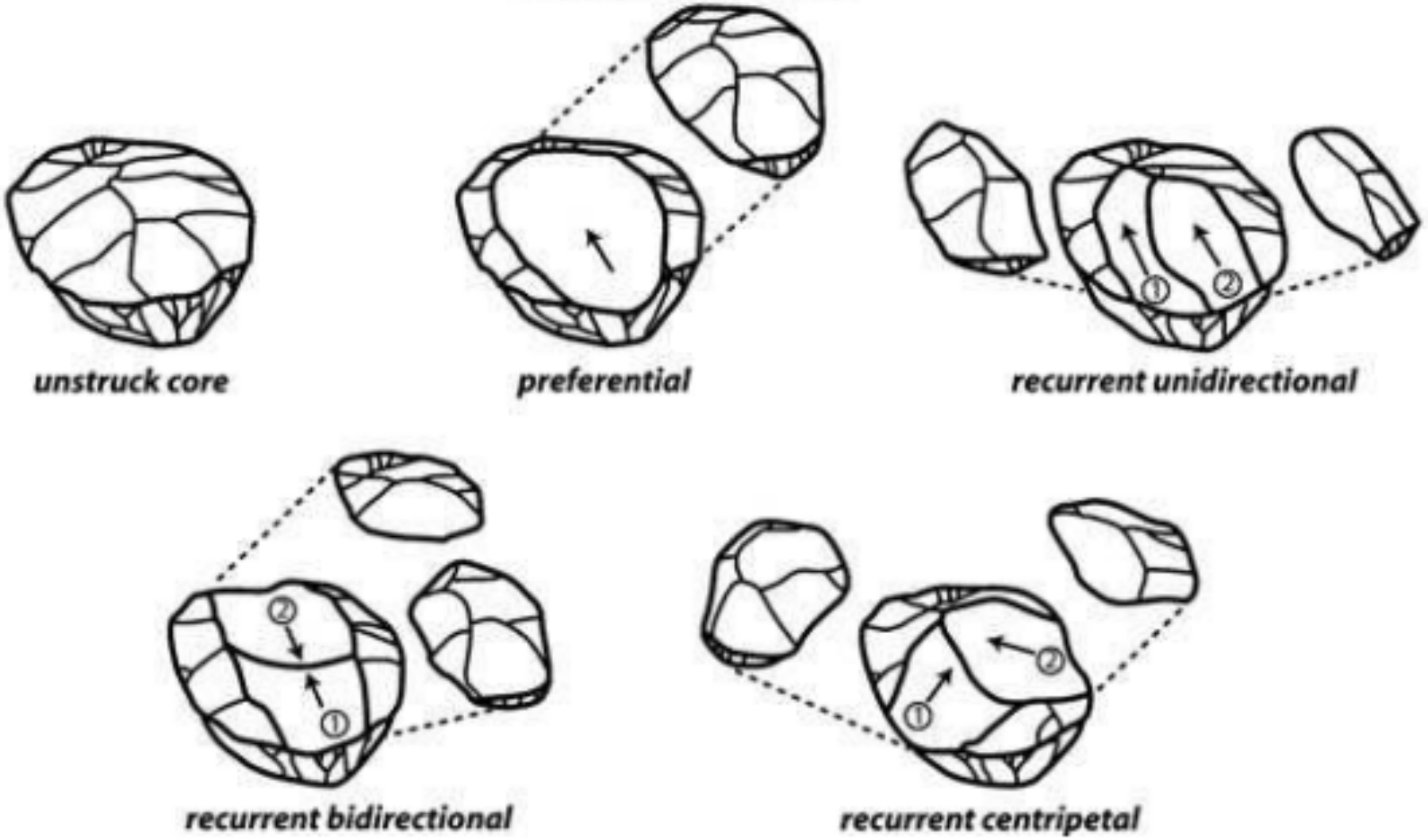
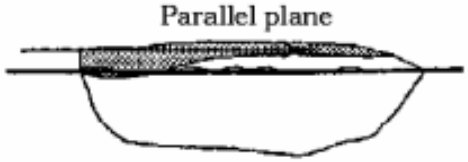


Fig. 4. Steps in the making of a Levallois flake.

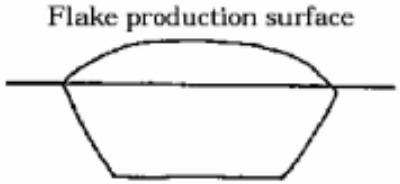
Levallois methods



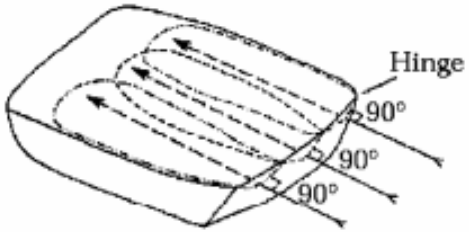
Criterion 1: Intersection of two surfaces



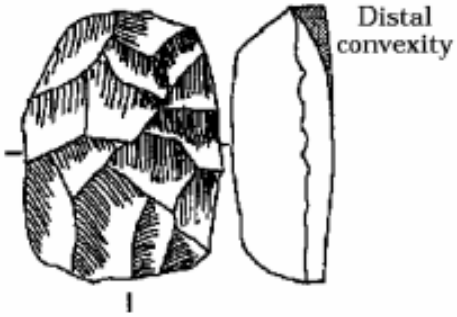
Criterion 4: Fracture plane of predetermined blanks



Criterion 2: Hierarchically related surfaces



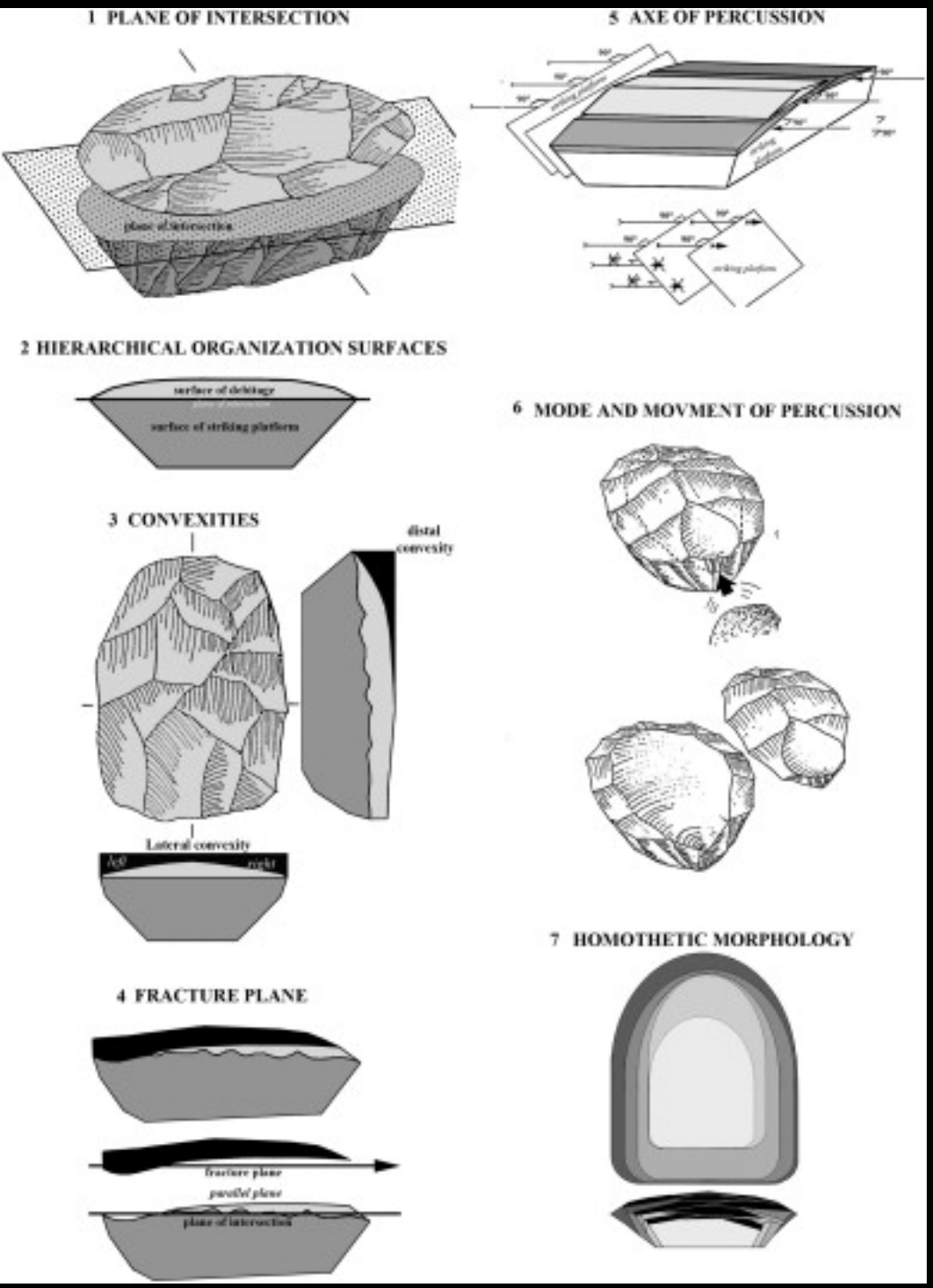
Criterion 5: Organization of striking platform



Criterion 3: Lateral and distal convexities

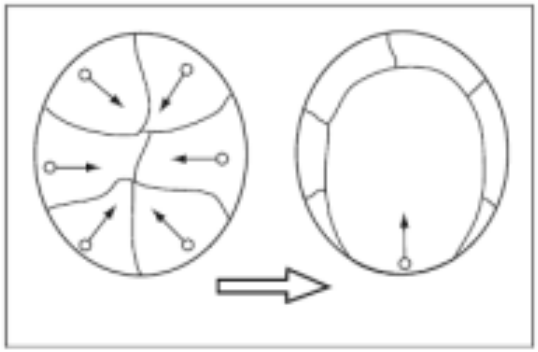
Technique: Direct percussion with a hard hammer

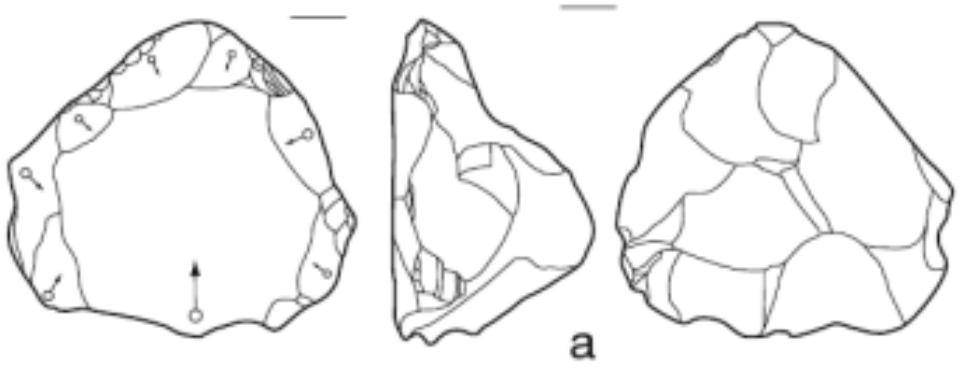
The Levallois Volumetric Concept after Boëda



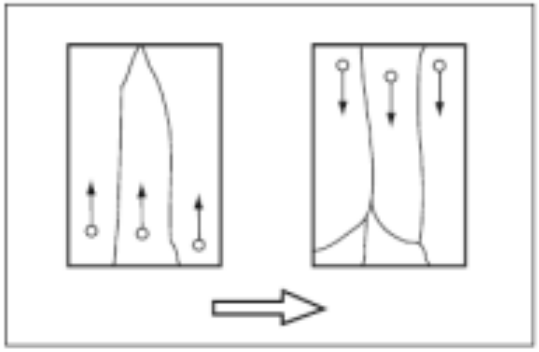
The Levallois Volumetric Concept after Boëda

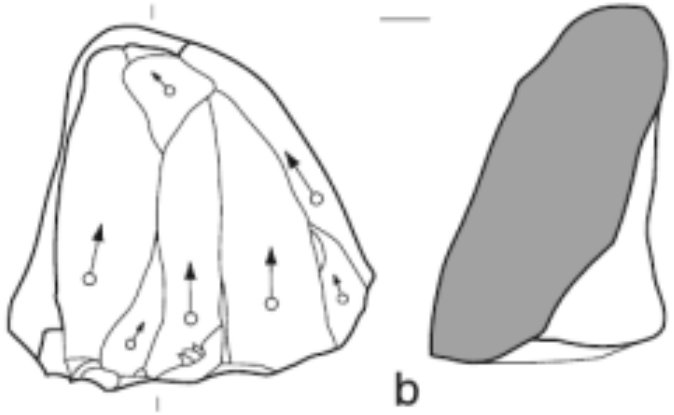
Preferential Levallois





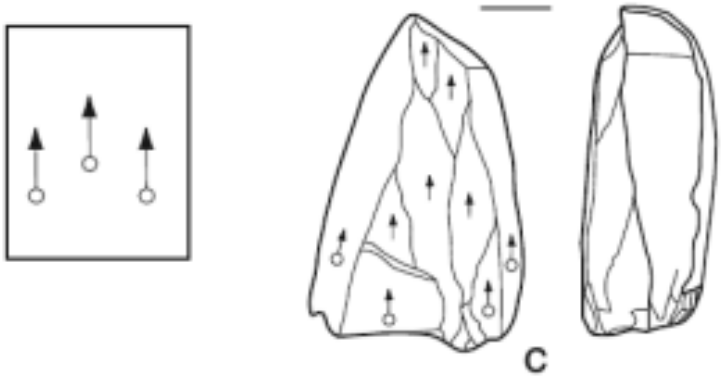
Recurrent Levallois





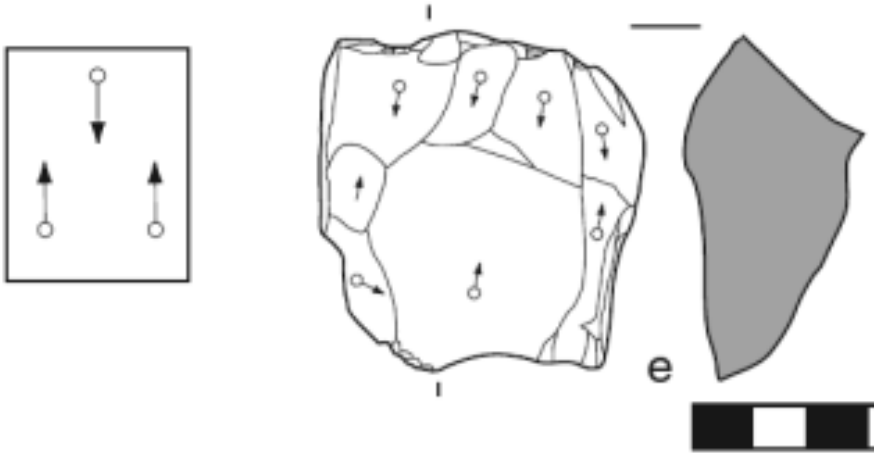
Different Flake-Release Surface Preparation Modes

Unidirectional-Parallel

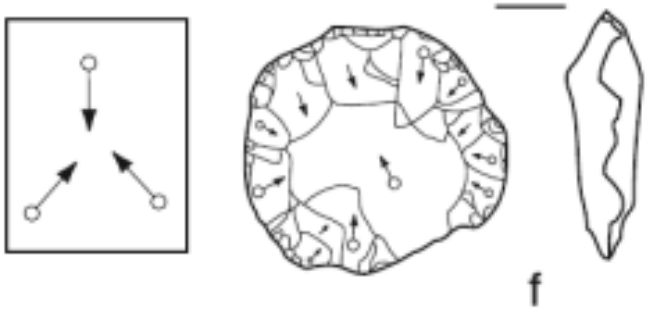


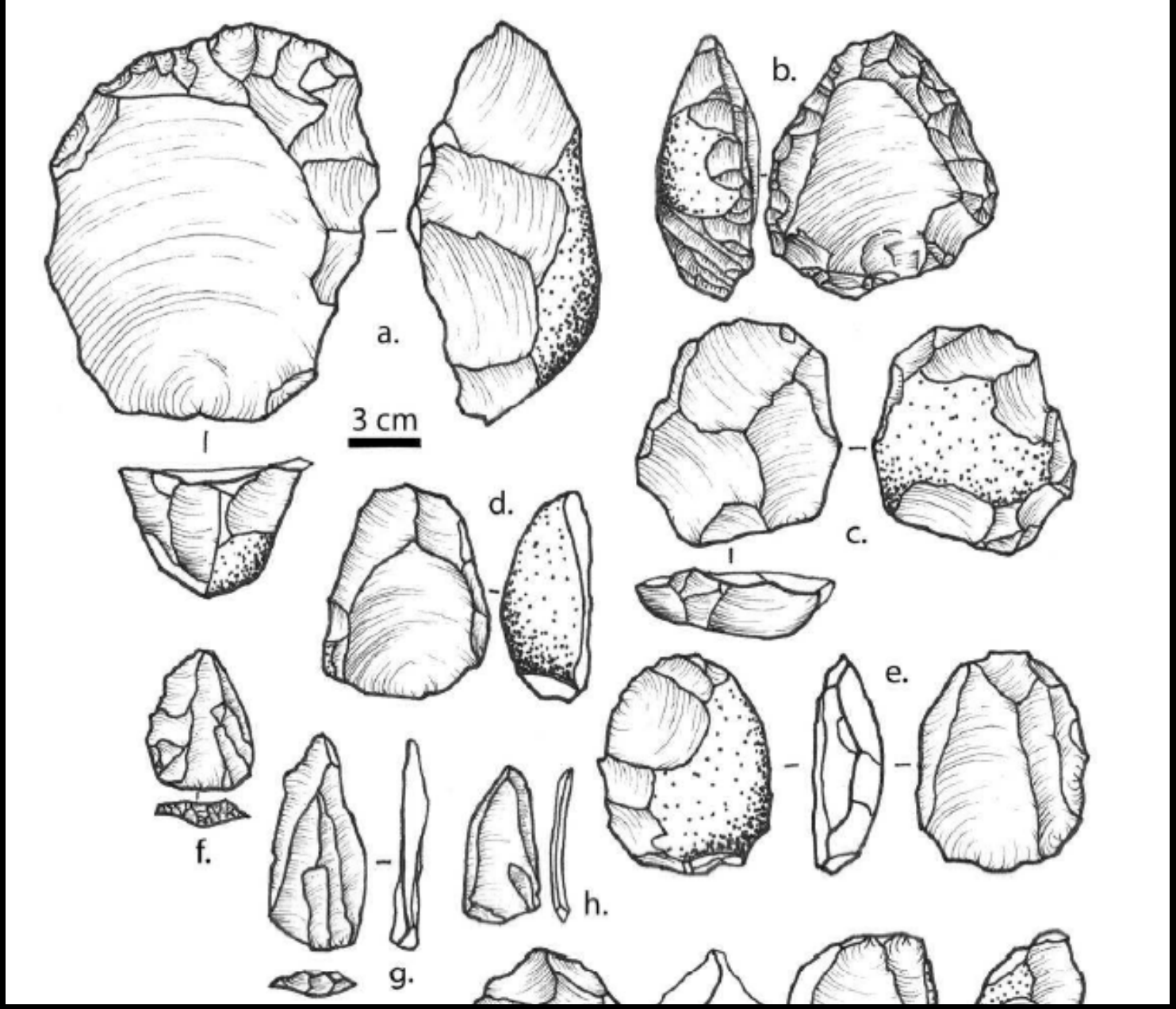
Unidirectional-Convergent

Bidirectional-Opposed



Radial-Centripetal





Selected cores and flakes from eastern African Middle Stone Age sites

Middle Palaeolithic in Europe

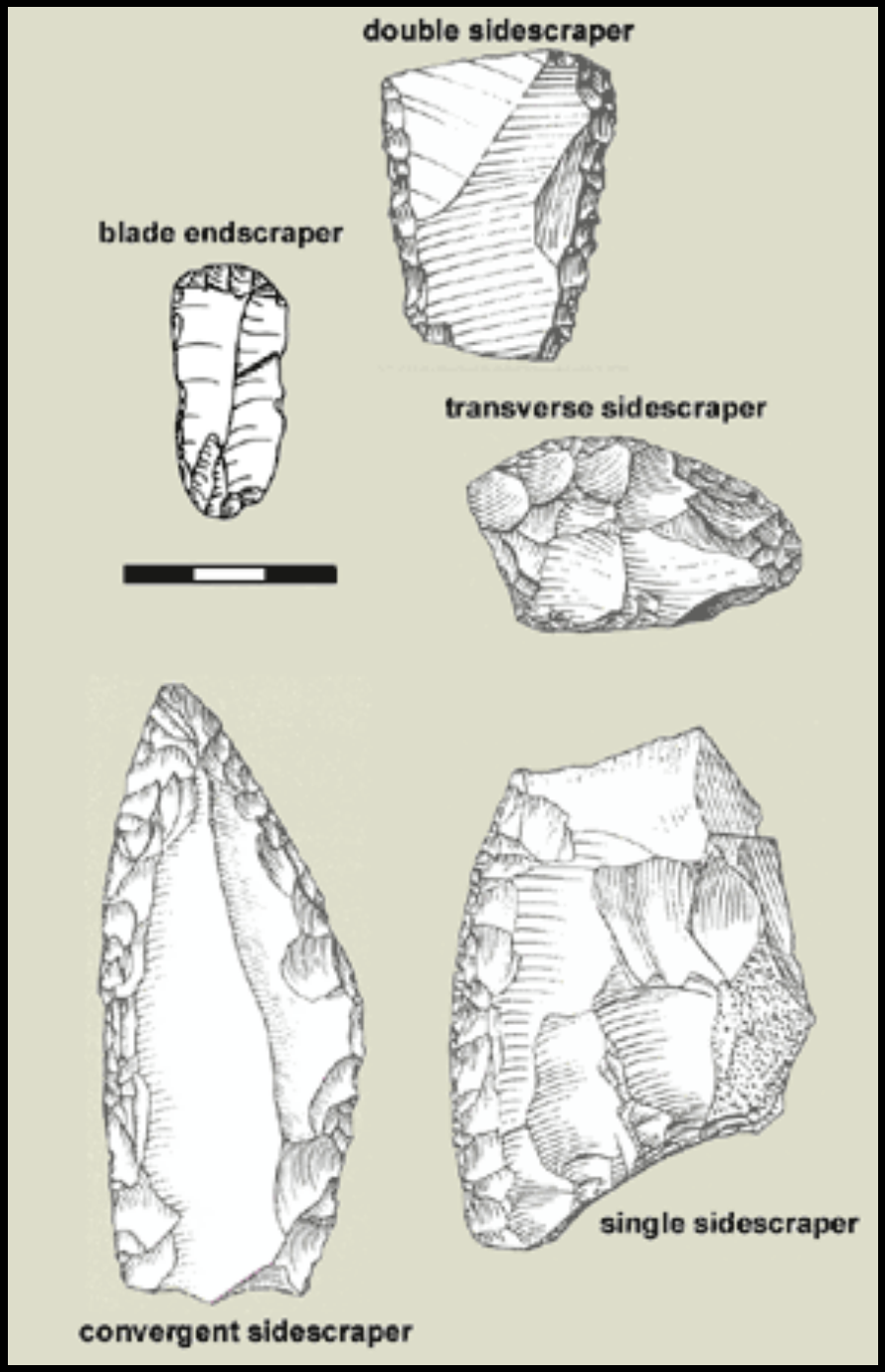

SITES AND AGE PARTICULARITIES
Important site showing Mousterian lithic
site showing Mousterian layers older than 100ka BP
Late Mousterian site
HOMINIDS ASSOCIATIONS
Neanderthal fossil in relation with Mousterian lithic
(pre)modern Human in relation with Mousterian lithic
ATLANTIC OCEAN
North Sea
Black Sea
Mediterranean Sea
Red Sea
Creswell Crags
Lynford Quarry
Arcy-sur-Cure
La Quina
Le Moustier
Chêne Vert
Sesselfelsgrotte
Vindija Cave
Gran Dolina
Grotta Guattari
Figueira Brava
Zafarraya
Gorham's Cave
Devil's Tower
Retaïma
Sidi Zin
Aïn Mhrotta
El Guettar
Jebel Irhoud
Karain Cave
Shanidar
Dederiyeh Cave
Hazard Merd
Warwasi
Kunji
Skhul
Qafzeh
Amud
Tabun
Tor Faraj
Qena Bend
Distribution of Mousterian lithic sites
by Manon Delamaison
500 km

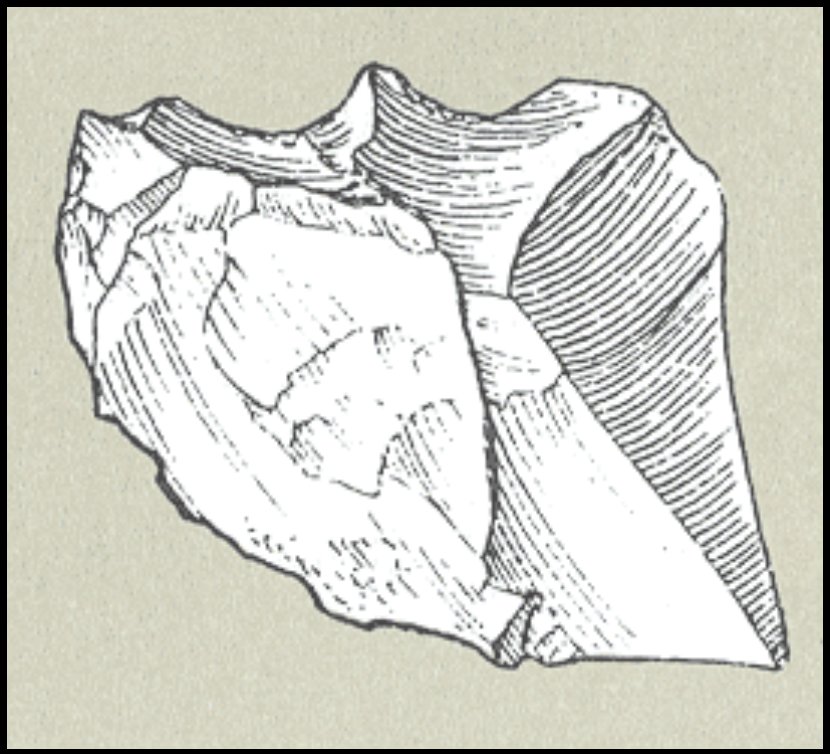
The Great Mousterian Debate

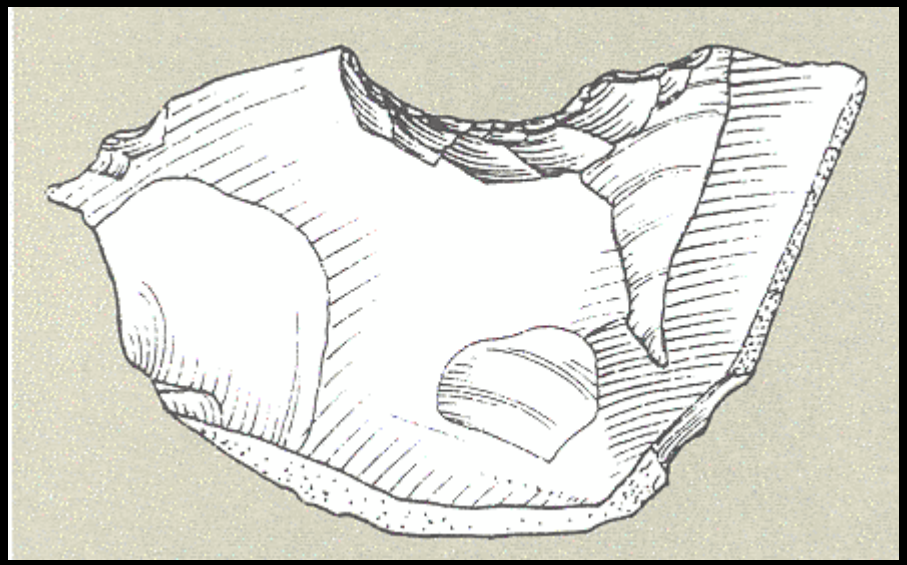
François Bordes' typology of Middle Paleolithic flake tools divides them into scrapers, points, denticulates, backed knives, bifaces, and miscellaneous other types.

According to Bordes, these facies were the product of different culture groups.

Others disagreed, suggesting that the facies represented diachronic patterning, different activities, scraper reduction, or intensity of raw material use and climate.


double sidescraper
blade endscraper
transverse sidescraper
single sidescraper
convergent sidescraper





Type # Description

1.....Typical Levallois flake
2.....Atypical Levallois flake
3.....Levallois point
4.....Retouched Levallois point
5.....Pseudo-Levallois point
6.....Mousterian point
7.....Elongated Mousterian point
8.....Limace
9.....Single straight scraper
10.....Single convex scraper
11.....Single concave scraper
12.....Double straight scraper
13.....Double straight-convex scraper
14.....Double straight-concave scraper
15.....Double convex scraper
16.....Double concave scraper
17.....Double convex-concave scraper
18.....Straight convergent scraper
19.....Convex convergent scraper
20.....Concave convergent scraper
21.....Déjeté scraper
22.....Straight transverse scraper
23.....Convex transverse scraper
24.....Concave transverse scraper
25.....Scraper on interior surface
26.....Abrupt scraper
27.....Scraper with thinned back
28.....Scraper with bifacial retouch
29.....Alternate scraper
30.....Typical endscraper
31.....Atypical endscraper
32.....Typical burin
33.....Atypical burin
34.....Typical perçoir
35.....Atypical perçoir
36.....Typical backed knife
37.....Atypical backed knife
38.....Naturally-backed knife
39.....Raclette
40.....Truncation
41.....Mousterian tranchet
42.....Notch
43.....Denticulate
44.....Alternate retouched bec
45.....Flake with irregular retouch on interior
46–49..Flake with abrupt and alternating retouch
50.....Bifacially retouched flake
51.....Tayac point
52.....Notched triangle
53.....Pseudo-microburin
54.....End-notched flake
55.....Hachoir
56.....Rabot
57.....Stemmed point
58.....Stemmed tool
59.....Chopper
60.....Inverse chopper
61.....Chopping-tool
62.....Miscellaneous
63.....Bifacial foliate

Criteria for Bordes' typology

- artifact shape in plan view,
- the number of retouched edges,
- distal/lateral position of retouched edges,
- dorsal and/or ventral location of retouch,
- the shape of the retouched edges in plan view,
- steepness of retouched edges, and
- invasiveness of retouch

Good or bad?

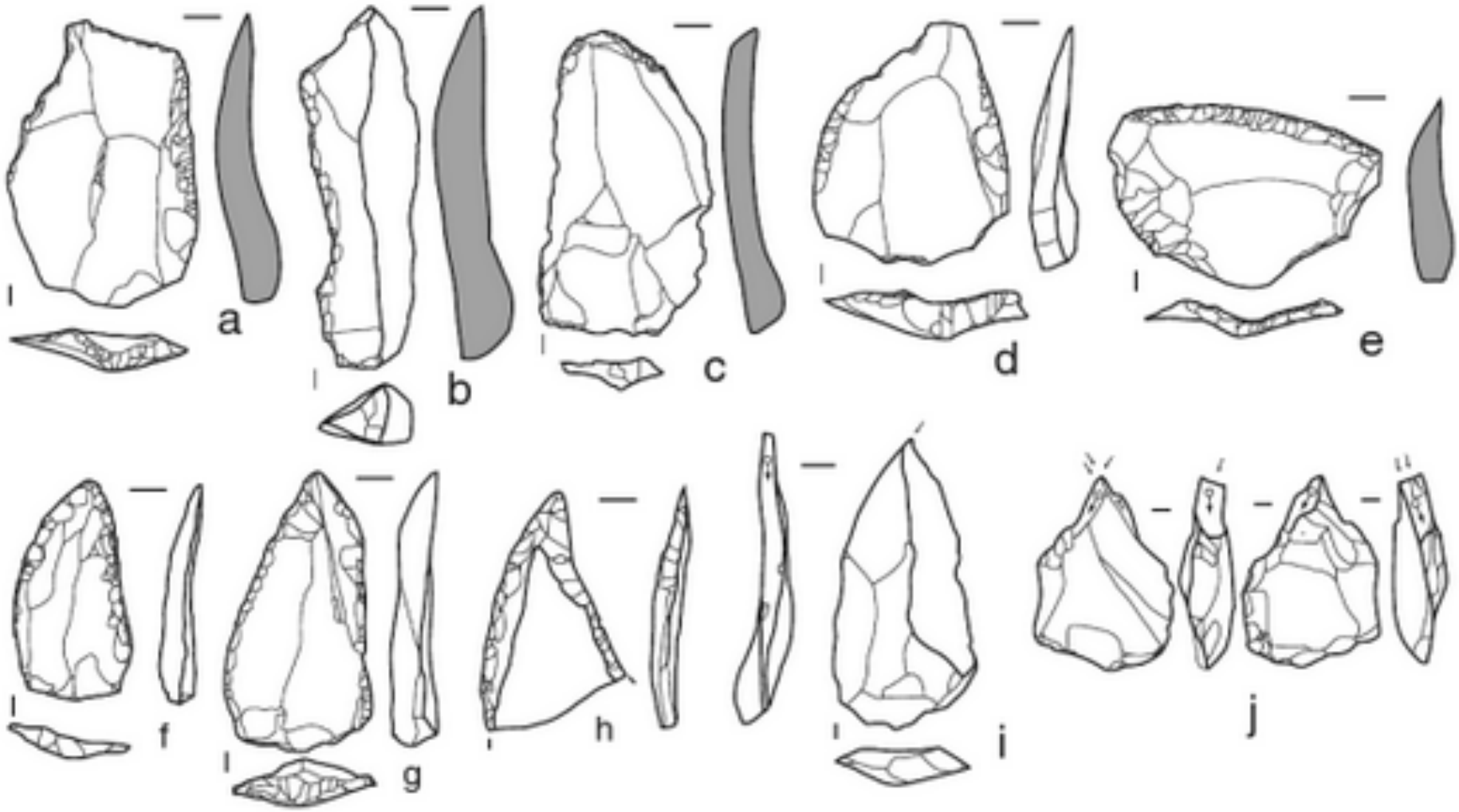


FIGURE 4.6. Middle Paleolithic retouched tools: a–b. sidescrapers, c. endscraper, d. double side scraper, e. transverse scraper, f–h. convergent scrapers, i. simple burin, j. multiple burin, k–l. notches, l–o. denticulates, p–q. awls, r–x. truncated-facetted pieces (r–t. truncation and facetting to impose shape, u–w. cores-on-flakes. Sources: Qafzeh (a–b, d, g–j, r–s), Rosh Ein Mor (c, k–o, q), Ras el-Kelb (e), Dederiyeh (f), Biqat Quneitra (p, t, v–w), Amud (u). Redrawn after Akazawa and Muhesen (2002), Copeland and Moloney (1998), Crew (1976), Goren-Inbar (1990b), Hovers (2004; 2009).

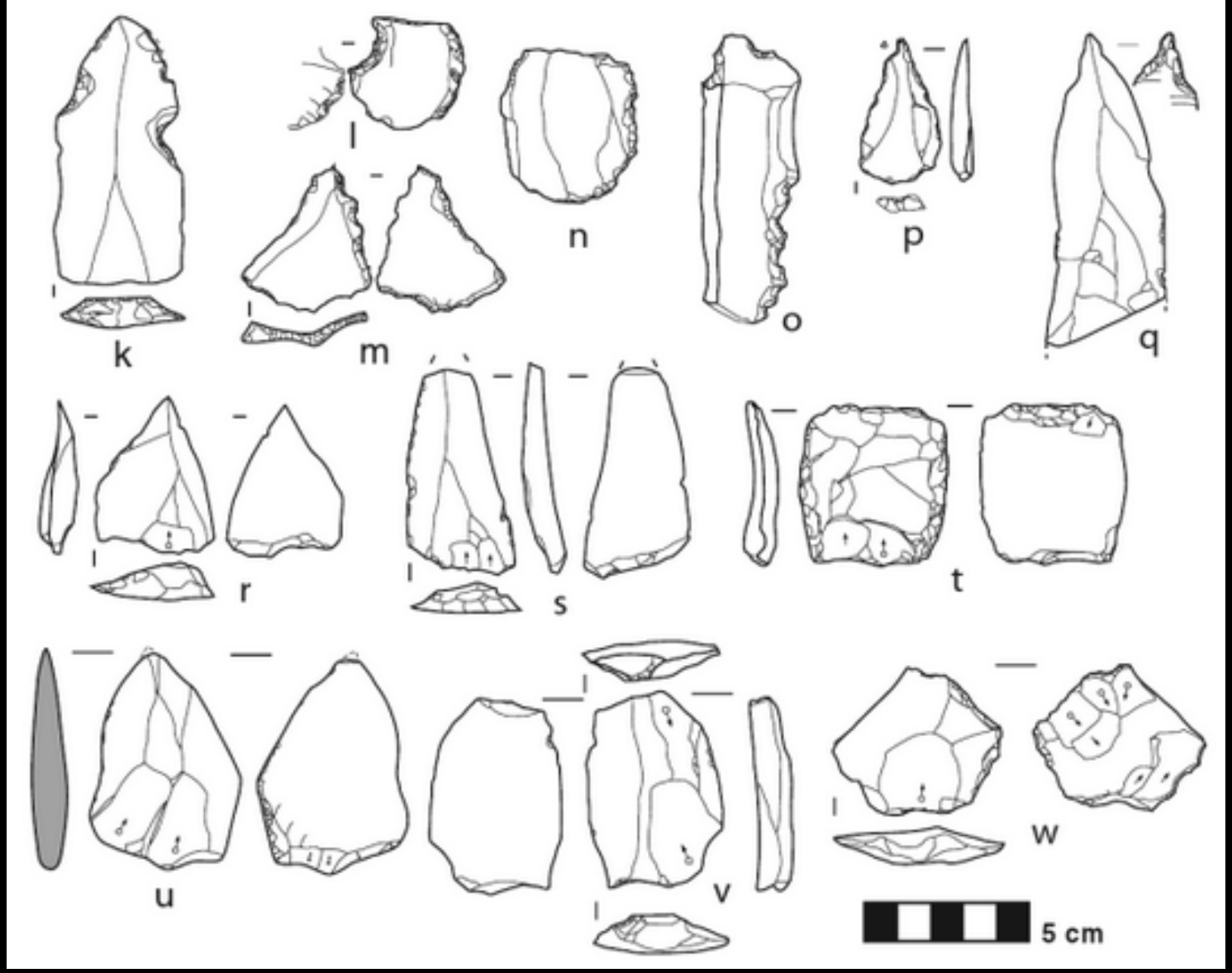
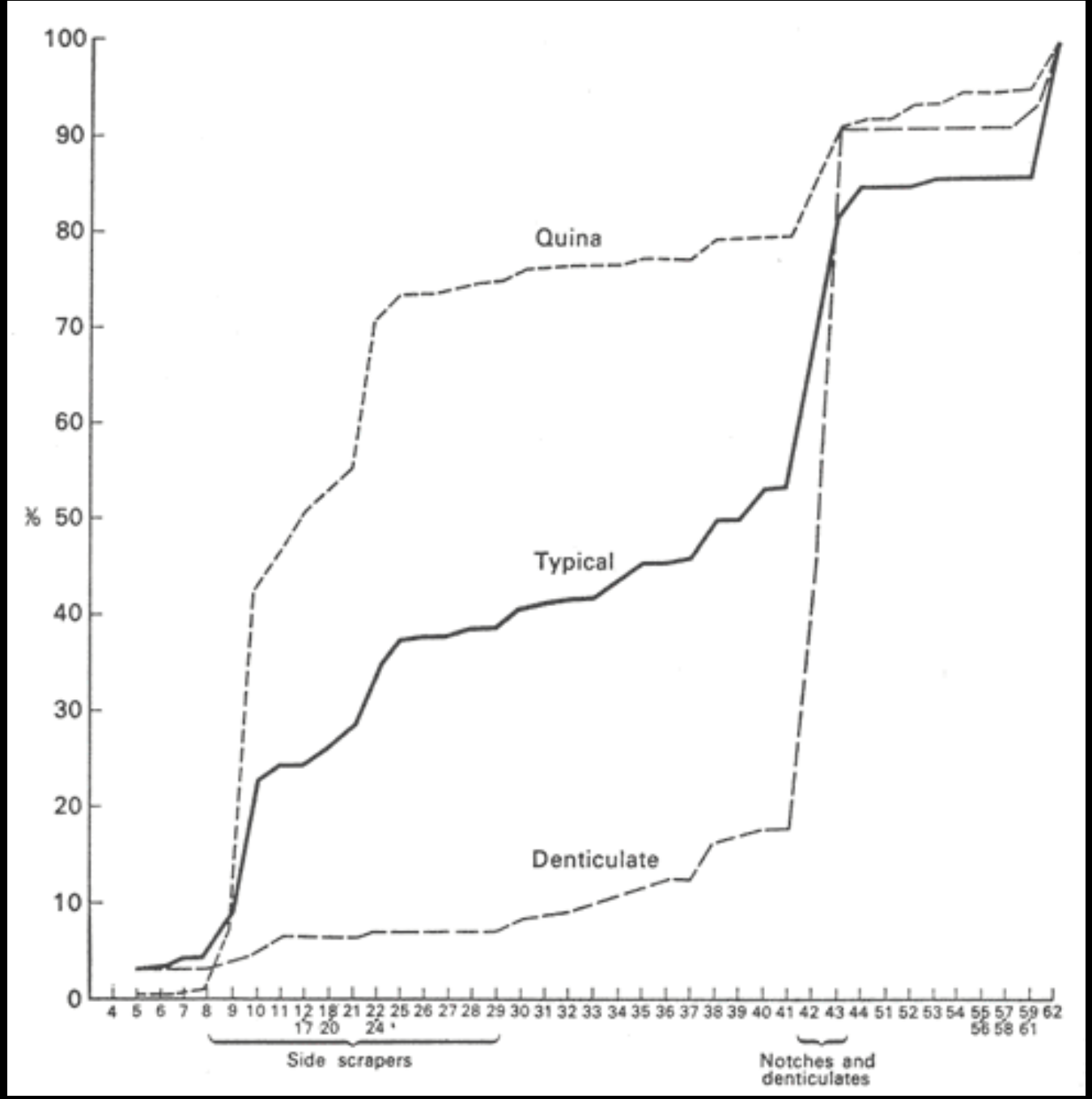


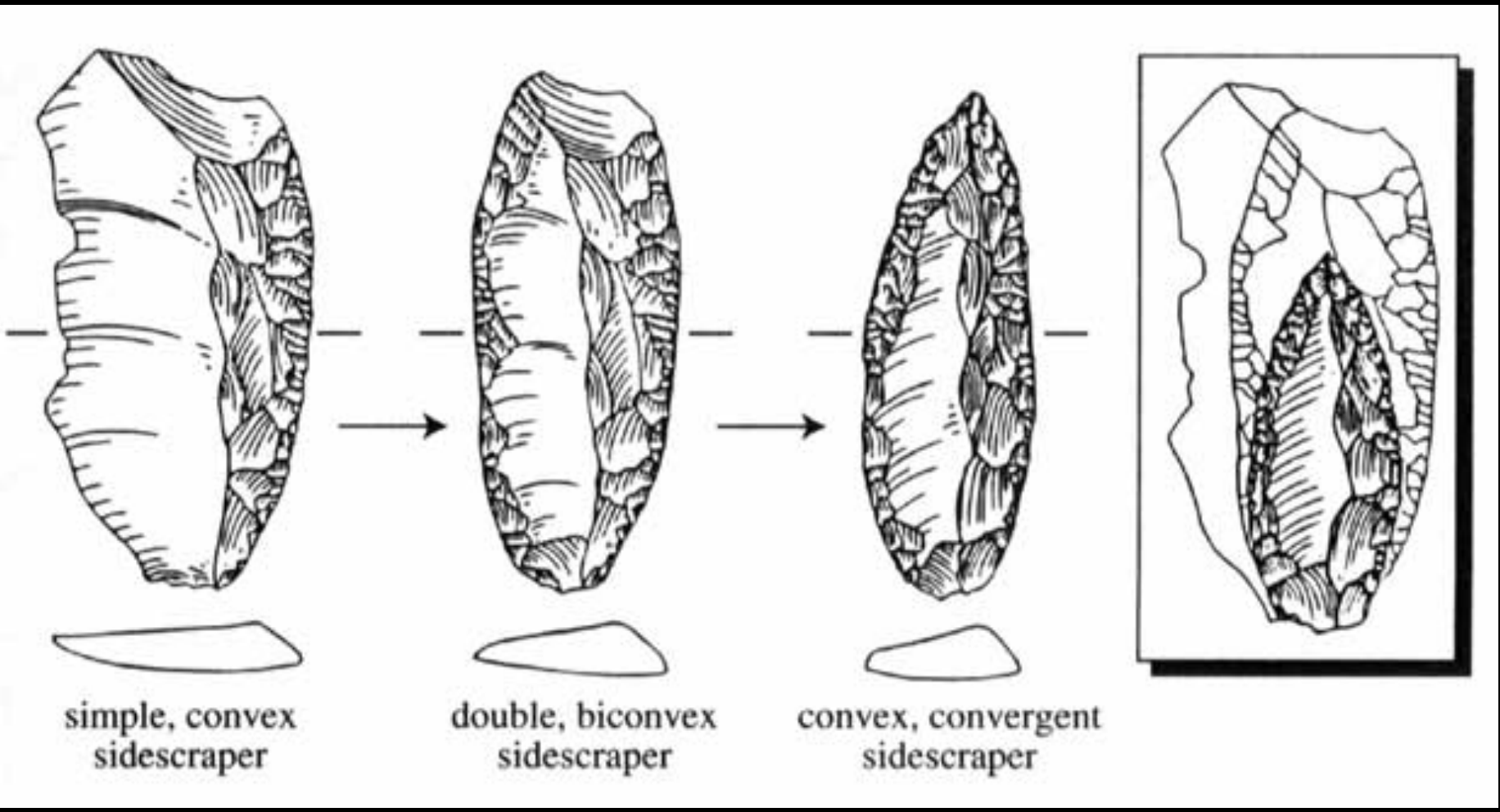
FIGURE 4.6. Middle Paleolithic retouched tools: a–b. sidescrapers, c. endscraper, d. double side scraper, e. transverse scraper, f–h. convergent scrapers, i. simple burin, j. multiple burin, k–l. notches, l–o. denticulates, p–q. awls, r–x. truncated-facetted pieces (r–t. truncation and facetting to impose shape, u–w. cores-on-flakes. Sources: Qafzeh (a–b, d, g–j, r–s), Rosh Ein Mor (c, k–o, q), Ras el-Kelb (e), Dederiyeh (f), Biqat Quneitra (p, t, v–w), Amud (u). Redrawn after Akazawa and Muhesen (2002), Copeland and Moloney (1998), Crew (1976), Goren-Inbar (1990b), Hovers (2004; 2009).


100
90
80
70
60
% 50
40
30
20
10
0
Quina
Typical
Denticulate
4 5 6 7 8 9 10 11 12 18 21 22 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 51 52 53 54 55 57 59 62
17 20 24
56 58 61
Side scrapers
Notches and denticulates

BUTCHERING AREA DETAILS

SCALE IN METERS

0 1 2 3 4 5 6 7 8 9



Harold Dibble's insights from Pech de l'Azé

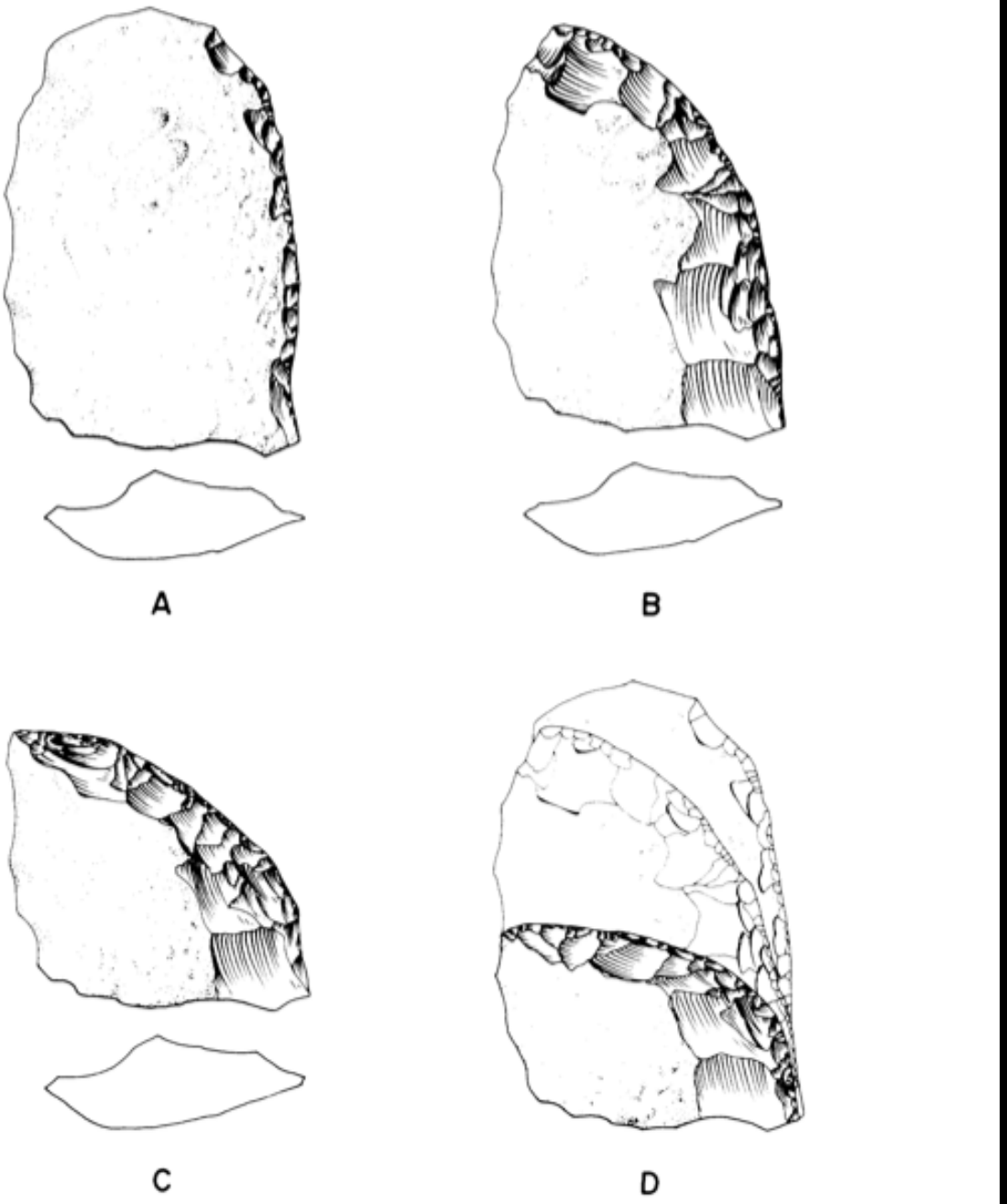
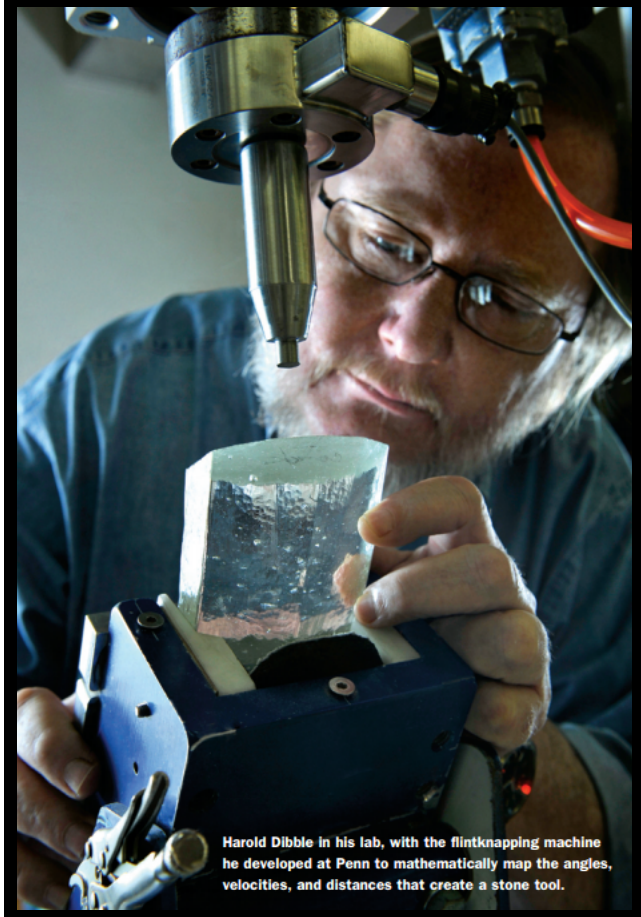
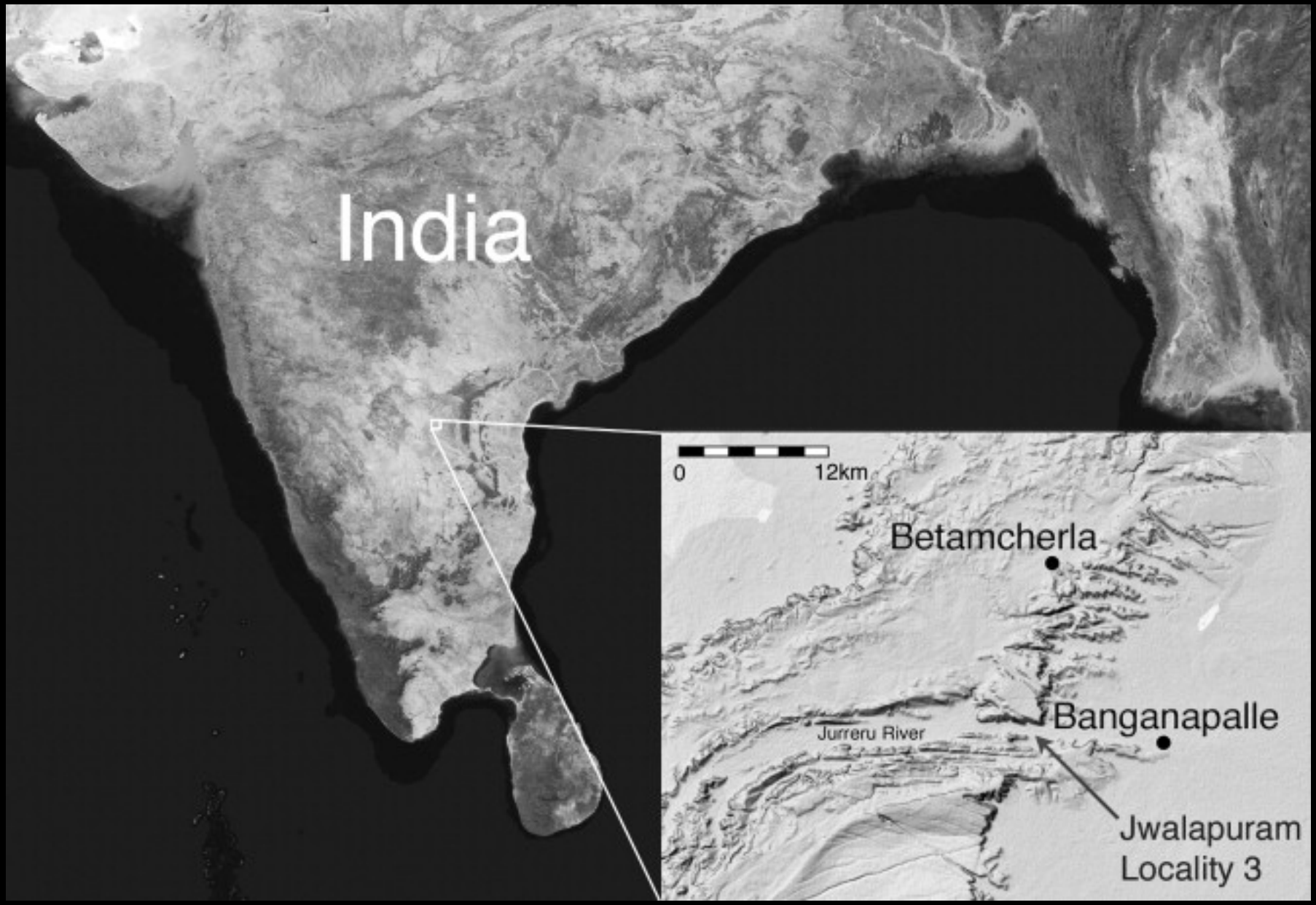


Figure 2. A scraper, replicated by the author, shown in four stages (A–D) of continuous reduction. As reduction continues, the retouch tends to get heavier, flake length and surface area decrease, and, typologically, the tool proceeds from a simple single-edged scraper to a transverse scraper.



Harold Dibble in his lab, with the flintknapping machine he developed at Penn to mathematically map the angles, velocities, and distances that create a stone tool.

Middle Palaeolithic in Asia



Haslam, M., C. Clarkson, et al. (2010). "The 74 ka Toba super-eruption and southern Indian hominins: archaeology, lithic technology and environments at Jwalapuram Locality 3." Journal of Archaeological Science 37(12): 3370-3384.

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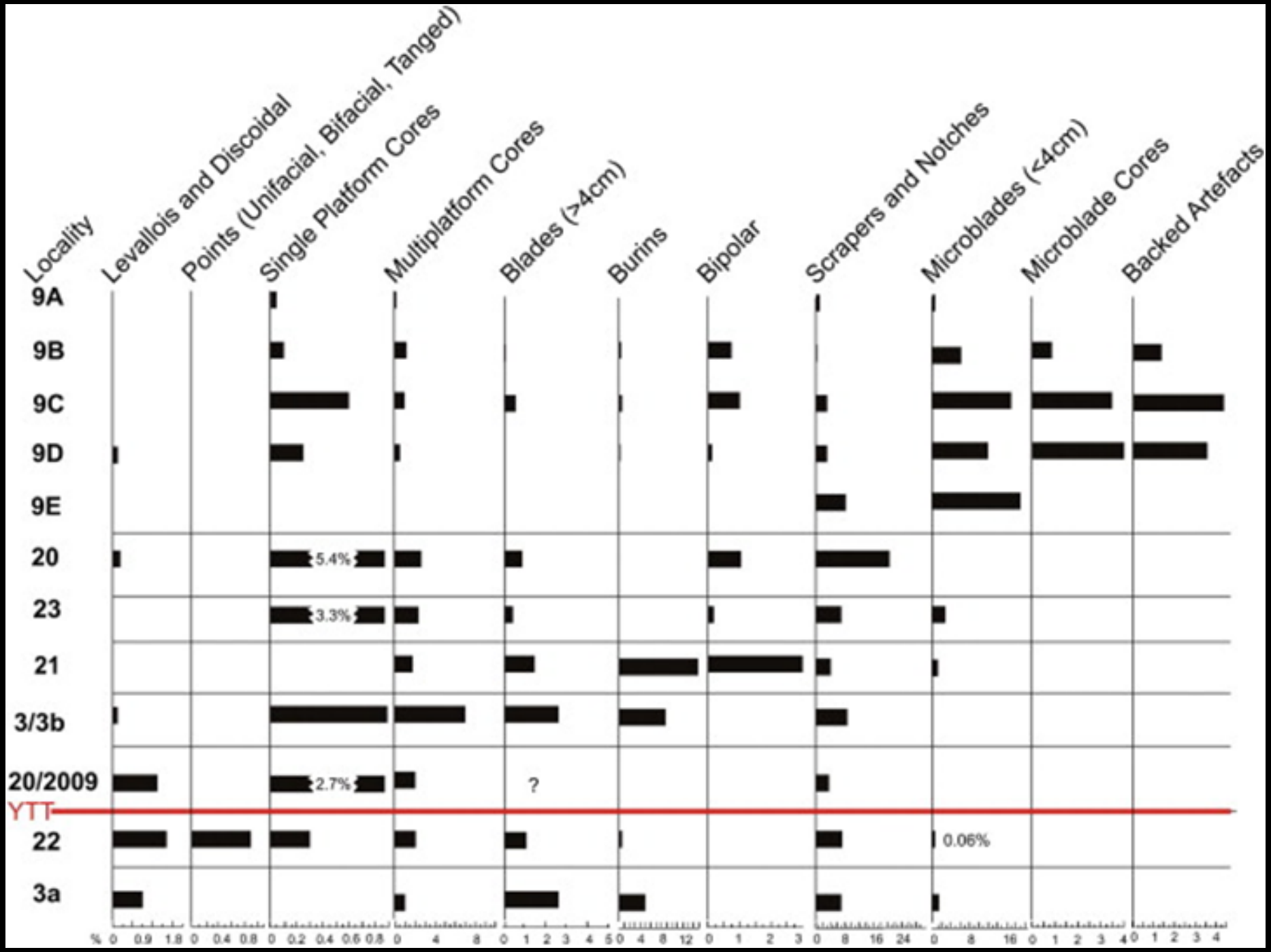
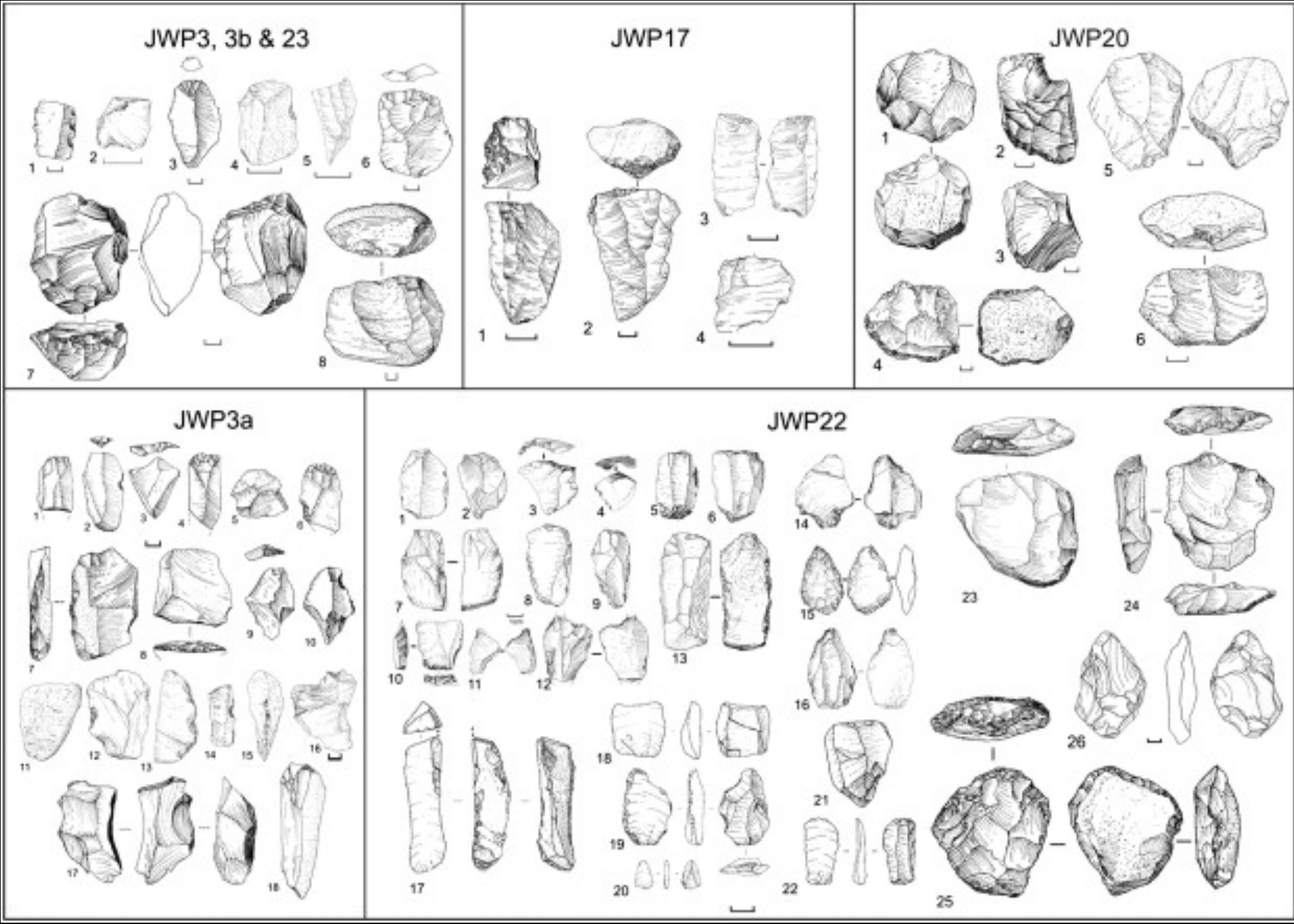
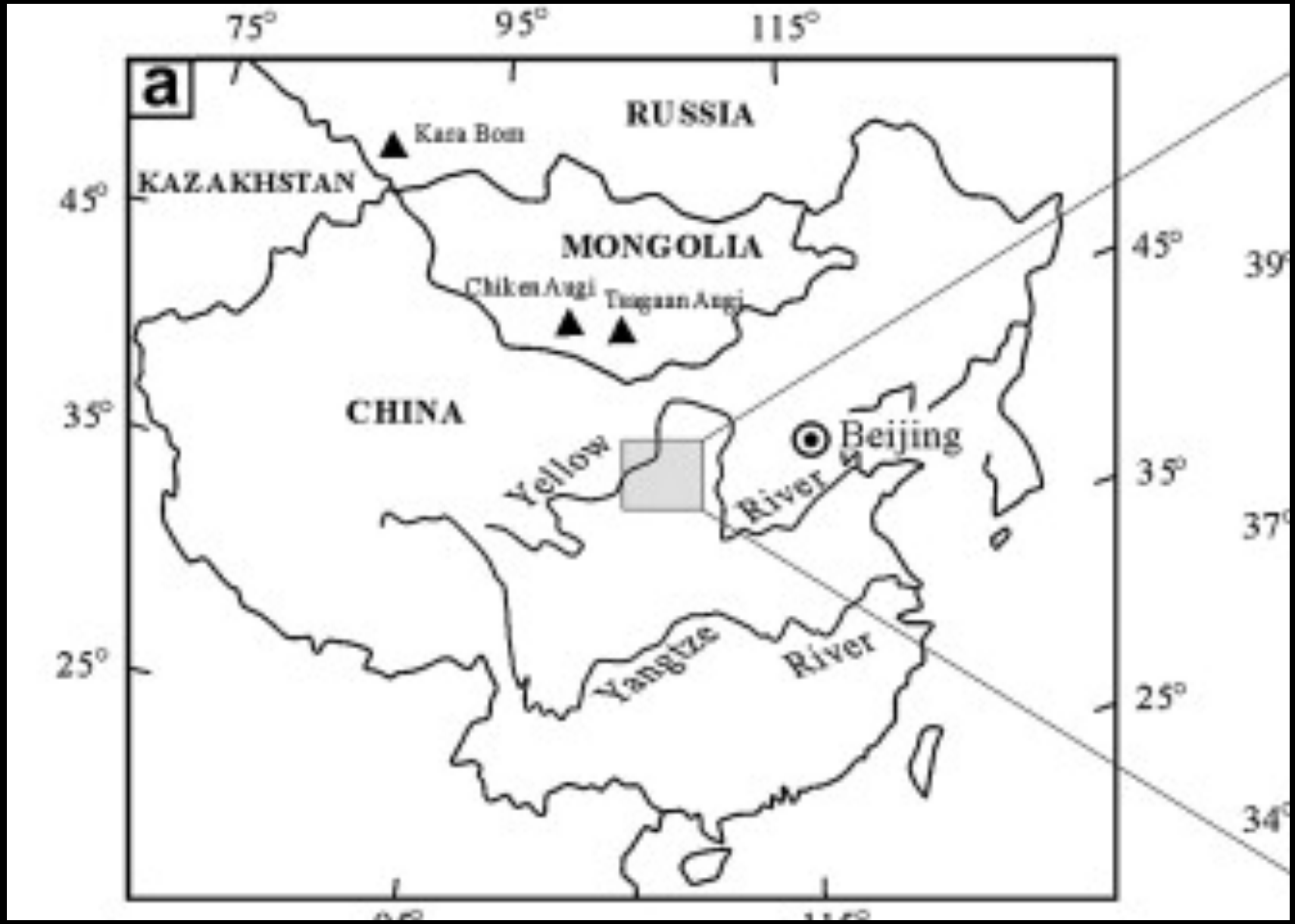

Locality
Levallois and Discoidal
Points (Unifacial, Bifacial, Tanged)
Single Platform Cores
Multiplatform Cores
Blades (>4cm)
Burins
Bipolar
Scrapers and Notches
Microblades (<4cm)
Microblade Cores
Backed Artefacts
9A
9B
9C
9D
9E
20
23
21
3/3b
20/2009
YTT
22
3a
5.4%
3.3%
2.7%
?
0.06%
%

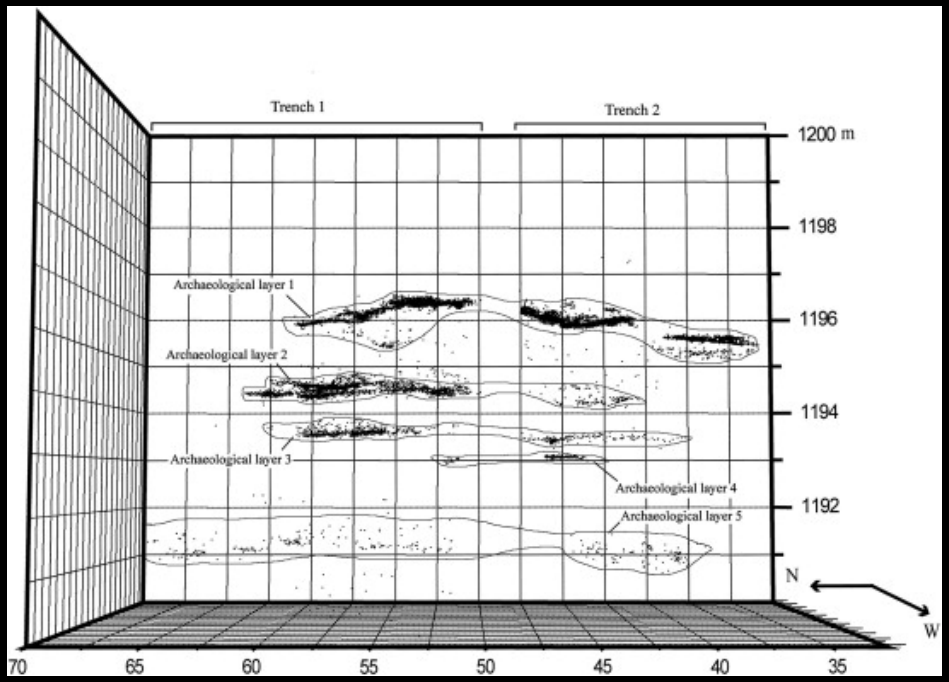


Clarkson, C., S. Jones, et al. (2012). "Continuity and change in the lithic industries of the Jurreru Valley, India, before and after the Toba eruption." Quaternary International 258(0): 165-179.

Shuidonggou, China



Pei, S., X. Gao, et al. (2012). "The Shuidonggou site complex: new excavations and implications for the earliest Late Paleolithic in North China." Journal of Archaeological Science 39(12): 3610-3626.



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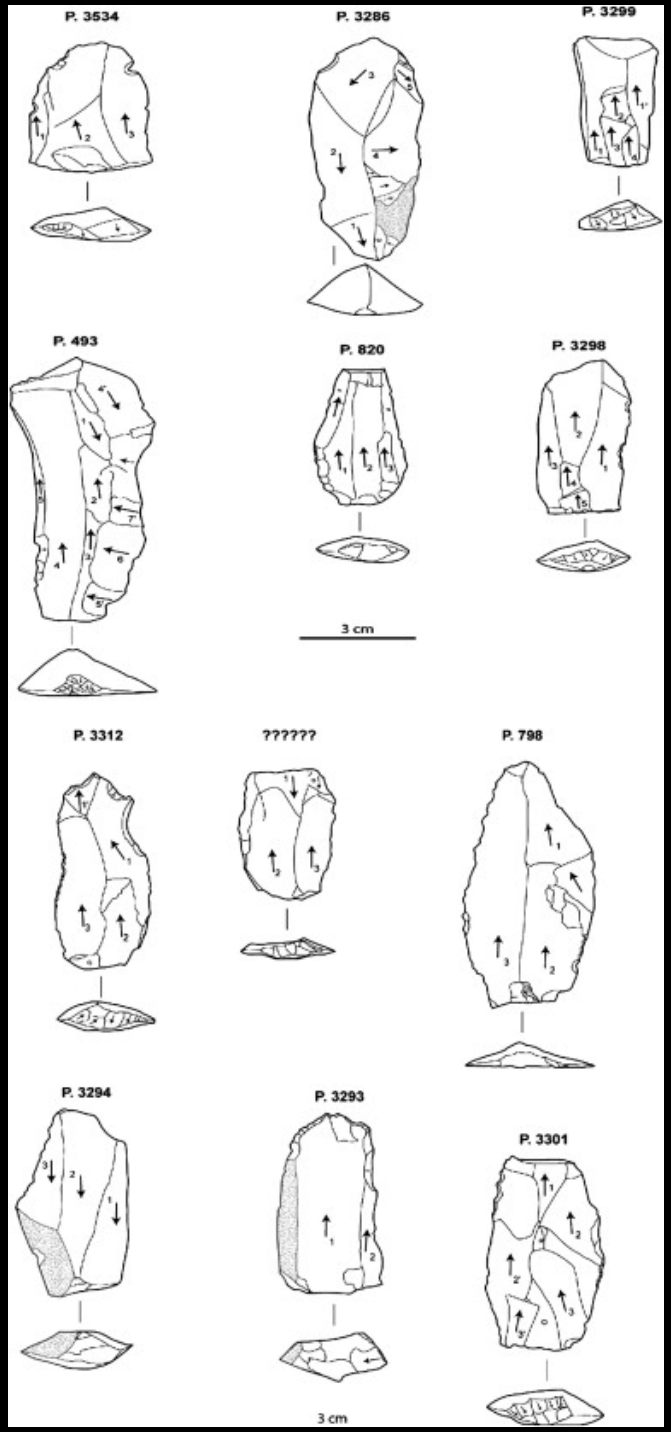
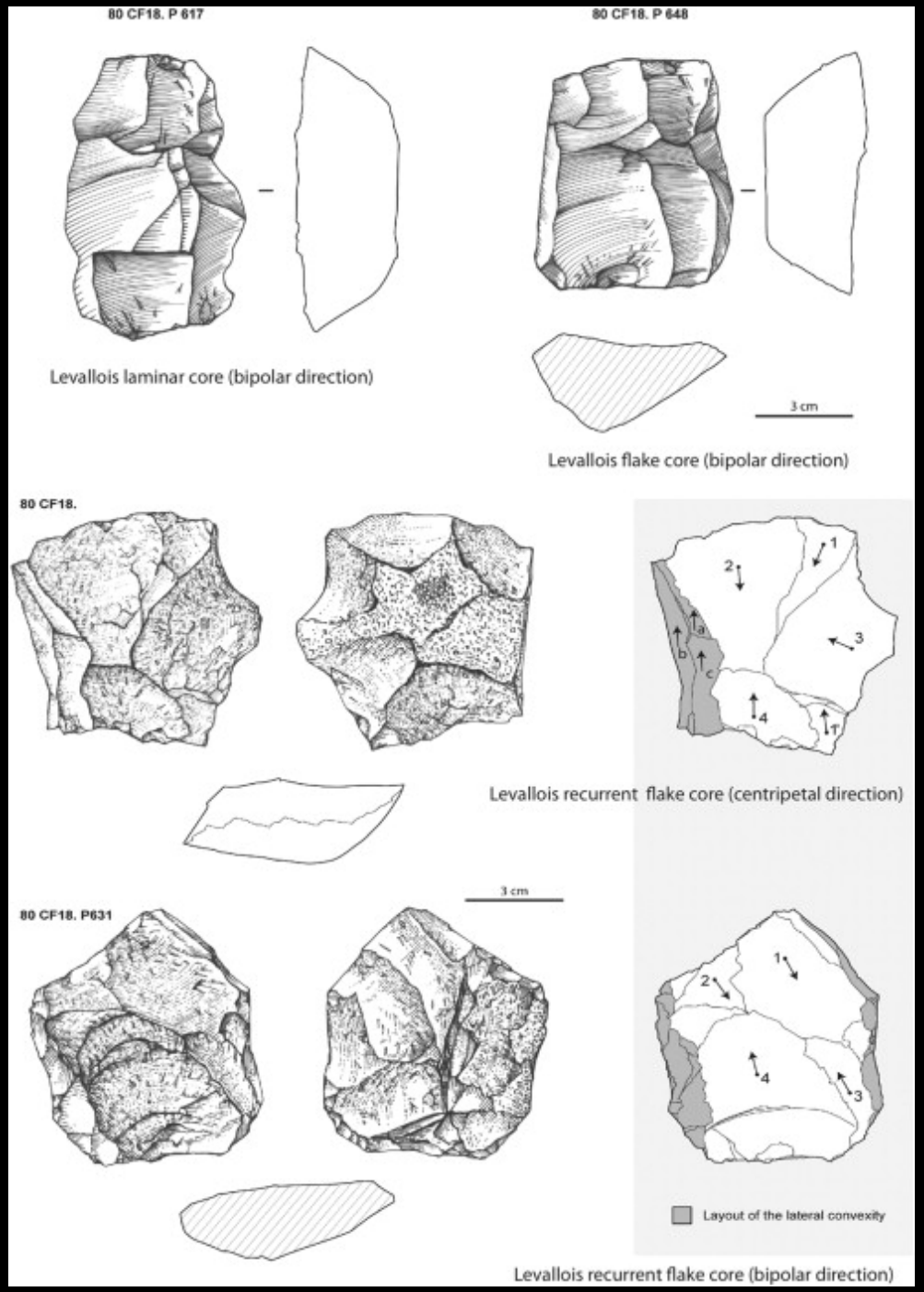
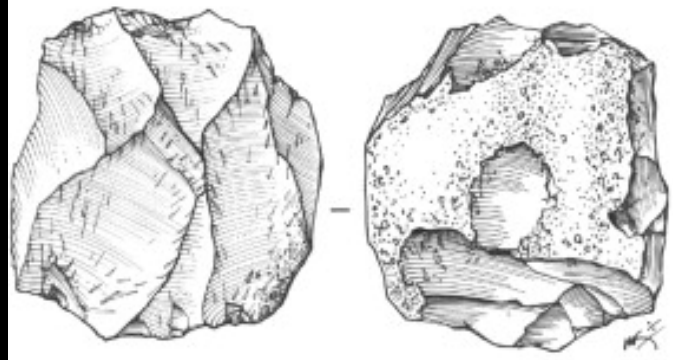

P. 3534
P. 3286
P. 3299
P. 493
P. 820
P. 3298
3 cm
P. 3312
??????
P. 798
P. 3294
P. 3293
P. 3301
3 cm

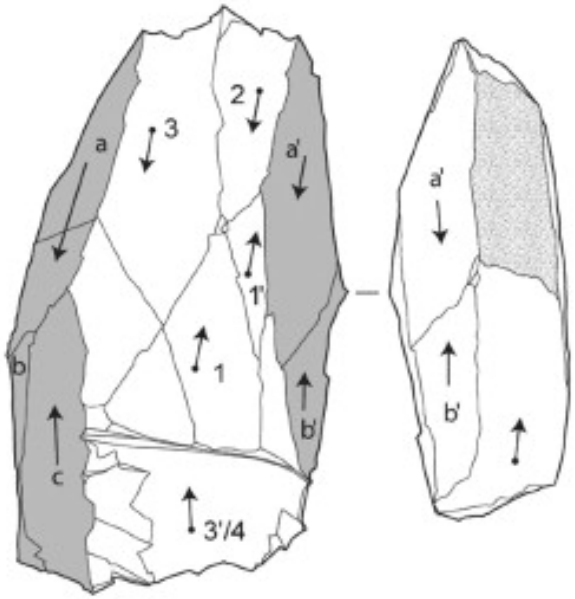

80 CF18. P 617
80 CF18. P 648
Levallois laminar core (bipolar direction)
3 cm
Levallois flake core (bipolar direction)
80 CF18.
Levallois recurrent flake core (centripetal direction)
3 cm
80 CF18. P631
Layout of the lateral convexity
Levallois recurrent flake core (bipolar direction)



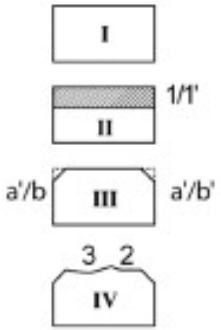
Layout of the lateral convexity

Cortex

3 cm



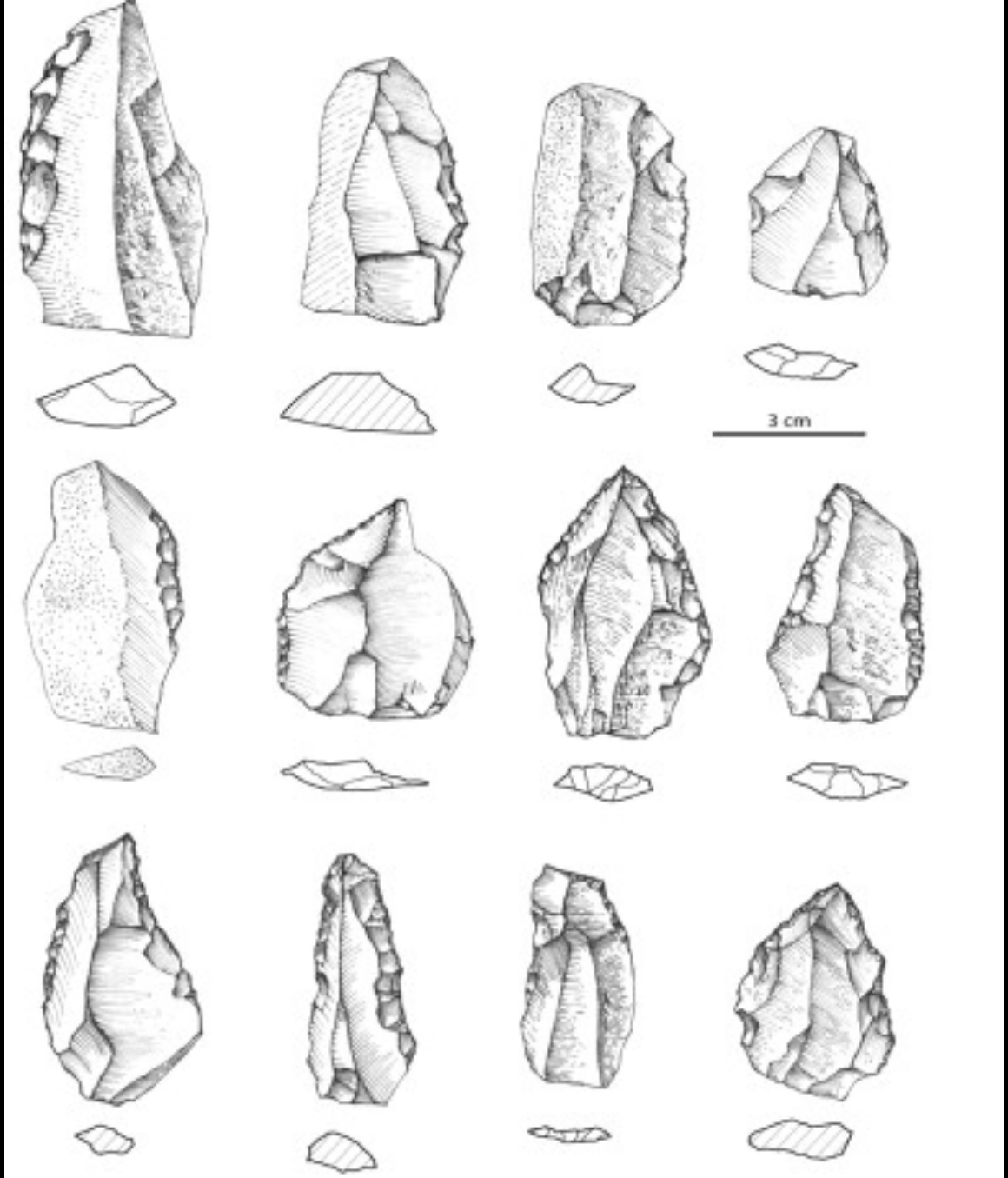
Technical biography
of the core 80c.F1.8.p.593



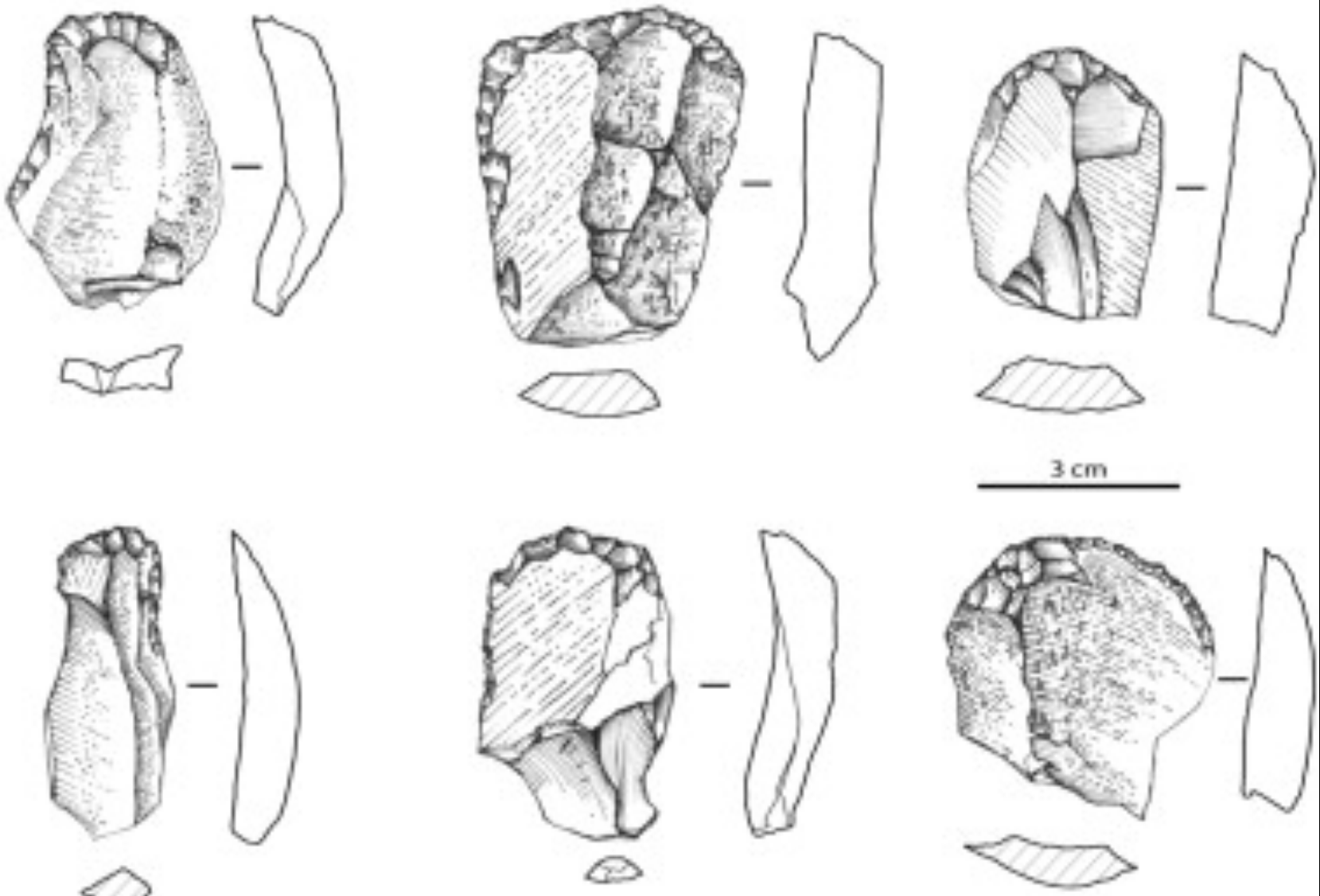
Layout of the lateral convexity

Cortex

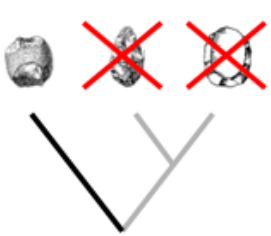
Levallois blade core (bipolar direction)

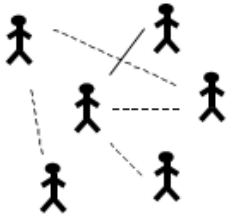


Levallois convergent tools: side scraper (single or double) and denticulated



tools: end-scraper

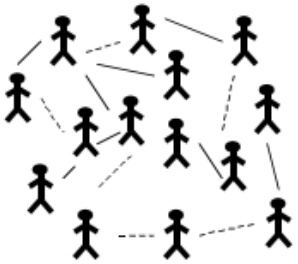




Mode 1

Demographic Level 1

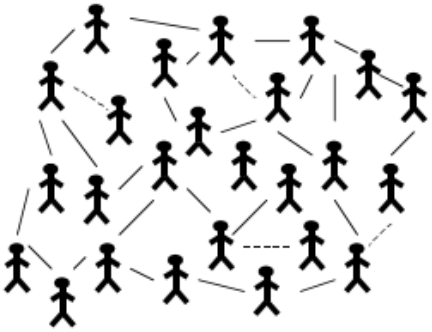
Relatively small population, low density, weak and/or irregular pattern of social interconnectedness



Mode 2

Demographic Level 2

Relatively larger population levels, moderate density, more regular and stronger levels of social interconnectedness



Mode 3

Demographic Level 3

Larger population levels, greater density, regular and strong incidences of social interconnectedness

Summary

Middle Stone Age in Africa

Mousterian in Europe

Middle Palaeolithic in Asia