



WORDS BONES GENES TOOLS
Tracking Linguistic, Cultural, and Biological Trajectories of the Human Past

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SignBase

A Data-Driven Approach to Abstract Signs in the Paleolithic

Ewa Dutkiewicz & Christian Bentz

11.09.2019



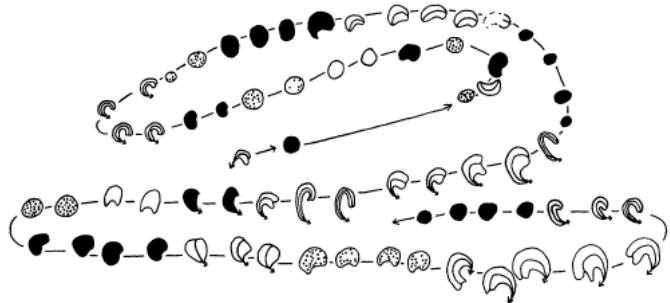
Staatliche Museen zu Berlin
Preußischer Kulturbesitz



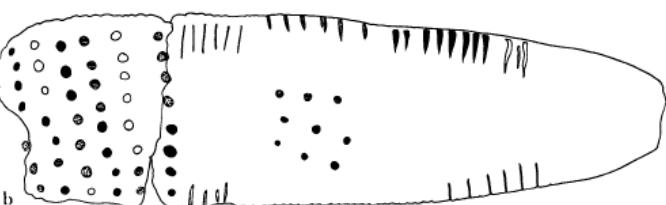
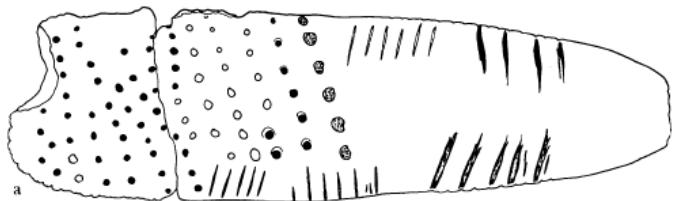
Universität
Zürich^{UZH}

Introduction

Alexander Marshack 1972, 1976
Notation systems and moon calendars

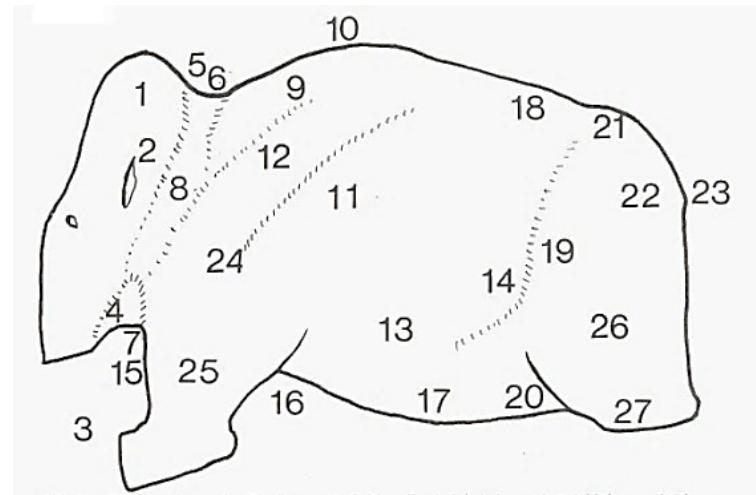


Abri Blanchard



Abri Lartet

Joachim Hahn 1986
Statistical analyzes



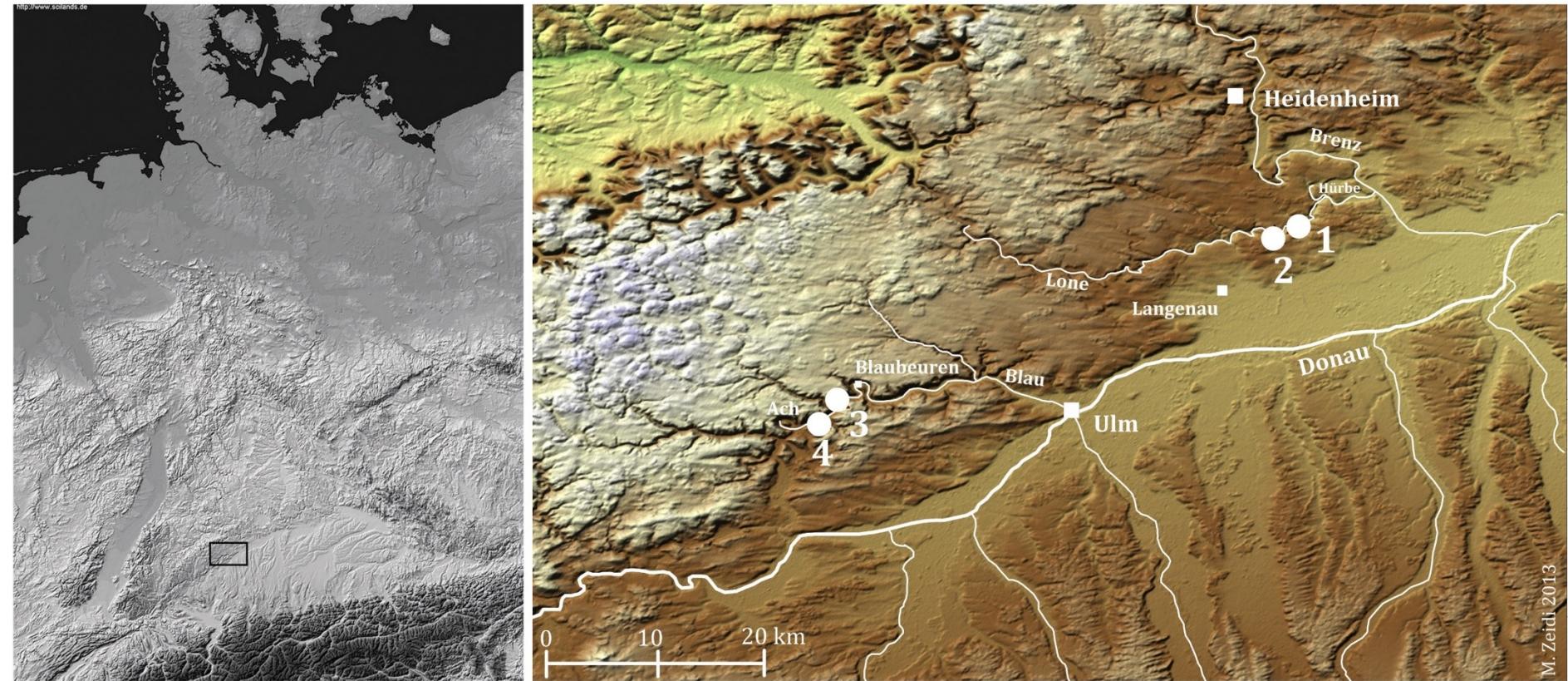
Zeichen in den Inventaren

Zeichen	Vogel-herd V	Vogel-herd IV	Vogel-herd o.S.	Geissen-klöst. II b	Geissen-klöst. II a	zus.
X	49 19 %	5 2 %	24 56 %	-	-	78 11 %
-	43 17 %	40 16 %	12 28 %	26 27 %	5 6 %	127 17 %
.,	97 38 %	157 64 %	-	48 50 %	-	302 41 %
/	14 6 %	20 8 %	3 7 %	- -	47 53 %	84 12 %
I	40 16 %	23 9 %	4 9 %	31 32 %	34 39 %	133 18 %
∞	8 3 %	-	-	-	-	8 1 %
▽^	2 1 %	1 0,4 %	-	-	2 2 %	5 0,7 %
zus.	253 100 %	246 100 %	43 100 %	96 99 %	88 100 %	736 100 %

Aurignacian figurines Swabian Jura

Swabian Jura

Swabian Aurignacian ca. 42,000 to 35,000 calBP

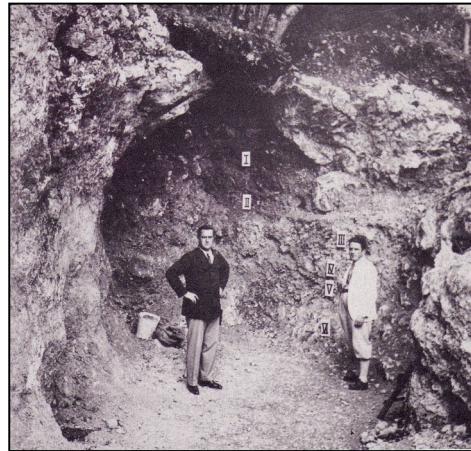


1 Vogelherd, 2 Hohlenstein-Stadel, 3 Geißenklösterle, 4 Hohle Fels

Vogelherd

1931: Gustav Riek

2005-2012: Nicholas Conard



Fotos: H. Jensen © Universität Tübingen

Hohlenstein-Stadel

1935-1939 und

1956-1960:

Robert Wetzel

1939 Fragments of

worked ivory

1969 refitted by
Joachim Hahn

2008-2013:

Claus-Joachim Kind,

Landesamt für

Denkmalpflege

Baden-Württemberg



Foto: Y. Mühlleis © Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart

Geißenklösterle

1974-1990 Joachim Hahn



Fotos: P. Frankenstein / H. Zwietasch © Landesmuseum Württemberg Stuttgart

Hohle Fels

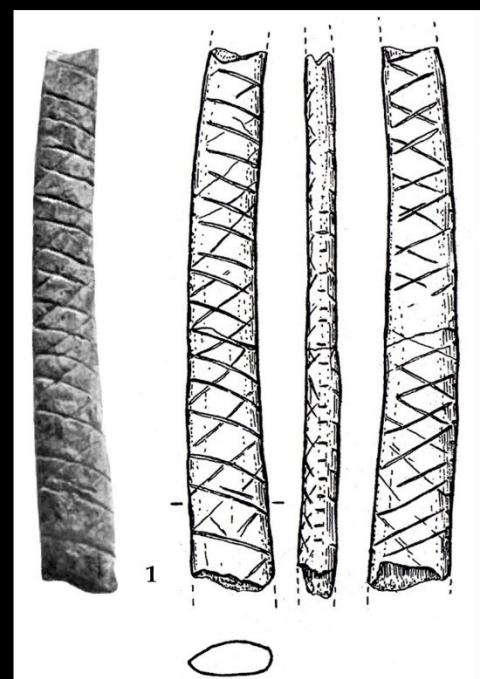
Since 1997 Nicholas Conard



Foto: M. Malina © Universität Tübingen



Foto: H. Jensen © Universität Tübingen



5 cm

Foto (1): Riek 1934, Taf. XXXI, 14
Zeichnung (2): Hahn 1977, Taf. 34, 4
Foto (3): J. Lipták © Universität Tübingen



Foto: E. Dutkiewicz

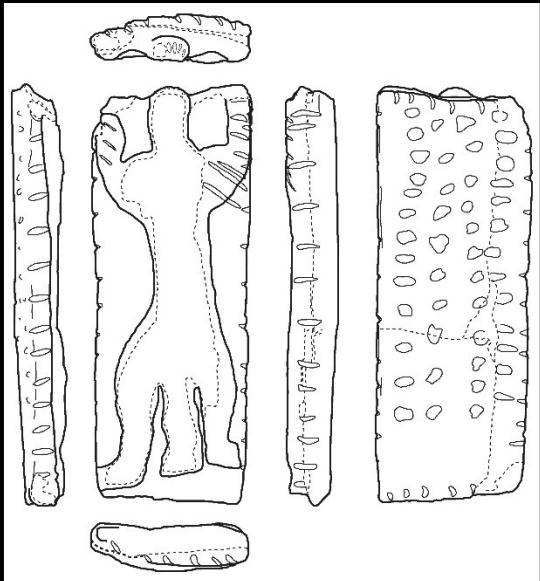


Foto: E. Dutkiewicz
Zeichnung: E. Dutkiewicz

Methods

Identifying markings as symbolic, utilitarian or unintentional

- 1.
2. Definition of basic graphic elements: dot, line, notch
- 3.
4. Establishing a typology for patterns that occur in the assemblage, e.g. parallel lines, rows of crosses, rows of dots etc.

Objects with symbolic markings:

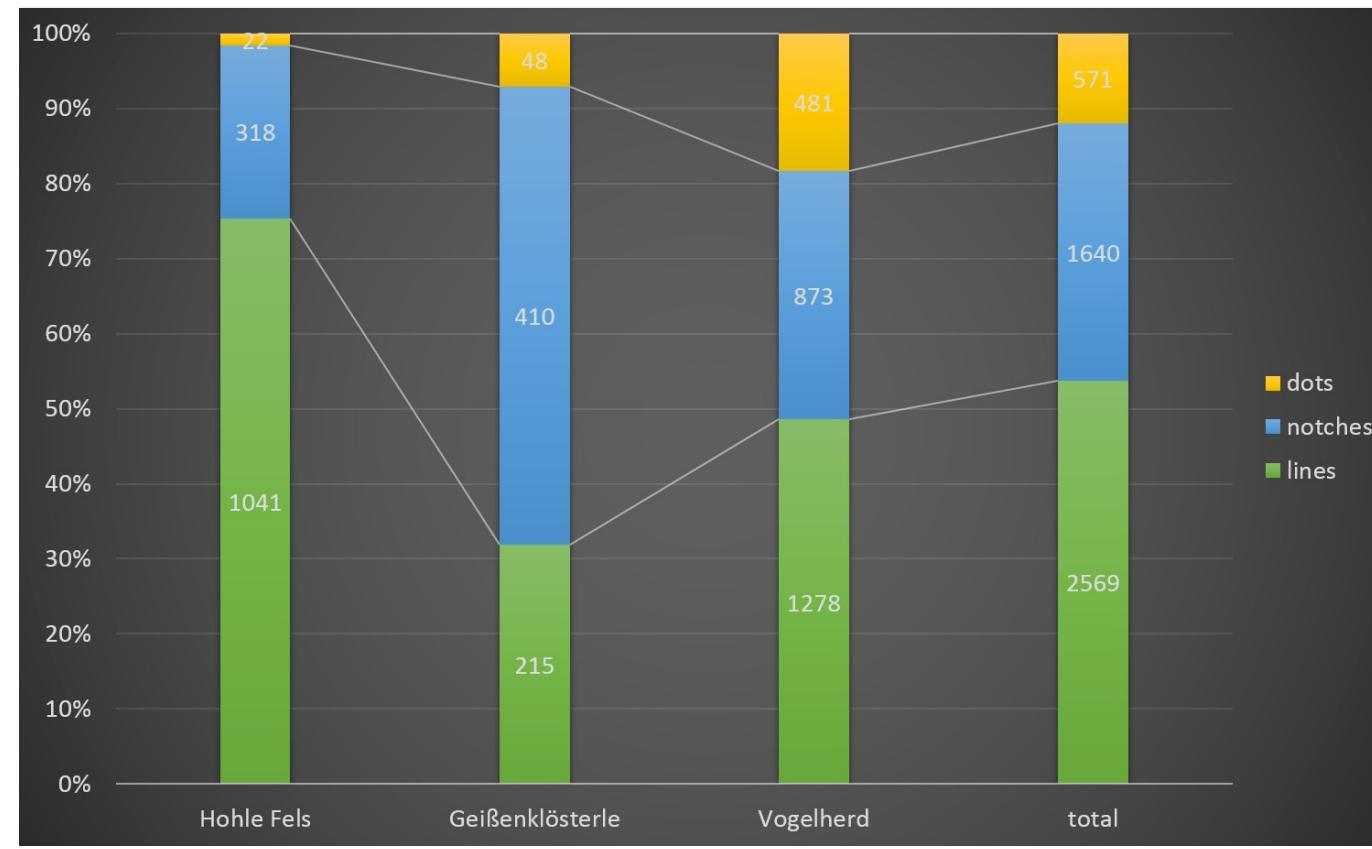
Hohle Fels n=52

Geißenklösterle n=30

Hohlenstein-Stadel n=1

Vogelherd n=175

Total n=260



Basic graphic elements
(n=4780)

Carriers for symbolic markings:

Figurines & possible figurines (24%)

Flutes and tubes (20%)

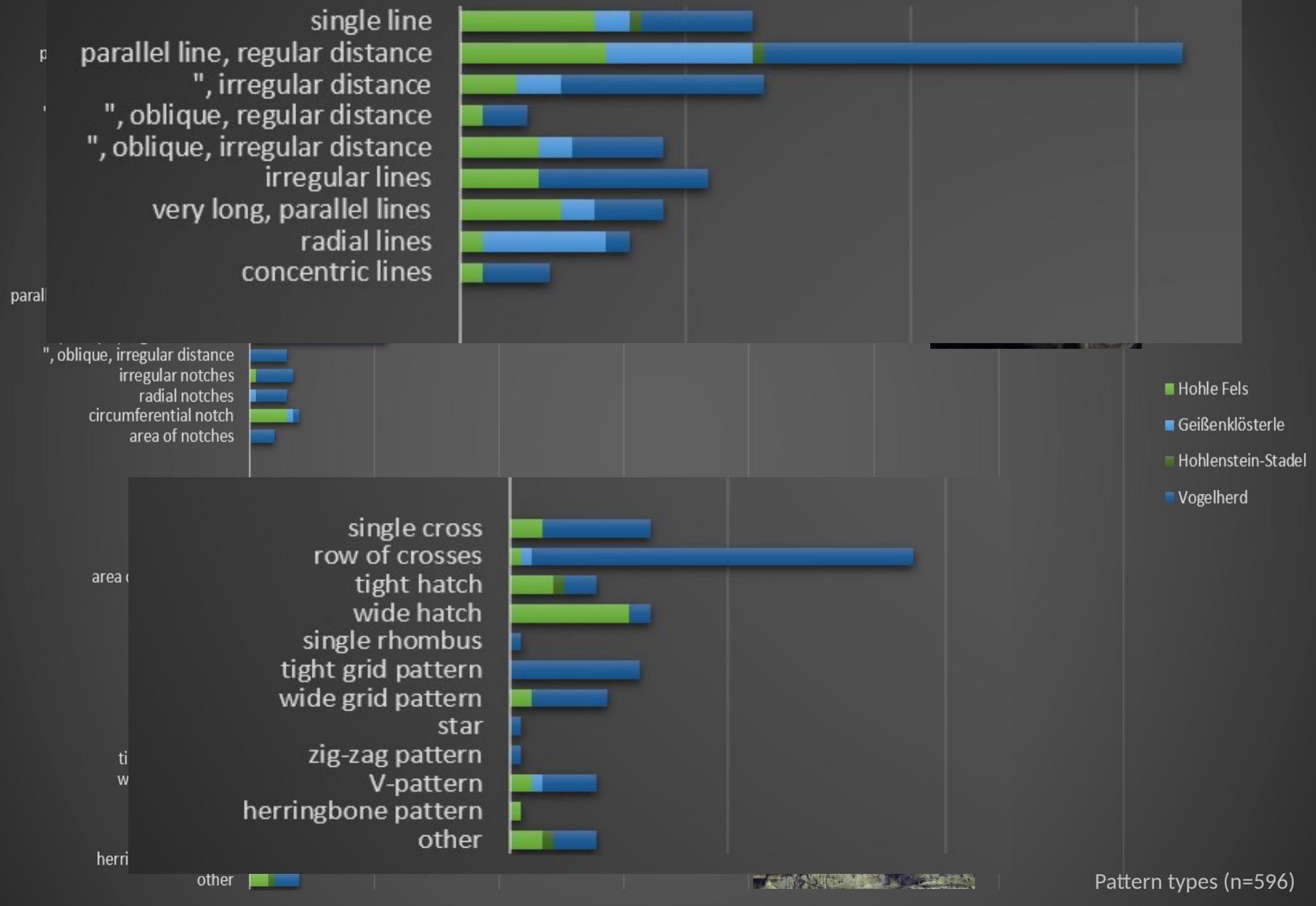
Personal ornaments (7%)

Tools (9%)

Rods (7%)

Other (1%)

Undetermined (32%)



Ewa Dutkiewicz

Zeichen

Markierungen, Muster und Symbole im Schwäbischen Aurignacien



SignBase

Data Collection

SignBase_Main : Database- C:\Users\ewa\bwSyncAndShare\SignBase (Christian Bentz)\signSheets\SignBase_Main.accdb (Access 2007)

File Home Create External Data Database Tools Tell me what you want to do...

Cut Copy Format Painter Filter Ascending Selection Descending Advanced Refresh All Remove Sort Toggle Filter Sort & Filter

New Totals Spelling Find ab ac Replace Go To Select

Records Find Text Formatting

Views Clipboard

frm_SignBase_Main

SignBase

object number gkl0025

object name 58-264 Adorant

site name Geissenklösterle

techno-complex Aurignacien

layer II

date BP min-max 30625 ± 796 - 35700 ± 700

dating method C14

excavation year 1979

material ivory

carrier statuette

length_mm 38

width_mm 14

depth_mm 5

preservation almost complete

short description

general_literature Hahn J. 1977; Hahn J. 1986; Dutkiewicz E. 2017: Taf. 8a-8b

picture

sign sequence + number

dot*13* _dot*10=_dot*12=_dot*13= | notch*13= | notch*13= |
notch* 7= | notch *6= | radnotch*4= | obnotch*4=_obline*2= |
obnotch*3=br

Navigation Pane

line cross vulva

obline rhombus anthropomorph

radline rectangle zoomorph

dashline hashtag paw

circumline grid hoofprint

concenline hatching

notch v

obnotch zigzag

radnotch zigzagrow

dashnotch star

circumnotch maccaroni

crossnotch dot

pin cupule

pinleft circle

pinright spiral

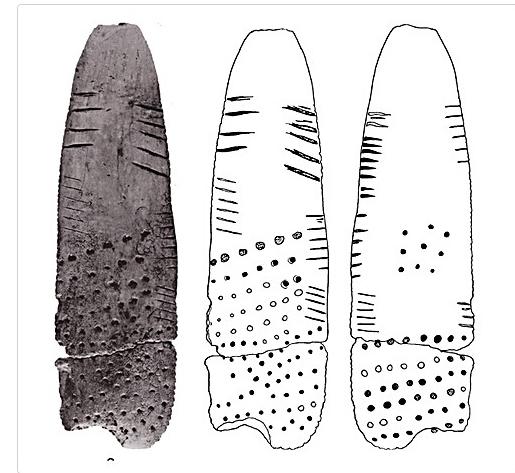
circumspiral

picture_reference Dutkiewicz E. 2017: Taf. 8a-8b

Online Website

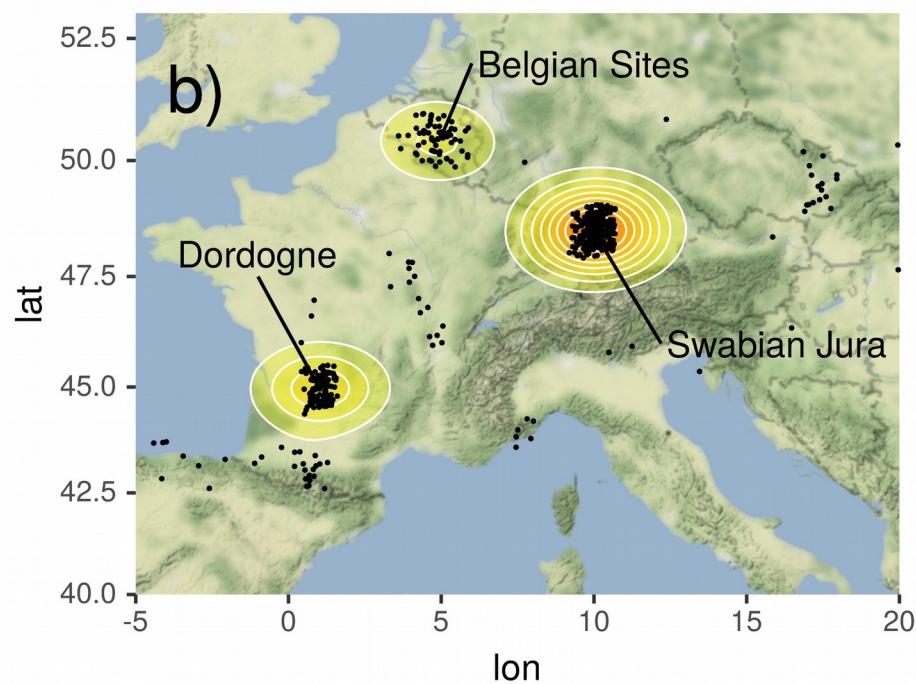
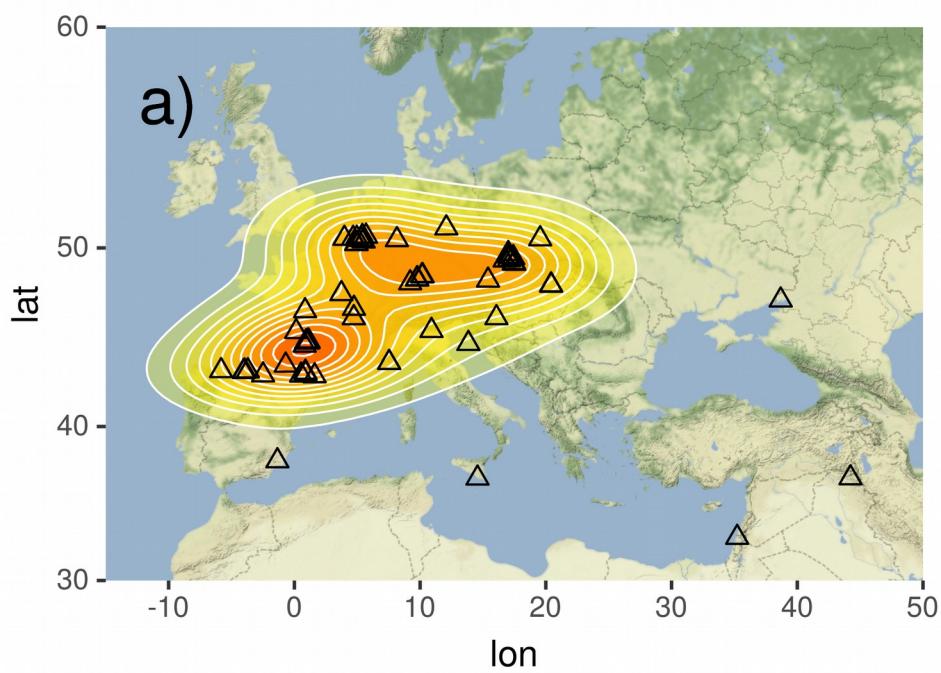
SignBase Home Objects References Description

lar0002	
Location	Les Eyzies-de-Tayac-Sireuil
Country	France
Site name	Abri Lartet/Gorge d'Enfer
Techno-complex	Aurignacien
Layer	
Data BP min/max	
Dating method	
Excavation year	1865
Material	bone
Carrier	lissoir/spatula
Dimensions (in mm)	102.0 × 30.0 × not available
Sign types	obline/line/dot
Sign sequence	<pre>dot*6=_dot*6=_dot*6=_dot*8=_dot*6=_dot*8=_dot*4=br_dot*9=_dot*7=_dot*9= dot*4=_dot*8=_dot*5br obline*5=_line*6=_obline*5= obline*6=_line*4= dot*8=_dot*8=_dot*8=_dot*7=_dot*7=_dot*7=_dot*7= line*6=_line*6=_line*2=_line*6=_line*3= line*4= line*6= dot</pre>
References	
Chollet-Varagnac M. 1980: p. 44-45	



Overview Sites and Marked Objects

Aurignacian



Coding

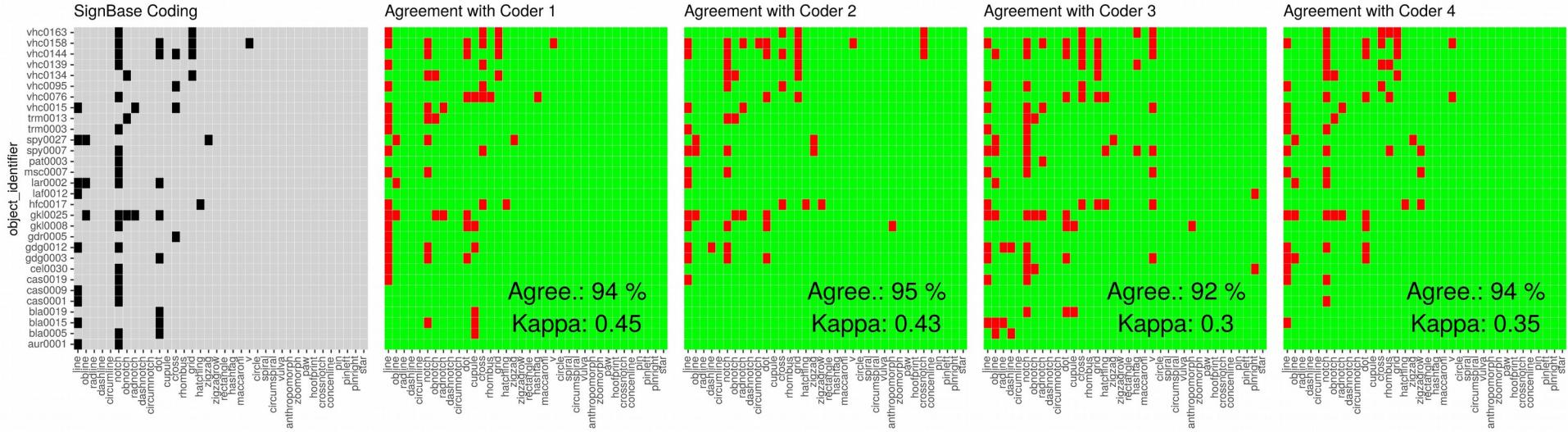
Vogelherd



line	<input type="checkbox"/>	cross	<input type="checkbox"/>	vulva	<input type="checkbox"/>
oblique line	<input type="checkbox"/>	rhombus	<input checked="" type="checkbox"/>	anthropomorph	<input type="checkbox"/>
radial line	<input type="checkbox"/>	rectangle	<input type="checkbox"/>	zoomorph	<input type="checkbox"/>
dash line	<input type="checkbox"/>	hashtag	<input type="checkbox"/>	paw	<input type="checkbox"/>
circumferential line	<input type="checkbox"/>	grid	<input type="checkbox"/>	hoofprint	<input type="checkbox"/>
concentric line	<input type="checkbox"/>	hatching	<input type="checkbox"/>	other	<input type="checkbox"/>
notch	<input type="checkbox"/>	v	<input type="checkbox"/>		
oblique notch	<input checked="" type="checkbox"/>	zigzag	<input type="checkbox"/>		
radial notch	<input type="checkbox"/>	zigzagrow (irregular zigzag)	<input type="checkbox"/>		
dash notch	<input type="checkbox"/>	star	<input type="checkbox"/>		
circumferential notch	<input type="checkbox"/>	maccaroni	<input type="checkbox"/>		
crossed notch	<input type="checkbox"/>	pin (head central)	<input type="checkbox"/>		
dot	<input type="checkbox"/>	pinleft (head left)	<input type="checkbox"/>		
cupule	<input type="checkbox"/>	pinright (head right)	<input type="checkbox"/>		
circle	<input type="checkbox"/>				

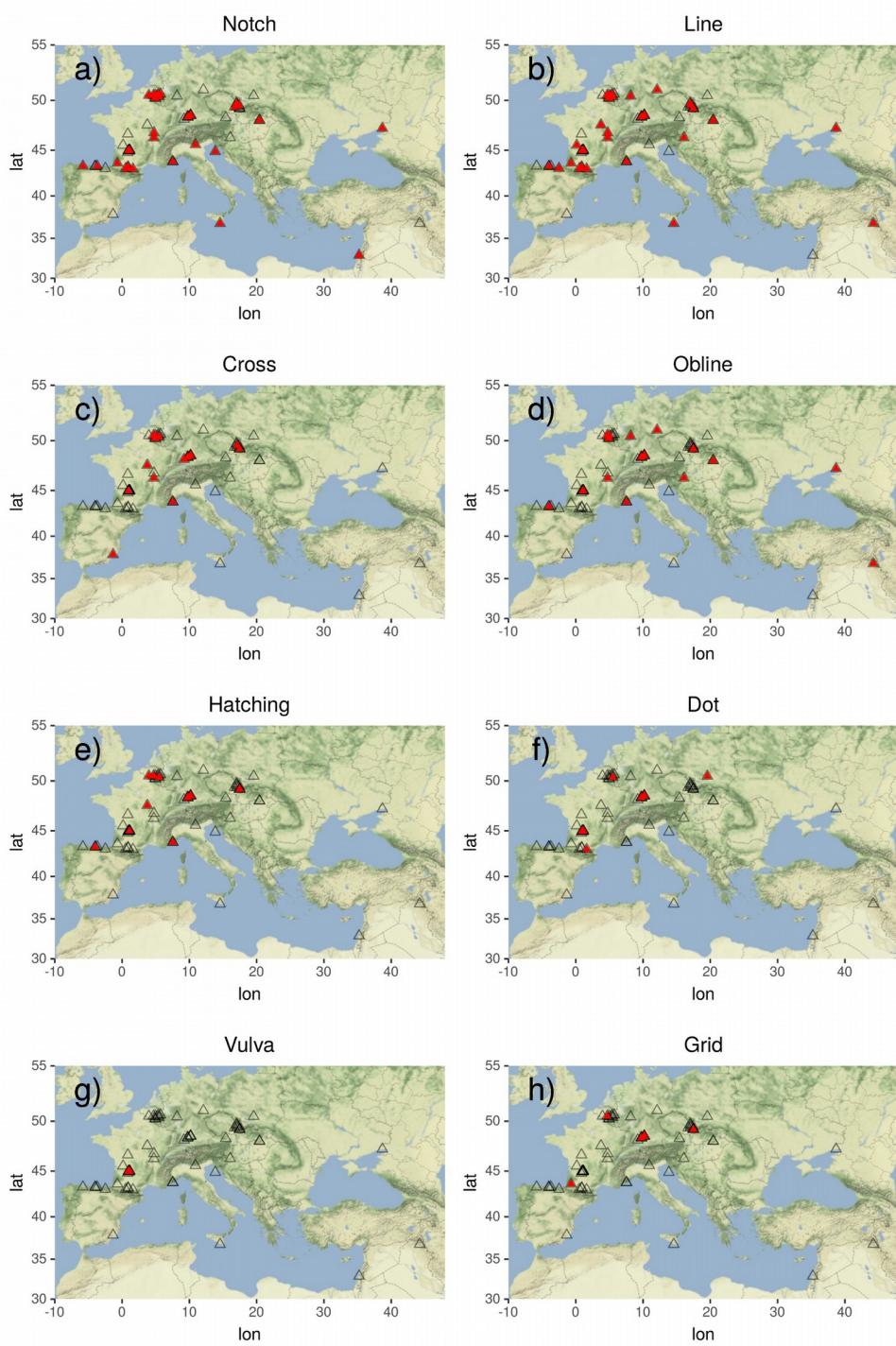
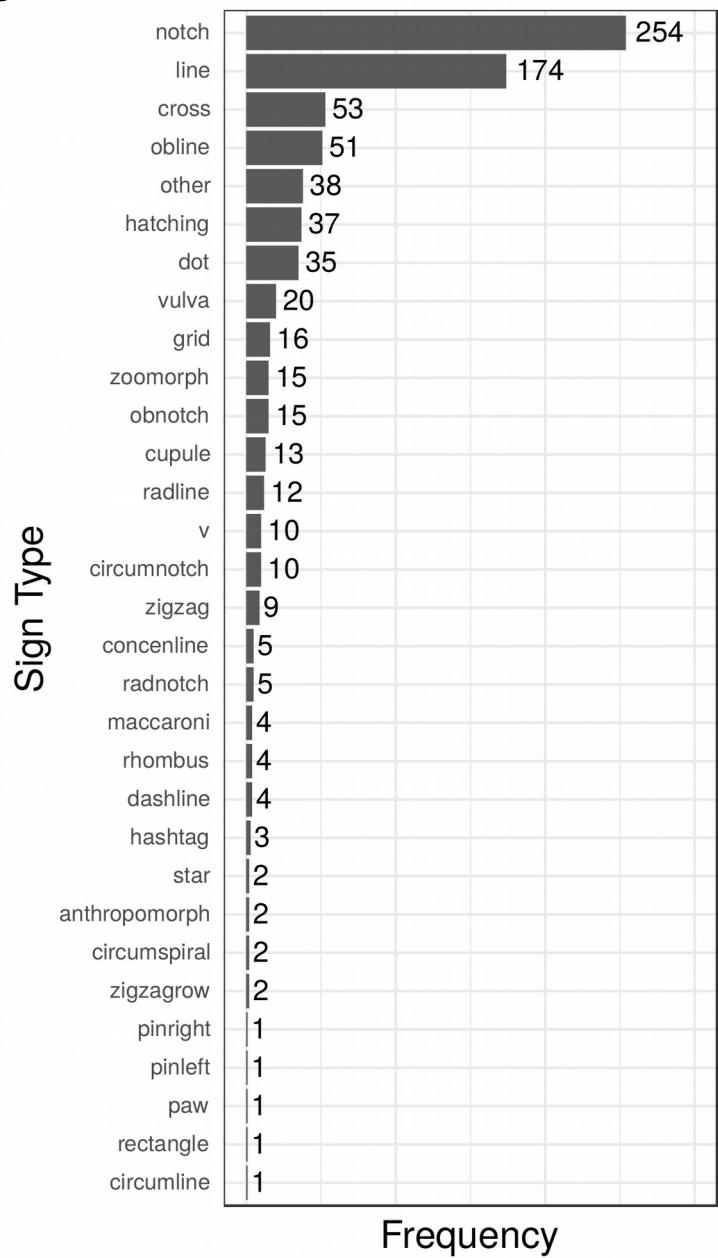
Coding Subjectivity Test

- 30 random objects
 - Test-coding by four researchers



Descriptive Statistics

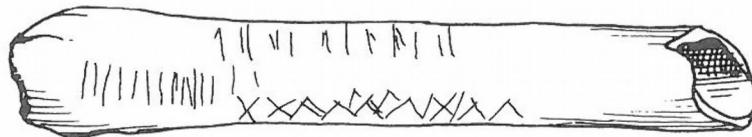
Objects n=531



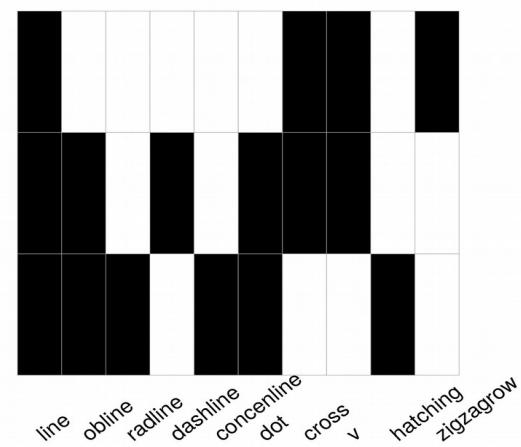
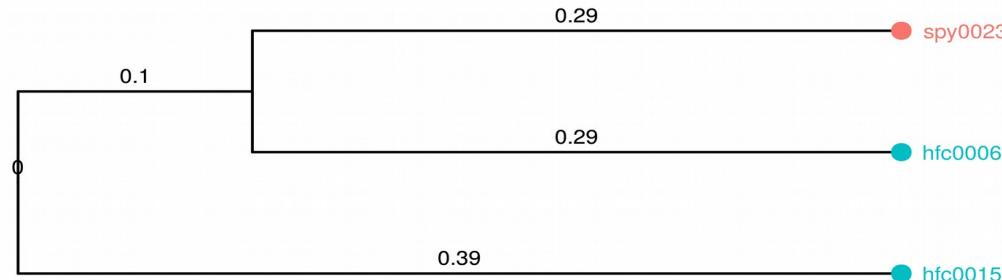
Geographical Clustering

UPGMA Tree with Jaccard Distances

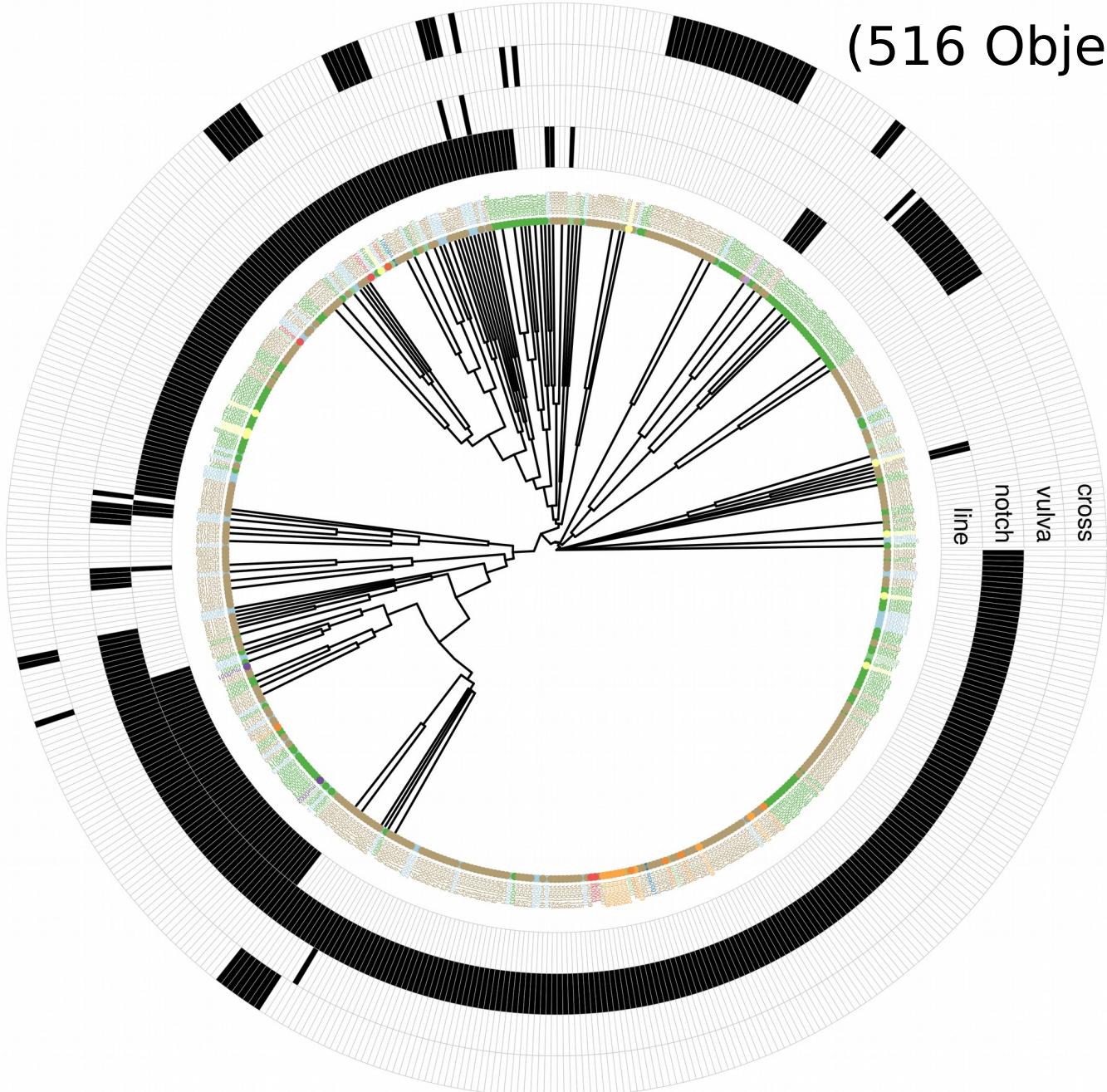
spy0023



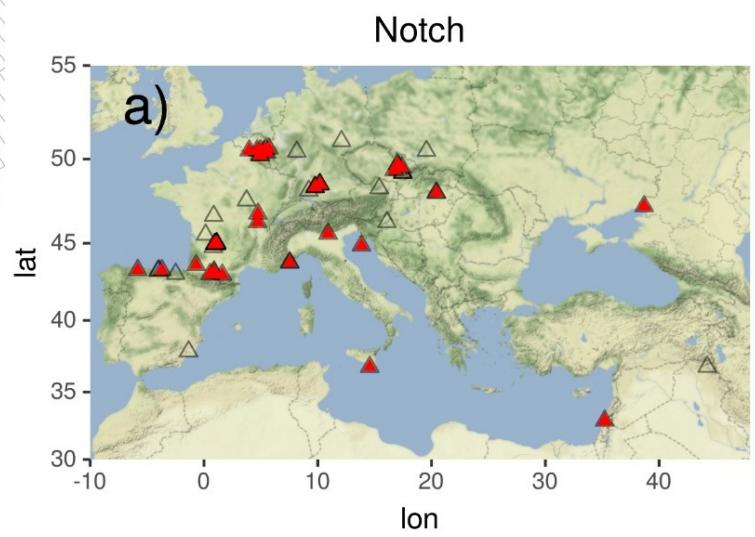
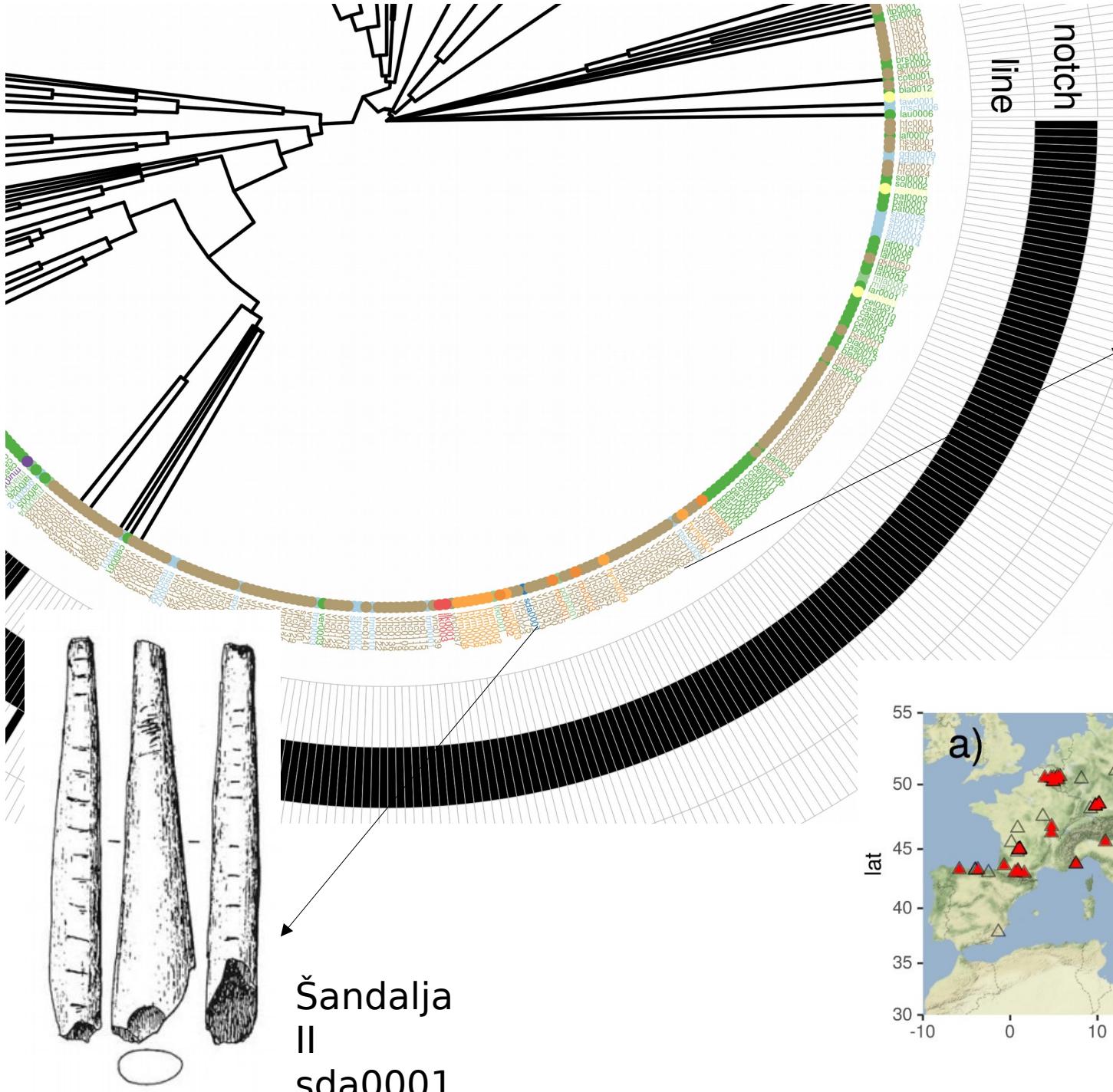
hfc0006

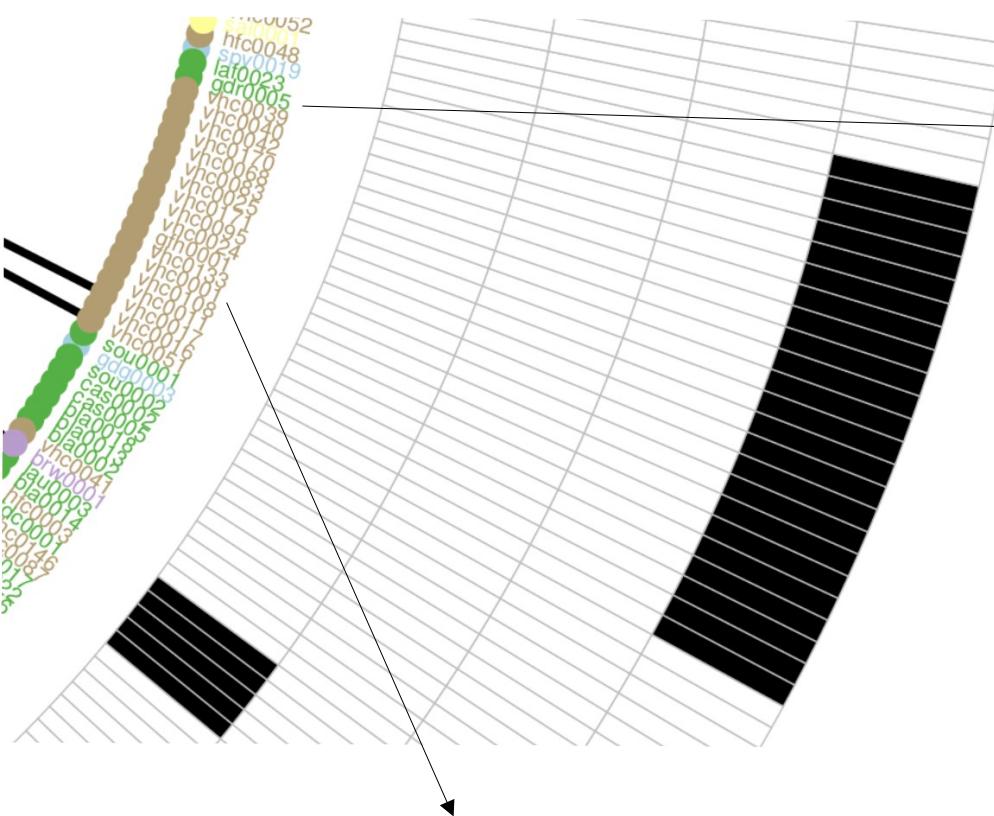


UPGMA Tree
(516 Objects; without “other”)

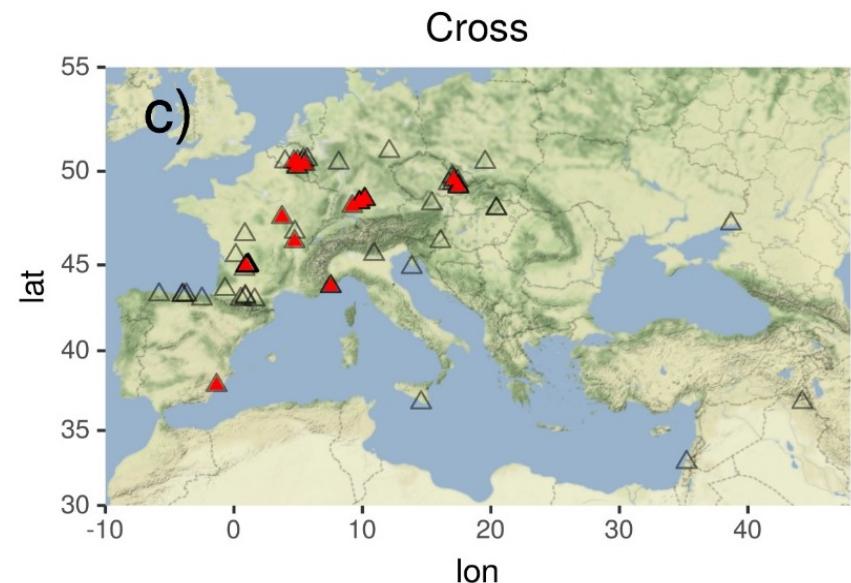


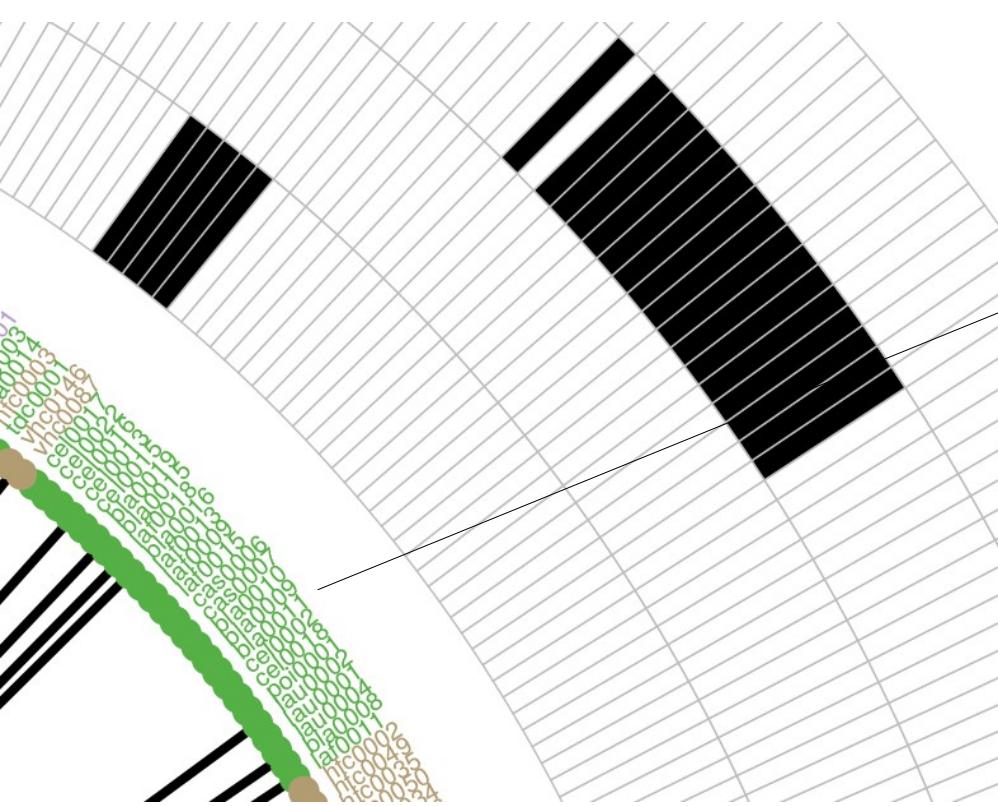
- absent
- present
- Belgium
- Croatia
- Czech Republic
- France
- Germany
- Hungary
- Iraq
- Israel
- Italy
- Poland
- Russia
- Spain





Grotte du Renne
gdr0005

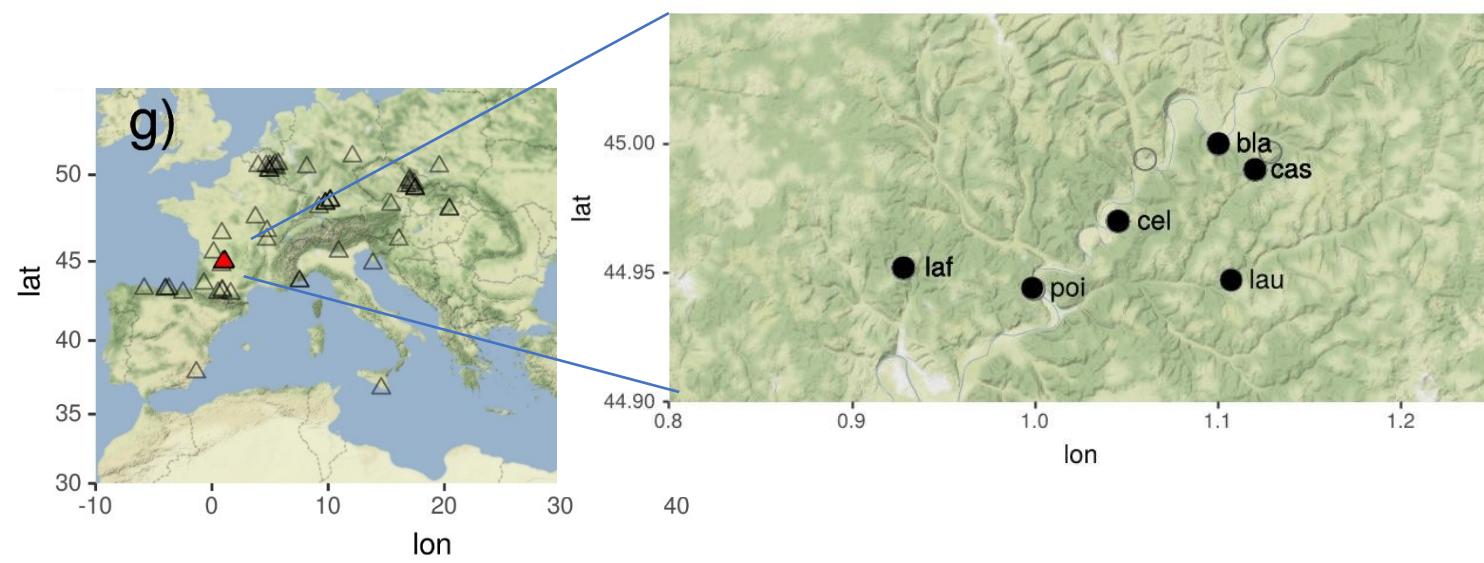




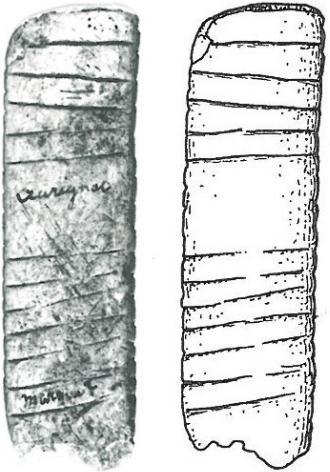
Blanchard
bla0011



Vulvae



Summary



Sign types that are widespread: lines, notches

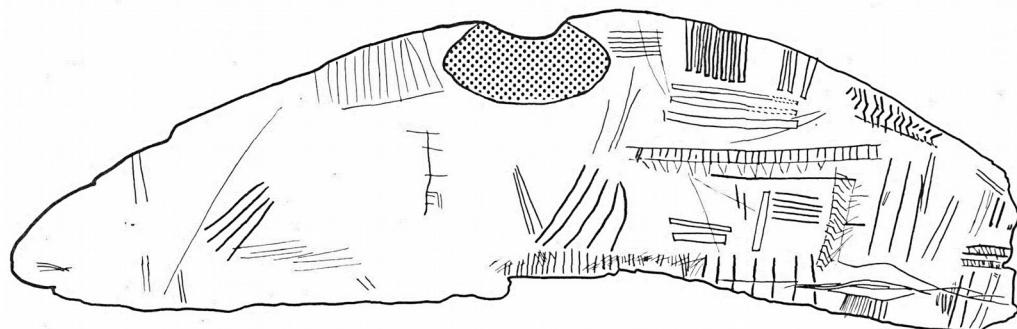
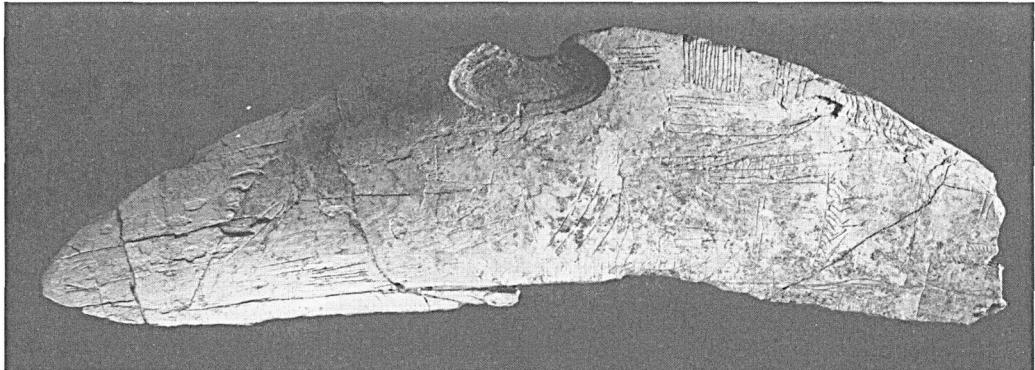
Independent appearance (?)

Cluster of particular sign types:
crosses, vulvae

Cultural marker (?)

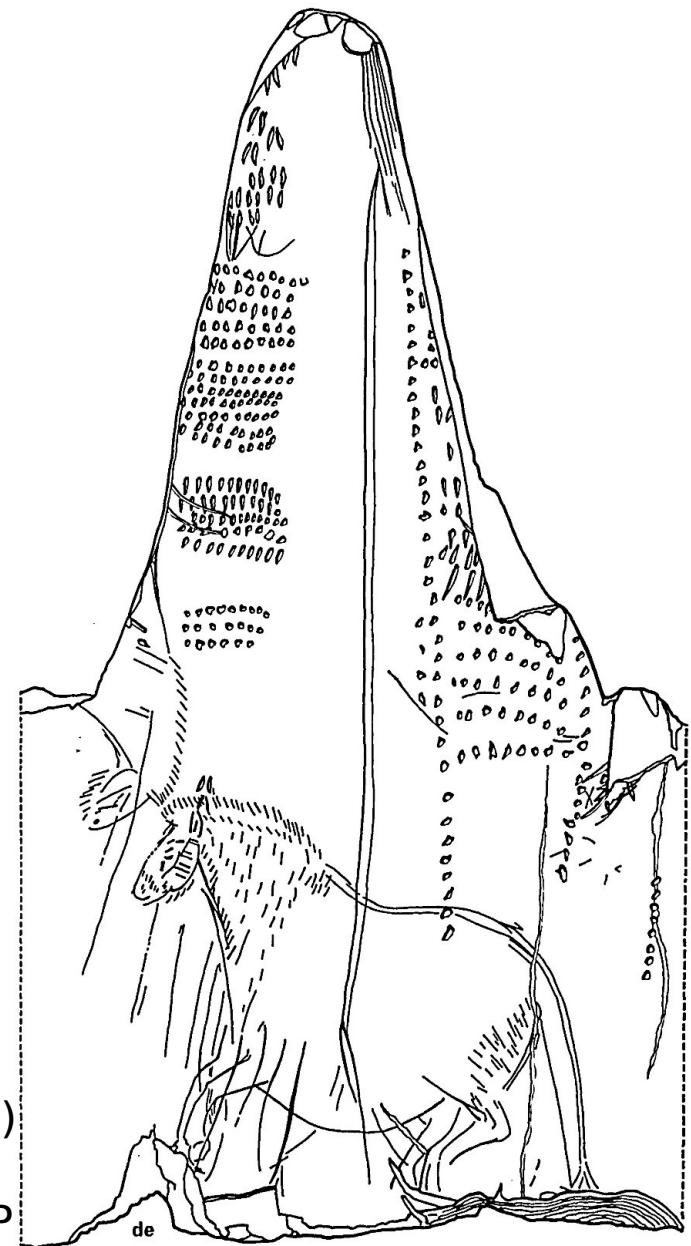


What about later periods?



Eliseevichi (RU)
Epigravettian
Ca. 15000 BP

La Marche (F)
Magdalenian
Ca. 15000 BP





Thank you for your attention!



Ewa Dutkiewicz



Christian Bentz



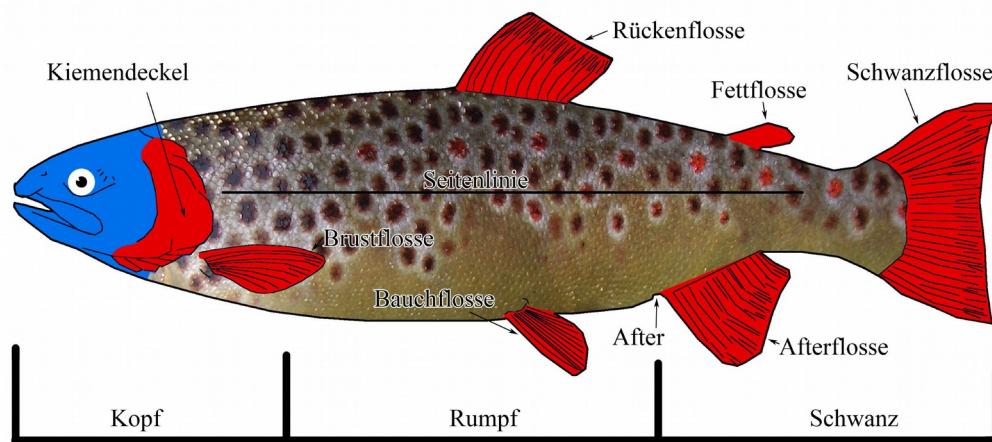
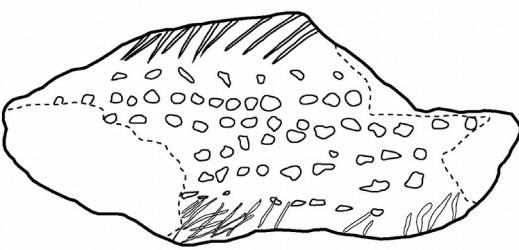
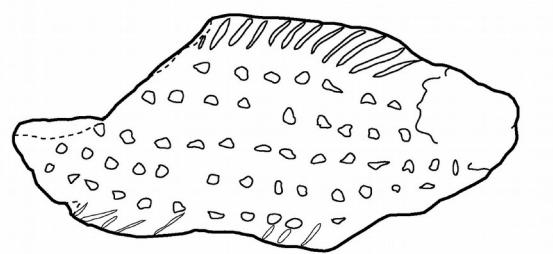
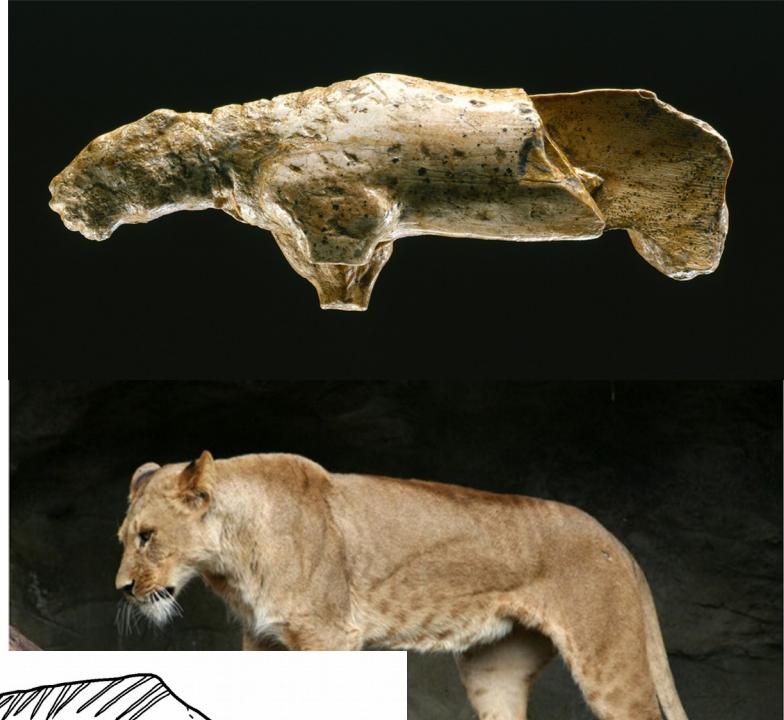
Stephanie Sampson

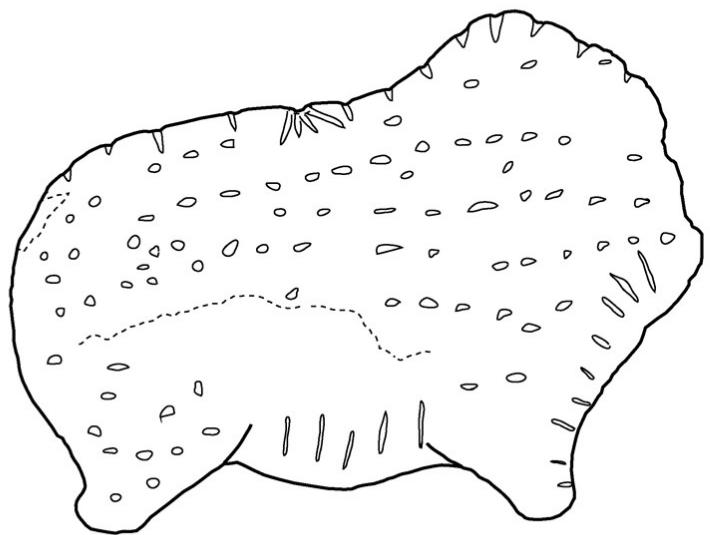
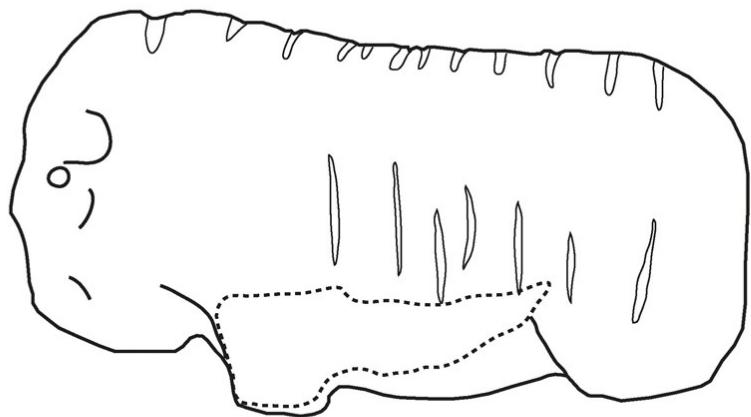


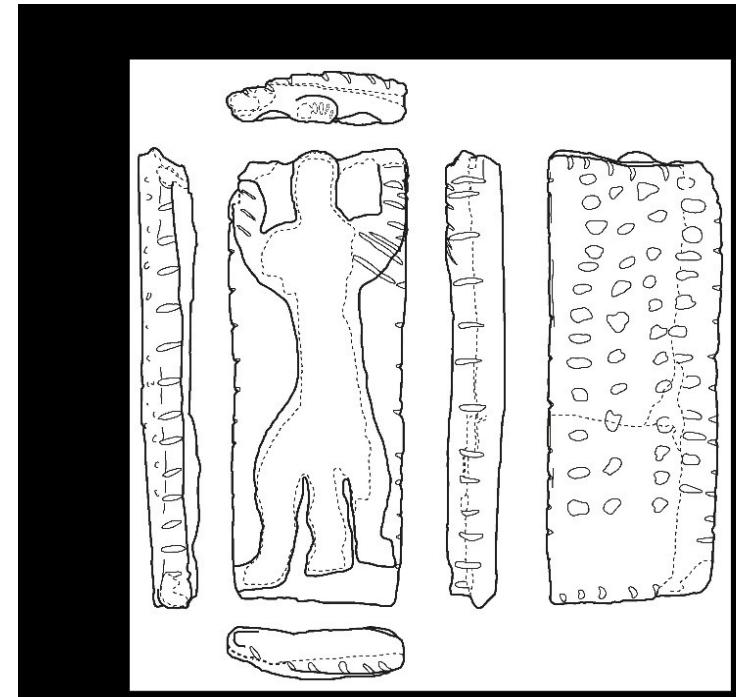
Saetbyul Lee



Gabriele Russo







2

Foto: E. Dutkiewicz
Zeichnung: E. Dutkiewicz