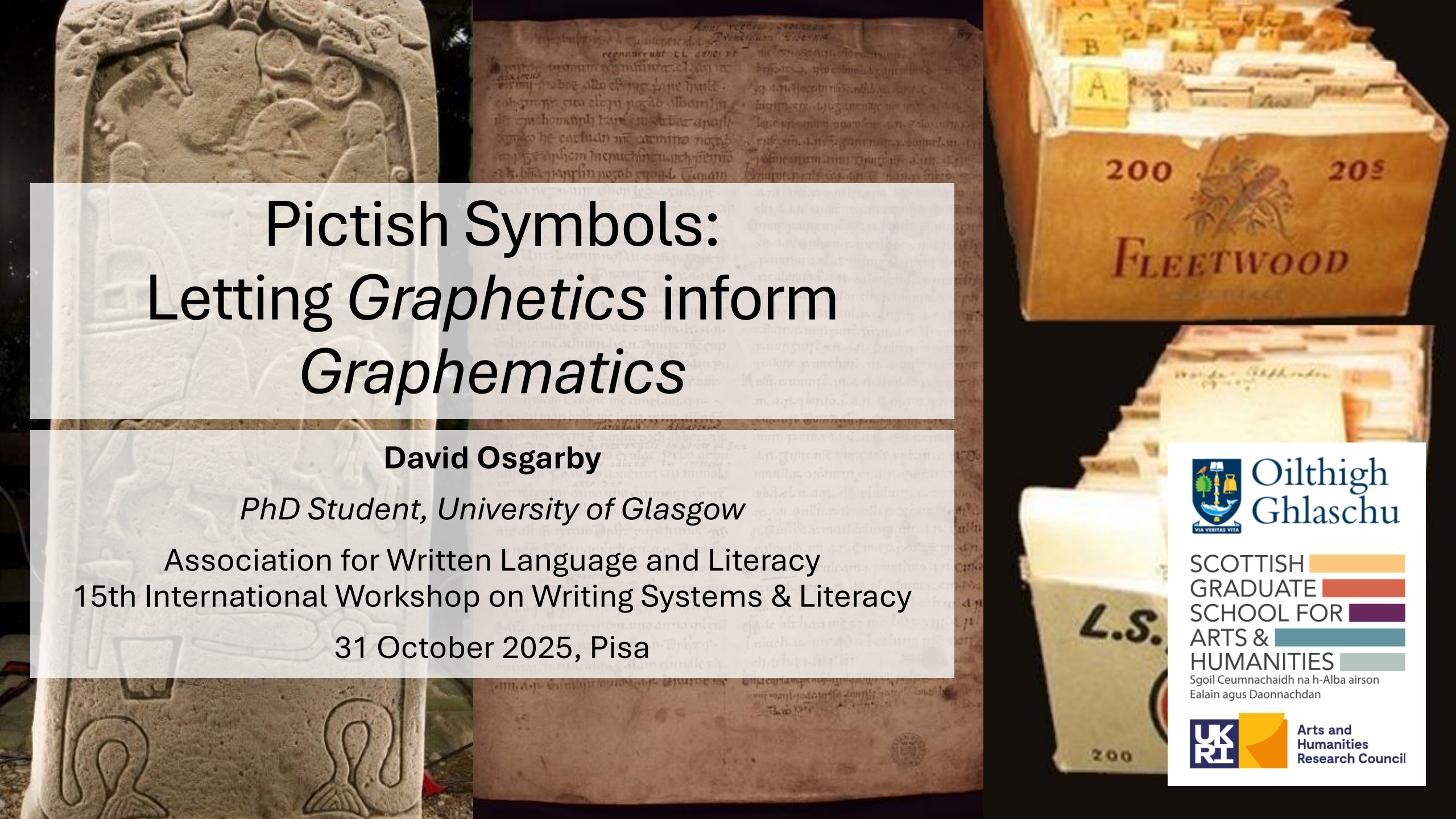

Pictish Symbols: Letting *Graphetics* inform *Graphematics*

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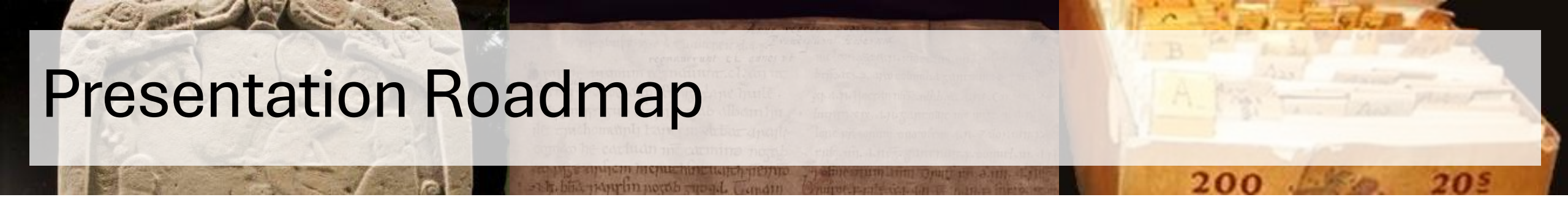
Association for Written Language and Literacy
15th International Workshop on Writing Systems & Literacy

31 October 2025, Pisa

Oilthigh Ghlaschu
SCOTTISH GRADUATE SCHOOL FOR ARTS & HUMANITIES
Sgoil Ceumnachaidh na h-Alba airson Ealain agus Daonnachdan

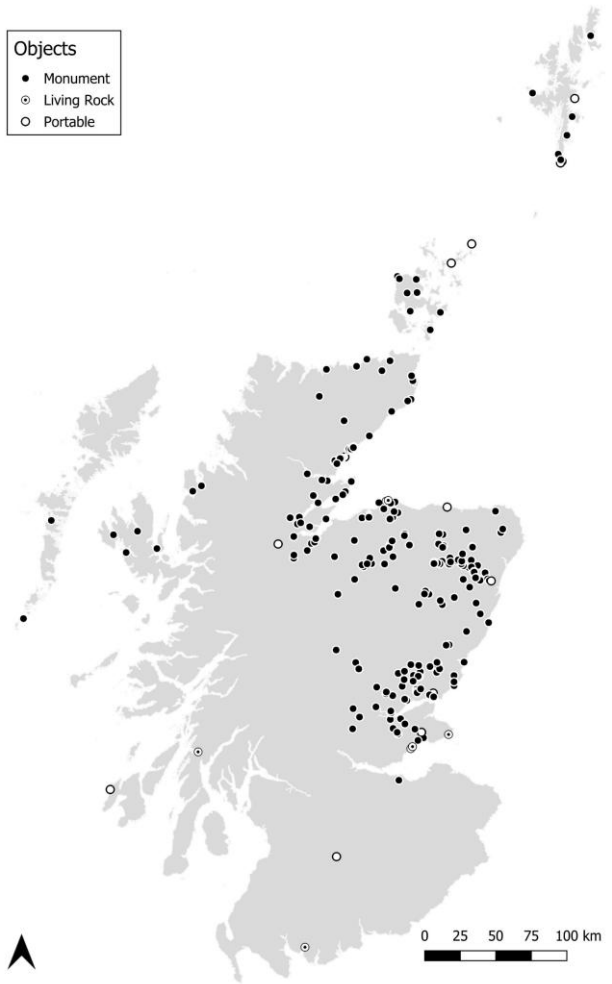
UKRI Arts and Humanities Research Council



Presentation Roadmap

- Introduction to **Pictish Symbols** as a *likely* writing system
- Micrographetics of basic shapes
  - Elementary forms, topography, symmetries, graphotatics
  - Pictish geometric basic shapes a **3×5×3 paradigm**
- Symbol inventory change over time/space
  - Systematic **loss of one type of modification**
- Implications of graphetic structure for possible graphematic models
  - Pictish abstract graphemes a simple **abugida**

Pictish Symbols




Author's


Author's


Author's


HES, SculptorsCaveFPhoto

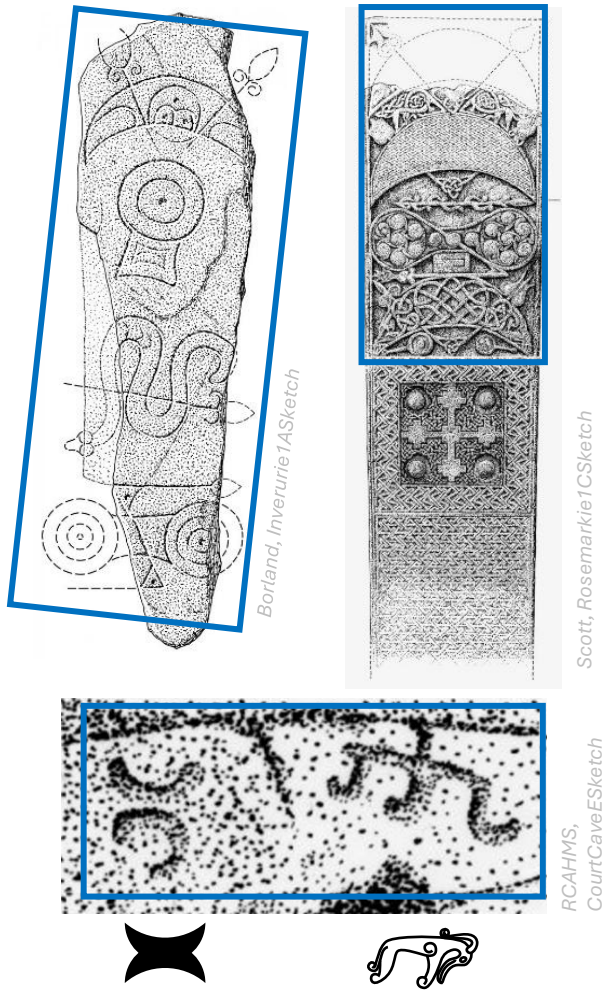

Author's

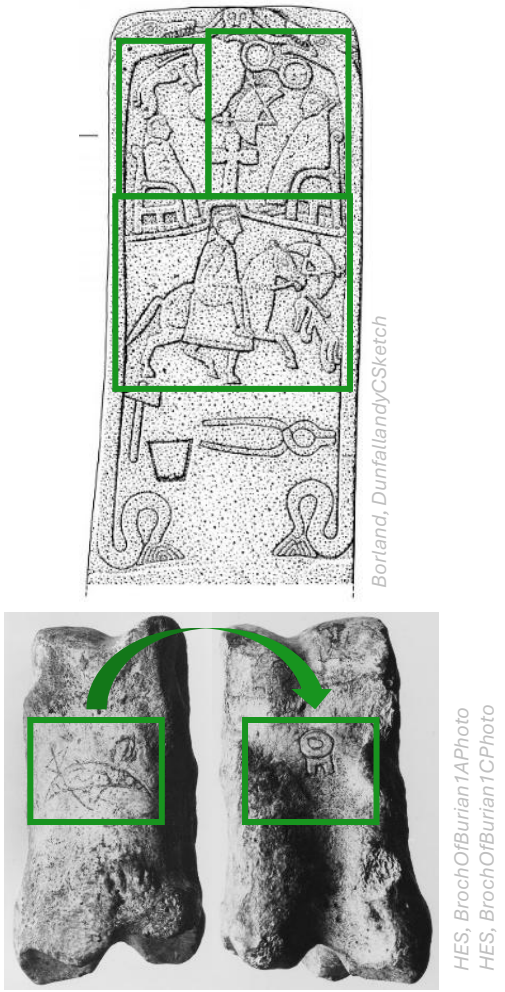
- Picts
  - 4th-9th Century AD
  - Brythonic (Celtic, IE)
  - Christianised
- Pictish Symbols
  - Symbol system
  - Regular over large area
  - Mostly monumental settings
- Proposed 'functions' of the symbol system to express
  - Social status
  - Tribal affiliation
  - Land ownership
  - Marriage alliances
  - Personal identifiers
- Alternative hypothesis
  - Writing system

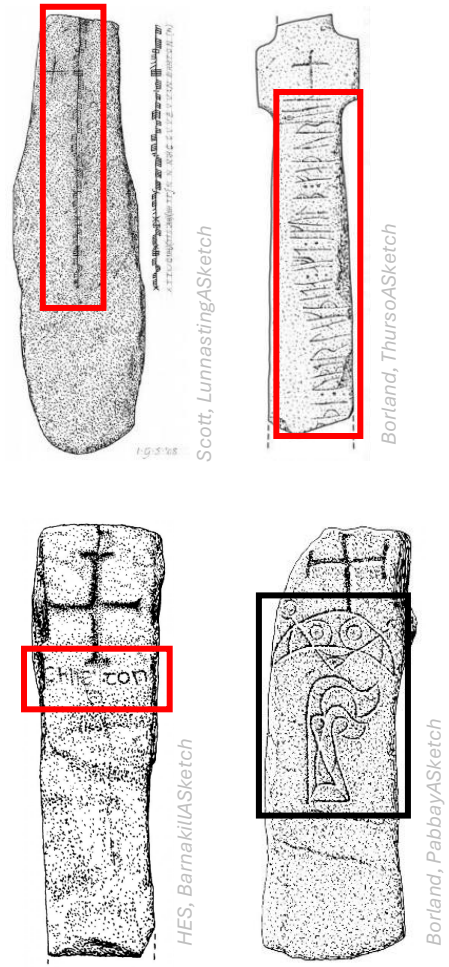
Thomas 1963, A. Jackson 1984, Forsyth 1995

Pictish Symbols: a *likely* writing system

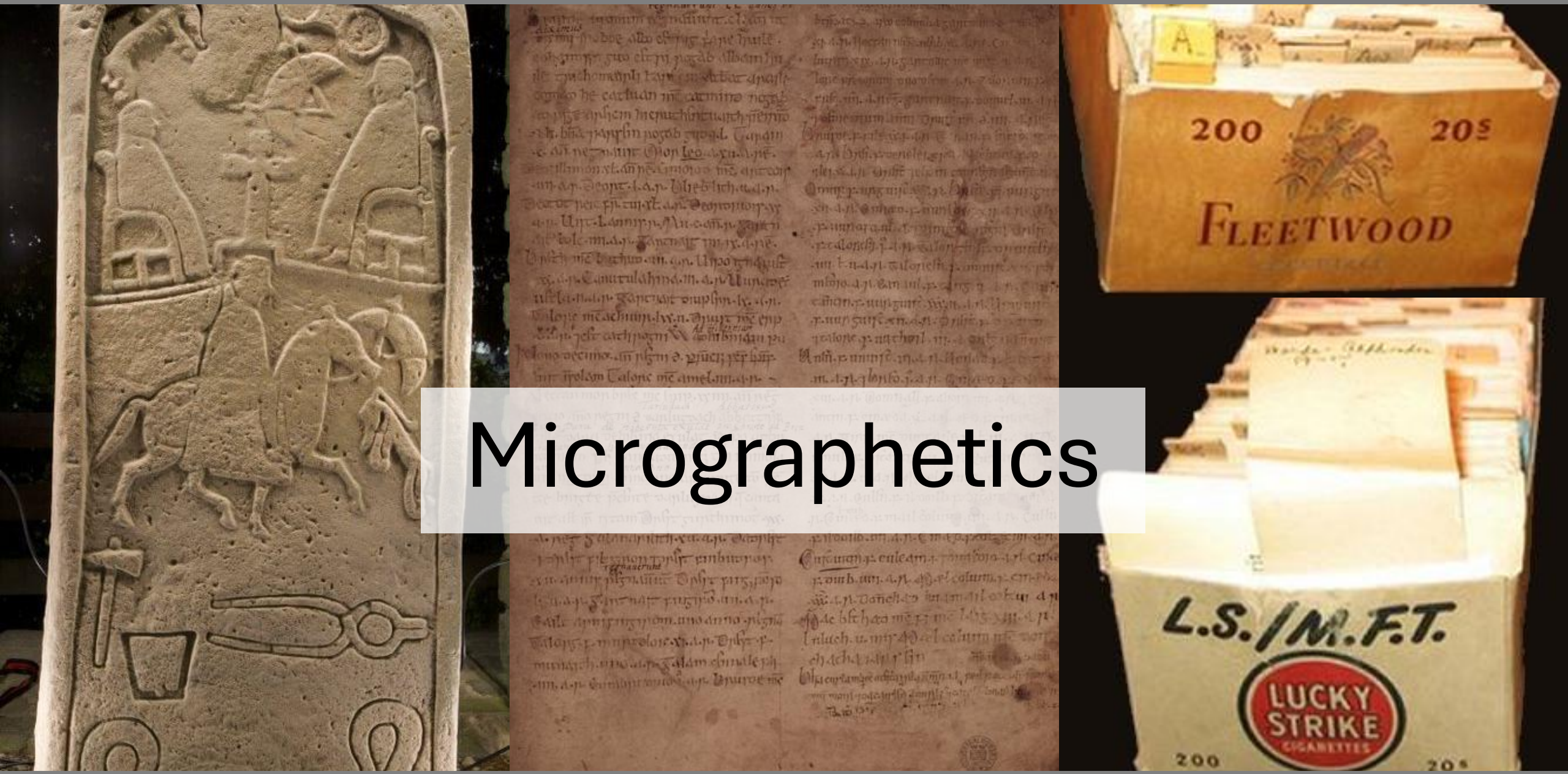
- Exhibits all ***necessary conditions*** to be a writing system:
  - Linearity, repetition, degree of cursivity
- Employed to serve **multiple functions**
  - Identification function
  - Non-identification function
- **Cognate textual settings** with known scripts
- Statistical arguments for and against Pictish Symbols as WS





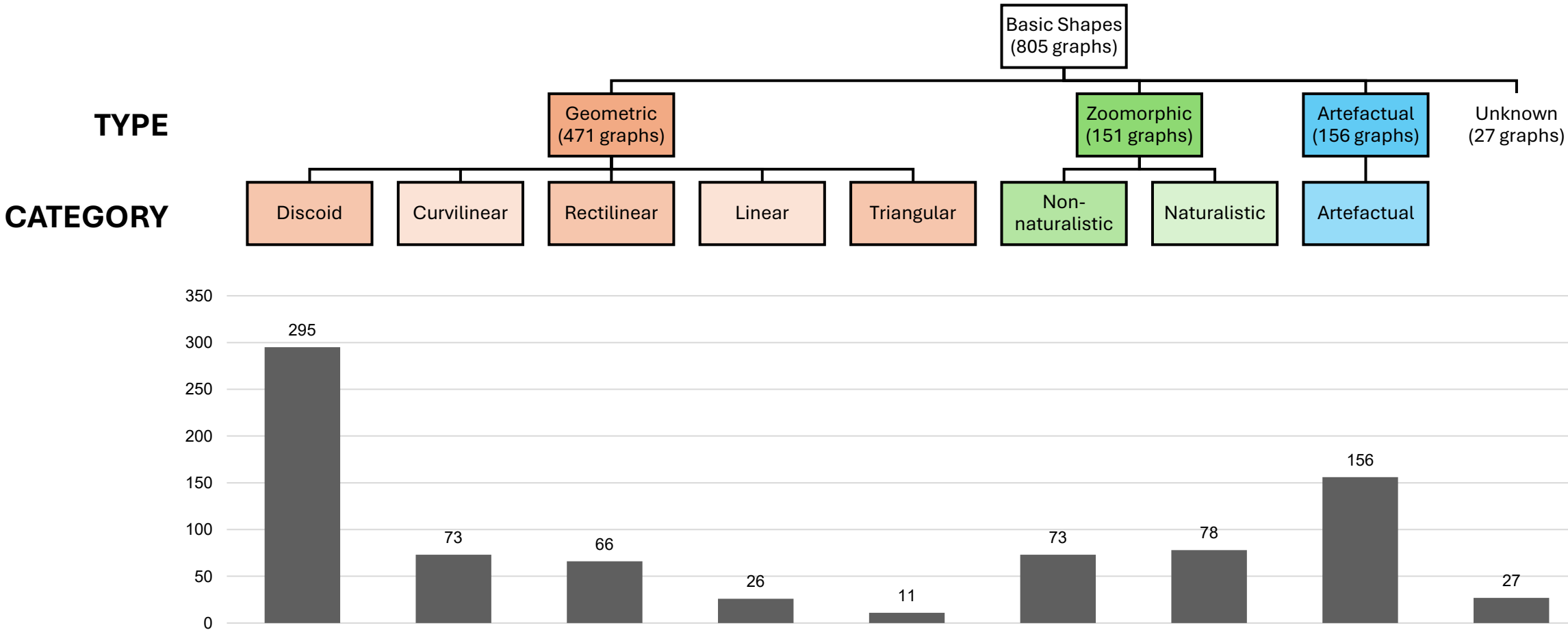


Lee et al. 2010; Lee 2010; Sproat 2010; Fournet 2011; Sproat 2014; Rao et al. 2015; Sproat 2015



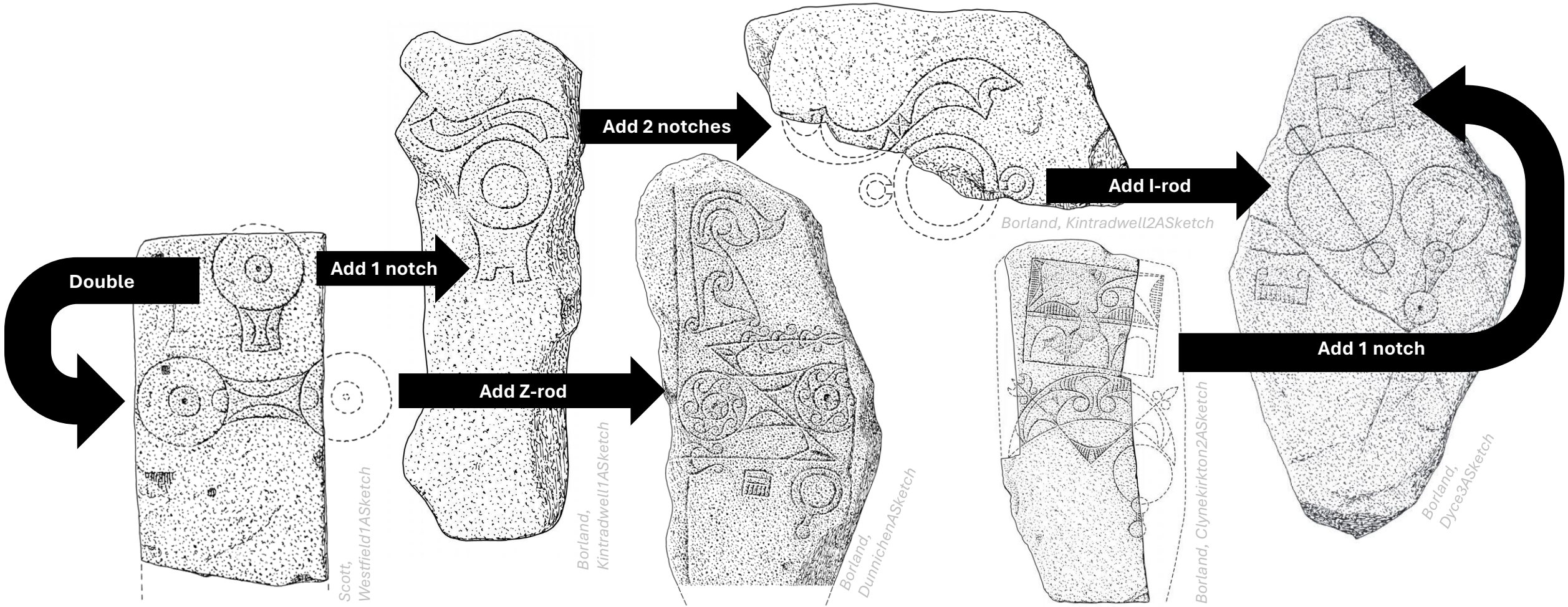
Micrographetics

Micrographetics: Groupings of Basic Shape



Henderson 1971; Forsyth 1995

Micrographetics: Geometric Basic Shapes



Micrographetics: Geometric Basic Shapes

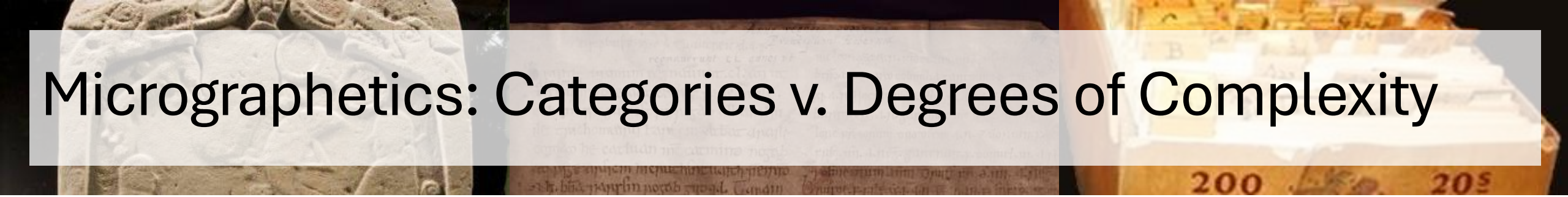
*‘the geometric symbols can be divided into one of **three categories** depending on whether their fundamental shape is based on complete circles, crescents/curved lines, or rectangles/straight lines.*

*Within each category, the symbols can be viewed as transformations of a single basic shape and arranged loosely in order of increasing **complexity**.*

*To take the **rectilinear** group: the simplest outline is that of a rectangle itself, transformed with one move it becomes the L-shaped-figure, once more and it is the stepped-rectangle, bent over it becomes the notched-rectangle. […]*

*Of course there is **considerable subjectivity** in this. […] My aim is merely to suggest an alternative way of conceptualising the symbols in which the whole series is generated by structured transformations from a number of basic forms.’*

Forsyth 1995: 90

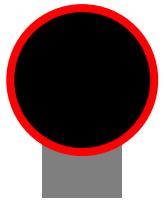


Micrographetics: Categories v. Degrees of Complexity

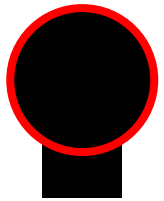
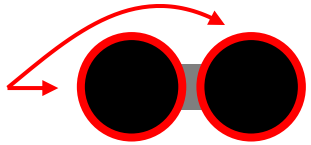
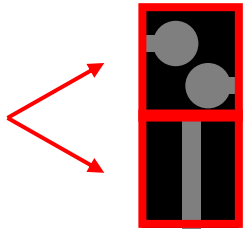
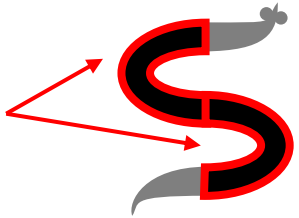
DEGREES OF COMPLEXITY

CATEGORIES	Single	Double	Triple	Half	Reflex
Discoid					
Rectilinear					
Curvilinear					

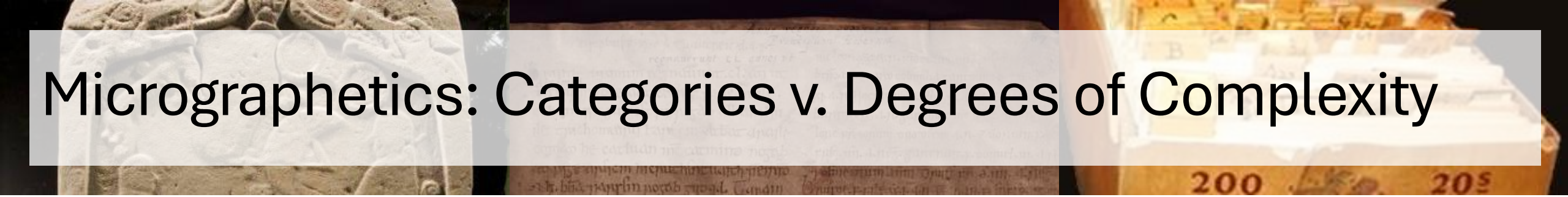
Micrographetics: Categories v. Degrees of Complexity

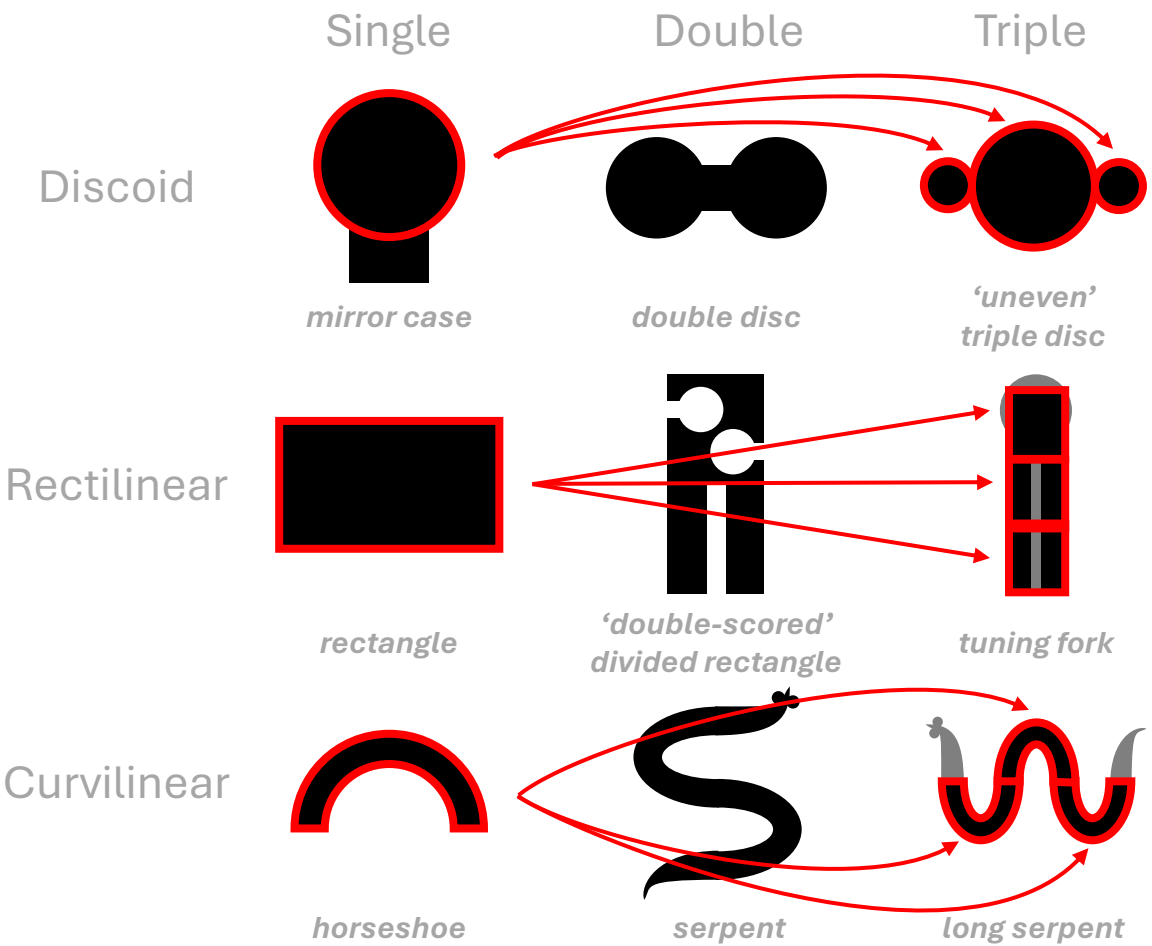
	Single	Double	Triple	Half	Reflex
Discoid	 *mirror case*				
Rectilinear	 *rectangle*				
Curvilinear	 *horseshoe*				

Micrographetics: Categories v. Degrees of Complexity

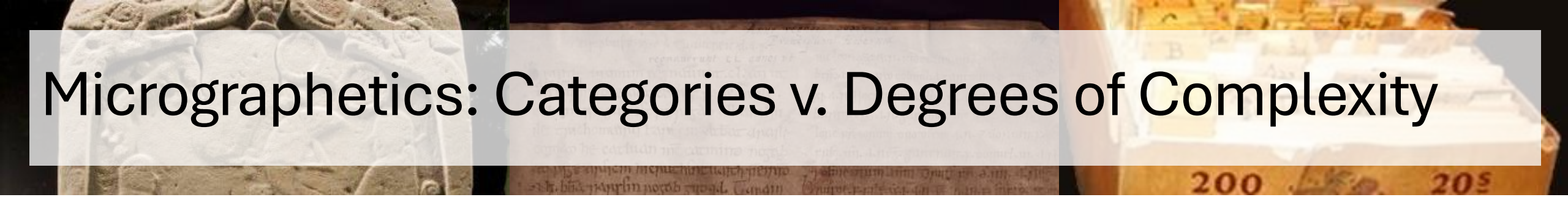
	Single	Double	Triple	Half	Reflex
Discoid	 *mirror case*	 *double disc*			
Rectilinear	 *rectangle*	 *'double-scored' divided rectangle*			
Curvilinear	 *horseshoe*	 *serpent*			

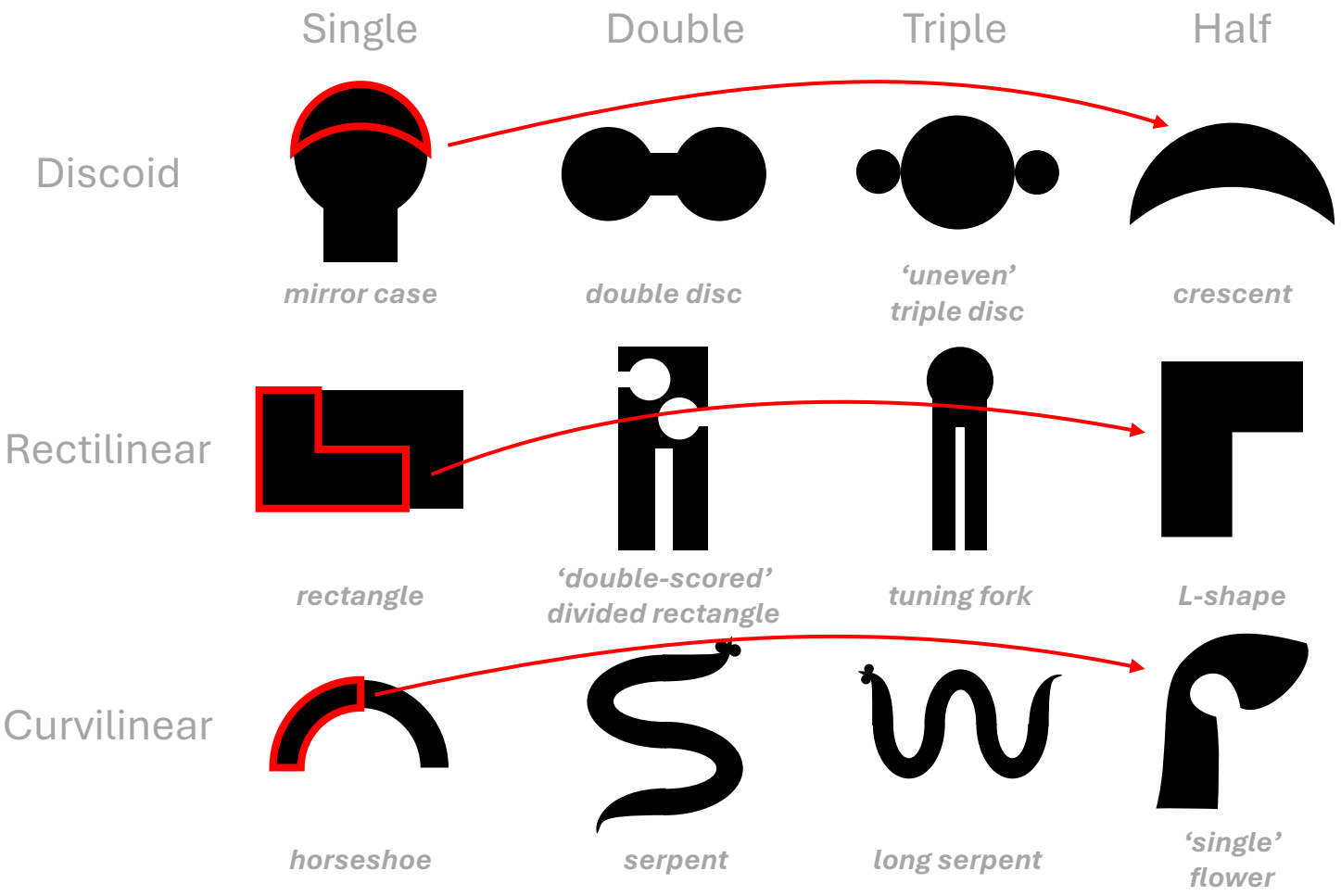
Micrographetics: Categories v. Degrees of Complexity



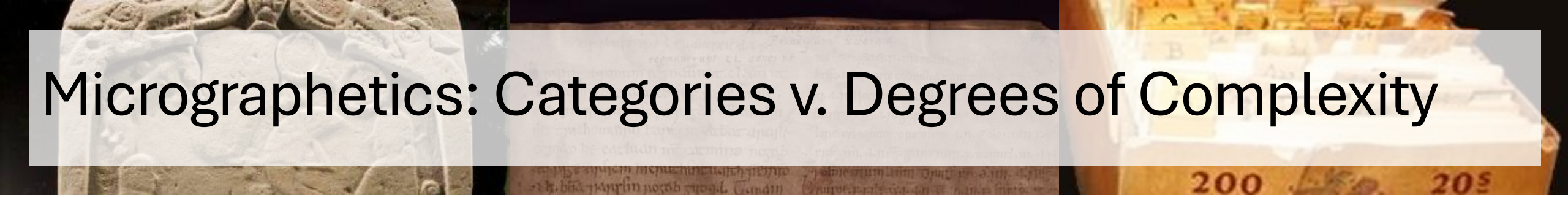


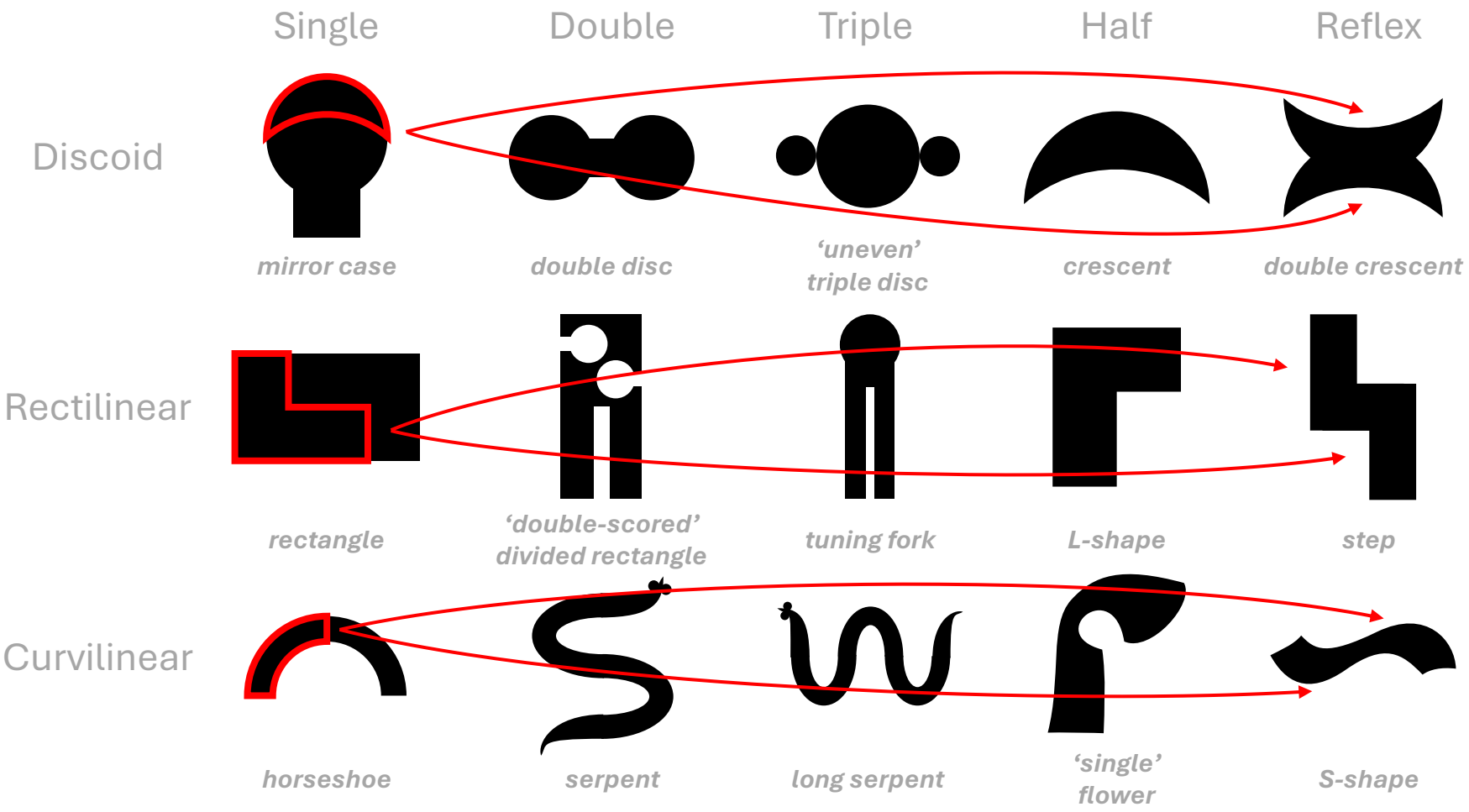
Micrographetics: Categories v. Degrees of Complexity



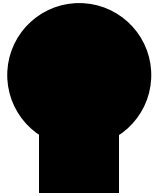
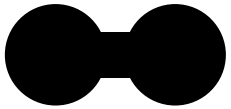
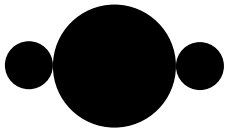
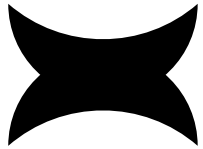
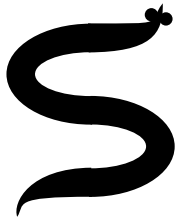
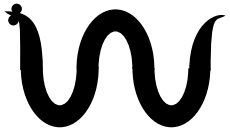


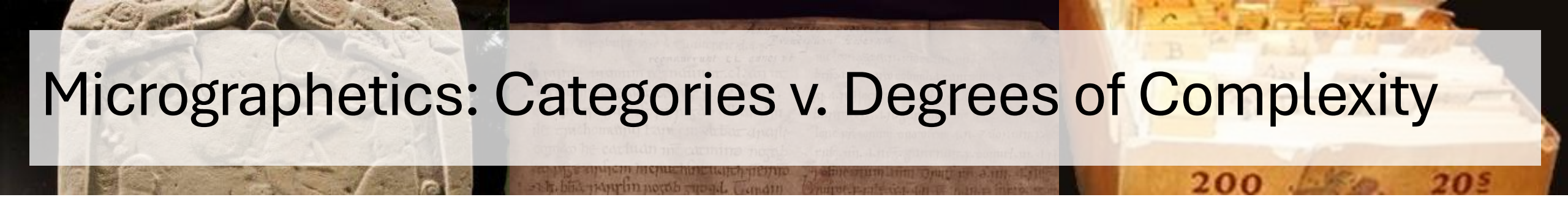
Micrographetics: Categories v. Degrees of Complexity





Micrographetics: Categories v. Degrees of Complexity

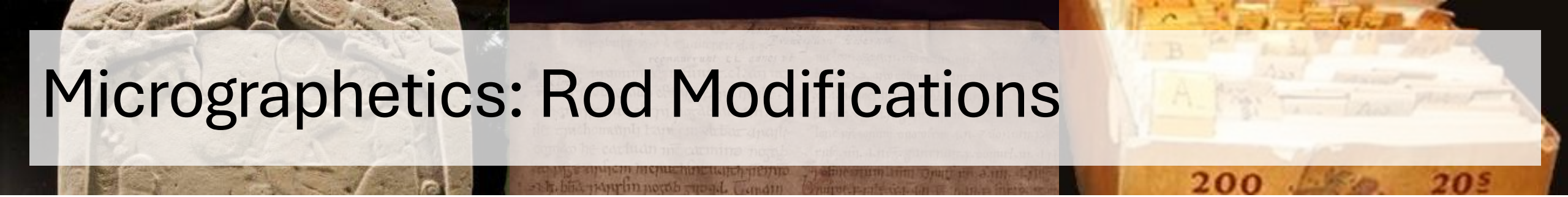
	Single	Double	Triple	Half	Reflex
Discoid	 *mirror case*	 *double disc*	 *'uneven' triple disc*	 *crescent*	 *double crescent*
Rectilinear	 *rectangle*	 *'double-scored' divided rectangle*	 *tuning fork*	 *L-shape*	 *step*
Curvilinear	 *horseshoe*	 *serpent*	 *long serpent*	 *'single' flower*	 *S-shape*

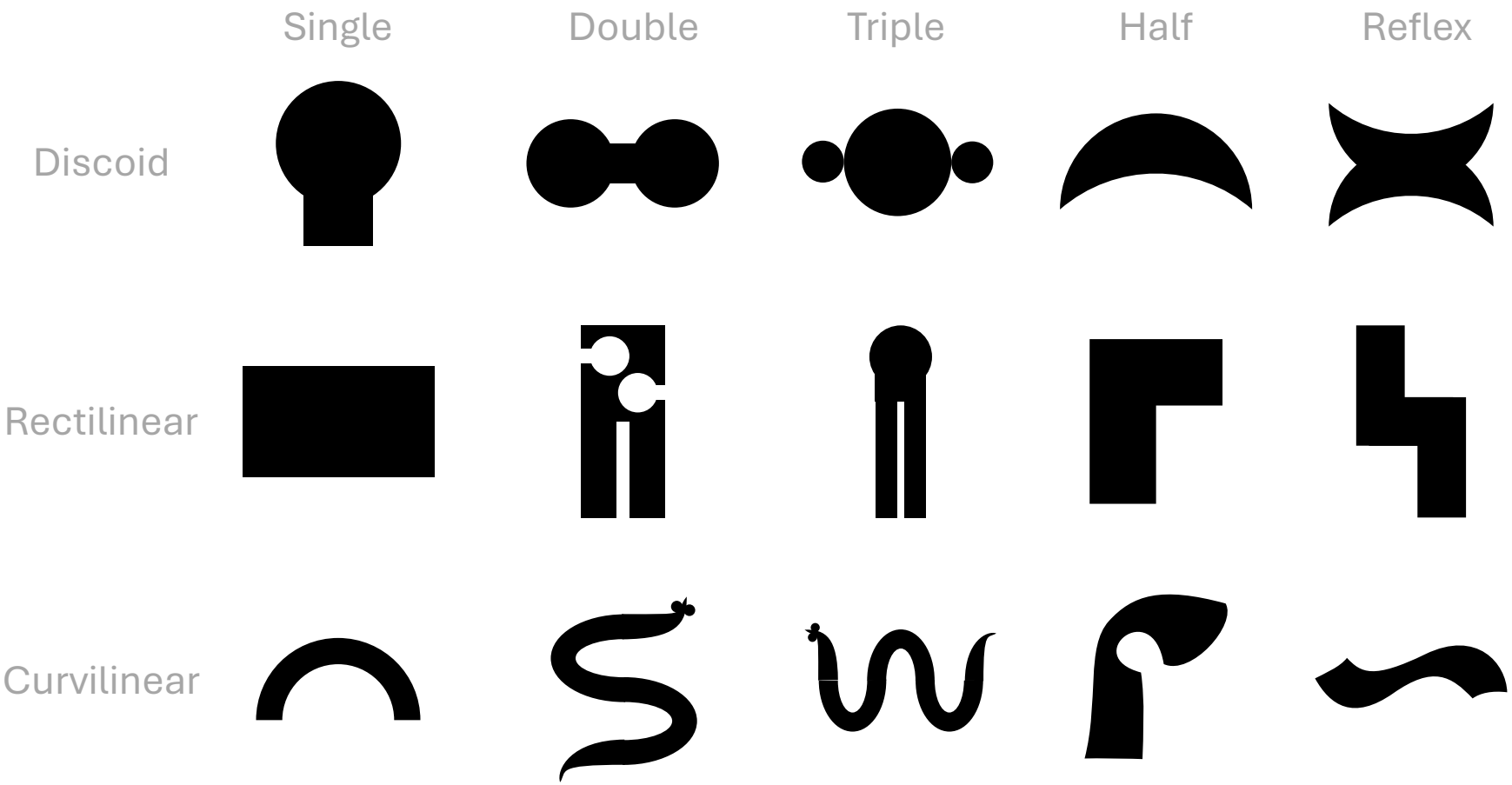


Micrographetics: Categories v. Degrees of Complexity

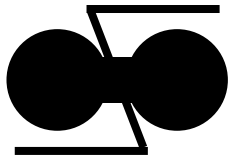
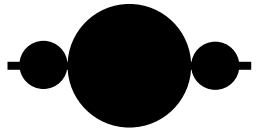
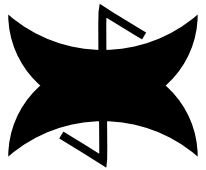
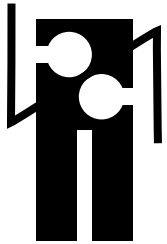
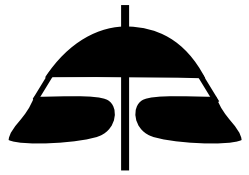
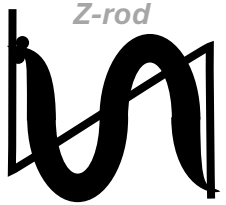
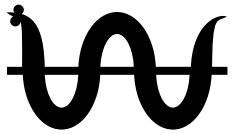
- All geometric basic shapes can be expressed in terms of **5 regular transformations of 3 basic shapes**
- Other graphetic properties of the basic shapes **reinforce** this paradigmatic characterisation
  - Rod-modification shape (Z, V, I)
  - Edge-modification number (1, 2)
  - Intrinsic symmetries

Micrographetics: Rod Modifications

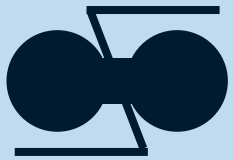
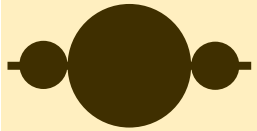
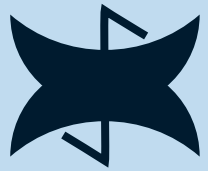
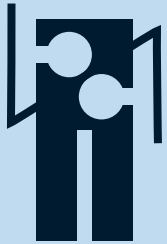
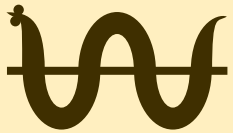




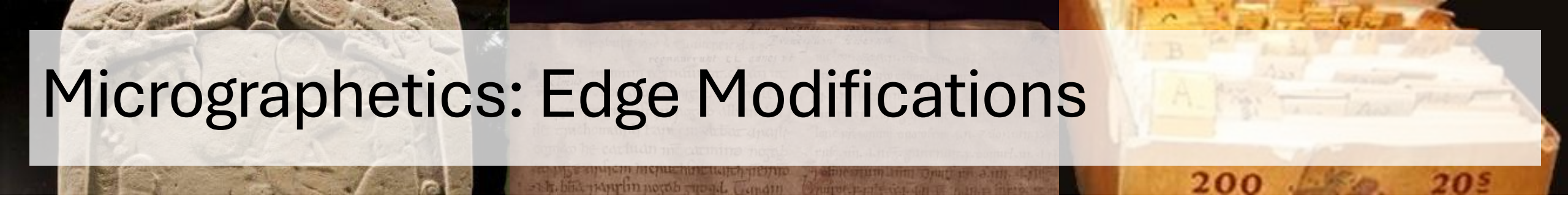
Micrographetics: Rod Modifications

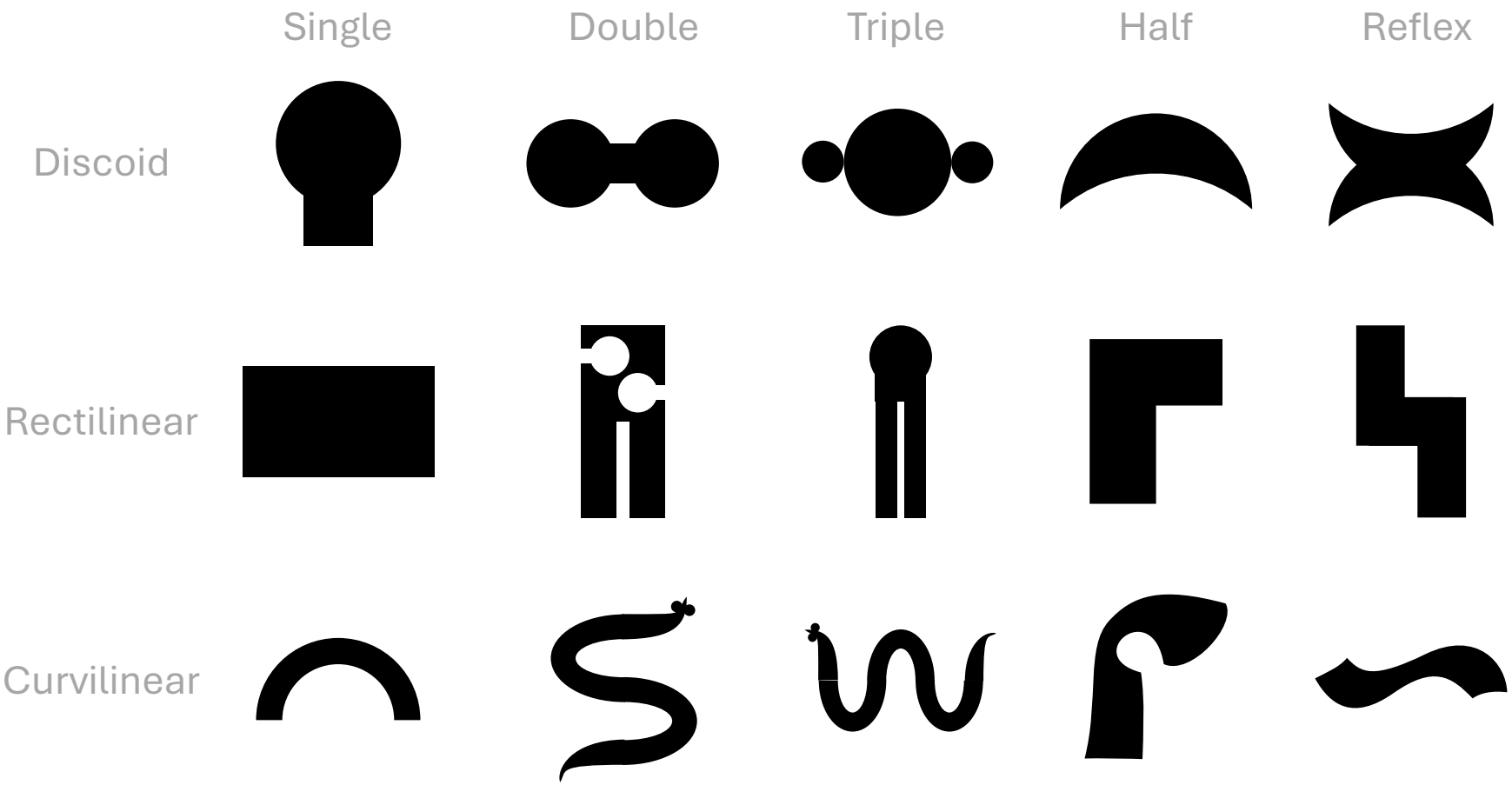
	Single	Double	Triple	Half	Reflex
Discoid		 *double disc Z-rod*	 *'uneven' triple disc I-rod*	 *crescent V-rod*	 *double crescent Z-rod*
Rectilinear		 *'double-scored' divided rectangle Z-rod*	 *helmet I-rod*		
Curvilinear	 *horseshoe V-rod*	 *serpent Z-rod*	 *long serpent I-rod*		

Micrographetics: Rod Modifications

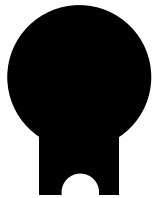
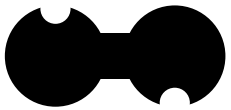
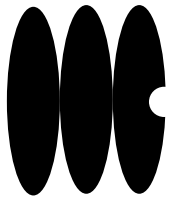
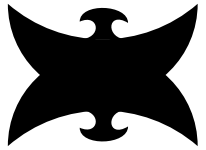
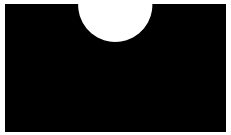
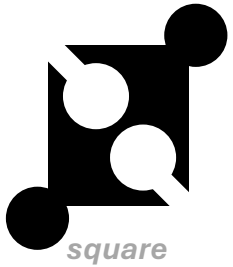
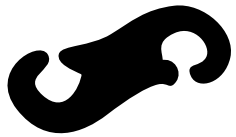
	Single	Double	Triple	Half	Reflex
Discoid		 *double disc* *Z-rod*	 *'uneven'* *triple disc* *I-rod*	 *crescent* *V-rod*	 *double crescent* *Z-rod*
Rectilinear		 *'double-scored'* *divided rectangle* *Z-rod*	 *helmet* *I-rod*		
Curvilinear	 *horseshoe* *V-rod*	 *serpent* *Z-rod*	 *long serpent* *I-rod*		

Micrographetics: Edge Modifications

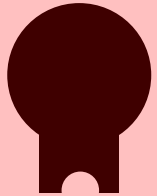
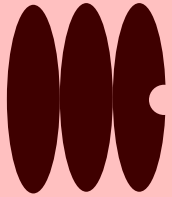
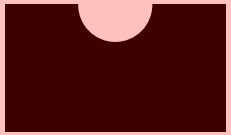
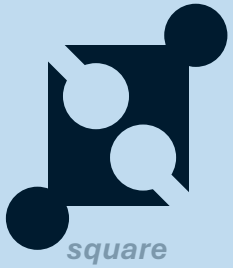




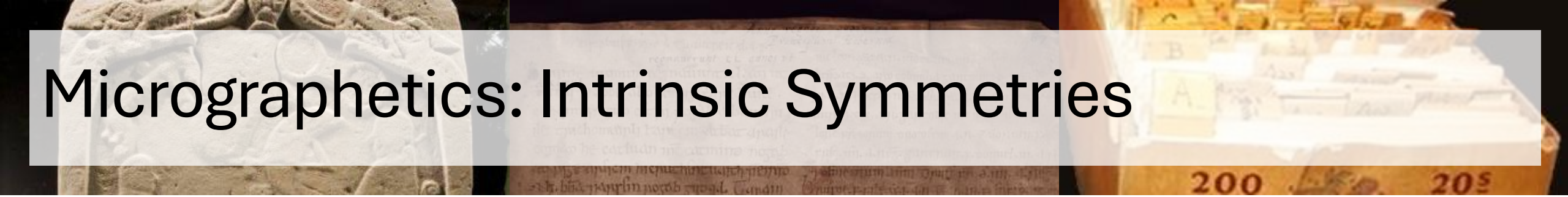
Micrographetics: Edge Modifications

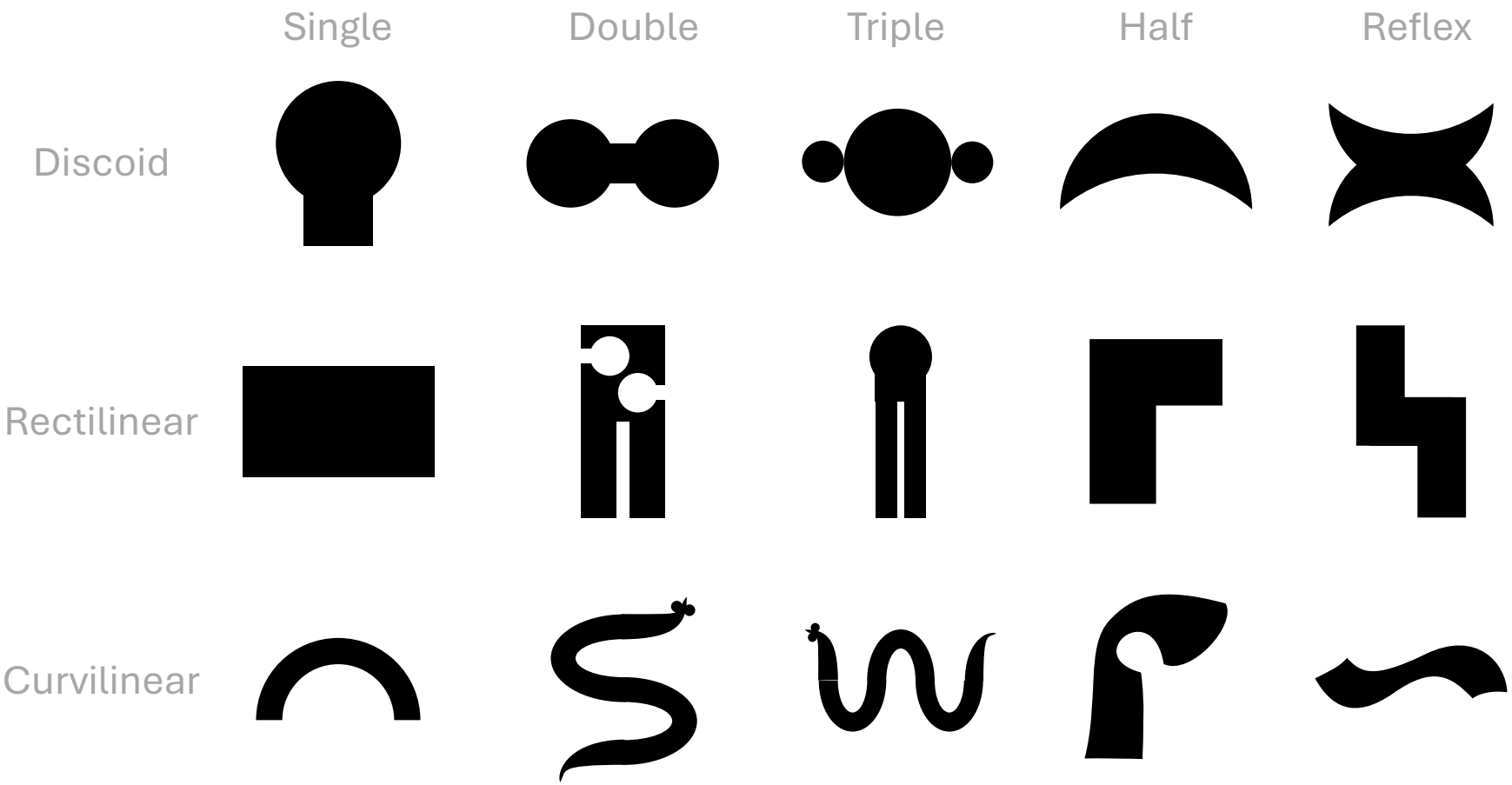
	Single	Double	Triple	Half	Reflex
Discoid	 *mirror case 1 notch*	 *double disc 2 notches*	 *'compressed' triple disc 1 notch*	 *crescent 1 notch*	 *double crescent 2 peltas*
Rectilinear	 *rectangle 1 notch*	 *square 2 bulbs*	 *tuning fork 1 pelta*		 *step 2 peltas*
Curvilinear	 *horseshoe 1 bulb*	 *dual carabiner 2 bulbs*		 *'double' flower 1 notch*	 *S-shape 2 notches*

Micrographetics: Edge Modifications

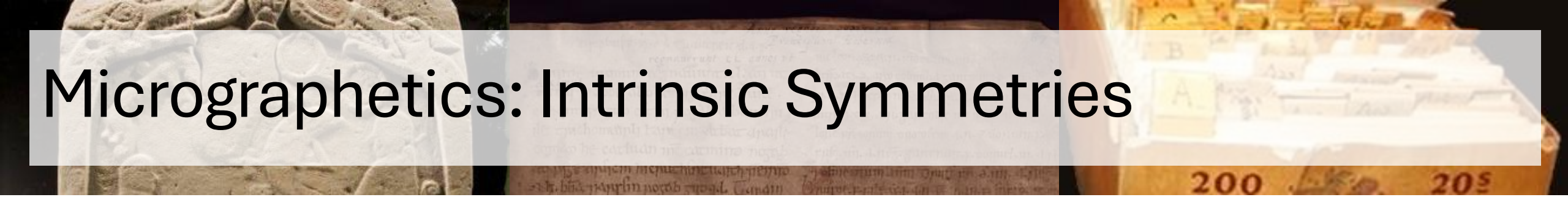
	Single	Double	Triple	Half	Reflex
Discoid	 *mirror case 1 notch*	 *double disc 2 notches*	 *'compressed' triple disc 1 notch*	 *crescent 1 notch*	 *double crescent 2 peltas*
Rectilinear	 *rectangle 1 notch*	 *square 2 bulbs*	 *tuning fork 1 pelta*		 *step 2 peltas*
Curvilinear	 *horseshoe 1 bulb*	 *dual carabiner 2 bulbs*		 *'double' flower 1 notch*	 *S-shape 2 notches*

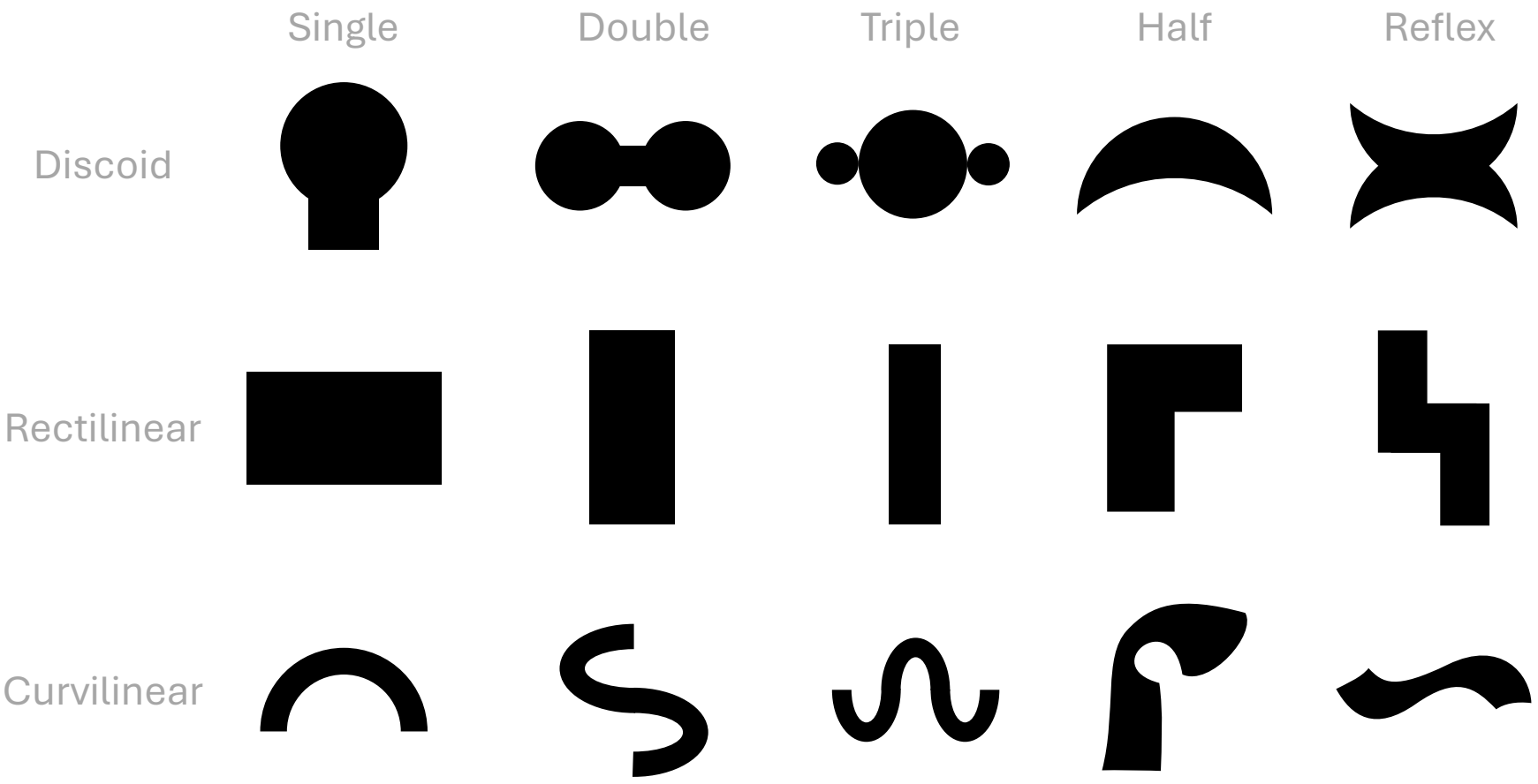
Micrographetics: Intrinsic Symmetries





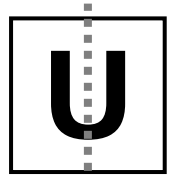
Micrographetics: Intrinsic Symmetries



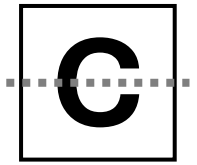


Types of Symmetry

- Reflectional
  - *Vertical*

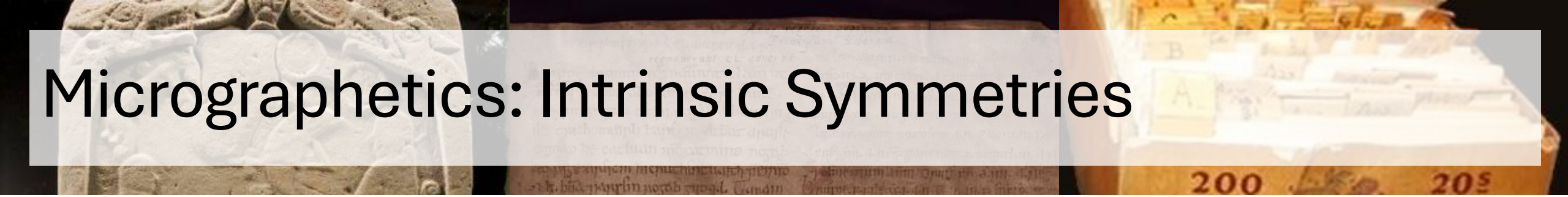


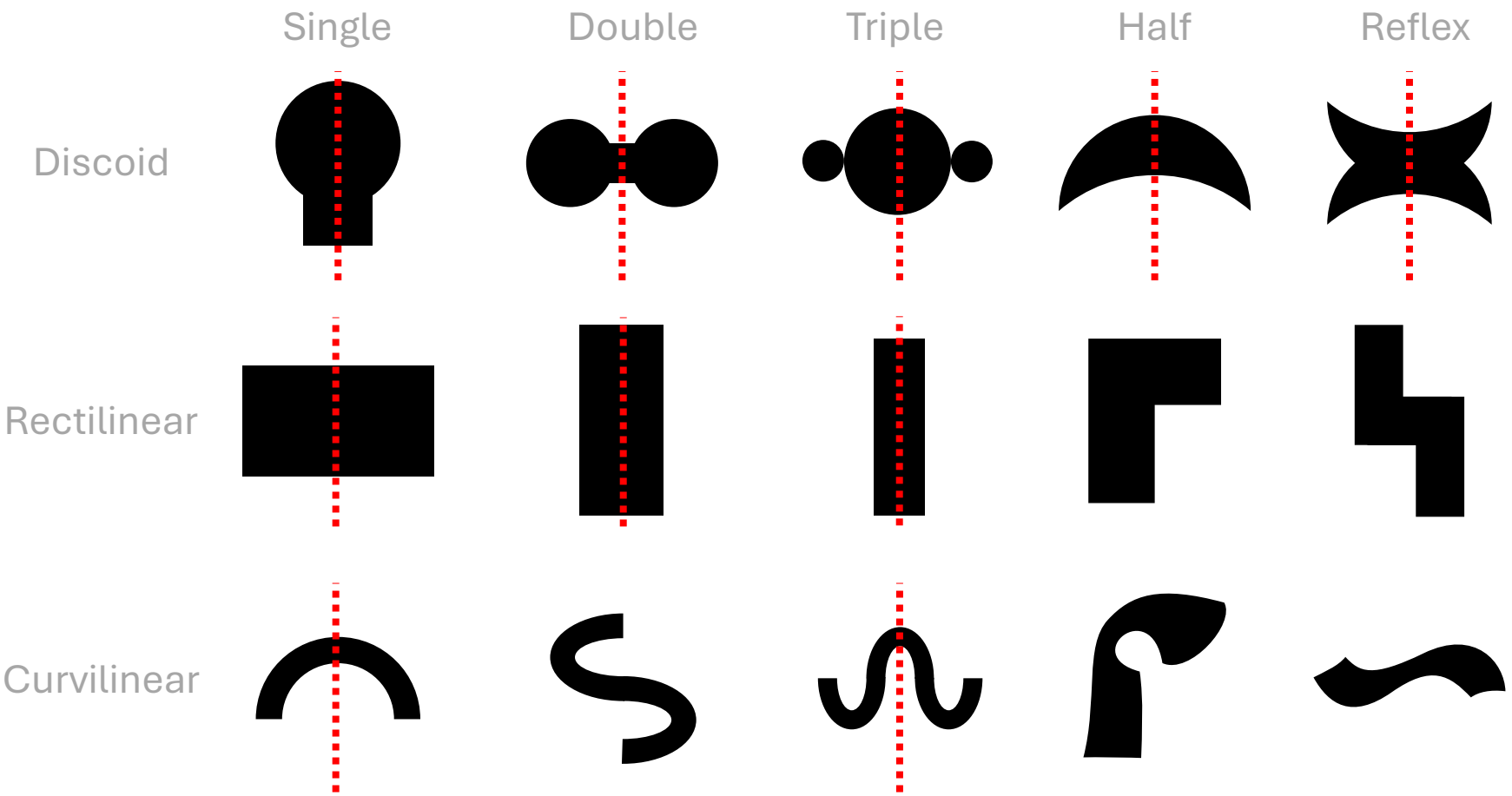
  - *Horizontal*



- Rotational

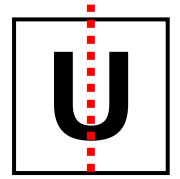
Micrographetics: Intrinsic Symmetries



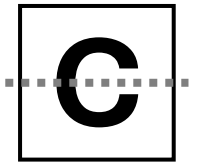


Types of Symmetry

- Reflectional
  - *Vertical*

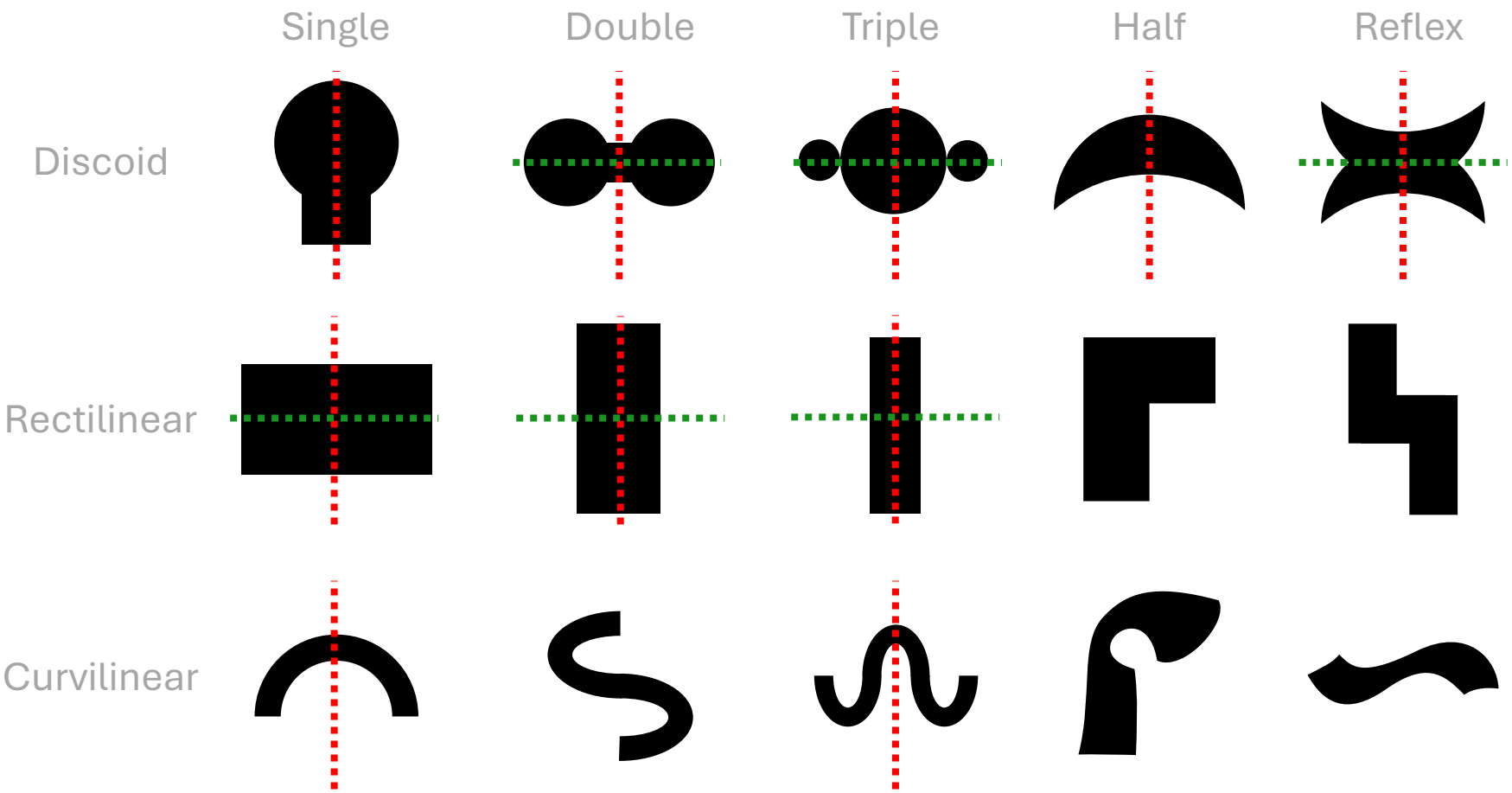


  - *Horizontal*



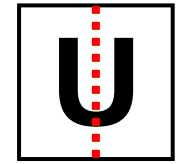
- Rotational

Micrographetics: Intrinsic Symmetries

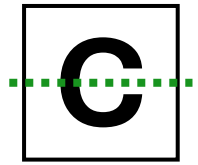


Types of Symmetry

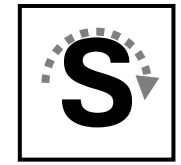
- Reflectional
  - *Vertical*



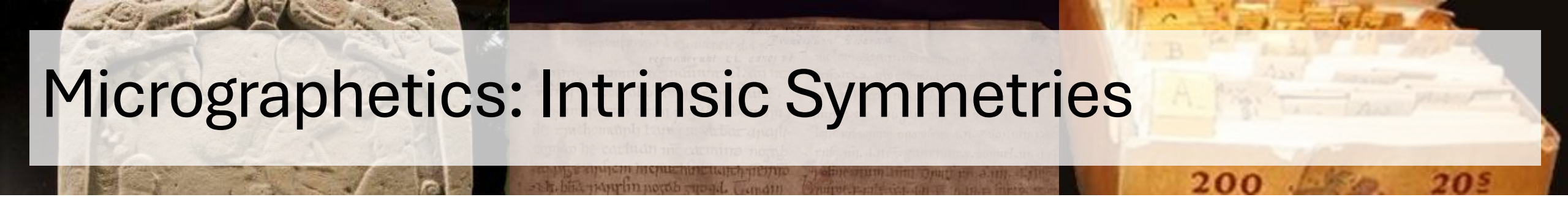
  - *Horizontal*

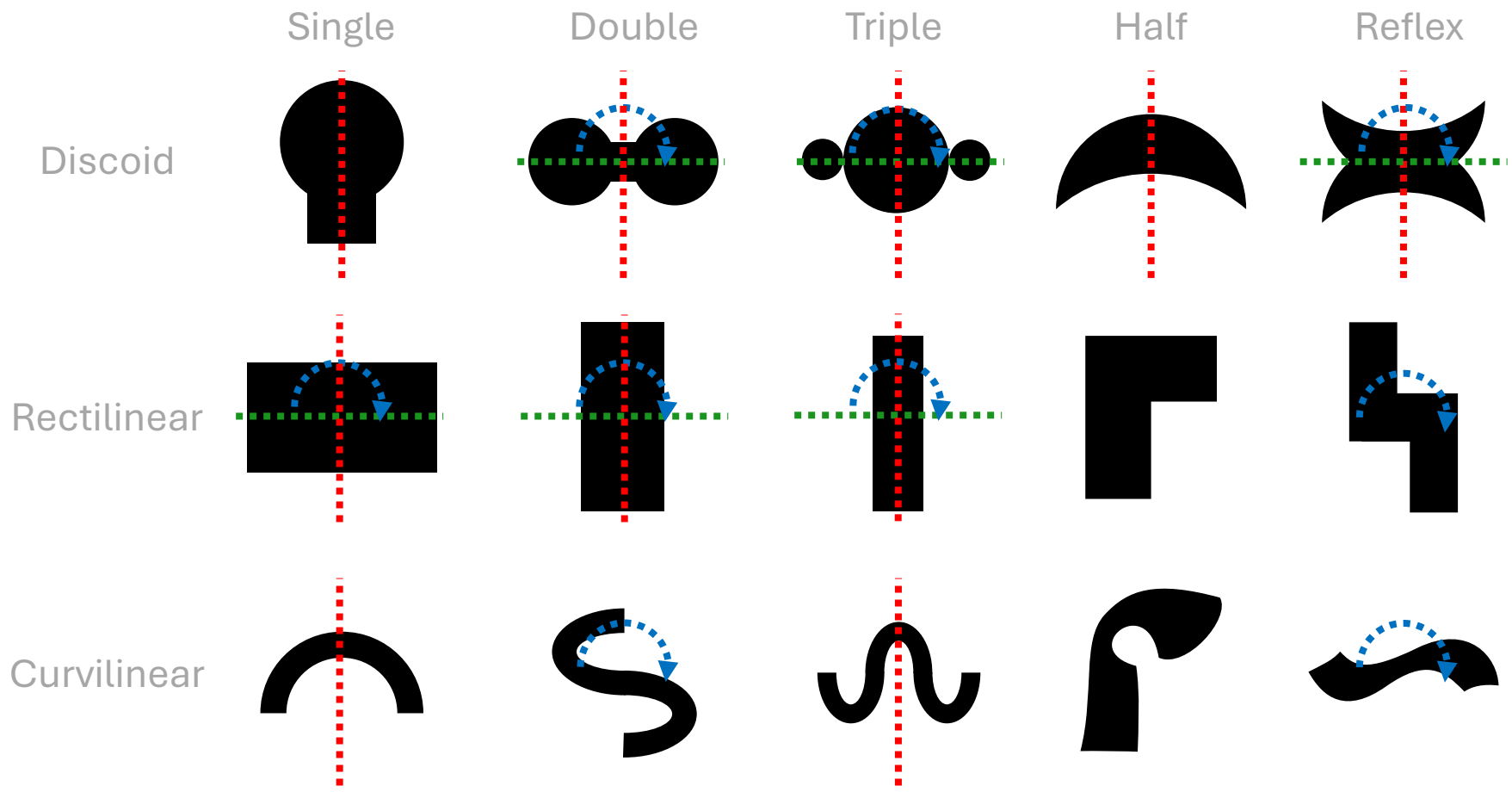


- Rotational



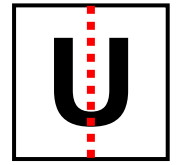
Micrographetics: Intrinsic Symmetries



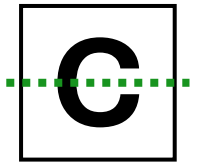


Types of Symmetry

- Reflectional
  - *Vertical*

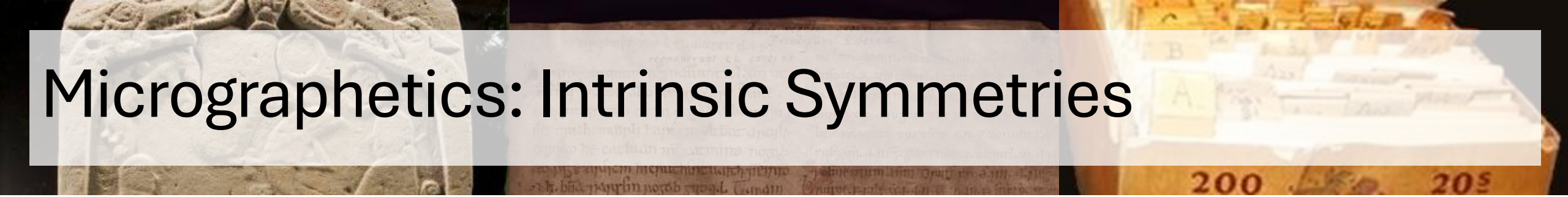


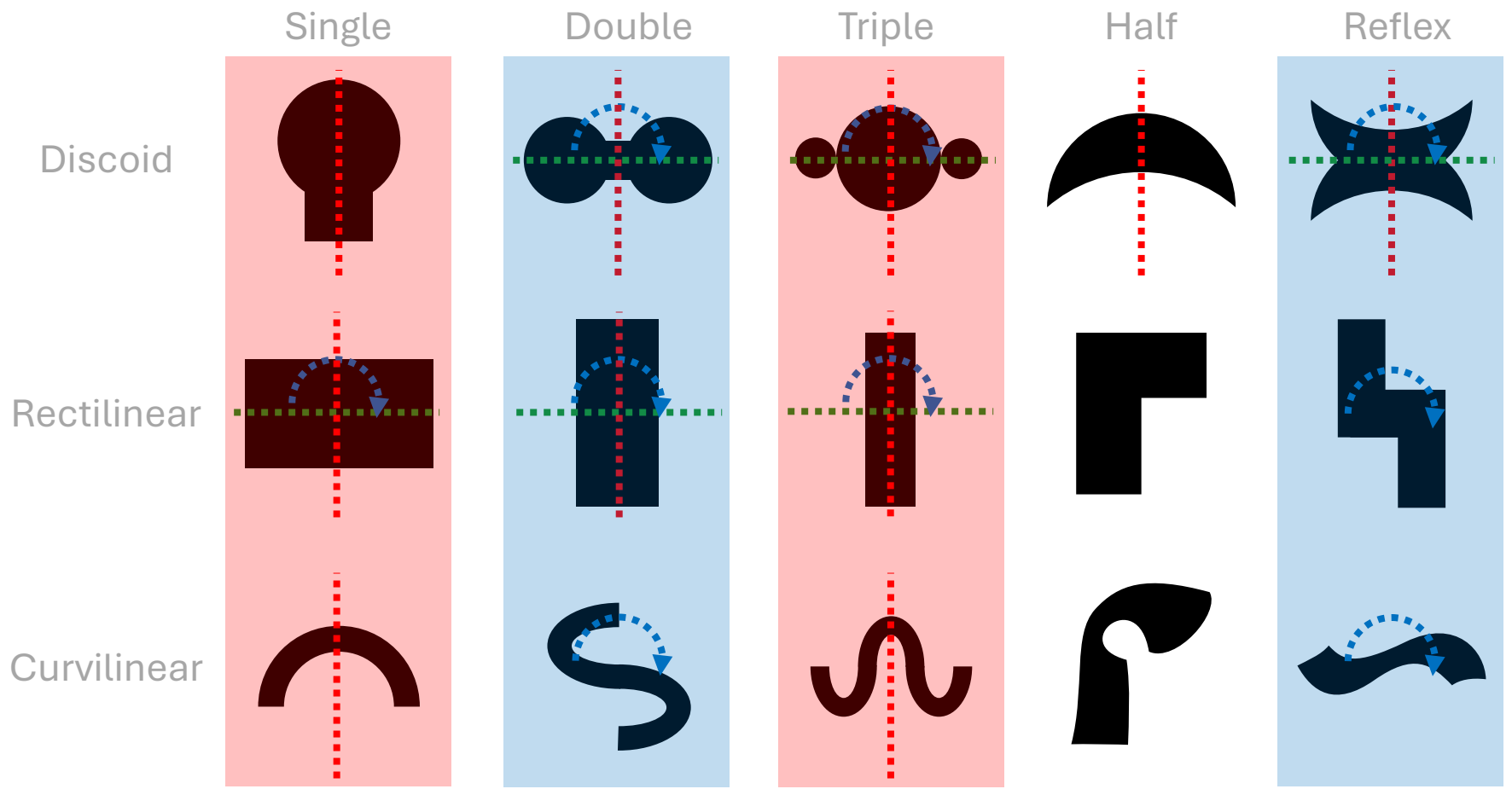
  - *Horizontal*



- Rotational

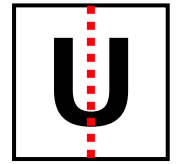
Micrographetics: Intrinsic Symmetries



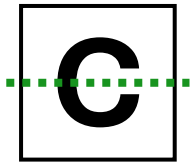


Types of Symmetry

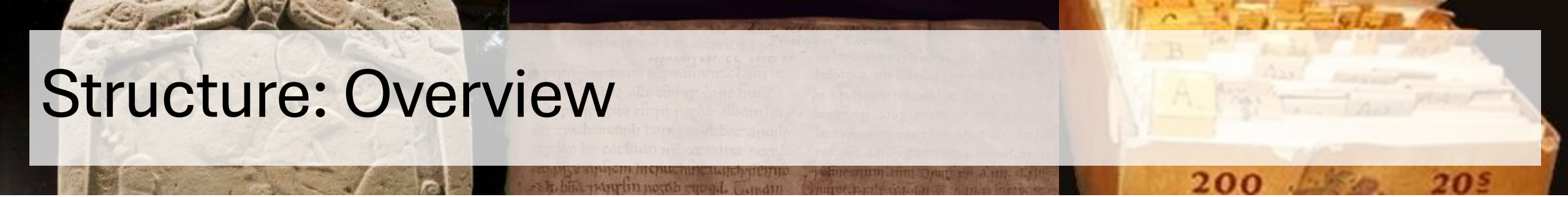
- Reflectional
  - *Vertical*



  - *Horizontal*

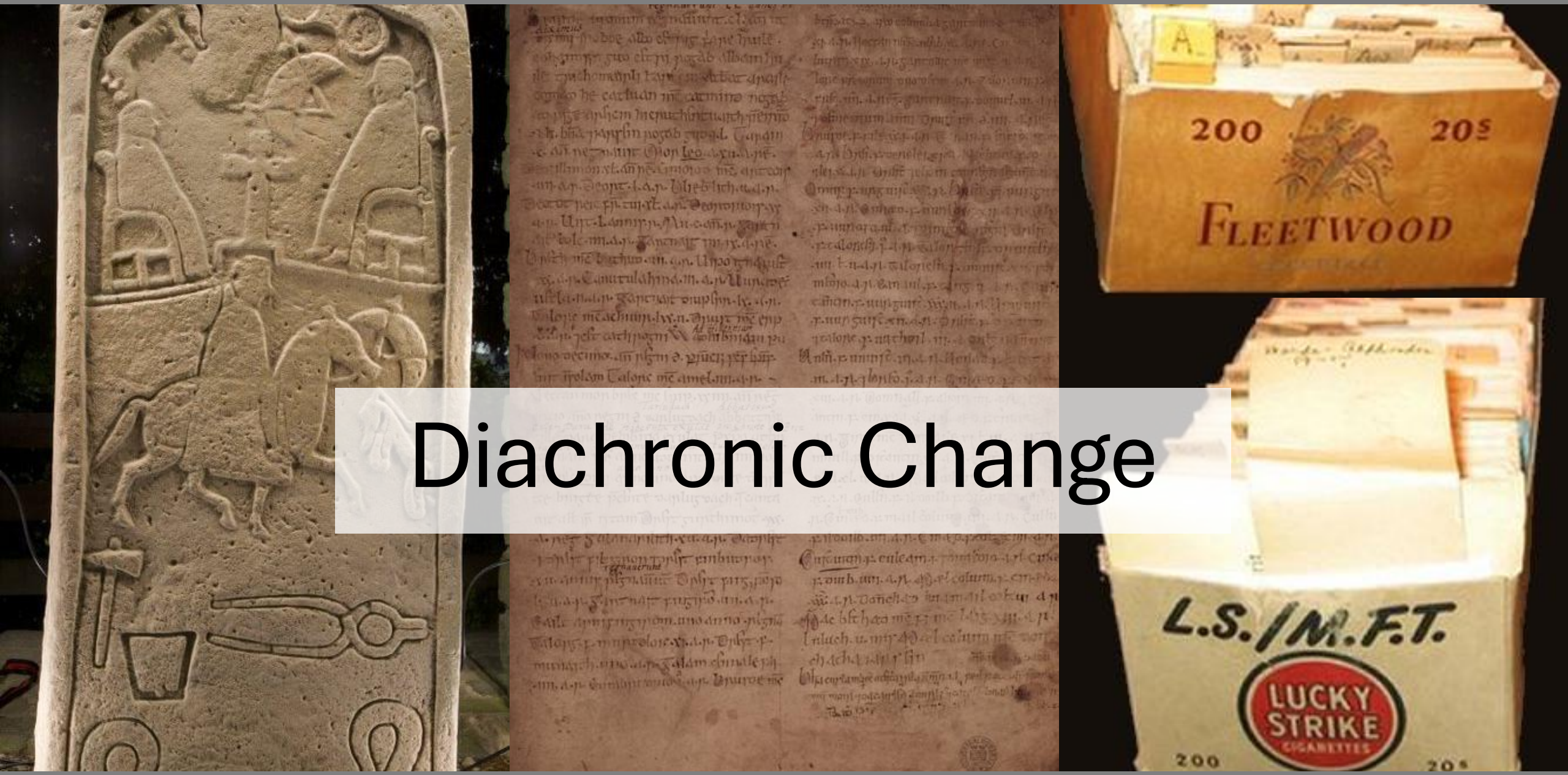


- Rotational



Structure: Overview

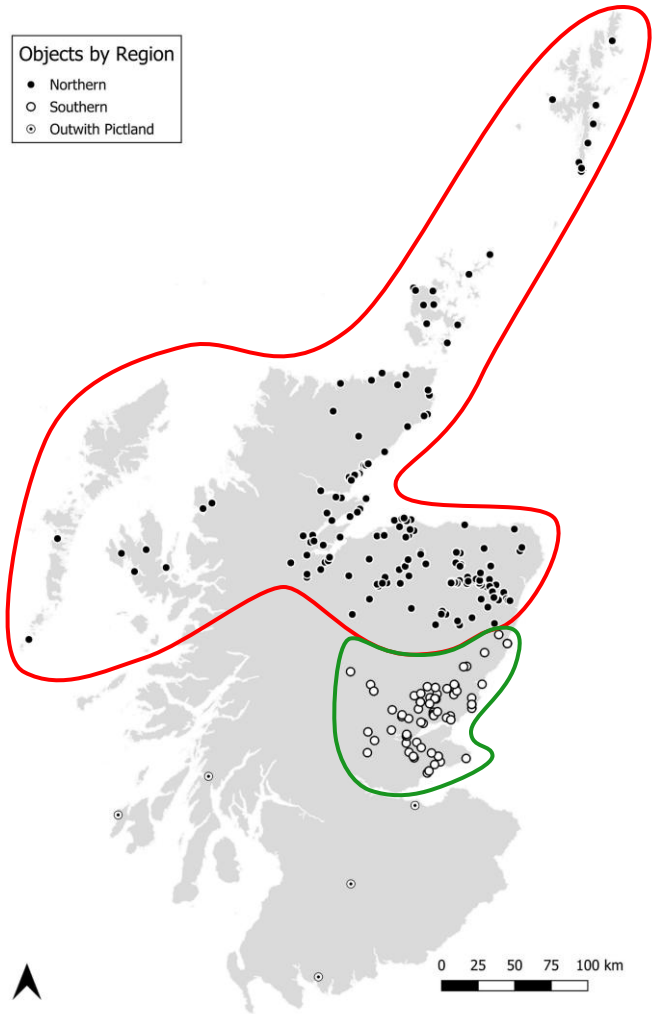
- Evidence that geometric basic shapes are formed according to **3 categories** and **5 degrees of complexity**
  - Independent evidence from other graphetic properties
- Most explanatory account to date of the geometric basis shapes
  - **IS NOT** an unplanned collection of symbols
  - **IS** a **structured inventory of interrelated basic shapes**



Diachronic Change

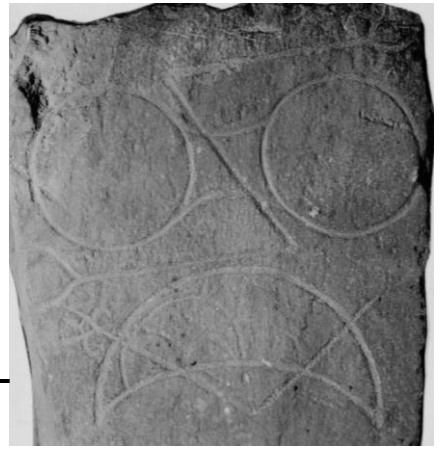
Biscriptal Hypothesis: Parameters

- Geographic regions
  - **Northern Region**
  - **Southern Region**



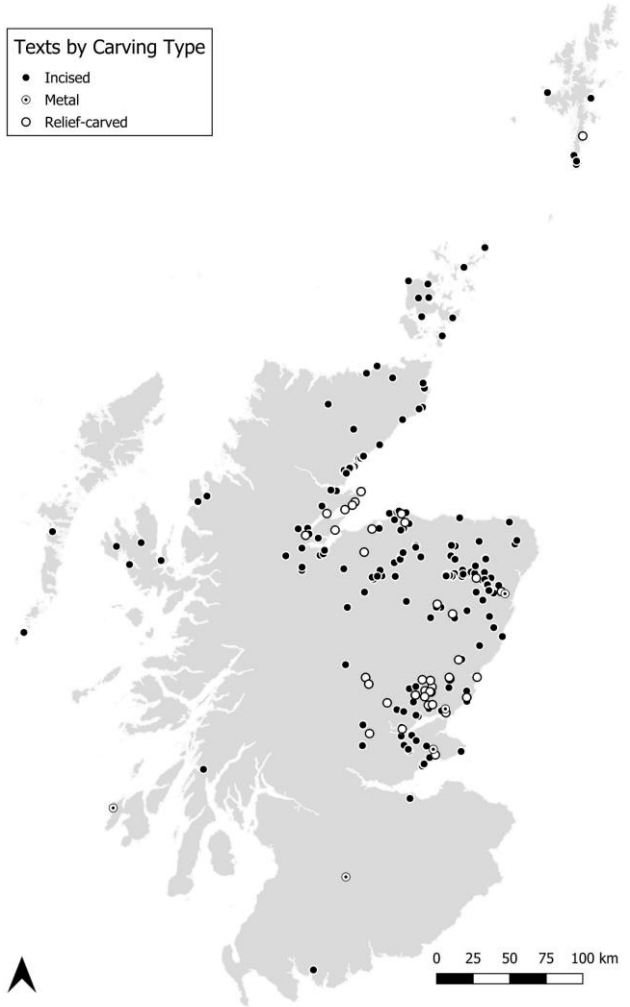
Biscriptal Hypothesis: Parameters

- Geographic regions
  - **Northern Region**
  - **Southern Region**
- Carving types
  - **Incised** ●
    ?? c. AD 400 to 700
  - **Relief-carved** ○
    ?? c. AD 700 to 900



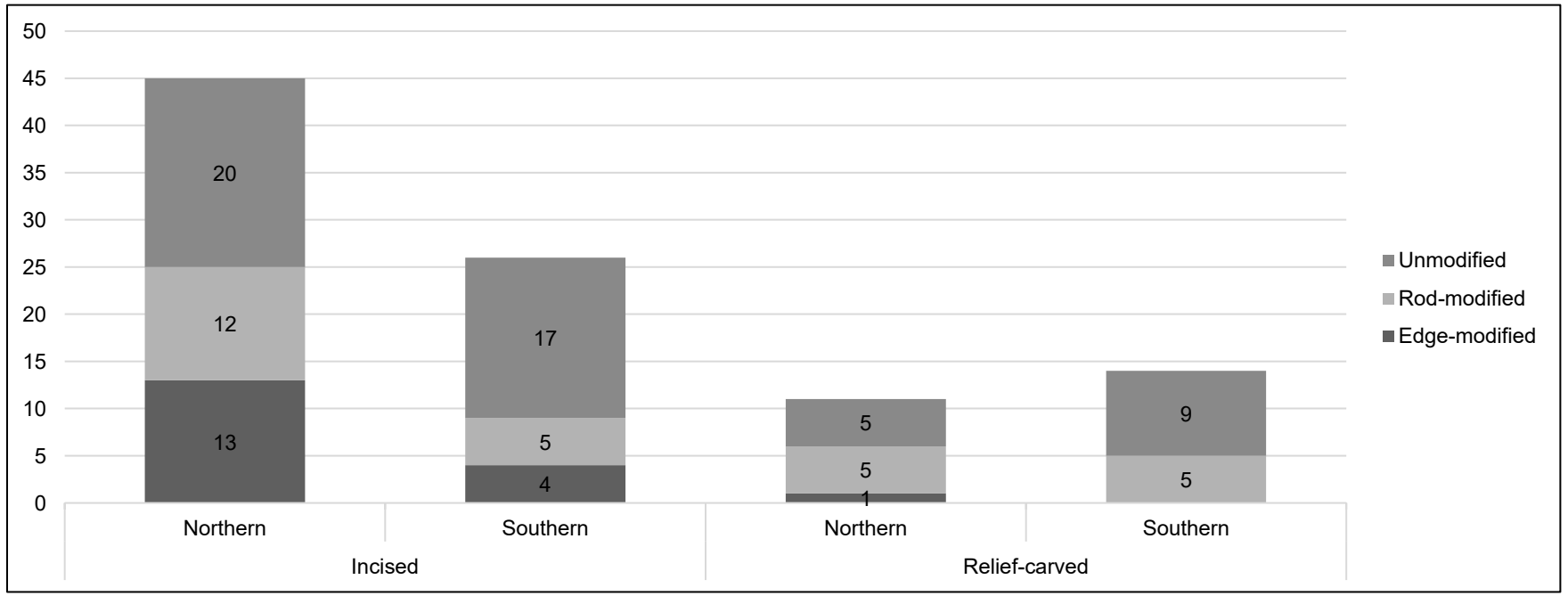
HES, FiskavaigAPhoto

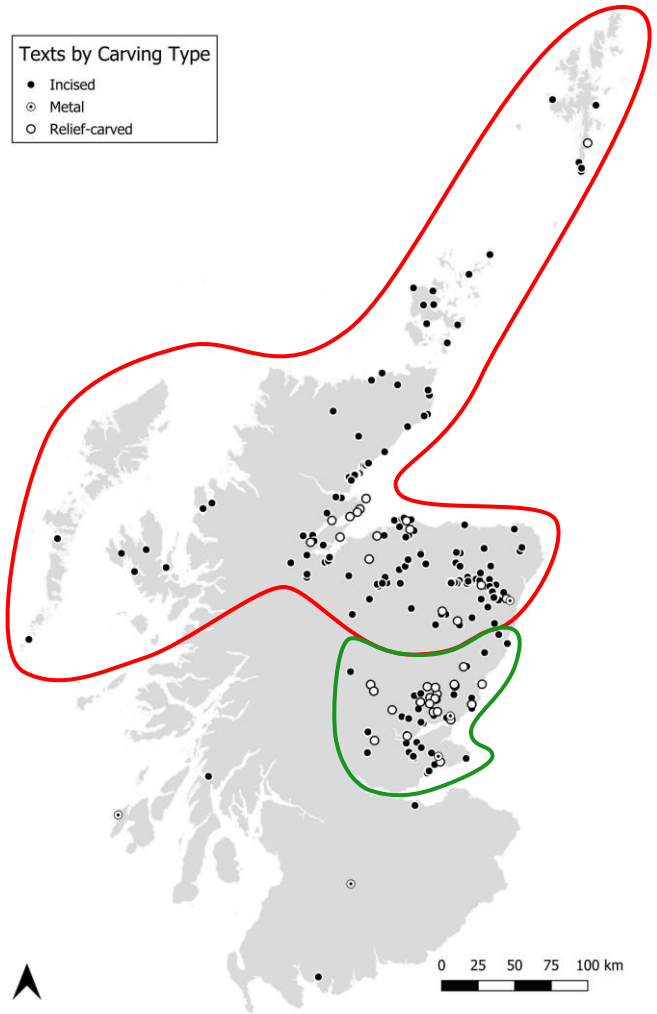
Gray, ElginCPhoto



Biscriptal Hypothesis: Contexts

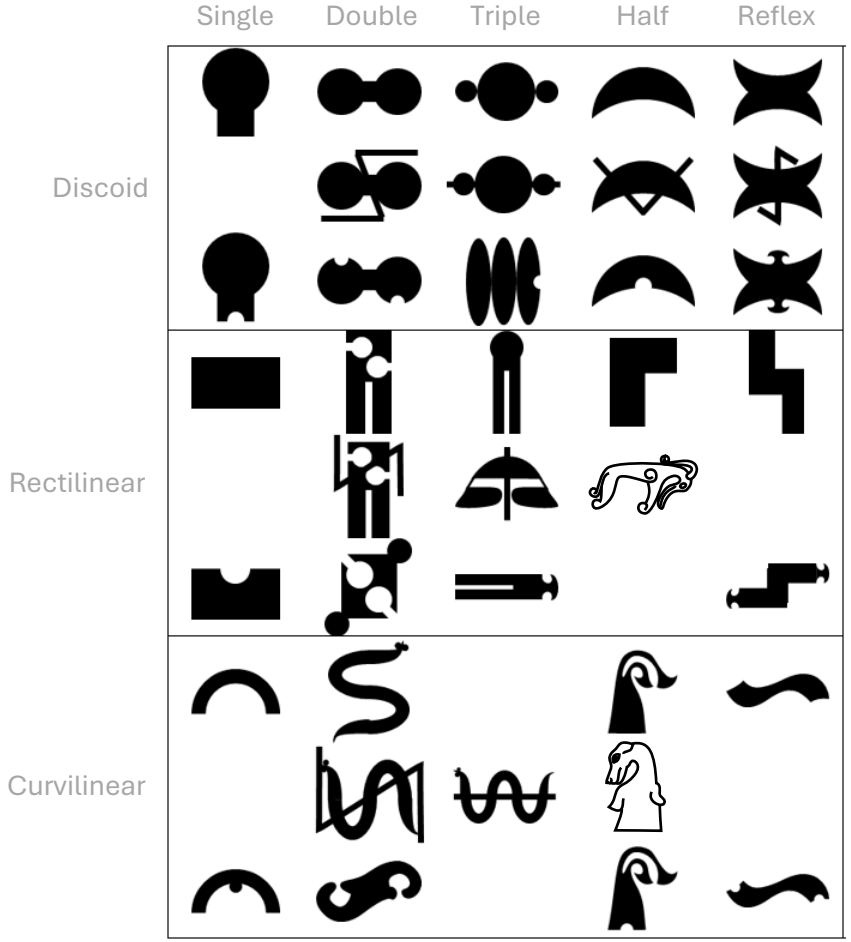
- How much ‘modification’ is present in each context?
- Number of **distinct basic shapes** in each context:



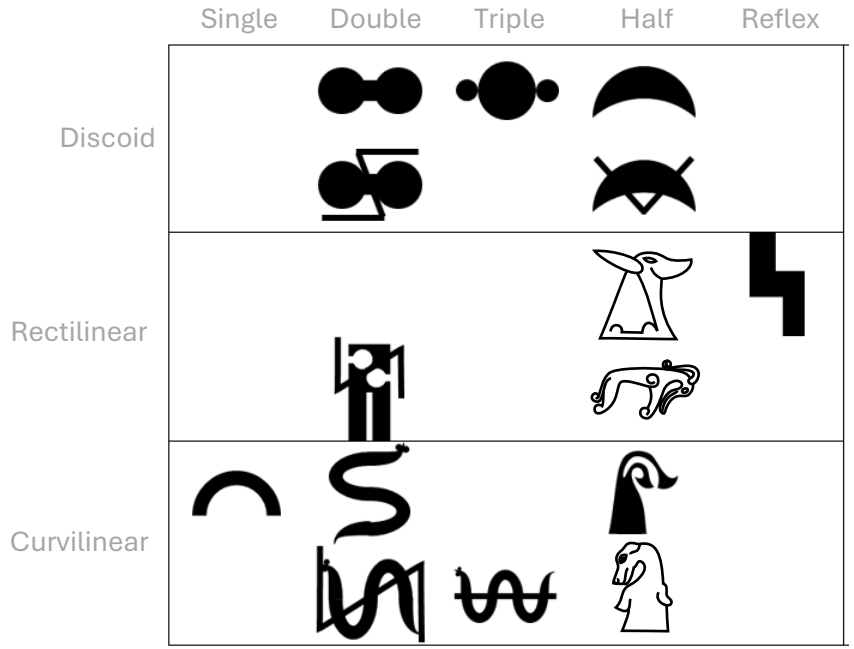


Biscriptal Hypothesis: Comparing Scripts

Northern Incised Script (Abstract Graphemes)

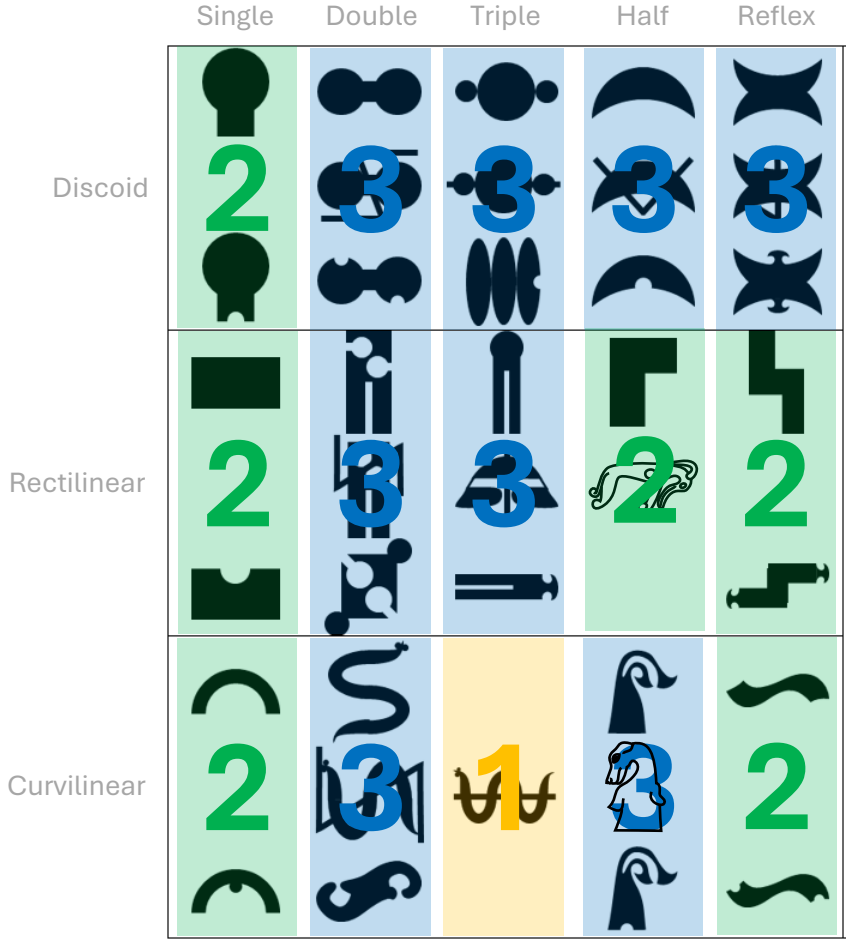


Southern Relief-Carved Script (Abstract Graphemes)

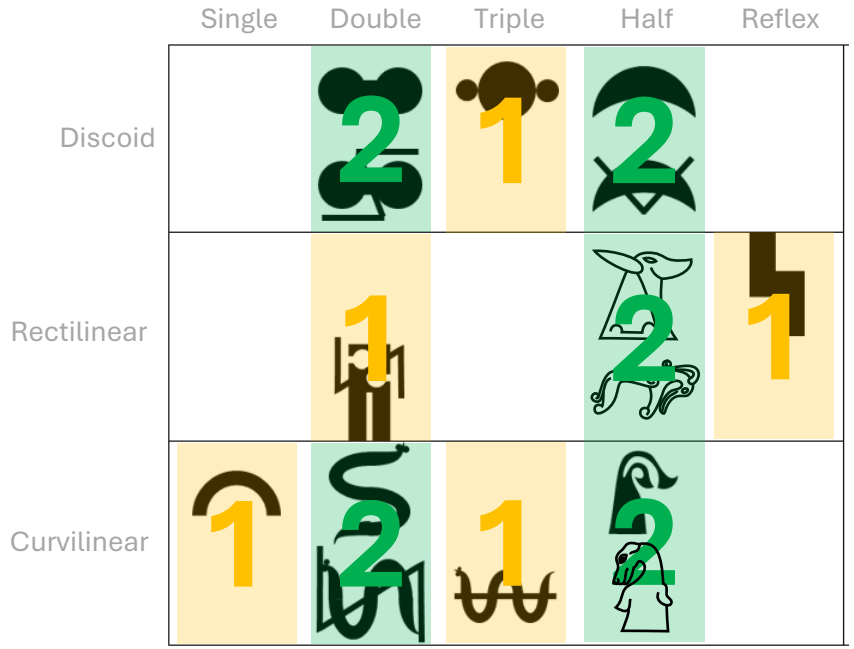


Biscriptal Hypothesis: Comparing Scripts

Northern Incised Script (Abstract Graphemes)

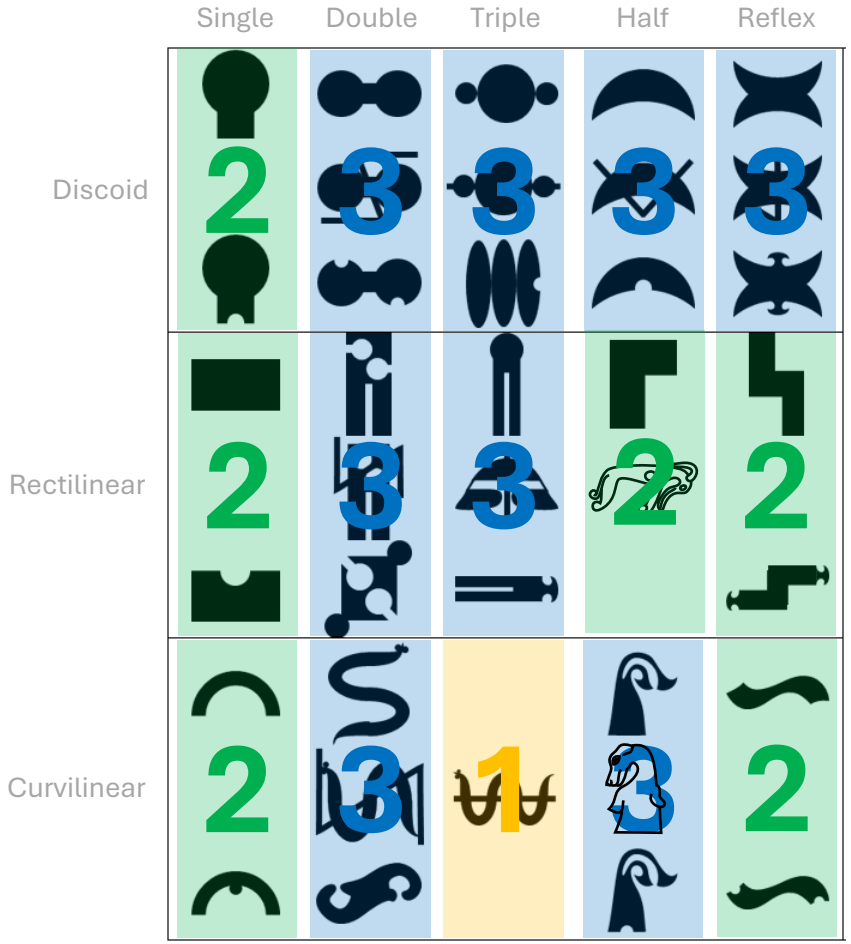


Southern Relief-Carved Script (Abstract Graphemes)

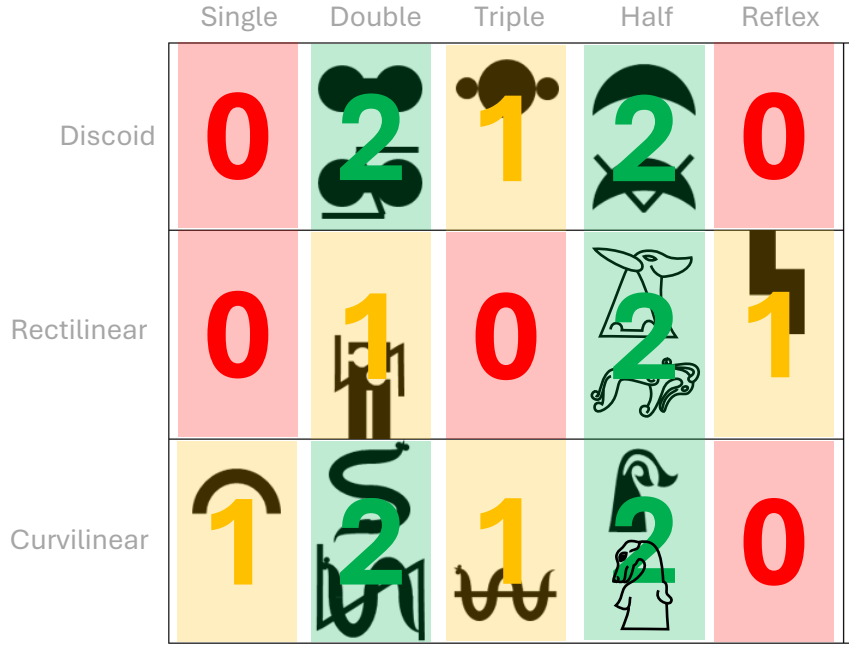


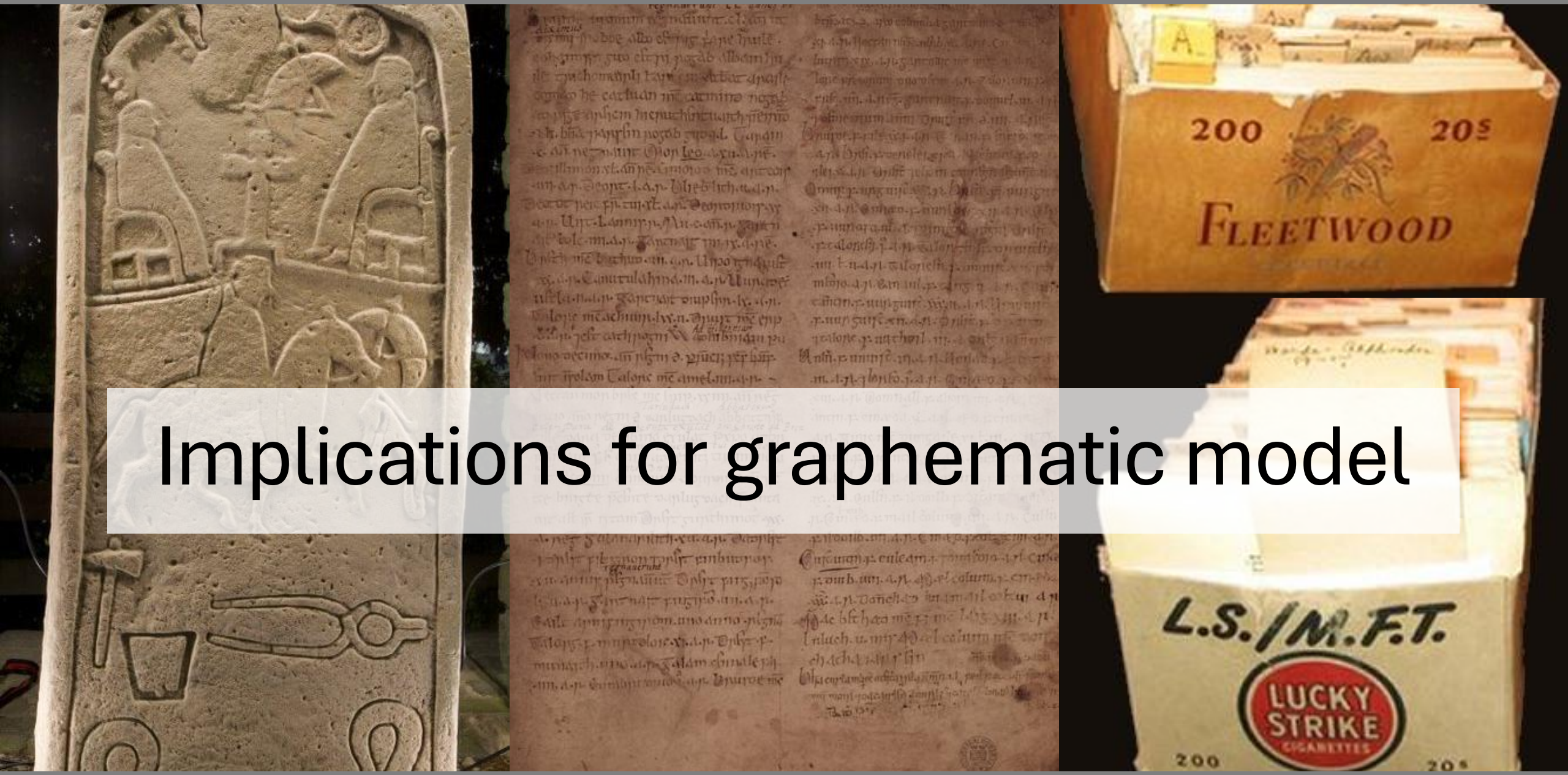
Biscriptal Hypothesis: Comparing Scripts

Northern Incised Script (Abstract Graphemes)



Southern Relief-Carved Script (Abstract Graphemes)



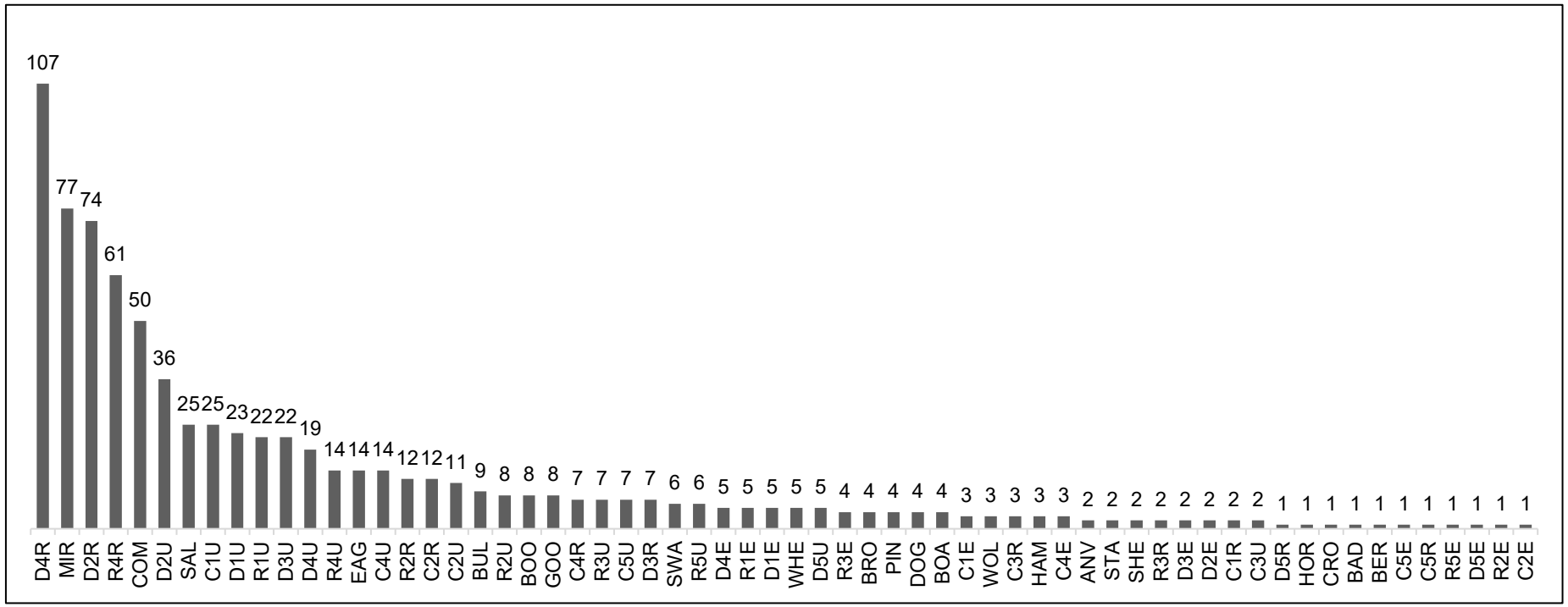


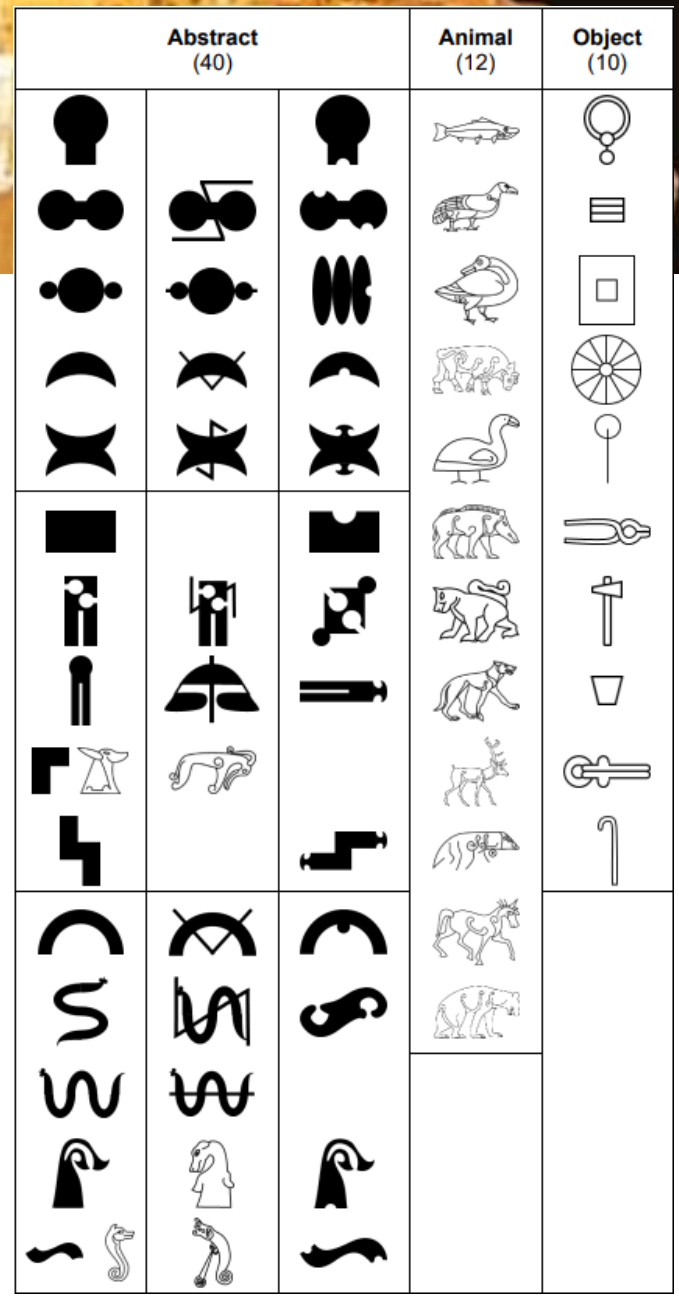
Implications for graphematic model

Implications for graphematic model

- Number of graphemes can be correlated with level of linguistic representation
  - ~30 or fewer, **Phonemes**
  - fewer than 100, **Syllables**
  - 100s, **Morphemes**

- **62 attested (67 theorised) graphemes overall:**
  - 40 attested (45 theorised) ***abstract*** graphemes, including non-naturalistic zoomorphic basic shapes
  - 12 ***animal*** graphemes
  - 10 ***object*** graphemes

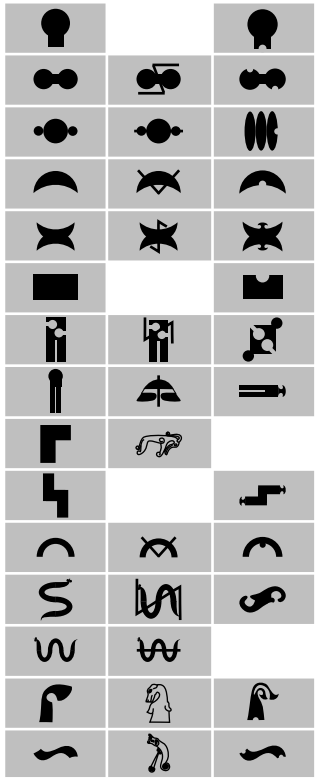




Segert 1994

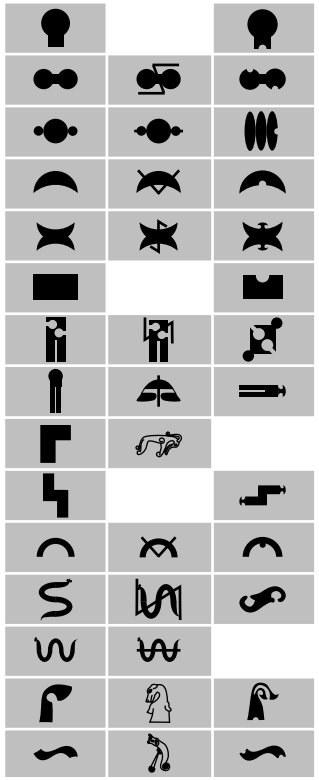
Implications for *abstract* graphemes

- Are there scripts with similar graphetic paradigms?



Implications for *abstract* graphemes

- Are there scripts with similar graphetic paradigms?
- Abugidas of **Palawan** (*Tagbanwa*) and **Mindoro** (*Buhid*, *Hanunóo*) Islands, Philippines
  - 13-15 consonant targets
  - 3 vowel targets
  - Unmodified basic shape + 2 modification types
  - Inherent vowel relating to unmodified basic shape



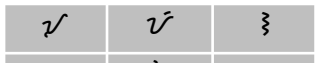
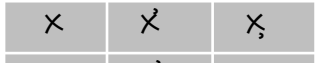
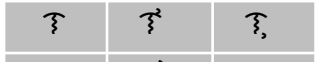
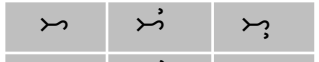
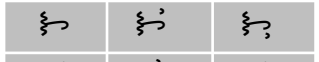
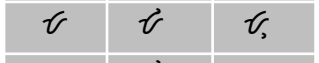
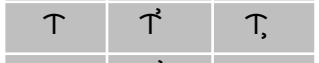
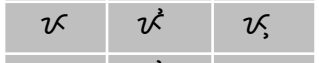
	Tagbanwa			Buhid			Hanunóo			
	-a	-i	-u	-a	-i	-u	-a	-i	-u	-Ø
Ø-	ᜀ	ᜁ	ᜂ	ᜄ	ᜅ	ᜆ	ᜀ	ᜁ	ᜂ	
k-	ᜃ	ᜃᜒ	ᜃᜓ	ᜃ	ᜃᜒ	ᜃᜓ	ᜃ	ᜃᜒ	ᜃᜓ	ᜃ᜔
g-	ᜄ	ᜄᜒ	ᜄᜓ	ᜄ	ᜄᜒ	ᜄᜓ	ᜄ	ᜄᜒ	ᜄᜓ	ᜄ᜔
ng-	ᜅ	ᜅᜒ	ᜅᜓ	ᜅ	ᜅᜒ	ᜅᜓ	ᜅ	ᜅᜒ	ᜅᜓ	ᜅ᜔
t-	ᜆ	ᜆᜒ	ᜆᜓ	ᜆ	ᜆᜒ	ᜆᜓ	ᜆ	ᜆᜒ	ᜆᜓ	ᜆ᜔
d-	ᜇ	ᜇᜒ	ᜇᜓ	ᜇ	ᜇᜒ	ᜇᜓ	ᜇ	ᜇᜒ	ᜇᜓ	ᜇ᜔
n-	ᜈ	ᜈᜒ	ᜈᜓ	ᜈ	ᜈᜒ	ᜈᜓ	ᜈ	ᜈᜒ	ᜈᜓ	ᜈ᜔
p-	ᜉ	ᜉᜒ	ᜉᜓ	ᜉ	ᜉᜒ	ᜉᜓ	ᜉ	ᜉᜒ	ᜉᜓ	ᜉ᜔
b-	ᜊ	ᜊᜒ	ᜊᜓ	ᜊ	ᜊᜒ	ᜊᜓ	ᜊ	ᜊᜒ	ᜊᜓ	ᜊ᜔
m-	ᜋ	ᜋᜒ	ᜋᜓ	ᜋ	ᜋᜒ	ᜋᜓ	ᜋ	ᜋᜒ	ᜋᜓ	ᜋ᜔
y-	ᜌ	ᜌᜒ	ᜌᜓ	ᜌ	ᜌᜒ	ᜌᜓ	ᜌ	ᜌᜒ	ᜌᜓ	ᜌ᜔
r-				ᜍ	ᜍᜒ	ᜍᜓ	ᜍ	ᜍᜒ	ᜍᜓ	ᜍ᜔
l-	ᜎ	ᜎᜒ	ᜎᜓ	ᜎ	ᜎᜒ	ᜎᜓ	ᜎ	ᜎᜒ	ᜎᜓ	ᜎ᜔
w-	ᜏ	ᜏᜒ	ᜏᜓ	ᜏ	ᜏᜒ	ᜏᜓ	ᜏ	ᜏᜒ	ᜏᜓ	ᜏ᜔
s-	ᜐ	ᜐᜒ	ᜐᜓ	ᜐ	ᜐᜒ	ᜐᜓ	ᜐ	ᜐᜒ	ᜐᜓ	ᜐ᜔
h-				ᜑ	ᜑᜒ	ᜑᜓ	ᜑ	ᜑᜒ	ᜑᜓ	ᜑ᜔

Kuipers & McDermott 1996

Implications for *abstract* graphemes

- Are there scripts with similar graphetic paradigms?
- Abugidas of **Palawan** (*Tagbanwa*) and **Mindoro** (*Buhid*, *Hanunóo*) Islands, Philippines
  - 13-15 consonant targets
  - 3 vowel targets
  - Unmodified basic shape + 2 modification types
  - Inherent vowel relating to unmodified basic shape
- Could the Pictish writing system work in the same way?

	Pictish		
	?-V_1	?-V_2	?-V_3
?C_1-			
?C_2-			
?C_3-			
?C_4-			
?C_5-			
?C_6-			
?C_7-			
?C_8-			
?C_9-			
?C_{10}-			
?C_{11}-			
?C_{12}-			
?C_{13}-			
?C_{14}-			
?C_{15}-			

	Tagbanwa			Buhid			Hanunóo			
	-a	-i	-u	-a	-i	-u	-a	-i	-u	-Ø
Ø-										
k-										
g-										
ng-										
t-										
d-										
n-										
p-										
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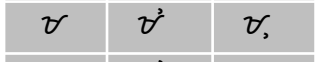
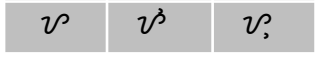
m-										
y-										
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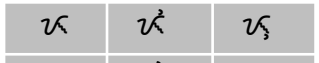
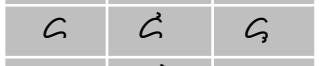
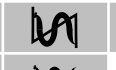
l-										
w-										
s-										
h-										

Kuipers & McDermott 1996

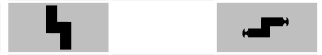
Implications for *abstract* graphemes: Comparison

- Are there scripts with similar graphetic interrelations?

	Pictish		
	?-V_1	?-V_2	?-V_3
?C_1-			
?C_2-			
?C_3-			
?C_4-			
?C_5-			
?C_6-			
?C_7-			
?C_8-			
?C_9-			
?C_{10}-			
?C_{11}-			
?C_{12}-			
?C_{13}-			
?C_{14}-			
?C_{15}-			

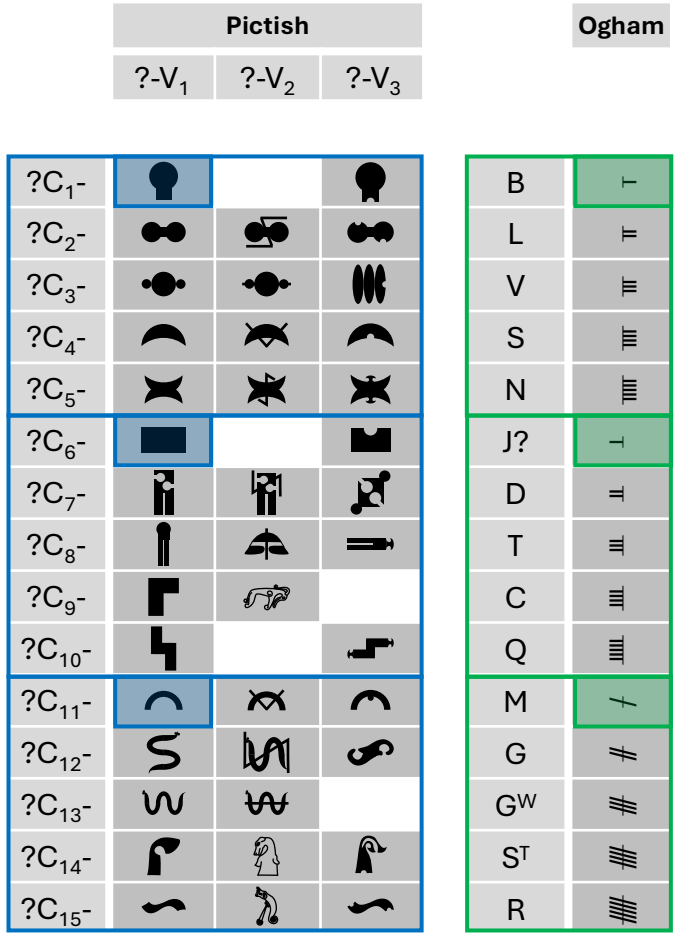
Implications for *abstract* graphemes: Comparison

- Are there scripts with similar graphetic interrelations?
- **Ogham** script
  - Survives epigraphically from Early Medieval period in Ireland, Man, Scotland, Western Britain

	Pictish			Ogham	
	?-V_1	?-V_2	?-V_3		
?C_1-				B	
?C_2-				L	
?C_3-				V	
?C_4-				S	
?C_5-				N	
?C_6-				J?	
?C_7-				D	
?C_8-				T	
?C_9-				C	
?C_{10}-				Q	
?C_{11}-				M	
?C_{12}-				G	
?C_{13}-				G^W	
?C_{14}-				S^T	
?C_{15}-				R	

Implications for *abstract* graphemes: Comparison

- Are there scripts with similar graphetic interrelations?
- **Ogham** script
  - Survives epigraphically from Early Medieval period in Ireland, Man, Scotland, Western Britain
- Systematic **similarities**
  - **15 consonants** in Ogham, **15 basic graphemes** in Pictish
  - 3 **elementary forms**
  - 5 **transformations** to populate groupings (*aicmi*, categories)
  - Involves **doubling/tripling** elementary forms
- **Same design principles** in grammatogenies of Pictish Symbols and ogham



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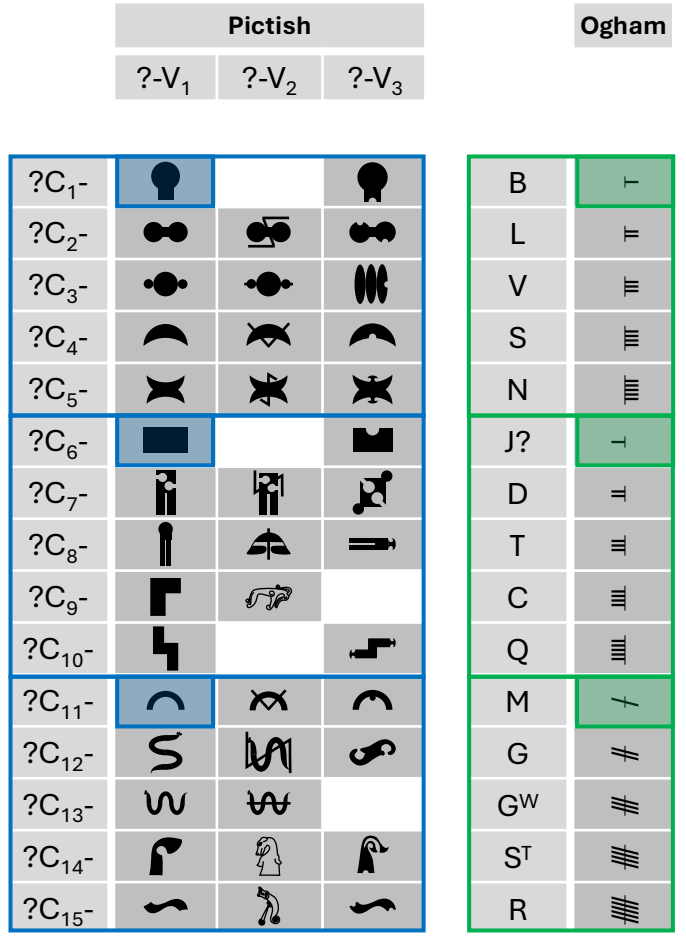
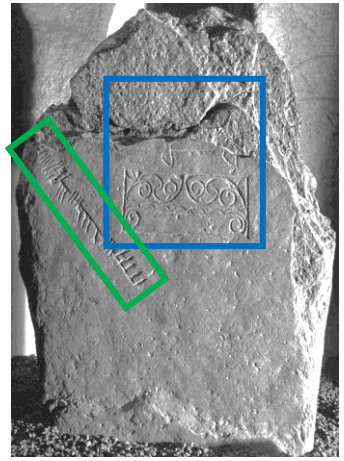
  - 5 **transformations** to populate groupings (*aicmi*, categories)
  - Involves **doubling/tripling** elementary forms
- **Same design principles** in grammatogenies of Pictish Symbols and ogham
- Several **Ogham**/**Pictish** biscriptals
  - ***Very*** unclear whether texts are equivalent



Gray, BrandsbuttAPhoto



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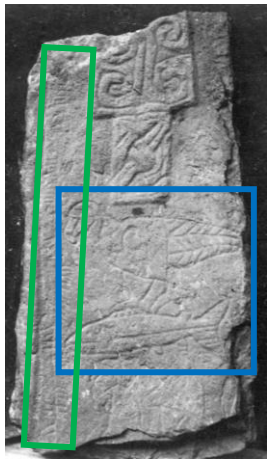

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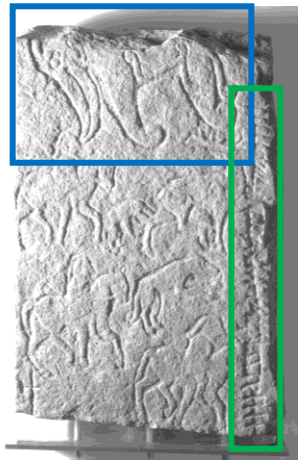
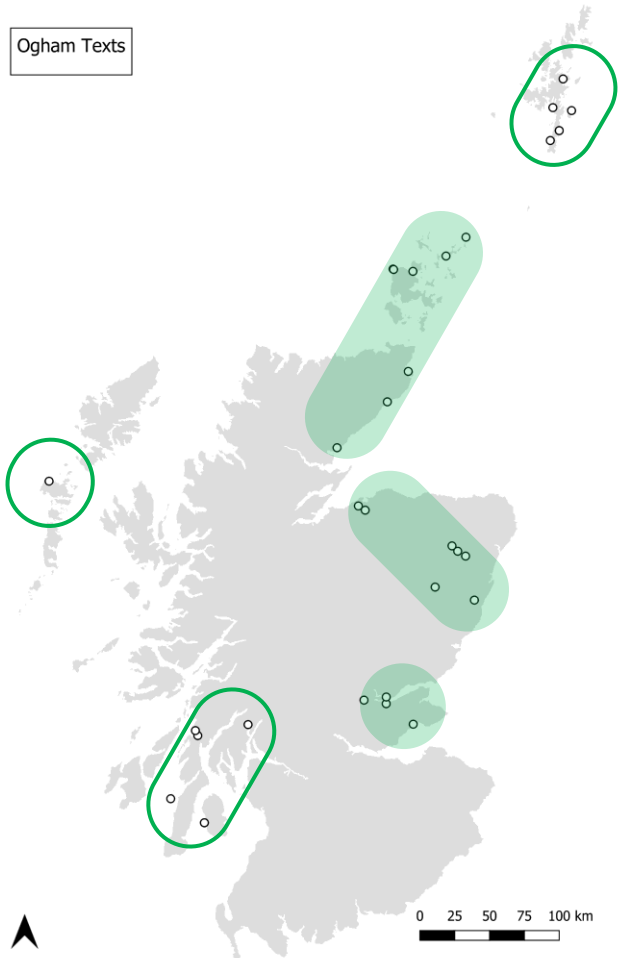


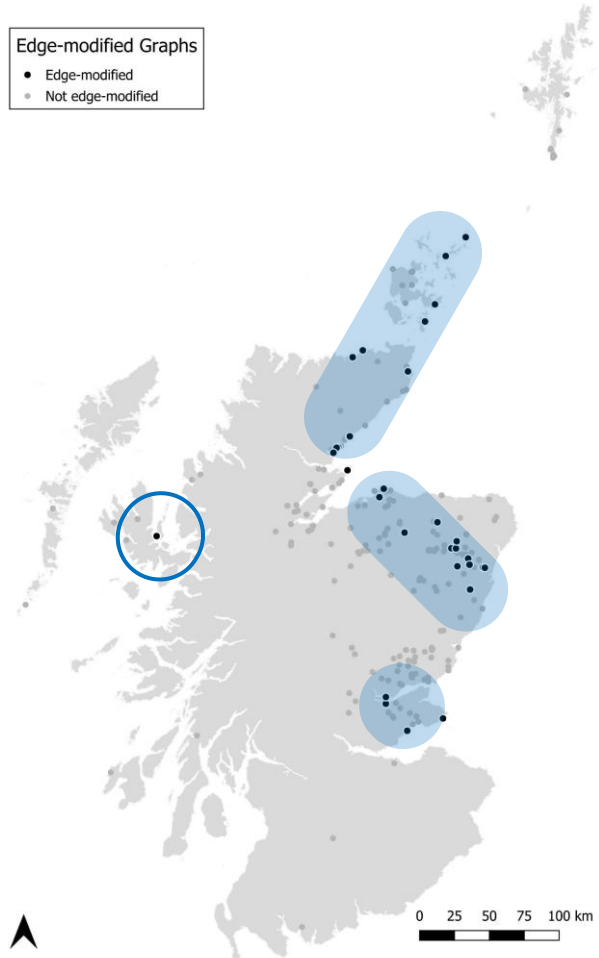
HES, ScoonieAPhoto

Gray, LogieElphinstone2APhoto

Implications for *abstract* graphemes: Comparison

- Distribution of **Ogham stones** in Scotland similar to that of **edge-modified Pictish graphs**
- Edge modification a feature of the *earlier* script as originally devised
- Distribution consistent with early influence between Ogham and Pictish Symbols





Forsyth 1996

Presentation Overview

- Pictish script a structured **3×5×3 paradigm**
  - Evidence from elementary forms, topography, symmetry & graphotactics
- Pictish script exhibited **systematic change** throughout c. 500 years of use
  - Loss of edge-modification
- Several aspect of the graphematic system of Pictish Symbols are implied by **graphetic comparison** to other known writing systems
  - Paradigmatic structure of Tagbanwa/Buhid/Hanunóo → **Abugida**
  - Interrelations of Pictish script parallel interrelations of Ogham consonants → **15 consonants** and **historically plausible influence**
- Grapholinguistic analysis provides clear path for decipherment models

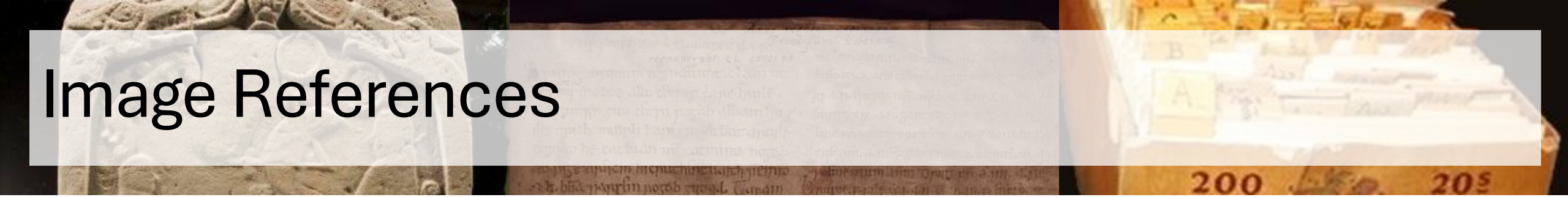


Image References

Borland, Clynekirkton2ASketch, https://www.trove.scot/image/1359584
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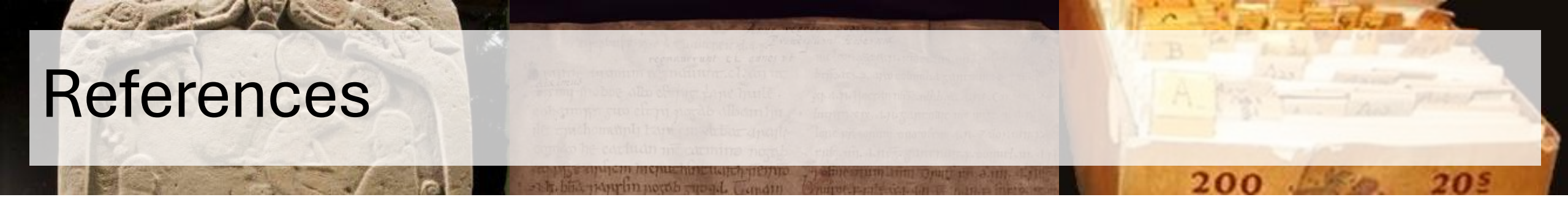

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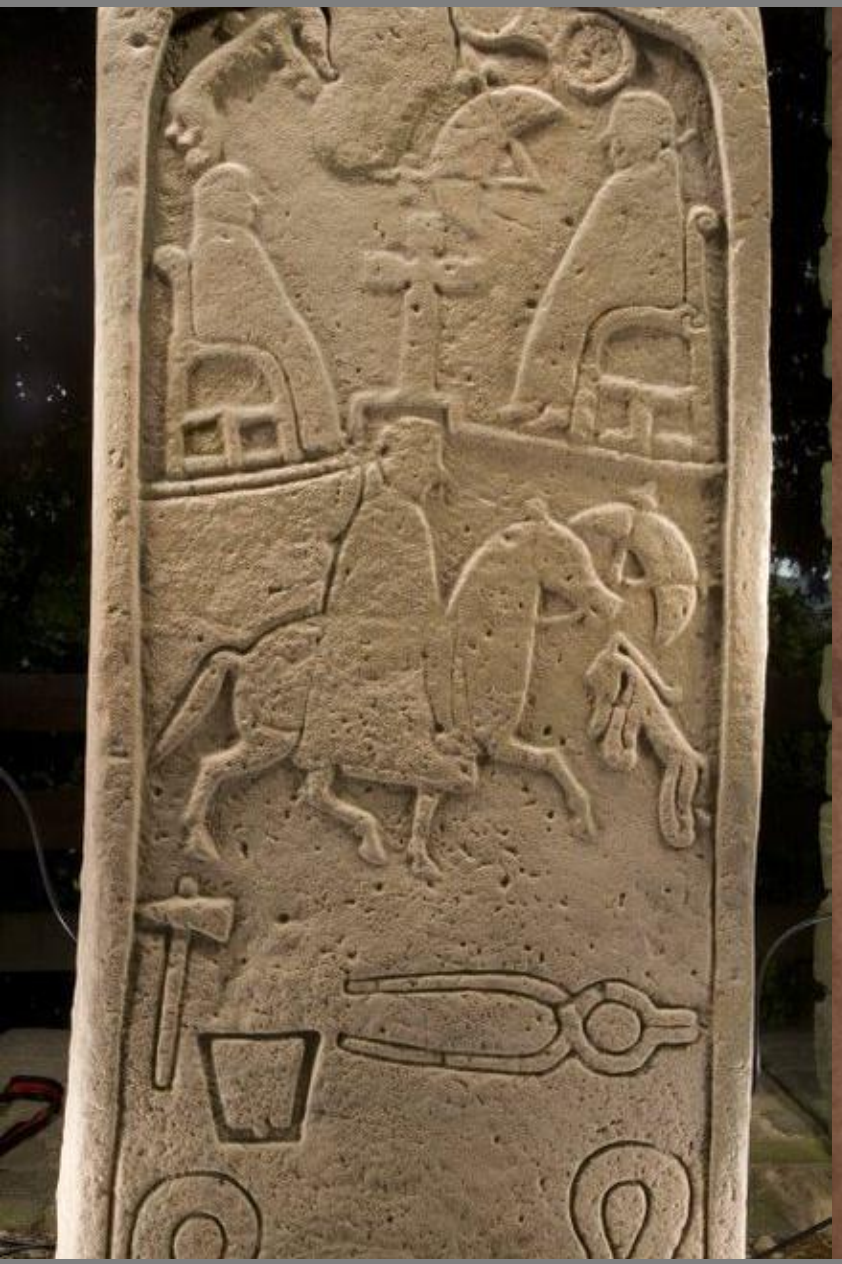

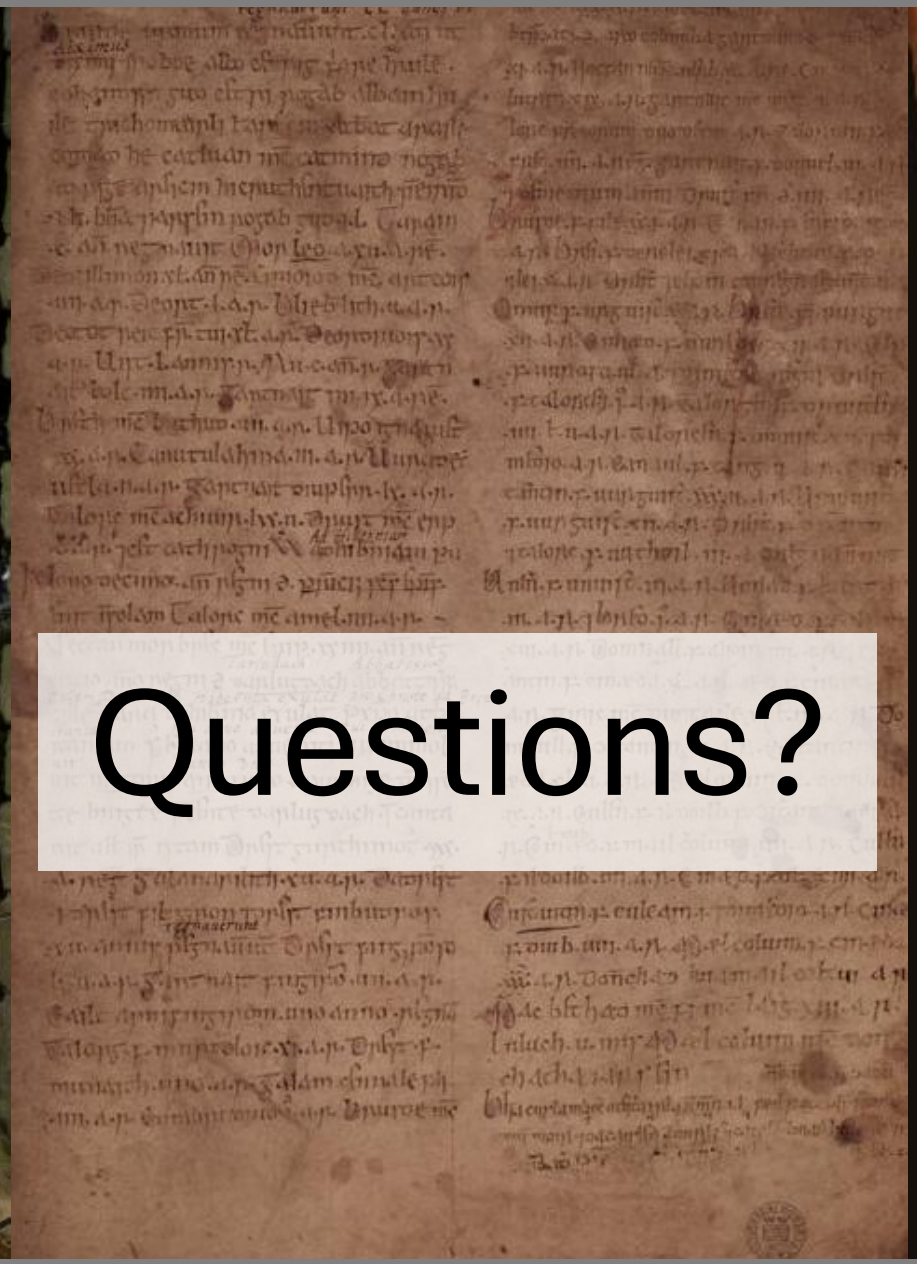

Questions?