

# Summer Institutes for Cross-Cultural Anthropological Research

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## Research Questions

Fiona Jordan

University of Bristol

<http://excd.org>







# Cultural evolutionary approach

Both diversity and design require explanation

Image: Fiona Jordan

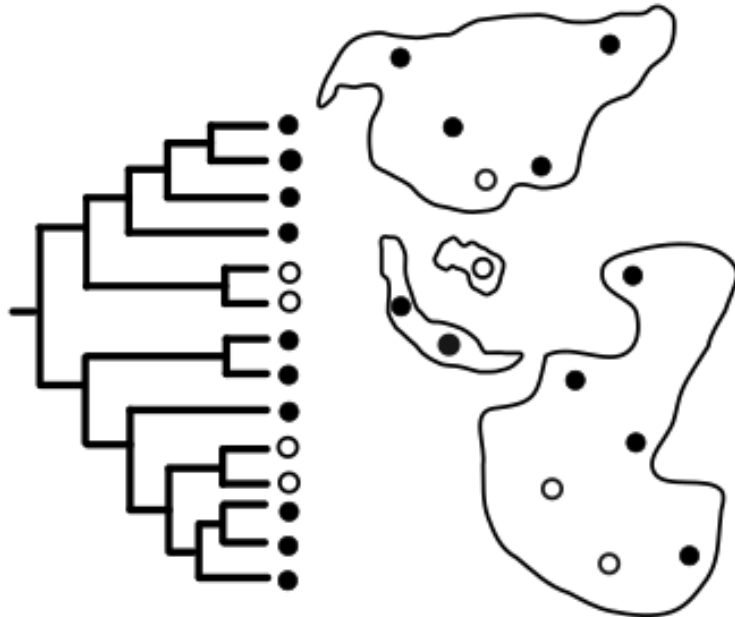


# Something old and something new

## Phylogenetic approaches allow process questions

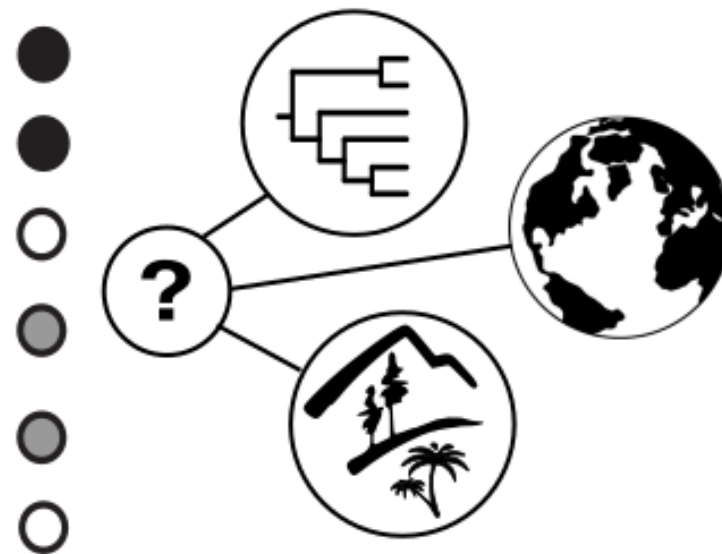
### EXPLORATORY

*How are features distributed across societies?*



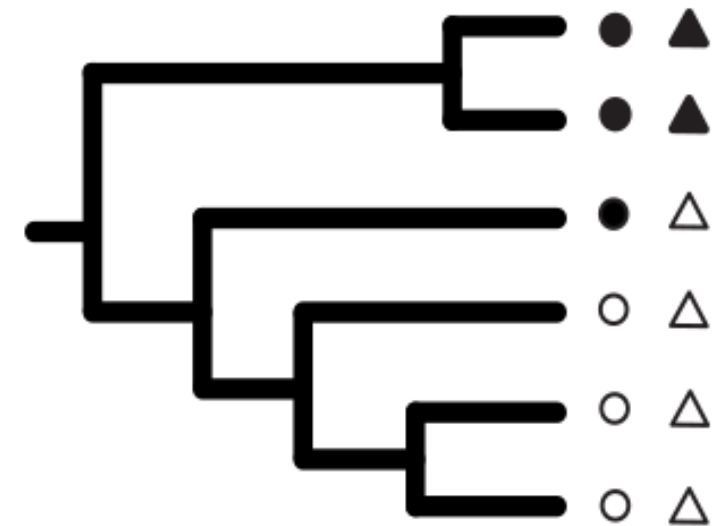
### REGRESSION ANALYSIS

*What predicts patterns of cultural diversity?*



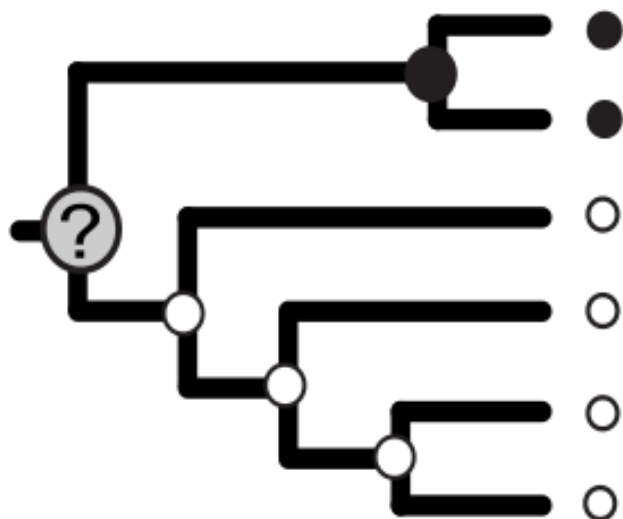
### CORRELATED EVOLUTION

*Do features change together?*



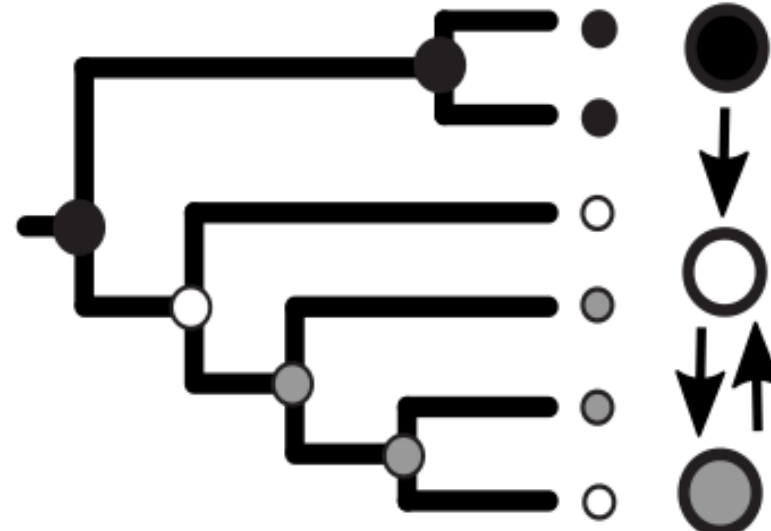
### ANCESTRAL STATES

*What was the earlier form of a feature?*



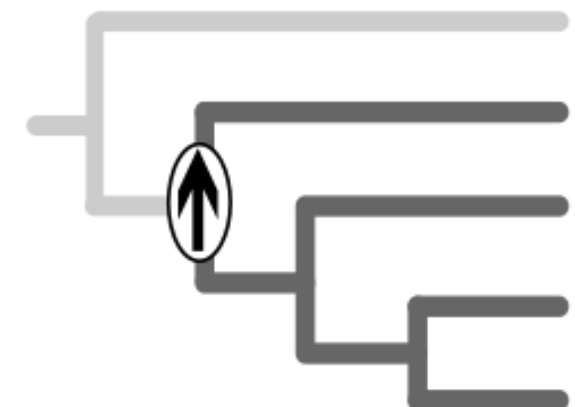
### TRANSFORMATION

*How do cultural features change form?*



### MODE AND TEMPO

*How and when do features diversify?*



Fertility and Mode of  
Subsistence: A Phylogenetic  
Analysis<sup>1</sup>

DANIEL W. SELLEN AND RUTH MACE

## **From Bridewealth to Dowry?**

**A Bayesian Estimation of Ancestral States of Marriage  
Transfers in Indo-European Groups**

Laura Fortunato, Clare Holden, and Ruth Mace  
*University College London*

## **Ritual human sacrifice promoted and sustained the evolution of stratified societies**

Joseph Watts<sup>1</sup>, Oliver Sheehan<sup>1,2</sup>, Quentin D. Atkinson<sup>1,2</sup>, Joseph Bulbulia<sup>3</sup> & Russell D. Gray<sup>1,2,4,5</sup>

## ***A Phylogenetic Analysis of the Evolution of Austronesian Sibling Terminologies***

FIONA M. JORDAN<sup>1</sup>

## **Testing for Divergent Transmission Histories among Cultural Characters: A Study Using Bayesian Phylogenetic Methods and Iranian Tribal Textile Data**

Luke J. Matthews<sup>1\*</sup>, Jamie J. Tehrani<sup>2</sup>, Fiona M. Jordan<sup>3</sup>, Mark Collard<sup>4,5</sup>, Charles L. Nunn<sup>1</sup>

The sequential evolution of land tenure norms

Geoff Kushnick <sup>a,\*</sup>, Russell D. Gray <sup>b,c</sup>, Fiona M. Jordan <sup>d,e</sup>

## **Matrilocal residence is ancestral in Austronesian societies**

Fiona M. Jordan<sup>1,2,\*</sup>, Russell D. Gray<sup>3</sup>, Simon J. Greenhill<sup>3</sup> and Ruth Mace<sup>1,2</sup>

## **THE EVOLUTION OF HUMAN SEX RATIO AT BIRTH: A BIO-CULTURAL ANALYSIS**

*Ruth Mace and Fiona Jordan*

## **Spread of cattle led to the loss of matrilineal descent in Africa: a coevolutionary analysis**

Clare Janaki Holden\* and Ruth Mace

## **Phylogenetic reconstruction of Bantu kinship challenges Main Sequence Theory of human social evolution**

Christopher Opie<sup>a,1</sup>, Susanne Shultz<sup>b</sup>, Quentin D. Atkinson<sup>c</sup>, Thomas Currie<sup>d</sup>, and Ruth Mace<sup>a</sup>

## **Rise and fall of political complexity in island South-East Asia and the Pacific**

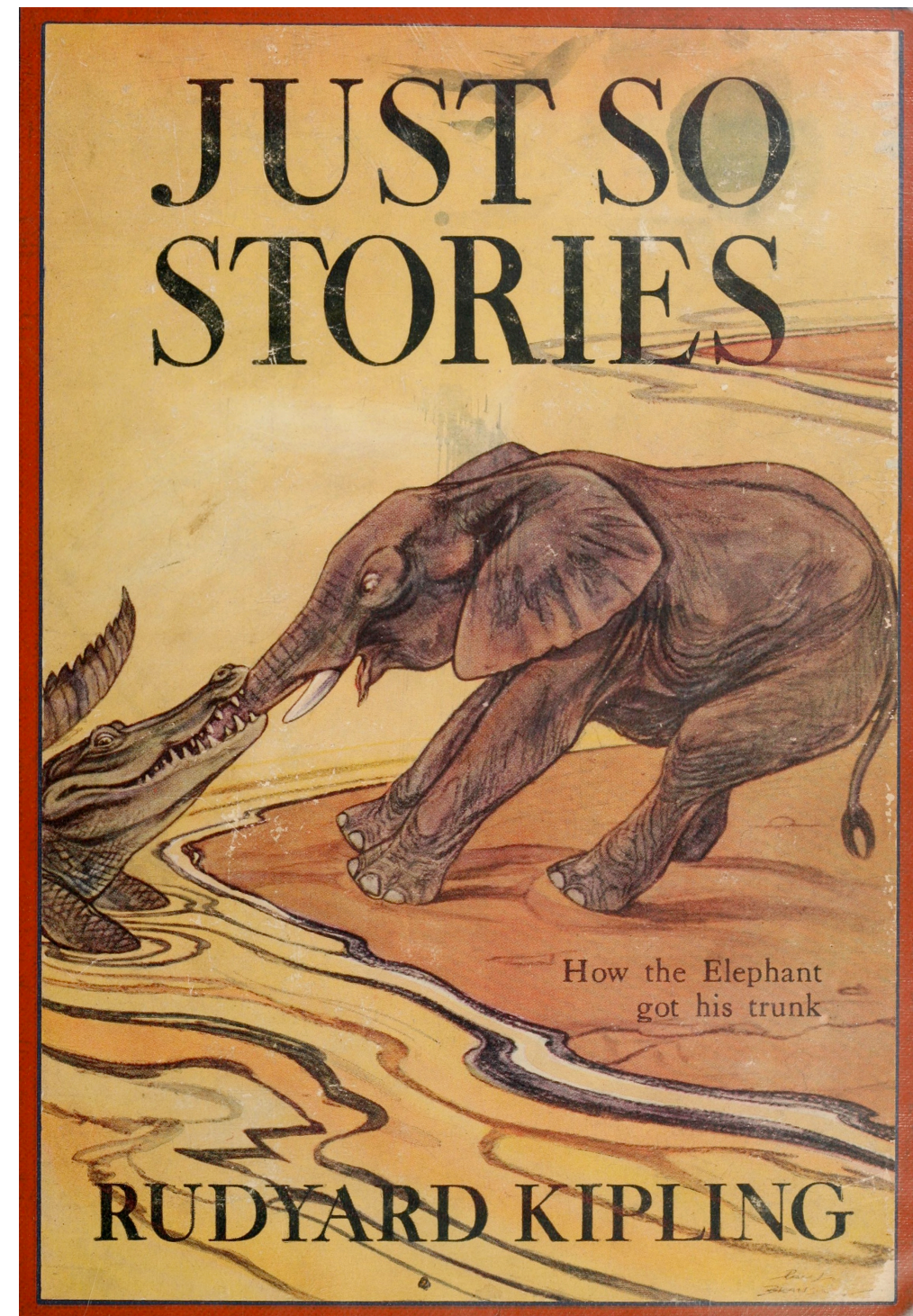
Thomas E. Currie<sup>1,2</sup>, Simon J. Greenhill<sup>3,4</sup>, Russell D. Gray<sup>3</sup>, Toshikazu Hasegawa<sup>1</sup> & Ruth Mace<sup>2</sup>



# Adaptive (causal) hypotheses

Easy to imagine, harder to test

- Observational studies
- Modelling
- Experimental manipulation
- Comparative (phylogenetic) tests



**Description is cool too**

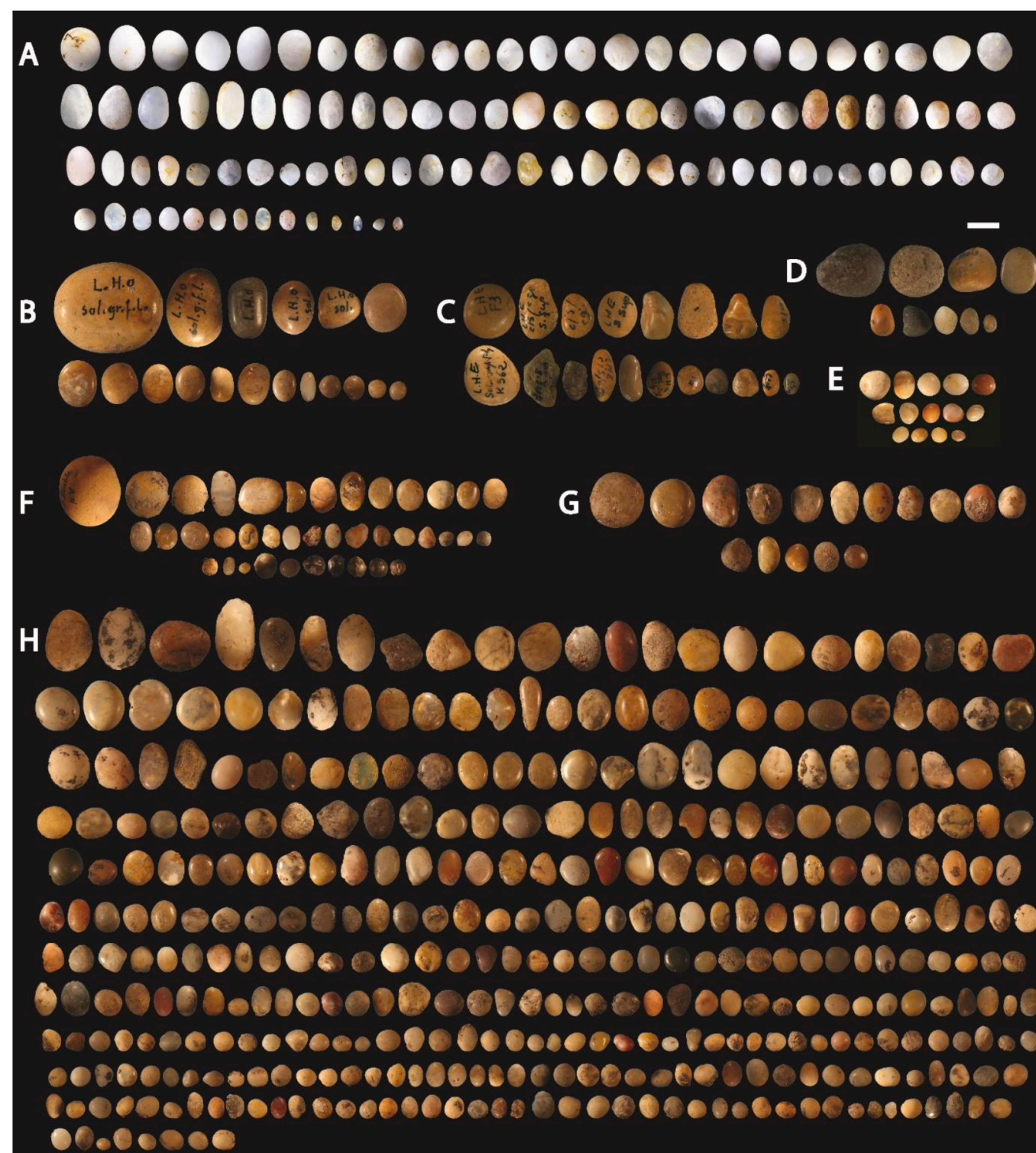




*Evolution of Cognitive Tools  
for Quantification*

# Lustrous Gravels


**Polished pebbles of the  
Upper Palaeolithic  
~21K  
Landry, France**





# Shiny rocks!

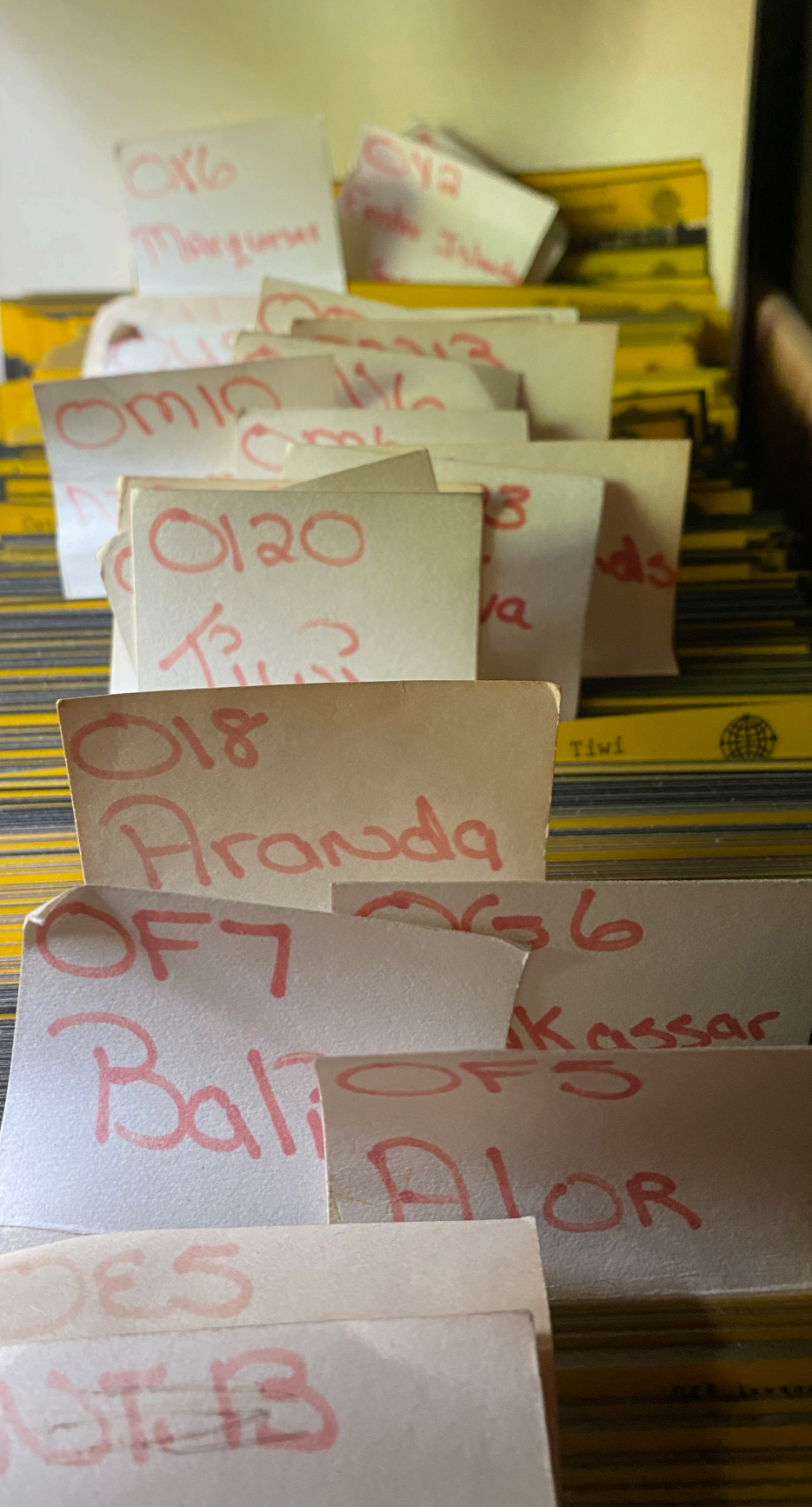
# Ruling out natural explanations

- Evidence of **deliberate selection**: non-randomly distributed, colour and shape more similar than natural chance
  - Evidence of **polishing**: microscopic analysis shows smooth surface texture, and experimental barrel-tumbling with leather produces shine
- 



# But why?





**What does the ethnographic record tell us?**



# Pebbles!

- **What are all the ethnographically-attested uses of small (~1 cm) polished pebbles (“lustrous gravels”)?**
  - Supporting info for QUANTA project on the cultural evolution of numerical cognition
- Exploratory and descriptive work
  - Global, all eHRAF or SCCS cultures. I don't care about absence!
- “Pebble\*”, “stones”, “rocks”, other synonyms?
  - Categories: counting, music, games, ritual, burial, jewellery, prayer



# 10488 pebble paragraphs

**“pebble\* OR stone\*” NOT subject:building and construction**

- 186 SCCS societies > 38 hunter-gatherer + 44 others by region
- Developed coding scheme for use, number, and containers
- What kinds of uses would you expect?

Use	Definition	Example
Weapon	Stones explicitly thrown at other people in defence or offence	The sling stones were not worked but were selected from waterworn pebbles (ala) of appropriate size. [Samoan]
Medicine	Primary functional use given in a medical remedy	Pour over the head of the sufferer an infusion of bark from the top of the trunk of the Bugare. But before pouring the liquid, it must be frothed. This is done by throwing little stones in and mixing it with a stick. [Azande]
Music	Used to make musical instruments or noisemakers (including ritual functions)	A woman's dance rattle contains many small pebbles and the handle passes entirely through the gourd. [Kuna]
Counting	Explicit mention as a counting tool	Pebbles are occasionally employed as a mnemonic aid to counting warp threads when weaving; each pebble represents 10 threads. [Aymara]
Ritual	Use is given as charms, amulets, religious symbols, curse stones, embodiments of spirits/gods, funeral tokens; or otherwise used as a magic ritual	There is a very strong magic power in these stones, and their form is regarded as variable. For instance, if such a stone is left uncovered it may grow legs and run away; so they are worn hanging from the neck in little sacks. [Aranda]
Games	Used as game tokens, or in other childhood activities	Thirty-three stones are arranged in a line which may be straight, but is more often curved or crooked. The player must touch each stone and say "Too" for all 33 stones in order, at a high rate of speed. [Kpelle]
Tool	Used in hunting, fishing, craft, headshrinking, or as weights	Dressing a hide is generally woman's work; sometimes men do this work, using woman's tools, which include a small sack of pebbles held behind the haft of the leg bone scraper to give added force to each push of the scraper removing fat and detritus from the hide. [Innu]
Other	Various uses as ornament, social coordination, genealogical tool etc	He talks about pedigrees. Our expert ... gathers a heap of small stones and says: "This is Ancestor Bangáchon and this is Gáyon, his wife". Meanwhile he places two small stones, side by side in front of his big toes. "They had four children", he continues... and four stones are put at a short distance of the two first ones. [A]nd so it goes on; names and more names, stones and more stones... [Ifugao]
None	Paragraphs contained the words stone* or pebble* but no relevant uses	



# Uses of pebbles cross-culturally

## What are your predictions?

Pebble use in 82 SCCS Societies

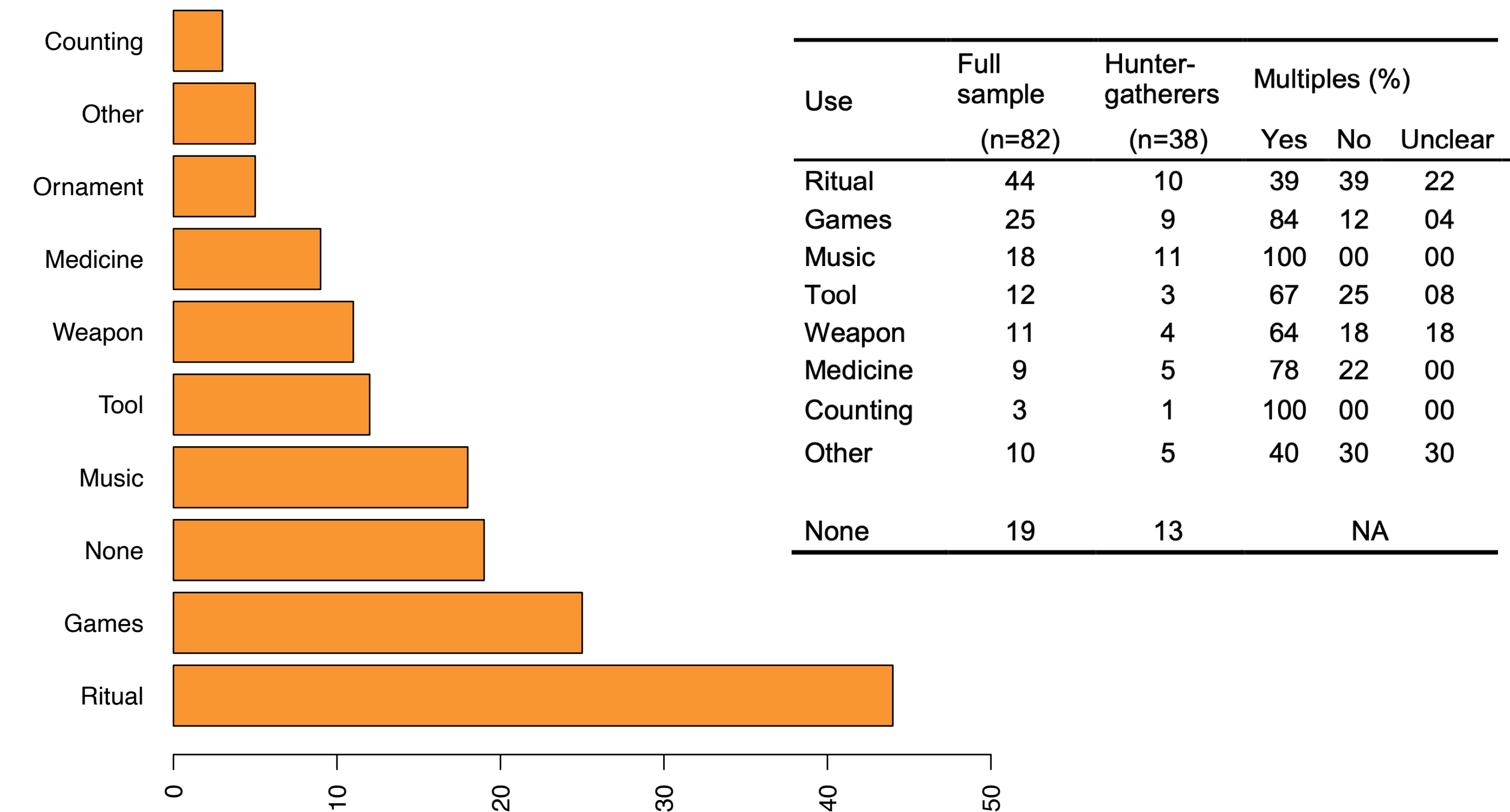
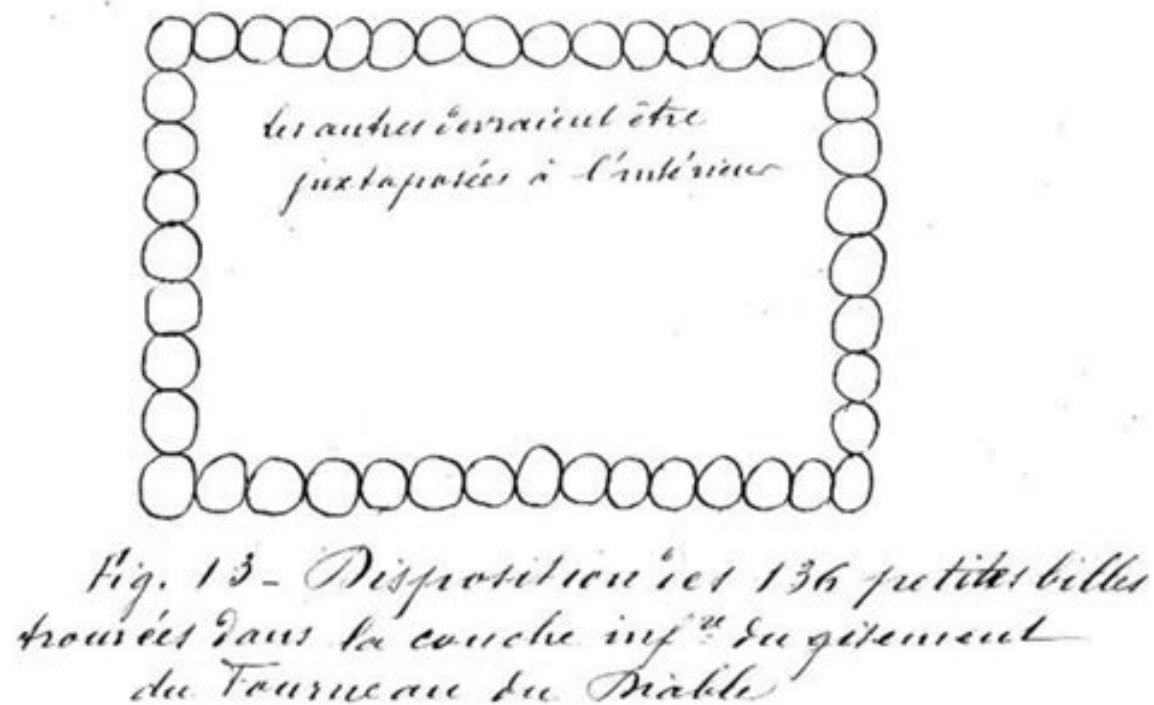


Table: Geis et al (2023) Multiproxy Analysis of Upper Palaeolithic Lustrous Gravels. *PLoS ONE*

# It's probably not counting\*

## Cross-cultural data to inform archaeological interpretation



### **Fourneau de Diable**

136 pebbles (9x15)

Dordogne, France

Peyrony (1922)

- **Magico-religious ritual use:** talismans, amulets, charms, divination, sorcery kits, spirit and ancestor embodiments.
- **Game pieces:** occur in multiples, handled frequently, children use.
- **Musical instruments:** drums and rattles mimic tumbling (bark, shell, dried fruit, cocoons, hides)