

# Human History in Order: A Developmental Interpretation of Early Material Engagement

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## Abstract

This paper proposes that the sequence of early human material engagement mirrors the mechanics of sensorimotor consolidation observed in human infancy. Drawing on developmental psychology, cognitive archaeology, experimental archaeology, and early metallurgy, it argues that repetitive percussion, rhythmic action, and impact-based material transformation reflect neurological constraints on skill acquisition rather than cognitive limitation. This framework does not introduce new archaeological data but offers a unifying developmental interpretation for the global consistency, repetition, and long plateaus observed in early human technological behavior.

## 1. Introduction

Early human behavior is frequently categorized as primitive, inefficient, or pre-symbolic. Yet, archaeological evidence consistently demonstrates that early toolmaking and material engagement were systematic, skilled, and remarkably stable across vast spans of time. This tension invites a reconsideration of what these behaviors represent.

What if early human behavior reflects a necessary developmental sequence rather than a cognitive deficit?

Distinct from 19th-century recapitulation theories, which sought to infantilize early human populations and were subsequently used to justify colonial hierarchies, this framework focuses strictly on material neuro-engagement. It does not propose that early humans were childlike in intelligence, culture, or social capacity. Instead, it posits that the mechanics of learning itself impose a universal order on skill acquisition. The same sensorimotor constraints that shape how a modern infant learns to control objects also shape how an ancestral adult learns to engage materials. The scale differs; the nervous system sequence does not.

## 2. Infant Development: Sensorimotor Consolidation (3–6 months)

In developmental psychology, the period between approximately 3 and 6 months marks a critical transition in the human nervous system: the shift from reflex-dominated behavior to voluntary, rhythmic action.

Building on the work of Jean Piaget (1952), this stage is defined not by exploration of space (dropping or throwing), but by the consolidation of impact and feedback.

Key features of this 3–6 month window include:

- The Grasp-Strike Loop: Transition from reflexive grasping to purposeful holding and striking.
- Percussive Action: Repetitive banging of objects against surfaces to generate sound and sensation.
- Rhythmic Stereotypies: Rhythmic kicking, bouncing, and arm waving that regulate arousal and coordinate the limbs.
- Auditory Feedback Reliance: A strong attraction to actions that produce immediate sound.

Critically, during this phase, the infant has not yet mastered intentional release. The primary mode of engagement is holding and impacting. Mastery appears rapidly, not through abstraction or instruction, but through the repetition of physical force and sensory feedback.

This stage is best described as sensorimotor consolidation: the nervous system is learning what happens when the body strikes the world.

### **3. Archaeological Parallels: Percussion Before Planning**

Archaeology consistently documents that early human material engagement is dominated by percussion and repetition. The earliest stone tools emerge from repeated striking rather than abstract carving or molding.

Experimental archaeologist Nicholas Toth (1985) demonstrated that novice knappers initially produce flakes incidentally through forceful percussion. Intentional shaping and precision appear only after prolonged interaction with fracture mechanics. Similarly, lithic analyst William Andrefsky (1998) notes that early tool traditions emphasize reliable force application over efficiency or standardized form. Once outcomes stabilize, tool forms persist with minimal modification for millennia.

While isolated instances of early symbolic behavior exist, such as the geometric engravings at Blombos Cave (~100,000 BP), the dominant global mode of material engagement remains percussive (Henshilwood et al., 2002).

From a cognitive perspective, Lambros Malafouris (2013) argues that cognition is not confined to the brain but emerges through material engagement. Neuroarchaeological work by Dietrich Stout (2008) supports this interpretation: early toolmaking recruits sensorimotor and auditory regions, with executive planning regions engaged only at later stages of consolidation.

These findings describe a learning process dominated by repetition, rhythm, and direct feedback. This is precisely the behavioral profile observed in the 3–6 month infant.

### **4. Rhythm as Regulation**

Infants respond to rhythm before language, intention, or symbolic meaning. Rhythmic sound reliably recruits coordinated movement even before balance or posture is established. This response is automatic and regulatory, not expressive.

Early human behavior displays these same features: rhythmic pounding and grinding, repetitive tool actions, auditory feedback guiding force and timing, and group synchronization during labor. Rhythm stabilizes repetition, reduces cognitive load, and extends endurance. In both infancy and early human contexts, rhythm functions as neural regulation, not communication.

## **5. Early Metals and the Limits of Impact**

The earliest human interactions with metal are restricted to materials that respond predictably to impact alone, mirroring the grasp-strike cognition of the infant stage.

This "Native Metallurgy" phase includes:

- Gold: Native, extremely malleable, cold-hammerable; primarily ornamental.
- Copper: Native in some regions, malleable, cold-hammerable; used for tools.
- Meteoric Iron: Harvested from fallen meteorites, shaped mechanically rather than chemically.

The absence of alloys such as bronze marks a developmental boundary. Bronze requires controlled smelting, precise temperature regulation, and the abstract combination of materials. Its absence during this phase is likely not a failure of intelligence, but a constraint of sequence: mastery of direct impact must precede the abstraction of transformation.

An important nuance is annealing. Early metalworkers discovered, through action and feedback rather than theory, that heating hammered copper restored its malleability. This represents sensorimotor learning rather than abstract chemistry.

## **6. A Developmental Sequence, Not a Hierarchy**

This framework does not rank societies or imply linear superiority. It proposes that both individual development and collective history follow non-negotiable neurological sequences.

Across early infancy (3–6 months) and early human history, the same order appears:

- Control before intention.
- Rhythm before meaning.
- Repetition before rules.
- Mastery before abstraction.

Long archaeological plateaus may therefore represent consolidation phases rather than stagnation.

## **7. Implications and Future Directions**

This developmental lens suggests several avenues for further research:

- Investigating the relationship between infant containment schemas and the emergence of pottery.

- Examining the role of rhythmic social scaffolding in toolmaking communities.
- Re-examining technological "delays" as necessary developmental constraints.

## 8. Conclusion

The most immediate evidence for understanding early human behavior may be the one most often overlooked: the human developmental sequence itself. Human history does not begin with abstract ideas; it begins with bodies learning what the world will do when acted upon.

Early humanity is not primitive. It is infantile in mechanism, being foundational, regulated, and dependent on direct feedback. And like the human nervous system, it develops in a strict, non-negotiable order.

## References

- Andrefsky, W. (1998). *Lithics: Macroscopic Approaches to Analysis*. Cambridge University Press.
- Henshilwood, C. S., et al. (2002). Emergence of modern human behavior: Middle Stone Age engravings from South Africa. *Science*, 295(5558), 1278–1280.
- Jambon, A. (2017). Bronze Age iron: Meteoritic or not? A chemical strategy. *Journal of Archaeological Science*, 88, 47–53.
- Malafouris, L. (2013). *How Things Shape the Mind: A Theory of Material Engagement*. MIT Press.
- Piaget, J. (1952). *The Origins of Intelligence in Children*. International Universities Press.
- Rehren, T., et al. (2013). 5,000 years old Egyptian iron beads made from hammered meteoritic iron. *Journal of Archaeological Science*, 40(12), 4785–4792.
- Stout, D., & Chaminade, T. (2007). The evolutionary foundations of human tool use. *Neuropsychologia*, 45(5), 1091–1100.
- Stout, D. (2008). Technology and scientific evolution. *Current Anthropology*, 49, 283–285.
- Toth, N. (1985). The Oldowan reassessed: A close look at early stone artifacts. *Journal of Archaeological Science*, 12(2), 101–120.