

# Evolution of Generative Imagery During the Pleistocene

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## Abstract

Some Pleistocene images and artifacts are hundreds of thousands of years old and may have preceded stone tools dated over 3 million years old. However, archaeologists are conflicted about their evolutionary significance. Some attribute seminal generative cognitive functions to making rock images that contributed to literacy and technology. Others simply dismiss them. Present research conducted a hermeneutical inquiry into the generativity underlying Pleistocene images that inexplicitly now appear in contemporary human cultures. Sensitivity to events in Nature and expressive exaptation are the central hypotheses, and results suggest that natural selection for psycho-motor coordination and aesthetics may have been instrumental to their incremental advance.

## 1. Introduction

The Pleistocene era was a geological period in “deep time” that began about 2.6 million years ago (Mya) and ended approximately 10 thousand years ago (Kya). A period of dramatic ecological change, which was characterized by several migrations out of Africa into Europe, Middle East, and Southwest Asia. Some archeologists have long speculated that images and artifacts made by hominids and hominins during this period mediated cognitive advances that we now call generative art [1]. Somehow, human ancestors extended their native symbolic capacities that were already common among higher mammals [2] with complex semiotic sign capacity and spontaneous generativity [3]. These advances would contribute to an evolutionary trajectory that would ultimately separate hominins from archaic primates. Yet virtually nothing is known about these adaptations, but a long trail of rock images now leads to *Homo sapiens*.

An enigmatic aspect of Pleistocene imagery is their appearance in contemporary 21<sup>st</sup> century cultures. Inexplicitly, Pleistocene images now appear in early childhood scribbling [4], contemporary Western paintings [5], and commercial designs, and they are distributed across macro and micro levels

of scale in Nature [6-8]. While substantial research has examined production and refinement of stone tools, virtually none have been conducted of paleolithic imagery, which in fact promises even greater understanding of higher cognitive evolution. Consequently, research is needed to clarify the contribution of Pleistocene imagery to cognitive evolution, and the transmission of cognitive structures across millennia. The following sections outline a strategy to conduct hermeneutic phenomenology to address those goals.

## 1.1 Marks of consciousness

*Though these old images are from art makers long dead, we can almost know them [hominins] through their art objects, feel the same processes operating in their minds, for those are not just marks made by hands but marks of consciousness, marks of developing brain synapses and circuitry in no large way different from our own, p. 147 [9].*

The objective of this research was to conduct a phenomenology of Pleistocene imagery. Prominent among several obstacles was understanding hominins' intentionality and consciousness, as well as conceptual continuity of images across time. They were addressed by "fusing" the horizons between hominins and humans [10] with an existential link abstracted from shapes and patterns in Nature (see Figure 1). Nine image fragments from Pleistocene culture represent a universal regularity of sun, water, and spirals in Nature. In the present research, they are primordial echoes that are believed to resonate in the contemporary Life-spaces of human

visual preferences through epigenetic DNA encoding [11]. Figure 2 presents their appearance in paintings and pottery, and they are common across cultures. In addition, their continuity across "deep time" is supported by an immense ontology appearing in biological cells but also celestial galaxies that is unchanged over millions of years. Arguably, their ubiquity is ingrained in the Universe, in insects, mammals, and humans defining a reality associated with survival [3, 6]. More specifically, those images are from the path that hominins took, and *Homo* followed.

## 2. Hypothesis

The hypothesis here is some hominids millions of years ago perhaps by chance perceived shapes and patterns in Nature and scratched images in the sand or on stones. A very rare event as primates in Nature do not spontaneously draw. Natural selection then conferred a reproductive advantage on this spontaneous expressive sensitivity, which was phylogenetically continued through the hominin line to *Homo sapiens*. Nine images are believed to represent abstractions of hominin perceptions of Nature.

## 3. Research questions

The central question here is how hominins and possibly earlier hominids initiated, maintained, and extended mark-making that is now widely interpreted in artistic terms. This remarkable advance has baffled anthropologists throughout the 20<sup>th</sup> century and remains unresolved.

Figure 1. Universal images in Nature and through time. Column A presents images from Hodgson [28], and some are hundreds of thousands of years old. Column B presents images from contemporary early childhood drawings originally identified by Luquet and rediscovered by Kellogg [4]. Column C presents abstracted images from their origins in Nature appearing at micro and macro levels of scale. This set of images also appears in contemporary visual art [29], and commercial design. The key point here is hominins are believed to have recorded their sensitivity to Nature in images, and this behavior was naturally selected. Preference for those images was assimilated over millions of years and is now in a collective human subconsciousness. Young children scribble them in drawings, professional artists paint them, and humans in general visually like them. In addition, the shapes are embedded throughout the Universe in biological cells to celestial galaxies, which suggest a fundamental affinity to ontology.

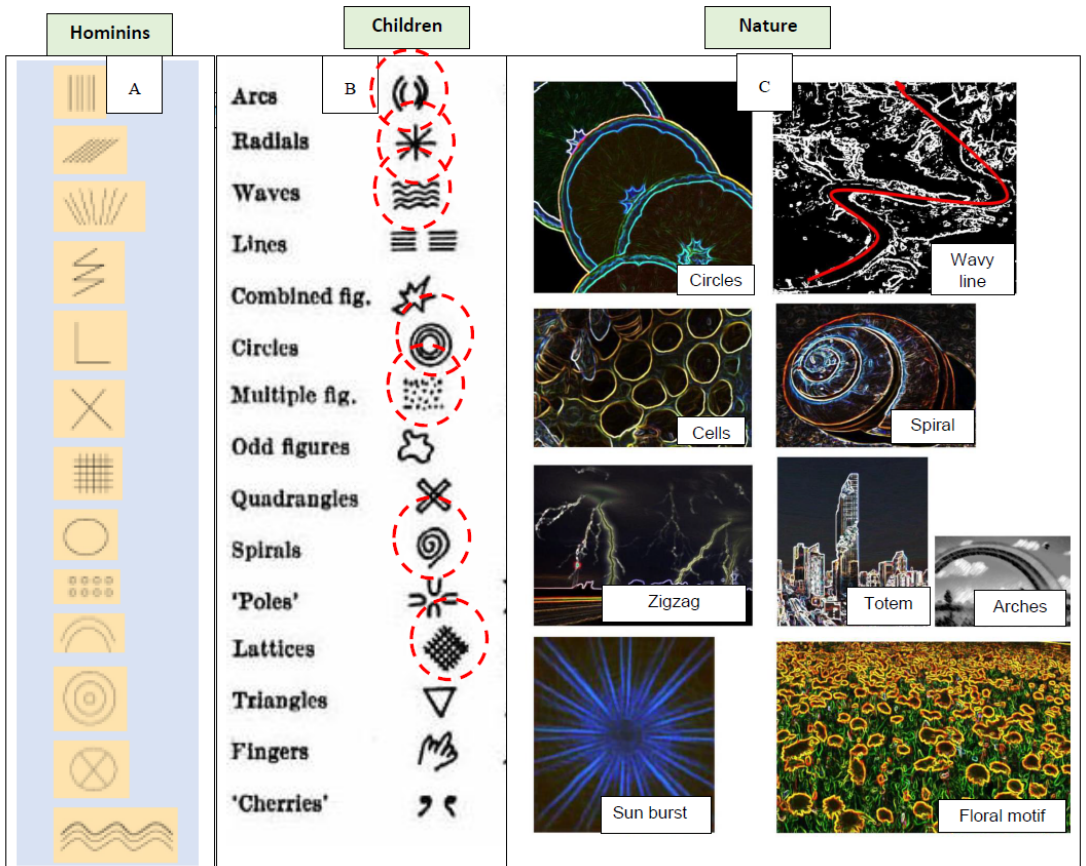




Figure 2. Universal images through art history. Among intriguing aspects of Paleistocene images is a subset called UIs that reappear throughout the history of visual arts but also in contemporary paintings and commercial designs. But even more surprising is the unawareness and sometimes overt scorn that viewers have for UIs despite obvious satisfaction seeing them in paintings. Consequently, we are forced to consider UIs as deeply ingrained in the human subconscious though viewers may be oblivious to them. In the present research, archaic hominins are believed to have abstracted images from Nature, which they preserved in drawings. Finally, hominins who followed

this path of graphic expression were naturally selected.

Specifically, what does Pleistocene imagery embody about their makers that might help understand them better? Then what do apparent changes in the expression of images and artifacts over hundreds of thousands of years reveal about hominins' cognitive evolution?

## 4. Methodology

### 4.1 "Being in the world."

*In looking at any phenomenon, one must place it within its possibilities, its variations., p.16, [16].*

Following Heidegger's lead, we may legitimately ask about hominins, what was their "being in the world"? To understand them better, a primordial leap across hominin externalizations to contemporary *Homo sapiens* consciousness would be needed, which could enable a reflective shift "to the things themselves". That strategy was implemented here by linking hominins and humans together through common images in Nature that also appear among Pleistocene images and in contemporary cultures. They established a survival background for conducting a hermeneutic cycle of hominin externalizations. The philosophical foundations underlying this approach to understanding Pleistocene images was discussed by Merleau-Ponty in his account of "nested gestalts" [18].

In practice, conducting this hermeneutic cycle first centered on a hominin survival background defined by signs in Nature. Then a dialectal, iterative process interpreted a sample of Pleistocene images from the archeological record, which incrementally generated transcendent meaning revealing a coherent network of image themes. Moving in the direction of reification, a complex process of concrescence enacted a "tentative" reality for interpreting images and artifacts [12].

*As Gadamer explains, 'It is a circular relationship. . . The anticipation of meaning in which the whole is envisaged becomes explicit understanding in that the parts, that are determined by the whole, themselves also determine this whole. [13]*

While literally bringing images "back to the things themselves" is obviously impossible, a culturally enacted reflection of images conducted here projected inferences that converged in a harmonious collective "voice".

*To make one more point concerning the 'voices' of evidence, harmonies are most likely to arise when there are convergences, p. 24 [14].*

The legitimacy hence validity of phenomenological insights presented here was justified, first, by perceived directness. Clearly, hominins directed conscious intentionality to making externalizations and specifically mark-making. Secondly, conducting a hermeneutic cycle is a concrescent process that was informed and embellished by assemblages and fossils in a predator ecology [12]. Together they mediated an obvious gap in mentality between hominins and humans that ultimately justified understanding and Truth. Heidegger would describe this process as knowing externalizations for "what they are in themselves and on their own terms" hence better to know hominins themselves.

*I suggest that we start by thinking of . . . the artifact, and the process of analysis . . . which includes perceiving and acting and interacting with the artifact . . . to be the complex concrescent process that enacts meaning, p.16 [12].*

## 4.2 Method: Sampled images

This research required two sets of images. First, nine templates were abstracted from Pleistocene images that

are believed to represent universal events in Nature, which also appear in child scribbles and contemporary paintings. They constituted a background (see Figure 1). This abstraction represents a synthetic “reality” that joins horizons and accommodates limitations of examining the phenomenon of Pleistocene images.

Then a second image set was selected from the archeological record of tools, weapons, mobiliary art, cave art, and body ornaments, which represented the objective diversity of authentic hominin externalizations (n=30). This sample can be viewed online [17]. They were hermeneutically rotated against an abstracted background in Nature, which enacted meaning. An explicit manipulation of figure and ground that yielded a gestalt of the image sample.

### 4.3 Method: Implementation of hermeneutical cycle

Together, abstractions from Nature and Pleistocene images during a hermeneutical cycle established a “phenomenological epoche” in Husserl’s tradition, which created conditions for convergence. Notably, this process emphasized *prelinguistic* reflexivity [18], which differed substantially from conventional phenomenology. A method that typically depends on unique “lived” experiences as revealed during participant interviews. Yet, inert visual images also embody a latent, but prelinguistic narrative that is realized through recursive hermeneutic mediation and reconstituted through interpretation. This coherent reconstruction here yielded knowledge about hominins.

*We are concerned with developing a methodology that is explicit . . . contributing to an understanding of the conditions under which phenomenological knowledge is produced, p. 35 [19].*

The following procedural steps were implemented. First, hominin culture was contextualized during a conditioning phase by conceptually embedding externalizations in a predator survival environment – a consolidation of information referred to as concrescence [12]. During this step, abstracted images of Nature sensitized observers to concepts of survival and security. Then a second set of Pleistocene images followed, which were first examined individually to clarify unique attributes. Then they were collected and compared in pairs to identify shared properties until all possible pairs were exhausted. This procedure is frequently called the constant comparative method [20]. Finally, pairwise results were interpreted for commonalities, cohesion, and emergent trends. Results from this procedure described perceptual structures precipitated by systematic examination of embodied Pleistocene images presumably transcendent, hence independent of time and place. Phenomenologically, Husserl would have referred to these results as “essences”. Specific images, of course, would vary across these essential structures.

After hermeneutical interpretation, the collected images were arranged in hierarchical semiotic order as defined by Peirce’s Theory of Signification. Those externalizations that were clearly indexical were lower on the hierarchy, while those associated with arbitrary

abstract motifs were much higher. The method implemented here was pragmatic intending to understand the images in the context they were expressed, and these results pointed to differences in semiotic properties.

## 5. Results

Many qualitative structures emerged during hermeneutic reflection, and a pragmatic philosophy emphasized material expressions, which were reduced to a small set of shared dimensions. Following structures were identified in all externalizations:

- **Perceptual awareness:** Degree of conscious perceptual mediation that was required to physically produce an externalization. Simple smashed rocks do not require as much conscious deliberation as a figurative narrative.
- **Ideation and proximity:** Every physical object and image displayed a conceptual distance from an idea. This distance was minimal for concrete objects such as tools and weapons, which are directly linked to physical ideas. Mark-making was typically a representation of animate or inanimate objects mediated by an idea, sometimes unknown. This issue of object proximity to ideas appears in all externalizations.
- **Psychomotor coordination:** Visual motor coordination is required to render an image, which presents a practical challenge. Difficulty is further increased as explicit intentions such as concrete, representational image, narrative content, and design properties become prominent.
- **Spoken language origin:** Externalizations varied in amount of relative spoken language that would have been necessary to produce them. Less spoken language would be needed for concrete objects versus representational figurative images. For example, more narrative content presented in visual images would suggest a more significant presence of spoken language.
- **Aesthetic sensitivity:** Externalizations displayed qualities reflecting preference. Contemporary visual arts authorities consider visual preference an indication of personal aesthetic values. Hominin's expression of uniformity, balance, simplicity, striving for perfection, and consistency in images are several recognized qualities that can be objectively identified without attributing cultural functions or importance.
- **Written notation and symbolism:** Evidence of arbitrary rules imposed on production of images. For example, syntax among images was documented in drawings [21-25]. Likewise, lunar calendars and counting devices presented evidence of rules and order. Construction of complex tools also demonstrated procedural rules.

## 6. Discussion

When one moves . . . into the Lower Paleolithic [2.6 - 1 Mya], assumptions regarding . . . meaningfulness must

be questioned. Rather than asking what something meant, we must ask whether something meant anything at all. We cannot assume that *Homo erectus* thought in the same fashion as *Homo sapiens* p. 63-66. [26]

The things at stake were originally acts of intentionality across an evolutionary span of over 3 million years, and their meaning now is hopelessly obscure. Indeed, no matter how similar images from the Pleistocene and 21<sup>st</sup> century may seem to be, that they had comparable meaning is highly unlikely. To accommodate this concern, three pillars of philosophical phenomenology -- essence, meaning, and understanding guided this interpretation of externalizations. More specifically, a method was embodied with what is believed eternal in the Universe to bridge an immense gap between hominins and humans, which yielded results surprisingly coherent. In addition, hermeneutics in the context of a pragmatic semiotic signification theory provided additional insights into images and consciousness within a time-invariant framework. Altogether, they point to an ontology, which, arguably, constitutes objective knowledge [15].

Those structures identified here point to much stronger semiotic pressure in Nature on hominin evolution than commonly recognized, which complements contemporary models of hominin cognition and tool making aptitude [27]. Hominin perceptual sensitivity to semiotic pressure likely led to natural selection.

In general, the structures identified here raise questions about the cognitive adaptations that would have been needed

to maintain effective hominin interactions with Nature for over 3 million years. For example, the cognitive leap from earliest symbolic conceptions needed to generate metaphorical insights associated with tools to the generation of notation devices and literacies was enormous. Clarifying those adaptations that made that trajectory possible remains a challenge.

## 6.1 Summary and conclusions

Results here suggest that hominin externalizations differed along at least six transcendent dimensions. Despite variation across deep time, all images can be represented to some degree on them. Surprisingly, the shared dimensions identified here were not chaotically organized or random, and, in fact, were well-defined pointing to separate pathways for image-making, aesthetic sensitivity, and notational literacies. The simplest externalizations (rock smashing) only required perceptual awareness of natural events and capacity to mimic them. More complex externalizations demonstrated ideation, and psycho-motor coordination, which incrementally improved over thousands of millennia. Aesthetic sensitivity presented an unexpected and separate pathway with existential implications. This semiotic progression culminated in arbitrary symbolic expression that was eventually characterized by notation and syntax in the Middle Stone Age (280 to 50 Kya).

The results here also showed that sampled Pleistocene imagery defined a pragmatic semiotic hierarchy, which provided insights into the complexity of cognition needed to produce them. For example, the lowest level of semiotic function was direct ideation of an object



without graphic mediation such as figure or shape. Those results suggest hominins already had substantial symbolic capacity more than 3 Mya making primitive rock implements called Oldowan choppers. They are the earliest evidence of a generative image by an ancestral human that would have required concrete conceptualization of a functional tool, and a metaphorical capacity to foresee its usefulness. In other words, possibly hominids and certainly hominins had the capacity to infer simple cause and effect relations. In addition, present research asserts that hominins had a semiotic response to perceived forms that were like other mammals but with a unique aspect, arguably, related to metaphorical insight. They perceived patterns in Nature and decisively preserved images of them. These results suggest that visual thinking preceded tool making.

In general, these results suggest hominins engaged in more symbolic functioning during Lower Paleolithic than archeologists commonly believe. In fact, assertions that hominins “leaped” into modernity and became anatomically modern humans only about 50 Kya, a distinctly European-centric claim, was probably more associated with fine motor coordination than significant advances in cognitive capacity. The brilliance of their visual art, notably at Altamira and Lascaux appears to have prompted a myopic jump to conclusions. Results here suggest cognitive trajectories and adaptations preceded contemporary *Homo sapiens* by millions of years.

A conclusion reached here is much published discussion about Pleistocene imagery is distorted by motor

development, which conflates images and tool making. While physical finesse producing beautiful images and refined tools is recognized relatively late in the archeological record and garners enormous attention, present research suggests that aesthetic and cognitive advances had appeared much earlier. Arguably, hundreds of millennia before motor coordination differentiated tools and aesthetics.

Finally, the identified structures here are excellent candidates for future empirical analysis. Any of them could be empirically parameterized and associations examined with prospective ecological influences or other parameterized forces. Statistical models would be logically possible.

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