SEMIOTIC INVESTIGATIONS INTO EARLY FORMS OF SYMBOLISM AND LANGUAGE

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Understanding early traces of symbolism and the origins of language is challenging given the difficult access to the psychological and cognitive operations which underlay them from the archaeological record. In order to address this issue, we propose a semiotic framework based on the notion of representational medium. This concept helps bridging the gap between ancient and modern semiotic activities by extending analyses of modern media. It also leads us to highlight a possible evolutionary trajectory to modern symbols.

1. Understanding early traces of symbolism

1.1. *Material signs and their hidden cognitive roots*

Recent years have seen an increase in the number of archaeological studies pointing toward early use of symbolic representations in *Homo sapiens* (d'Errico et al., 2001; Vanhaeren et al., 2006; d'Errico et al., 2010). They are based on the discovery of engraved pieces of ochre or bones, or collections of perforated and colored shells; their demonstration relies on ruling out all explanations to the properties of these items but a symbolic usage. When it can be evidenced that shells were brought to a distant site from the sea, were deliberately collected or perforated, and show microscopic residues of pigments (Vanhaeren et al., 2006), the most likely explanation is that they were worn as ornaments. This means that the human beings who owned them had collectively agreed on attributing them a specific meaning, likely related to the expression of social identity. Such a description echoes the symbolic nature of language, which emergence can be considered in link with the above discoveries.

Like other past behaviors such as ritual burials, parietal art or sea-crossings, early symbols point to the lives, words and thoughts of our ancestors. Understanding their social and cognitive environment however proves to be challenging. The materiality of the archaeological record indeed requires chains

of speculative inferences to go from artifacts to behaviors to cognitive representations. From this the question arises whether more can be said of the previous cues, and how.

1.2. *Distributed cognition as a framework for the study of early symbols*

A possible answer to the previous question consists in defining a theoretical framework in which to think of symbolic artifacts in a more generic way. Our aim is indeed to get insights from a variety of fields, from photography to philosophy to media studies, which objects and theories may first appear distant from cognitive paleoanthropology, but can nevertheless be brought closer through the use of shared concepts. Such an approach builds on the assumption that humans since at least 100,000 years share similar cognitive abilities with us (d'Errico & Stringer, 2011), notwithstanding the progressive accumulation of technical and social knowledge.

At the most general level, the intended framework may benefit from the point of view of *distributed cognition*. In this paradigm departing from the classical focus on the individual mind, cognitive systems may encompass several individuals and the artifacts mediating their interactions. A classic example is the landing procedure of a plane, which is only properly addressed by taking the whole cockpit – the two pilots, their interactions and their various navigation tools – into account. Distributed cognition emphasizes a shift with respect to where knowledge is stored and how information is represented, transformed and propagated in the performance of tasks (Hutchins, 1995). External 'devices', like verbal communication or artifacts, matter as much as mental transformations. This approach is obviously appealing to archaeologists who can only rely on material residues, and it will underlie our next propositions.

2. Representational media and their human comprehension

2.1. *The notion of representational medium*

Our framework revolves around the central notion of representational medium – R-medium for short. Conceived in an abstract fashion, R-media carry information between entities that are able to process it, whether they are actually human beings, other organisms or computers. In our species, they convey representations of the world we all experience, with cultural and technological dimensions born from the human mind and continuously shaping it. A watch displays a visual representation of time; roadmaps mediate knowledge about the spatial organization of transport systems; words mediate the entities they refer

to, either as acoustic signals or written units. As human beings, our lives lie deeply embedded in a large number of diversified R-media, on which our cognition relies to build inferential processes and take decisions.

Such a broad definition of R-media allows considering prehistoric situations meaningfully. Either colored shells, engraved bones, painted bodies or walls can be considered as R-media, since they conveyed information and meaning between those who produced or wore them, and those who witnessed them.

The previous examples point mainly toward artifacts and more generally human achievements, anchored in the social and technical dimensions which characterize all human societies. However, considering as R-media other elements that do not fall into these categories does not seem unreasonable: footprints in a way mediate the past presence of an animal or a human being where they appear on the ground. Such an extension of the notion actually hints at a more careful semiotic reading, as proposed below.

2.2. *A semiotic reading of the notion of representational medium*

Extracted from the framework of individual cognition, representations escape from their mental substrate, and therefore the properties attached to it. They then get closer to their etymological status of substitute of an entity to an interpreter, and therefore display an intuitive proximity with the notion of sign, defined by Peirce (1931) as '*something which stands to somebody for something in some respect or capacity*'. Through the notion of representation, a semiotic reading can thus be applied to R-media, which can be considered as *carriers of signs*.

From then on, semiotic typologies can help classify R-media according to their properties and usage. For example, Eco (1988) operates a distinction between artificial and natural signs based on the intentionality of the emission process. Complementarily, signs may fall into two categories: entities which primary task is to signify, and entities that primarily serve a different function, but which display a secondary function of signification.

Some R-media carry artificial signs with a primary function of signification. Shell beads were likely worn to primarily express social identities or situations, just as modern neckties do. In this case, the signification relies on an established, "symbolic", convention. Other R-media may convey artificial signs with a secondary function of signification, like weapons which come to signify the power of their owners. Others yet may convey natural signs with a secondary function of signification, like bones allegedly belonging to the Buddha becoming meaningful relics. Natural signs with a primary function of signification are more difficult to conceptualize, unless one extends the notion

of intentionality to encompass a more biological acceptation: the tail of the male peacock primarily and unintentionally 'signifies' the quality of its genes.
This diversity of R-media and the notion of intentionality highlight the central role played by the process of *semiosis* - the process of "meaning making" - and more importantly how it can be understood by animate beings. Artificial signs can only be produced by creatures who understand the role an entity can play as meaning something for someone else. A semiotic rereading of Von Uexküll's notion of *Umwelt* states that all organisms live in a dense web of relationships of signification and processes of semiosis (Sebeok & Umiker-Sebeok, 1992). However, although each species, through its senses and cognitive apparatus, builds its own world of signification and infers its behavior from it, only human beings seem capable of understanding the nature of these ubiquitous processes. Animals can or can learn to use signs of various natures but do not understand their nature and cannot therefore create any intentionally. Reversely, symbolic manifestations in the archaeological record are important since they undoubtedly testify of the capacity to understand the process of semiosis.

2.3. *Primary and elaborated properties of representational media*

To further understand how semiosis takes place along R-media, it makes sense to investigate their properties. Each R-media is indeed characterized by various features; they relate to which information will be carried, or in other words the kind of semiotic mediations it will be more or less susceptible to perform.
On the one hand, *primary* properties of the R-medium can be defined independently of any potential interpreter; they strongly impact on the conveyed representations. An intuitive classification derives from our sensorial modalities, but semioticians like Sebeok have put forward broader classifications of signs according to the channel they take - either material or energetic - with subdivisions such as acoustic, optical or electrical energies (Eco, 1988). These different channels carry representations according to their spatial and temporal properties. Acoustic and visual media do not require the source to be in contact with the receiver, contrary to tactile and gustative signs. Acoustic, tactile and visual channels carry more structured information than flavors and smells etc.
Early symbolic R-media can be analyzed along such lines, with notions such as disruption and stability through time of the representations they convey. Being acoustic, language can be disrupted if noises cover the emission of signals. Visual R-media can be disrupted by darkness. Words uttered basically don't last; material media last longer and can be further distinguished: as markers of social identity, scarifications and tattoos live much longer than body paintings

or ornaments, and don't suffer "disruption". Engravings can go past human life, possibly forming external memories and allowing cumulative knowledge.
In addition to these primary properties of R-media, others relate to the way we, humans, conceptualize R-media, and how we derive *elaborated* attributes from primary ones, whether intentionally or not. Hence, the choice of shells as body ornaments and the signification they became to express were perhaps motivated initially by an aesthetic feeling for their 'primary' shapes and colors. However, such conceptualizations are uneasy to derive from primary features, and may actually be partly independent from them. As they do not link directly to the medium but rather coexist with it for some interpreters, they prove difficult to investigate without direct account from these interpreters. Resorting here to more recent, better informed proxies can then prove useful.

We have introduced the main lines of a framework in which to analyze processes of semiosis. Additional ideas cannot be presented for lack of space, like the competition between R-media, and the balance that get established between them to carry meaning. But all in all, a coherent context can be assembled which provides conceptual tools to analyze past situations. We will now see how some of these tools may be borrowed from studies of modern R-media, and how they can inform us regarding a possible evolutionary and historical scenario for semiotic systems.

3. From the analysis of modern R-media to early semiotic systems

3.1. *Elaborated features in studies of modern R-media*

An interesting proxy for the emergence of early semiotic systems is the long lasting and evolving relationship between painting and photography. Entering into its details exceeds the scope of this paper, but the main argument can be summarized as follows. In addition to the quest for a precise and conform representation of reality, photographs have very early been looking for ways to grant the durability of the pictures taken. The achievement of virtually infinite mechanical reproducibility has been seen by Benjamin (1936) as a major evolution or even revolution in Art. The core issue is the divorce that takes place with photography between the *truth* of a representation and its *authenticity*. The cause lies in the displacement induced first by the autonomous process of production of the photographic picture, and then by the cheap mechanical reproduction of this initial image. Such a procedure shifts the value granted by the unicity of the painted masterpiece, its *hic* and *nunc* and the aura it

provides to it, to a different domain; the talent of the painter cannot be transferred to the photograph. In other words, it is not because a picture is a true representation that it is felt as authentic; its value has to come from elsewhere.

In this framework, truth and authenticity can be interpreted as elaborated features of the photographic medium, and further details could show how they shaped the various directions taken by photography in the 20th century.

Does it make sense to consider *elaborated* features such as truth or authenticity when it comes to prehistoric R-media? We argue that our ancestors had indeed similar judgments in mind.

If one looks for example more specifically at the symbolic expression of social identity, language seems to be a strong competitor given its productivity and internal consistency. However, language shares with photography the cheap reproducibility of its content, and therefore a low degree of authenticity. Since faking with words is easy, it is difficult to grant authenticity to someone's speech, however articulate its content. Contrastively, 'primarily' irreversible and painful body alterations can be granted more authenticity. In between, the time needed to collect and prepare necklaces made of rare shell beads gives value to these ornaments. Given that various aspects of social identity exist on different time scales – inclusion into a group for a brief time period, long-term affiliation to a clan or family –, it makes sense to distribute their expression along R-media depending on their primary and elaborated features.

Other elaborated features can be suggested by studies of modern visual media: Bolter & Gruisin (1988)'s notions of *immediacy* and *hypermediacy* for example refer to the degree of transparency of the medium with respect to the signs it conveys, and can enrich the description of past R-media.

3.2. *An evolutionary road to modern symbols and R-media*

It is difficult to envisage the symbolic ability as something else than a nothing-or-all capacity, as reflected by the broad category of symbols used in many publications. However, the continuous evolution of modern media and earlier glimpses into the typology of signs point to the possibility of a gradual trajectory leading to modern semiotic capacities.

A plausible scenario can start with the endowment of natural signs with a secondary function of signification. This can be the case with untransformed perforated shell beads, where a secondary signification is 'simply' applied to a natural object. Intentionally perforating the shells, applying coloring pigments or performing other alterations are then a step further, with a modification of the primary features of the medium in relation to its secondary signification.

An evolving evaluation of the primary and elaborated features of R-media could also explain some evolutions. Kuhn & Stiner (2005) have for example made some proposals regarding the use of colorants and ornaments during prehistory, and the shift in predominance that occurred from the firsts to the seconds. This is explained by the fact that colorants were unconstrained, fugitive, hard to assess in quality and uneasily transferable, while ornaments were standardized, durable, transferable, and showed varying degrees of investment.

A significant change may have taken place with the first productions of artificial signs. According to this distinction, geometric engravings on ochres or bones differ significantly from the previous elements, a distinction not commonly operated by prehistorians. The degree of complexity in the production of these R-media would then have increased, leading to refined parietal art. Primary features may also have been better conceptualized, as exemplified by how the volumes of cave walls were used to create more 'alive' animals.

Interestingly for a scenario fitting the gradualness of natural selection, individuals with differing degrees of mastery of signs can be considered. It is indeed enough to have some people producing signs for them to be used in a group where not all understand the nature of semiosis. Experiments with a variety of animals, from parrots to dolphins, have demonstrated that animals can learn symbols, manipulate and even transmit them (Savage-Rumbaugh et al., 2001; Fouts, 1973), even if they are not able to produce them in the first place – something our ancestors did with language. Natural selection could thus have gradually favored individuals with a refined understanding of semiosis, until it became ubiquitous in human populations (as today).

3.3. *Testing hypotheses*

Descriptions of known symbolic manifestations and derived hypotheses are a first step, but an obvious issue is to be able to provide test beds for them. Analyzing the spatial and temporal distribution of colorants, beads and engravings (d'Errico & Stringer, 2011) is such a test, and we currently look at the following questions: do we observe natural signs with a function of signification before artificial ones? Do they appear in pre-*sapiens* populations? Can distributions relate to different groups, or populations of different semiotic abilities? Why did beads disappear in some regions between 70 kyr and 40 kyr?

4. Conclusions

We have outlined a semiotic framework to consider early symbolic activities in the light of modern ones. We are now focusing on the predictions it suggests

and how to test them. All in all, it highlights the complexity of the processes of semiosis which took and still continuously take place in human societies. It also suggests that the development of a semiotic capacity was a crucial step in human evolution, but that it matured only gradually along the evolution of various R-media. Investigating the semiotic nature of past symbols is hence a useful window onto human cognitive evolution.

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