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Technical Creativity, Material Engagement and the (Controversial) Role of Language[1]

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Abstract. For several hundred thousand years, the genus homo deployed a characteristic technical creativity, communicating and transmitting its outcomes, together with its operative protocols, without the available recourse to articulated language. The thesis proposed here is that the aforementioned functions should be attributed to a complex intertwining of embodied abilities, which can in turn be ascribed to the classic philosophical concept of imagination. It is through imagination that the human becomes involved in material engagement (Malafouris), by virtue of which its extended mind takes part in the processes of producing artifacts and is in turn shaped by them. The main issue of this article consists in investigating how this involvement occurs (§§ 1 and 2) and the part that articulated language plays in it, following the invention of the latter (§§ 3 and 4). The latter's emergence can indeed be traced back to the transformation and specialization of a recursive element, already present in the pre-linguistic work of imagination, whose ability to implement a denotative semantics is discussed in particular (§ 5).

Keywords. Technical creativity; Extended mind; Imagination; Language; Denotative semantics.

1. LIVING BEINGS AND THE INORGANIC

The forms of life with which the genus *homo* experimented in the course of its evolution are primarily characterized by a set of practices related to its specific *technical creativity*. Regarding this thesis, which I am inclined to take as self-evident, it seems to me that particular attention is due to the issue of empowerment: namely, the process of acquisition, via interiorization, of skills previously experimented with for a long time according to the externalized[2]

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[2] "Externalization" is a largely current, albeit unfortunate, expression. It is frankly deceptive inasmuch it makes us think that the process at stake here

modes typical of technical action. To clarify what is to be understood by "technical empowerment", and what is important about it, one need only consider two particularly powerful technologies: articulated language and writing. My aim is to reflect on the former in particular, starting from the idea that, generally speaking, articulated language – when not suppressed as irrelevant or even misleading – has not been adequately investigated within the overall context of technical creativity.

My starting point here is the concept of "material engagement" introduced by Lambros Malafouris in a recent influential book (Malafouris [2013]). Malafouris's approach has the merit of integrating the phenomenon of technical creativity into a highly efficient and persuasive paradigm, *Material Engagement Theory (MET)*, with which I largely agree. Recently, Malafouris, together with Don Ihde, reaffirmed the programmatic character of this approach, proposing anew the classic figure of *homo faber*: if we humans correspond primarily to this figure, rather than to that of *homo sapiens*, this is not so much on account of our propensity for creating artifacts, but because «we make things which in turn make us» (Ihde, Malafouris [2018]: 195). The reversibility of this relation, along with the emergences that derive from it at each turn, is thus the main requirement of MET.

I cannot enter into the details of the theory presented by Malafouris, whose debt with regard to the concept of "extended mind" I assume is recognized (Clark, Chalmers [1998]). After all, Malafouris himself defines *MET* as a «strong version of extended mind theory» (Malafouris [2013]: 227), and relates it to a "hylonoetic field", while focusing on the «importance of *mediation* in human thinking» (italics are mine), in direct opposition to the classic "hylomorphic" conception, according to which a design conceived by a human mind gives shape to lifeless matter. For its part, "mediation" should be understood as the general technical action constituted by the *equal interactive relation* established among the different "contractors" of the processes governing the emergence of artifacts. Among the many cogent examples offered by Malafouris, let us take the case of a vase produced through the proper molding of a piece of clay; I will come back to this example several times. Considering this process in the light of *MET* implies, on the one hand, emphasizing the extent to which the affordances exhibited by the clay – pliability, flexibility, relative permeability, resistance, and so on – contribute *as much as* the sensitivity of the potter's hands and the movement of the wheel to the emergence of an artifact. On the other hand, it highlights the configuration of the whole productive operation as a complex *cognitive event*, in the course of which the extended mind taking part therein ends up being re-modeled in its own turn and initialized to intentional competencies that did not exist prior to the event itself.[3] In other words, intentionality itself is an emergence within the process of material engagement, not something instructing it in a privileged way. One last point needs to be underlined: the technical creativity related to material engagement and the empowerment processes is as old as the genus *homo*. This means that this creativity had been at work long before something like language even remotely emerged. I therefore assume that material engagement can be considered a general sensorimotor agency of the human body, to which we can give the classic name of "imagination", while taking care not to lose sight of its fundamental embodiment and constitutively interactive character. Human beings "imagine" with their whole bodies – and, of course, primarily with their hands. Likewise, it was an increasingly complex system of sensorimotor protocols that drove the communicability of the human being's interactive routines for thousands of years. In spite of that, it does not seem justified, strictly speaking, to grant these forms of communication (and learning) the status of "language" (Corballis [2002], Everett 2017).

consists in "putting outside" something already conceived "inside". As will become clear in the following pages, this movement from inside to outside must be radically questioned.

[3] This description essentially coincides with what I have called "technical empowerment".

Before focusing more closely on MET in connection with the emergence of articulated language, I would like to add that, if we consider a large number of disciplinary approaches that are mutually diversified but significantly representative of the status assumed by the humanities vis-à-vis the hard sciences for the last forty years, it is possible to observe a broad consensus concerning the theoretical paradigm that Malafouris ascribes to the field of cognitive archaeology. In other words, the idea that we should focus on the embodied character of human cognition and its communication systems is broadly shared across the anthropological, neuroscientific, paleontological and psychological fields today (Gallagher [2005, 2017], Gallese, Lakoff [2005], Grusin [2017], Ingold [2001, 2013], Latour [1999], Noë [2009], Tomasello [1999]). In short, the mode of formulating the question of human cognition and experience at stake here – beyond specific, and sometimes important and significant, divergences – can be identified with a philosophical orientation characterized by the clear and rigorous delimitation of a precise system of incompatibilities (for instance, with representationalist, intentionalist or innatist theories of the mind, etc.). To that end, it applies methodological protocols that are increasingly scrupulous about the empirical adequacy and the experimental import of the theoretical hypotheses proposed.

Two points in particular deserve to be underlined. The first, already mentioned, is the radical dismissal of the "hylomorphic" paradigm (Ingold [2013]). According to this paradigm, the inorganic is nothing but a lifeless matter more or less compliantly available to receive the seal of a form following from an intentional design previously conceived by somebody's mind. The second point is that the "imaginative" performance of *homo faber* largely precedes, and deeply instructs, that of *homo symbolicus* (Malafouris [2013]: 153-177, 227-49). The two points are obviously interrelated: as we saw, on the one hand, material engagement implements and oversees the active participation of the inorganic in the emergence of the human mind; on the other hand, the temporal development of material engagement produces cognitive infrastructures, preparing the field for the emergence of the symbolic. The emergence, in particular, of something like a *phonetically articulated* and *semantically denotative* language – a technology whose implications for the radical reorganization of the human forms of life, where it likely introduced an element of discontinuity, are indeed difficult to underestimate[4] – is the specific issue that I would like to discuss.

The problems arising in connection with this event are impressive and far from being adequately formulated, let alone settled. I limit myself to listing a few of them, to which I will return in the conclusion of this article: Is it more likely that the appearance of articulated language had the character of a "sudden" irruption, or rather that of a long and gradual development? Is the phonic-articulatory trait more likely to be discriminating or rather interchangeable with resources coming from other systems of organization on the plane of expression, for instance, gesture? Is the semantic-denotative property of enunciation, that is, its "objectivity" or "aboutness", likely to determine the characterization of this technology, or rather only to integrate it into other pragmatic, communicational and expressive properties? Is the degree of self-consciousness governed by an articulated and denotative language likely to be in every way comparable with that imputed to the imaginative practices, both operative and performative, of *homo faber*, or rather to mark a significant and irreversible transformation?

2. MODES OF "CORRESPONDENCE" BETWEEN THE LIVING BEING AND THE MATERIAL WORLD

It might be useful to differentiate the *equal interactive relation* paradigm – as I have defined it in general, with reference to Malafouris's theses – from the specific theoretical inflection that a similar interpretation of human technicity assumes

[4] I will take a position on this point, which is among the most debated, in my closing remarks.

for an anthropologist such as Tim Ingold (2011, 2013). As I have already pointed out, these two conceptions, and others besides them, share a radical critique of the matter-form model, as it has been conceived for thousands of years, in terms of a hylomorphic approach. By contrast, these two conceptions can be distinguished, as it were, by the description of the "role play" discernible within this very relation, starting from the rather significant fact that, per Ingold, the concept of "interaction" should be dismissed in favor of that of "correspondence", and extending to a similar, even overly scrupulous, censure of other conceptual tools, such as embodiment and agency, which are usually associated with the idea of an extended mind.

In many respects, Ingold presents his position, starting with his terminology and recurrent examples, as a conciliatory and reassuring version of Martin Heidegger's reflections on technics – especially the oft-cited Heidegger (1949). More precisely, Heidegger's anti-humanism seems to resurface here, in the form of a non-anthropocentric humanism that willingly grants the human being's propensity to enter into a deep resonance with those "things" whose most authentic nature essentially consists in keeping their "thing-ness" in a state of flow, unlike the deplorable "objects", which Ingold considers to be stiffened products of a representational *hybris*. The result is a remarkable view of technical mediation, understood as the invention of a system of "transductors"[5] capable of setting the parallel course of two energetic flows – namely, the flow of human life and the many-sided flow of inorganic matter – into a synchronic relation, to be renewed at each turn. Here, Ingold's thought intentionally resonates with that of Gilles Deleuze and Félix Guattari (1980). Ingold offers several examples, all of which are extremely evocative and presented with irresistible commitment. Among these is Malafouris's driving example: namely, the particular material engagement through which artifacts – or rather, "things" – referable to the kind of "pottery", emerge. Desiring to maintain a rigorously non-anthropocentric position and, moreover, having opted to eschew the concepts of agency – whether human or material– and embodiment, Ingold describes the productive process according to the following scheme: the "correspondence" of the human being – and more precisely, its fluid proprioception – with the flow properties of clay is made possible only by the mediation of a transductor, which, for the matter at hand, is the potter's wheel. In the aforementioned "role play", Ingold's working model thus assumes a precise *triadic configuration*: the correspondence between human being and the fitting and fluid overabundance of *physis* – although Ingold prefers to speak of "world" – must be *creatively* mediated by the invention of transductors that actualize and "phase" it, so to speak. The place for this encounter is simply the "thing", considered in its irreducible difference from the object. This argument is commendable not only for its ability to put Heidegger in dialogue with Deleuze-Guattari, against the backdrop of a vitalist and conciliatory phenomenological *Stimmung*, but also for its effort at modeling the role of *homo sapiens* from a perspective that fosters technical creativity, outside of any lust for dominion. This *Stimmung* is the very "second technique" that Walter Benjamin (1935) connected to the ideas of play and *mimesis* qua "enhancements" of nature and neutralizations of any will to power (or destiny to submission[6]), although Ingold's (2013) text lacks this reference.

Another remark is warranted before we can assess if and where Ingold's approach encounters challenges. One might indeed wonder why such a rich and creative harmony with the fluid superabundance of the world only characterizes the

[5] Ingold is careful to distinguish between his use of this term and the concept of transductivity advocated by Gilbert Simondon (1992), an author whose original theses he values and reechoes to a certain extent.

[6] Granting the legitimacy of another Heideggerian reference, one could also speak of "production in the cradle of *physis*". Nevertheless, the fact that so many authors, so different one from the next, can stay together – or "correspond" – in the irenic problematic space opened by Ingold could be reasonable cause for suspicion.

existence of human beings, and not that of other living beings as well – or at any rate, why only the former is characterized as so powerfully marked by determining and downright catastrophic evolutionary turns. Indeed, since Ingold cannot resort to the traditional explanations that lead us, in some way or another, to consider certain cognitive, presumably species-specific, functions as innate, he appeals to the human quality that, amongst all others, seems the least anthropocentric: "feeling", understood as an *aisthesis* attuned to the paradoxical, but far from counterintuitive, condition of an ek-static and decentered proprioception[7]:

> *To correspond with the world […] is not to describe it, or to represent it, but to answer to it. Thanks to the mediating work of transduction, it is to mix the movements of one's own* sentient awareness *with the flows and currents of animate life. Such mixture, where sentience and materials twine around one another on their double thread until […] they become indistinguishable, is of the essence of making. (Ingold [2013]: 108, italics are mine)*

It is therefore by virtue of an *aisthesis* that is particularly open, mobile and free from selective filters that, of all living beings, the human being alone seems capable of corresponding with the world in the creative and transductive, which is to say, technical, way considered above. As we will now see, this last position of Ingold's must be maintained, though it cannot be taken at face value. Indeed, it does not suffice to say that the human being "feels" the fluid superabundance of the world in a "different" way than the tick or the chimpanzee does, let alone that this "diversity" is responsible for historical effects unknown to other living species – or perhaps for history *tout court*. I would now like to turn back to Malafouris's work, in order to present the problem that I left open in a new and potentially more appropriate way. I am referring to the question of articulated language as a benchmark of the specific role played by the human being within the radical and equal interaction that characterizes material engagement.

3. ANTHROPOCENTRISM OR ANTHROPOMORPHISM? AESTHETICS AND TECHNO-AESTHETICS

Ingold and Malafouris, along with many others, share an explicit suspicion toward the anthropocentrism that is likely to have supported the objectifying position at its origins and throughout its development: namely, toward the isolation of (human) agents from things, which is underwritten by the representative and hylomorphic approach. Malafouris responds very sharply to this position by definitively reaffirming a thesis that we have already examined:

> *If there is such a thing as human agency, then there is material agency;* there is no way human and material agency can be disentangled. *Or else, while agency and intentionality may not be properties of things, they are not properties of humans either; they are properties of material engagement. (Malafouris [2013]: 119, italics are mine)*

Nevertheless, Malafouris is quite aware that the kind of entanglement evidenced by the material engagement in which the human being takes part has something peculiar about it and is not entirely generalizable. He specifies this peculiarity by distinguishing between anthropocentrism and anthropomorphism. He writes that «to engage in anthropocentrism is to perceive humans at the center of reality; to engage in anthropomorphism is to perceive reality in human terms», adding that this «is a biological necessity of the human condition that we need to embrace» and that it would be impossible even merely to imagine what it would mean, for us as humans, to live and think without the constituent metaphorical apparatus on which our perception of the world – interwoven with deeply embodied sensorimotor schemes,

[7] Indeed, the prospect of a "decentered proprioception" sounds like an oxymoron. However, as a very simple exercise of insight should suffice to convince us, it is a condition readily available to intuition. For instance, it should suffice to relate it to the experience of beauty.

such as up/down, front/back, interior/exterior, and so on – is based. It follows that anthropomorphism must not be thought of «as a problem that we failed to overcome, but as a central characteristic of human projection and material engagement that demands attention and understanding» (Malafouris [2013]: 131).

The epistemological scope of this issue needs to be clarified and developed even beyond the methodological boundaries to which Malafouris confines it. More precisely, we should question whether the concept of "perception" used here is entirely appropriate, or whether it would be preferable to speak, as Ingold does, of a more general and indeterminate "sentient awareness", namely, the characteristic *openness* of human *aisthesis*. I mean to say that the reference to a specifically "aesthetic" element could help ensure a better understanding of the anthropomorphic perception to which Malafouris refers, as well as of the ek-static proprioception advocated by Ingold. Now, the "anthropomorphic" need noted by Malafouris is clearly foreshadowed in its specific epistemological status in the *Critique of the Power of Judgment*, the work in which Immanuel Kant (1781) unveils his aesthetics. Kant speaks of a "purposiveness of nature", to be understood as a "subjective" principle of the reflecting faculty of judgment. That is, namely, the principle of the particular cognitive activity whereby we formulate hypotheses concerning the existence and positive detection of regularities within the natural world. Kant writes that, in the exercise of this fundamental activity, we thus behave "as if" an intelligible design were concealed behind the great and apparently irreducible "variety of forms" with which "nature" confronts us, although this design remains entirely to be discovered. In so many words, we behave "as if" the internal structure of nature were anthropomorphically attuned to our way of knowing. It is a question, however, of a non-objective principle, a sort of hypothetical simulation, on whose grounds the reflecting faculty of judgment gives itself, and not nature, a procedural rule. Now, the point that most interests us here is that, according to Kant, the form of the anthropomorphic projection whereby nature is taken "as if" it were spontaneously attuned to our deepest expectations, that is, available to be dwelt-in and known, is a "feeling of pleasure and pain" – a feeling of something together with a feeling of oneself. It is therefore something very close to the "correspondence" claimed by Ingold, whose primary place is *aisthesis*, and not perception – as Kant would agree, insofar as the latter is interwoven with conceptuality – much less understanding (which is the seat of conceptuality).

The question set aside at the beginning – namely, of what is at stake in the "role play" between the contractors of the equal interaction in which material engagement consists, and in which the technical creativity characteristic of *homo faber* is performed – thus points toward the possibility of an aesthetic answer. The human being enters such play initially by virtue of an extremely intense, but also indeterminate and open, feeling that orients its imagination in the course of the entanglement of material engagement. And it is clear that the import of this feeling has to do with the specific creative adaptation of a living being that is compelled to find the resources for survival technically because it lacks them biologically.

On this last point, it is noteworthy that, in the *First Introduction* to the *Critique of the Power of Judgment* (which was subsequently replaced), Kant defines the principle of the reflecting faculty of judgment as a "technique of nature". This definition is less comprehensive than the definitive one, but more revealing. Put otherwise, what is felt as anthropomorphic in nature, in a purely hypothetical and "simulative" way, is first and foremost nature's conformation to a broad and indeterminate technical texture. It follows that, from its origin, human *aisthesis* has been a technically attuned feeling: a *techno-aesthetics*[8].

In Kant's original formulation, the commitment assigned to the agency of the human being through its attunement with a constitutive technicity needs to be given its proper weight; this is one possible reason, and not the least important

[8] Simondon (2014) uses the term "techno-aesthetics" in a different acceptation from this one.

one, for the philosopher's subsequent recourse to the much more indeterminate "purposiveness". If we take this last scenario seriously, the framework that we have hitherto established for relating Malafouris and Ingold in spite of their respective differences undergoes a rather fundamental change. Indeed, not only does Ingold's conciliatory *Stimmung* make room for a certain uncanny *compulsion to technical creativity* – recalling the *deinotes* that Sophocles attributes to the intrinsic technicity of the human being in the first stasimon of the *Antigone* – but in addition, the repeatedly invoked "equality" of the elements contributing to material engagement is, at least partly, called into question by the excessive activism and spectacular plasticity displayed on the part of one of them. This last aspect needs to be better defined.

4. HYPER-INTERACTIVITY OF IMAGINATION: SALIENT AND SUPERVENIENT AFFORDANCES

A final reference to the philosophical system of Kantian aesthetics will be useful for formulating the problem according to a conceptual scheme that I deem appropriate and intend to adopt for the rest of this article. While describing, in analytic terms, the aesthetic feeling whereby we humans feel an agreement, or correspondence, with nature, Kant speaks of a "free play" between imagination and understanding. More precisely, he speaks of a free play between the indeterminacy of the former and the determinateness of the latter. I will stress a few points from this well-known definition without excessive concern for philological rigor. What does it actually mean that imagination has to do with the indeterminate? It means that imagination's task consists in going through[9] the affordances of the empirical data, configuring the manifold possible synthetic unifications[10]. In the clay-work example, for instance, these involve not only the affordances manifested through the pliability of the material but also those that make the material's reactivity to a rotatory movement emerge. In the first case (pliability), one might speak of salient affordances; in the second (sensitivity to the rotatory movement), one might speak of supervenient affordances.

The point that I want to highlight is the following: in the "free play" that Kant describes, we are bound to note a focused and attentional orientation – governed, according to Kant, by understanding – along with another orientation, this one decentered and indeterminate – governed by imagination. Far from being compelled to distinguish between two faculties, as Kant does, we can attribute these two "phases" of the process to an attentive and at the same time unbiased hearing of the material: clay, in our case. It is a hearing that proves capable of focusing on the salient affordances and, at the same time, *keeping a distance from them* – a disinterestedness, as Kant would say – in order to anticipate hypothetically the supervenient affordances. In other words, a *disengagement* is at work in the play. Such a disengagement is also temporal: it is a mode of delay, among other things. This disengagement is enacted with regard to the formative cogency of the moment of salience and focused attention (Desideri [2011], Nanay [2018]). In short, the play involves a *deliverance*, capable, as it were, of displacing the sensitivity to an area at a distance. Or rather: it is a sort of *débrayage* or real *disembodiment*, which realizes a *reflective and recursive distancing* within the imaginative event itself[11]. If this were not so, the element

[9] In a surprising passage of the *Critique of Pure Reason* (Kant [1781]), Kant uses this very verb, *durchgehen*, to describe the synthetic action of imagination. In another passage in the third *Critique*, Kant speaks of "different proportions" of the relation between determined and indeterminate.

[10] In § 21 of the *Critique of the Power of Judgment*, Kant describes this imaginative process in detail.

[11] Lev S. Vygotsky was the first to present this situation in terms of recursion (Vygotsky [1934]). The aspect of the disengagement (*débrayage*) and of the following modification of the sensorimotor schemes is the pivot of a remarkable experiment with a group of macaques (Iriki et al. [1996]) that Malafouris reports (2013: 164-69) with precision. He speaks of a process of "disembodiment", which is necessary to the formation of a new skill. The concept of *débrayage*, used here in a non-formalized way,

that Ingold calls transductive would not be able to emerge. In the case in point, this element is easily discernible, not only in the wheel, but also, for instance, in the firing that the artifact must undergo to ensure its resistance and impermeability.

We must extract and highlight two points from this brief discussion. The first concerns what could be called a hyper-interactivity of the human imagination: namely, the latter's inclination to work with provisional syntheses while keeping open the possibility of grasping other profiles from among those offered by the affordances of the material world. The second concerns the reflective and recursive distancing discussed above, and more specifically, the setting up of this distancing as the condition of a process destined to favor a detachment from "things" that is sufficient to situate them in the position of "objectivity". It should be noted that this same process must be thought of as subtending the phenomenon of *scientific observation* from an epistemological perspective. Indeed, it must be understood that the objective representation (*ob-jectum*, *adaequatio*, *Richtigkeit*, *aboutness*, etc.) is not a mistake of Platonic metaphysics or the Cartesian *cogito*; it is an event with an evolutionary advantage, born of a joint action: on the one hand, of the need to identify and emend the technical errors necessarily encountered through the material engagement[12] of *homo faber*, and on the other hand, of the onset of verbal articulated language qua *specialization* of the work of profiling and articulating, spacing and segmenting, already performed by the hyper-activism of imagination for hundreds of thousands of years.

It is by no means necessary to suppose that this very function of imagination, as an immediate forerunner of language, should have somehow escaped the emergent and co-evolutionary process that Malafouris in particular elucidates.[13] Over time, in fact, imagination gradually achieved a self-consciousness of its articulatory function, thanks to a long series of externalized experiences, as one can clearly see in the earliest practices of *intentional inscription*, such as those found in the Blombos Cave dating back eighty thousand years. Here, imagination was at work in a hand as it traced lines or carved spots, testing itself out qua potential proto-writing and proto-language: this practice would later be taken up in the production of a real mnemo-technique (d'Errico, Colagé [2018]). By virtue of this technique, it would be possible to implement the similarly externalized formation of the operative concept of number (Malafouris [2013]: 106-16).

5. REFLECTIVE DISTANCING AND LINGUISTIC ARTICULATION

But the second point is even more important, as evidenced by the fact that it can be considered a specific characteristic of *homo sapiens*, whereas the previously discussed scriptural phenomena are also observable in other families of hominins. On this specific point, André Leroi-Gourhan (1964), an author respected by both Ingold and Malafouris, provides a guideline that is as valuable as it is neglected by the specialized literature. Leaving aside the fact that the periodization and terminology used by Leroi-Gourhan has been substantially reconfigured by the most recent discoveries in the field, the theoretical import of the basic guideline that he provides us stands largely independent of any potential weight attached to its precise dating. The guideline is the following: in a timeframe attributable to the Middle Paleolithic period, «a very important evolution in the field of lithic tools» took place, whereby the block originally used as material for obtaining an artifact (e.g. an amygdala, i.e. a bifacial flint) began to be exploited to produce

belongs to the theoretical terminology of semiotics (Greimas, Courtés [1982]).

[12] The derived and corrective character of the scientific attitude, with regard to technical creativity, is one of the guidelines in Georges Canguilhem's thought. For an introduction to this thinker, see Fiorenza Lupi & Stefano Pilotto (2019).

[13] «The knapper first thinks *through* and *with* the stone before being able to think *about* the stone and hence about himself as a conscious and reflective agent» (Malafouris [2013]: 176).

a certain number of splinters, which would in turn be reworked to obtain diversified tools. According to Leroi-Gourhan, this implies that:

> *the tool function had shifted from the mass initially intended to constitute the tool to the flake derived from that mass. […] We shall see later that this process is generally characteristic of the more developed industries. In other words, from being the tool itself the lump of stone has become a source of tools (as we shall see, an additional stage was to be introduced from the Upper Paleolithic onward). The blade or flake would then no longer constitute the tool but would be divided into sections providing the starting point for the making of the tool proper. (Leroi-Gourhan [1964]: 100)*

In this text, Leroi-Gourhan speaks of a "shift". However, in a highly significant essay, Emilio Garroni (1977) argues that the transformative process that Leroi-Gourhan describes should be recognized as a full-fledged discontinuity[14]. Indeed, it was not just a question of the enhancement of previous productive protocols but of the emergence of a new component, identifiable with the assumption of a specific role by the reflective and recursive trait of material engagement, which I traced above to the configuration and imposing of a process of objectifying distancing. It means that an original element was introduced into the radical and equal interaction of material engagement: this element was able to redirect material engagement toward completely new evolutionary trends, thanks in part to the decisive processes of *exaptation* concerning the phonatory and auditory apparatus (Lieberman [2007], Tattersall [2016], Cox [2018]). In short, only on this basis was it possible for something like an articulated and denotative proto-language to appear.

If this account is coherent, the problems raised at the beginning of this article could be reconsidered in a new light. Here, I must limit myself to making a list and save a proper discussion for another time.

More precisely, on the question of whether the appearance of articulated language had the character of a "sudden irruption" or a long and gradual development, one could answer that a gradual development was doubtlessly necessary, so as to allow for a reflective and distancing element to arise within the material engagement of the *homo sapiens* (and of it alone). This element would find, in phonic articulation, an extraordinarily effective medium for actualizing the work of profiling and segmentation imputed to imagination. As a consequence, we should answer the second question as follows: the phonic-articulatory trait should be considered decisively discriminating with respect to the resources of other systems of organization on the plane of expression, such as expressive-gestural ones. After all, it is clear that only once language had emerged could a large part of its articulatory properties be easily projected onto the structure of gestural communication. As to the third question, we should acknowledge that the semantic-denotative properties of enunciation, that is, its "objectivity" or "aboutness", are determining for the characterization of this technology. Furthermore, while language is integrated with other pragmatic, communicational and expressive properties, recognizable in the forms of pre-linguistic communication, it *radically reorganizes these properties*. This point leads us to another question, the one that I raised first, which now returns in all its theoretical scope and complexity. It is precisely what I called the «degree of self-awareness governed by an articulated and denotative language» that now appears incomparable with the one assigned to other communicational and performative practices governed by imagination, not only on account of the degree of grammatical formalization attainable by the subtlety of this self-awareness, but also, and above all, because language supplies the specific form of metadiscursivity to the recursion already at hand in material engagement. As Emile Benveniste (1966, 1974) in particular underlines, articulated language is indeed the only semiotic system that is able to consider itself – that is, its constituent units and enunciations – as the object of enunciation.

[14] Several paleoanthropologists agree about this specific discontinuity, on the basis of many other convergent clues. For all of them, see Ian Tattersall (2008, 2016).

Without a doubt, in the end, the incredible technological innovation that articulated language represented would go on to reorganize the "role play" of material engagement in a profound and irreversible way, by introducing the absolutely original element of a denotative semantics. The latter, of course, is a very powerful device, albeit one that depends fundamentally on the work of imagination: only this work can supply it with objectual meanings – *Bedeutungen*, as Kant calls them (1781) – and indeterminate senses (Kant [1790], Garroni [2005], Montani [2017]). In other words, once language had been invented and had assumed its articulatory properties, the inexhaustible synthetic movement of imagination alone ensured the continued rootedness of the linguistic units in the world of praxis, together with the extension and reorganization of the latter. This point is hardly discussed in the studies examined here, perhaps in part as a consequence of a conception of articulated language aligned with what is essentially a conventionalist interpretation. It happens not only that language took over, with an unparalleled power, the articulatory work ("profiling", "segmentation") previously entrusted to imagination, as well as to the scriptural events that I briefly discussed above, but also that this work empowered many other actors in the "role play" of material engagement (Gahrn-Andersen [2017]). Some of these actors may be undesirable and uncanny. I refer in particular to the irresistible tendency of recursion to behave, and understand itself, not only in terms of metadiscursivity but also in terms of *self-reference*.

In other words, it is as if language were capable of forgoing the contribution of imagination (in the very broad sense given here) and autonomously providing for the constitution and reorganization of the order of reference. It is not by chance that this process, reminiscent of autistic pathologies, evinces parallels with other symbolic practices that have a significant historical bearing. In late modernity, for instance, the sphere of images, media (Manovich [2001, 2014]), and the arts (Danto [1986], Andina [2012], Velotti [2012]) has concerned itself with phenomena of this sort in a rather characteristic way, and – somewhat convergently (Cecchi [2013]) – so has the economic sphere based on the tools of financial capitalism: one need only think of the intrinsic self-reference of so-called "futures". In our time, in short, material engagement is likely to unfold in a field so deeply permeated by technological mediation (Grusin [2017], Cecchi, Feyles, Montani [2018]) that a general reorganization of its model of understanding seems to be in order: in the new model, the crucial question of articulated language and its effects on material culture – at times controversial and at times even enigmatic – should be granted its rightful place.

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