The Transcendental Revolution

Giorgio Buccellati

Kant's critical concern was aimed at separating clearly the categorial dimension of human reason from the perceptual dimension. A basic assumption that underlies his entire philosophical system (and, for that matter, all of philosophy) is that perception and pure reason coexist in human beings, and have to be clearly separated in order to give pure reason its due. In this perspective, the beginning of pure reason coincides with the beginning of humankind, and a critical approach lays bare what has always been there: a transcendental dimension whereby the apriori operates, as it were, on perception.

But what if there was a time when cognition rested only on perception, with no logical overlay at all? It is precisely in this light that we may look at the immensely long pre-linguistic stage of the genus *homo*. Against this background, the emergence of language and categorial thought, after some two million years of purely perceptual cognition, can indeed be considered a full scale revolution. It is the moment when, with categories that are at the same time conceptual and linguistic, cognition transcends pure perception without, however, obliterating it.

The argument I can develop here must necessarily be brief, and on account of its brevity it will appear all the more daring.[1] But I have shared with Antonio many a moment of personal and institutional daring, enough so as to let me believe that this itinerary beyond our confines of Egypt and Mesopotamia might pleasantly intrigue him. It will, in any case, show him how I wish to share with him, in friendship, one more intellectual exploration.

1 The pre-logical stage

What was the hominins' claim to reason? I share the view that articulate and syntactic language began at a relatively late single point in time, and I assume this to be the beginning of conceptuality, i. e., the transcendental revolution to which we will presently return. The question as to what the hominins' claim to reason was must then be viewed in the light of the

1 One will find a fuller exposition in two forthcoming books: *The Four Republics* (Eerdmans) and *A Critique of Archaeological Reason* (Cambridge). I presented an earlier version of this in 2013 *Alle Origini*, chapter 1. In this paper I will restrict references to a bare minimum. I am very grateful to David C. Schindler for his comments on an earlier version of this paper.

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presupposition that, for a span of some two and a half million years, these individuals were not endowed with logical thought and the language needed to express it.

The beginning of an answer lies in the concept of spatial competence as evidenced by some of the earliest known stone tools. Thomas Wynn's extremely careful and insightful topological and metrical analysis[2] has shown quite convincingly that tool production was carried out according to complex, if intuitive, geometric principles. This indicates that there was an explicit sense of structure that governed the toolmaker's operation. Looking at a raw stone, there was a perception of what possible shape it would take as a result of a given knapping sequence. It is both the complexity of this sequence, as it can be reconstructed through the stratigraphic history of the traces on the objects, and the existence of inventories with large numbers of repetitive examples from the same "model," that supports the conclusion that these products were intentional and that there was a craft tradition. In other words, the sense of structure was shared among individuals and on that basis the specific "templates" could be communicated.

Expanding on this, two concepts may be introduced that will help us assess the scope and limits of a pre-conceptual and pre-linguistic "reason."

The first takes as its starting point what I just said about a perception of the potential structure of an artifact before it was actually produced. The term "perception" is in fact improper in that context. The sense of structure is not derived from a sensory response, since there is no physically visible representation of the structure embodied in the raw material. It is, we might say, an anticipatory perception: what has been seen already (the model) and what one wants to produce (the target) are projected as single and distinct wholes. To describe this phenomenon I use the term "para-perception." It is parallel to, and distinct from, perception, yet it is based on it.

The constitutive mechanism that makes para-perception possible may be described as "bracing." This term refers to the ability to link together, or brace, elements that are not contiguous in nature. Thus the seed and the plant that derives from it are never seen physically together: they are not contiguous, either in space or in time, they are only made contiguous in the mind of the observer. In the same manner, the finished product of tool-making and the raw stone from which it is derived are not perceived, physically, together. They are "braced" in the toolmaker's mind.

It was bracing that gave hominins a first measure of control over nature. Making contiguous what is not so given, breaks down a most significant barrier, namely the objective distance, in space and time, among elements. Subjectively, these elements are brought together and acted upon in ways that open completely new horizons. Herein lies the hominins' claim to reason. It was, in Kantian terms, a *perfectly impure reason*, i. e., one without a categorial overlay. Alternatively, we may call it a *pure para-perceptual reason*, in contrast with *pure theoretical and practical reason*, the purity of which depends on the ability to detach the overlay from its perceptual infrastructure.

2 Wynn 1989: viii–108; his earliest material dates from Olduvai, 1,800,000 years ago.

2 The revolution

We can set a beginning for such pure theoretical and practical reason.[3] It coincided with the beginning of articulate and syntactic language, to be placed chronologically around 60,000 years ago. It was the moment when logic[4] began, in the sense of a sequential ordering of elements on the basis of universal principles. Obviously not in the sense that there should have been a theoretical statement in just these terms, but in the sense that linguistic definition, both of the elements and of their syntactic relationship, gave a completely new handle for controlling non-contiguity as given in nature.

Against the background of the long pre-logical stage, we may say that the core of the innovation lay in the reification of perception. As we have seen, para-perception had made it feasible to brace non-contiguity, as a result of which it had also become possible to develop a para-perceptual *culture*, i. e., one whereby the ability to so operate could be transmitted from one individual to another. But this transmission was based on the sharing of intuitive cognitive modes, not on any ability to define the given elements as abstract entities. The spatial competence required in knapping a stone core and to extract from it a tool of a given type did not depend on a definition of either the type or of the operational steps to be followed. This was precisely the great novelty that was ushered in by the transcendental revolution.

The notion of "transcending" has, for Kant, a rather modest resonance: it means only to transcend the limits of perception (or even para-perception, in my understanding). The modesty of the terminological claim may be expressed with the term "reification."[5] The physicality of perception is transcended when perception is made into a thing that has a wholly new valence, i. e., a thing that has a conceptual dimension and, immediately correlative with it, a linguistic dimension. A "logical" thing. A whole new referential system opened up, that made it possible to extend the limits of control beyond imagination. A toolmaker could now "refer" (1) to a raw stone of a given rock formation along with the tool that was to come of it, and (2) to the process involved in making it happen. The concepts and words underlying the whole sequence were new "things" – new *abstract* "things," which could now be manipulated at will on their own and in wholly new ways.

We do not have a record of such reification for tool-making – no lexicon or operative manual. But there is another type of evidence that speaks to the same issue. Dating back to

3 It has been argued forcefully by Chomsky, see for example Chomsky 2005: 12: "the Great Leap was effectively instantaneous, in a single individual, who was instantly endowed with intellectual capacities far superior to those of others, transmitted to offspring and coming to predominate." The topic has been developed in great detail, from a physiological as well as from a linguistic point of view, by Andrea Moro (Moro 2008).

4 I will use henceforth the term "logic" to subsume both conceptual/categorial thinking and articulate/syntactic language.

5 We could also speak of a "logical" revolution, in the sense that includes conceptualization and verbalization; or of a "referential" revolution, considering the referent as the combination of concept and word that is introduced at this point. It coincides with the "tectonic" age described by Colin Renfrew (Renfrew 2007). – The term "transcendental" differs both from the pre-Kantian one and from the one used in contemporary New Age transcendentalism.

almost the time when we can place the beginning of language, there are incisions on stones and bones that have been interpreted as calendrical notations.[6] They have been interpreted as representing a record of nightly observations of the phases of the moon, done with a different tool at different times. The sequence is one that does not exist in nature, because one never sees twenty-nine moons in the sky; it exists only as a "thing" of the mind. It is inevitable to presuppose that there was by then a word for the moon, and possibly for its phases, and a linguistically defined syntactic nexus for the sequence itself.

The transcendental revolution consisted then of the reification of elements in nature, and even more importantly in the reification of the mental processes that connect them. In this respect, we may say that language has from the beginning a vocation towards writing, since writing is in effect a reification of the spoken word. The prehistoric calendrical notations are therefore the most telling antecedents of writing, in a conceptual sense if not in a genetic sense (cuneiform does not derive from these notations). This is not to belittle the introduction of writing in Mesopotamia and Egypt, but only to place it in a different perspective, one that enlightens us on the proper function and uniqueness of that new technology. Writing provided an extra-somatic extension (Buccellati 1981) for the linguistic reification that was otherwise restricted to the interface between speaker and auditor. As such, writing extended even further the capability of control over discontiguity in nature: the reified elements were now endowed with a new physicality, the written sign, impressed on clay or drawn on papyrus. Conceptual and linguistic reification had already produced a "thing" that was, yes, independent of its own referent, but still dependent on human living interaction. Now, writing made this same "thing" independent not only of its referent, but also of any living interaction between the writer and the reader. The reification process had taken one extremely significant step further.

3 Fragmentation and sequentiality

There was a deeper epistemological dimension to the transcendental revolution, because it affected the very nature of the human rapport with reality. Conceptual reification, or transcendentality, was a new *logos* that provided a representation wholly *sui generis* of what had, until then, remained pure perceptions, embedded in the mind of the perceiver. It was a representation detached from the things perceived. This offered a degree of control that was absent from the para-perceptual dimension: the manipulation of concepts and corresponding words gave an immensely wider latitude to the opportunities of interaction of humans among each other and with their environment. It all depended on two major factors.

The first was fragmentation. Concepts and words were the referents of individual aspects of the whole with which logic was now confronted. The moon was different from the stars, a full moon different from a quarter moon, and so on. The consequent atomization made it possible to deal more effectively with each fragment, which could be moved at will within the new logical universe, and reassembled as it suited the nature of alternative new wholes. The

6 First discussed by Marshack 1972. For a recent assessment of Marshack's research see Bahn 2009. For a critical assessment see D'Errico 1989.

great Sumerian lexical lists (and Antonio will forgive me if I privilege Mesopotamia here...) are at the cusp of a trend to fragment and reassemble: professions, objects, natural phenomena, and so on, are defined individually and then regrouped under the category to which they (conceptually) "belong." The large administrative cuneiform ledgers of the third millennium represent a similar conceptual encroachment on the world, with complex series of totals and subtotals nested within each other, reaching, for example, dimensions in the tens of thousands of animals for herds, which cannot possibly be seen physically assembled. This "encroachment" had very practical consequences, of which agriculture and the domestication of animals in the Neolithic is the most telling example.

The second epistemological aspect of the transcendental revolution was a new understanding of sequentiality. In the long para-perceptual stage, there was an implicit grasp of a *chaîne opératoire* that made it possible to produce the intended artifacts. It was implicit in the specific sense that it could not be seen or "discussed" as a sequence, i. e., as something conceptualized and verbalized in and of itself. All of this changes dramatically with conceptualization and language. Logic is, in fact, not just the *logos* that defines the attributes of the single fragments seen as the constitutive components of reality; it is the discourse that binds them together in a controlled sequential order. An argument has a syntax all its own, which of course matches closely the syntactic arrangement of linguistic expression. Thus the sequence of the phases of the moon as represented by incisions on bones is intrinsically a sequence: the fragments (in this case, the individual signs of the observed moon appearance) make sense only because they are sequentially ordered. They are not a random aggregate, but a step-like progression where each element receives meaning from its juxtaposition to the other elements. It is on this ability to express sequentiality that the notion of causality began to be clearly perceived and expressed.

4 Rejoining fuzziness

The para-perceptual dimension never left us. Kant's critical approach was aimed at defining the range of perception and its relationship to categorial reason: for such reason to function properly, it had to be "pure" of any commixture with the non-categorial (i. e., para-perceptual) dimension. But there can be no pretense to ignore it, nor any assumption that it was somehow replaced. The great interest in perception that followed in the wake of Kant (one may think of Husserl, Merleau-Ponty and Piaget) underscores the importance of this dimension. The suggestion advanced here is that there was a specific point in the development of the genus *homo* when perception came to be "transcended" through the introduction of logic (concepts and language) – and that, therefore, a reflection on the pre-logical, or para-perceptual, stage can be of immense help in assessing the nature and role of perception.

I will refer to three aspects that are relevant for the central theme of this volume: (1) the notion of fuzziness and its impact on an understanding of (2) the humanities and of (3) the digital dimension, including artificial intelligence.

(1) Without logical thinking, there were, in the para-perceptual stage, no metric standards.[7] That is, there were no standards based on criteria extrinsic to the object being observed. We may say that in this stage there was only an -emic dimension, not an (e)-tic one.[8] It is in this connection that we may apply the notion of fuzzy sets to para-perception. In his seminal paper, Zadeh (1965: 338) writes:

> Clearly, the "class of all real numbers which are much greater than 1," or "the class of beautiful women," or "the class of tall men," do not constitute classes or sets in the usual mathematical sense of these terms. Yet, the fact remains that such imprecisely defined "classes" play an important role in human thinking, particularly in the domains of pattern recognition, communication of information, and abstraction.

This would apply to the artefactual inventory of even the earliest toolmaker: through para-perception, a tool was perceived as belonging to a class because it could be matched against its structural template that had shaped the making of the tool in the first place. There were no articulate inferences, much less measured standards. But the richness, distinctiveness and repetitiveness of the inventories supports the notion of a taxonomic organization.

We may plausibly attribute this to two characteristics of para-perception: simultaneity and a sense of the whole. Unlike logic, para-perception is not exclusively sequential. Different sensations are simultaneous, and are blended into single perceptions (and consequent para-perceptions). From this derives a strong sense of the whole, which comes to the fore most explicitly with the sense of structure inherent to para-perception. Simultaneity and sense of structure regulate the approach to fuzziness. The continuums that are detected are split without being properly split: there are sub-continuums, as it were, that are identified within the fluid or liquid state of the larger continuum.

(2) We may say that, -emically, there is precision in imprecision; that Zadeh's "imprecisely defined classes" are in fact precise, according not to the logic of sequential fragmentation, but rather to the awareness of simultaneous wholeness.[9] It is a dimension to which the humanities are intrinsically sensitive. Without the quantitative thrust of fuzzy logic, the humanities have been dealing all along with the imprecision of classes: the -emic dimension of linguistic analysis (then broadly borrowed within the social sciences) is a relatively recent example of it. In this respect, we may say that the humanities are the firm heirs of hominin para-perception. Only apparently are we rejoining fuzziness. Qua humanists, we have always been firmly rooted in a tradition that could perceive wholeness on the one hand and, on the other, fluid boundaries within it – and act accordingly.

Fuzzy logic aims to constrain the data within an extra-cultural type of precision, i. e., a system that defines an entity from outside its own cultural identity. Such precision derives

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7 In his masterly work, Thomas Wynn develops the notion of "interval" as an intermediate type of standard of measurement, see Wynn 1989: 39–44.

8 On this notion, and the notation I use, see Buccellati 2006: 12–13.

9 For a very insightful discussion of the role of wholeness in Plato, and hence in western philosophy, see Schindler 2008.

from the quantitative urge to place extrinsic standards of measurement as a means to impose control on the data. It is of course effective and useful, but it does not exhaust the ways to assess the true and proper identity of the item being considered. There is value to a fuzziness that remains uncharted metrically, but can nevertheless be internalized through a para-perceptual system that can assess its structural wholeness.

(3) We can read here a call for the humanities to remain sensitive to this dimension, especially when they are called upon to become digital. Written at times with an underscore sign, and understood in any case as a collective, "digital_humanities"[10] labors, in my view, under too easy a surrender to the technical dimension. There is no question but that this dimension is indispensable. However, it must remain the special role of humanistic sensitivity to give proper emphasis to what I have called "digital thought."[11] Beyond technique, this lies at the core of the hermeneutic task, which aims at appropriating experience through the most thorough possible (hence, the most digitally effective) system of distributional analysis.[12]

In particular, the humanistic summons is to point to the centrality of a para-perceptual intelligence that, being irreducible to segmentation and sequentiality, i. e., to logical thinking, cannot be captured by the current standards of artificial intelligence. Seeking the roots of continuity much further back in time than is normally the case, into the earliest paleolithic period, emerges thus not as a marginal curiosity, but as a springboard for a better understanding of our own and present human make-up.

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10 See recently Burdick/Drucker/Lunenfeld/Presner/Schnapp 2012; it is an excellent review of the field, oriented in the technical sense more than in the direction of method, in the sense to which I refer in the text. For an insightful approach to the technical dimension in the light of contemporary thought see Frabetti (2011: 1–22; 2014).

11 On this see Buccellati 2010: 46–55. I develop this in detail in a forthcoming book to be published by Cambridge University Press, *A Critique of Archaeological Reason*, chapters 11 and 12.

12 The concept of distributional analysis is central to a formally controlled hermeneutic task, and it can ultimately be applied to a broken tradition (a "dead" civilization) only with a strong digital support. It has been amply developed in linguistics (for my part, I may refer to my book Buccellati 1996, especially chapter 58). I am developing this at length within the framework of a research project devoted to *The Philosophical Basis of a Hermeneutics of Archaeology*, which I am co-directing in the Department of Philosophy of the Catholic University of Milan.

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