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EPISTEMOLOGICAL ISSUES AS ONTOLOGICAL QUANDARIES: WHY PHENOMENOLOGY HAS THE EDGE OVER ANALYTIC PHILOSOPHY

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Abstract. In this article I will try to show how phenomenological philosophy may come to terms with the predominant epistemological paradigm of our time in ways that analytic philosophy cannot do, especially by focusing on certain disciplines of natural science, primarily foundational mathematics (permitting this classification) and quantum physics. I note that logic, mathematics and physics may be considered as fundamental sciences in the Husserlian sense of being rational and explanatory enterprises that help clarify the sense of being-in-the-world. In putting up my arguments in this respect I have considered both the Husserlian transcendental phenomenology as a key component of my argumentation but also in a kind of juxtaposition Heidegger's existential version, even as Husserl denounced it upon the appearance of *Sein und Zeit* as a kind of 'anthropology', to the extent that they both have as an ultimate line of convergence the reduction to a sort of transcendence of the self irreducible to objectivist, mundane terms. In this approach I take up the task to show that phenomenology in a more inclusive global sense is better qualified to accede to the ideal of a rigorous science insofar as it can set up a more reliable theoretical philosophical context to interpret ontological issues raised by modern epistemology.

Keywords: analytic philosophy • Dasein • non-eliminabilities • transcendental phenomenology • process • quantum individuality

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Introduction

A major issue raised in the contemporary epistemology of natural science is the ways physical science in general as largely conditioned by the observational framework, this latter integrating both the cutting edge technological capabilities of our time and the human faculties of apprehension and comprehension,[1] is osmotically influenced by the mathematical substructure. In turn and to the extent that the mathematical substructure itself, in virtue of an autonomous body of mathematical knowledge, has been 'relegated' from the metaphysical realm to the confines of a special human intellectual activity within the world, raises *eo ipso* ontological issues downplayed by the

long held platonist views of mathematics as residing in the safe heavens of ideality extraneous to human contingence. What stands between the countable and the continuous infinity, what stands between performing a definite mathematical act in the present now and thinking about this particular act in the present now, what stands between the ante and post state of the state vector of a quantum entity in performing a quantum measurement are just a few of the issues which, even though largely epistemological in character, touch upon the contact between epistemology and ontology, not to say of metaphysics. A thorough discussion into the ways the elusive parts of formally expressible mathematical and physical theories may be re-appraised as non-eliminabilities in the constitution of the objective world by a subject's consciousness seems to be in order, especially in view of the ontological concerns raised by the galloping pace of the technological advance of contemporary civilization that makes the idealist-metaphysical certainties of past philosophies look rather obsolete.

There is no more emphatic place in the philosophical turf in which the aforesaid non-eliminabilities may be better re-appraised as reducible to a subjective origin than the so-called continental philosophy, in particular the phenomenological tradition initiated by Edmund Husserl in the beginnings of the 20th century and later elaborated or even challenged in various nuances in the writings of Heidegger, Sartres, Levinas, Deleuze and others. For, in these terms the being itself of the world is only conceivable as transcendence with regard to a subject who is part of the world and yet due to its own particular kind of transcendentality with regard to the world it can re-present the world in terms of its immanent constitutive modes as a meaningful objective totality. In a kind of a circular turn the conception of the world as meaningful objectivity can be only referrable to a subject insofar this latter can transcend itself as part of the world so as to project itself, to use the Heideggerian idiom, to the world in virtue of its own transcendence.

Even as Husserl flatly disapproved of Heidegger's distortion of the transcendental phenomenological doctrine, I chose to dedicate some space to the Heideggerian transcendental thinking insofar as it may presumably serve my main goal of showing the ways phenomenological thinking in a broad and inclusive sense can deal from a better position than the analytic tradition with epistemological issues pertaining to the three fundamental sciences mentioned above (i.e., logic, mathematics and physics), to the extent these issues are in a certain fundamental sense ontological too. Of course my strongest emphasis is on the ways Husserlian phenomenology in the sense of a rigorous yet transcendental science, as its founder wanted it, can cope with the issues raised by the more sophisticated theories of mathematics and physics of the last century. All the more so as quantum field theory, in particular, allegedly bringing closer quantum mechanics and special relativity, requires a more elaborate notion of observability than any admitted by naive empiricism of every hue, to be accounted of. Let it be known that Husserl in his magnum opus *Logical Investigations*

had pointed out that:

> [...] physical laws of higher level are *hypotheses cum fundamento in re*, compatible with low-level physical laws only thinly connected to them, and such that the latter could admit other higher level laws incompatible with the presently accepted higher level laws. Thus, there exists an empirical indeterminacy in usual physical laws: they are in no way determined or even conditioned by experience, but simply need to be compatible with the sophisticated experiments designed in physical science and have explanatory power.[2] (See Rosado Haddock 2019, p.90)

However my main concern being the post *Logical Investigations* period, that is, the transcendental phase of Husserlian phenomenology, I have undertaken in sections 3 and 4 to offer a convincing argument on the ways transcendental phenomenology as inquiring into the *Sosein* rather than the, vacuous in effect, mere *Sein* of things-in-the-world, can form an alternative, more cogent view, e.g., of the 'residuum' between reality as being in absolute sense and reality as registered by a co-constituting subjectivity. To the extent that Husserlian transcendental thinking may dispose of all intentional, constitutive faculties of the transcendental subject in an a priori, non-physically reductive sense, can by this token acquire a more radical sense of meanings as noematical correlates of objects and achieve an apodictic grasp of essences by means of the so-called categorial intuition. Under such terms, unfettered by the contingencies of facticity, transcendental phenomenology may lay claims to being a philosophy in the sense of a rigorous science as cherished by Husserl himself. At the same time I have left room for a discussion of the pending issues of the transcendental phenomenology itself especially with regard to its *prima causa*, or simply the origin of the transcendental subject as temporality, object and meaning constitutive.

Lastly I have taken up in the last section to discuss the reasons for which analytic philosophy, for all its recent and relatively recent overtures to ontology, it still misses the the right vantage point, in contrast with phenomenology as a subjectivist transcendental science, to face the ontological issues raised at least by the three fundamental sciences of our time.

1. The Heideggerian transcendental thinking within the world, yet not in terms of the world

I regard the following discussion as relevant, in fact, as contributing to the goal of this article insofar as Heidegger sought a foundation of the knowledge about this world, touching in effect on its ontological underpinnings, in the peculiar transcendence of Dasein as projecting itself to the world. At the same time the Heideggerian discussion of Dasein seems to provide a radical, even if controversial, perspective to

the kind of residuum between reality as being in absolute sense and reality as registered and formed in non-mundane terms. On this account and in Heidegger's sense non-Daseinal being would necessarily remain concealed were not for Dasein to be projecting itself to the world in terms of its own transcendence 'in being in the midst of ..'. And yet due to its own facticity Dasein is deprived of certain other possibilities with regard to the world as the totality of being, so that the 'actually' realizable possibilities of the project of the world are set 'over against Dasein as its world' (Heidegger 1969, pp.107, 110). This means that Dasein while it is preoccupied with the question of being as solely possessing the capabilities, in terms of its own transcendence, to ask the question of its own existence vis-à-vis the world, it is yet fettered by its own facticity to proceed to an ontical derivation of the totality of being in the world, *a fortiori* of the non-Daseinal being. This is presented by Heidegger in virtue of a clue from Plato's discussion of the μέθεξις (participation) of ideas in the human soul in the Republic, in the sense that "even though the world is formed in Dasein, access to the world is denied Dasein on nonfinite terms" and also in a more straightforward fashion in the following:

> So our ontological interpretation of Being in terms of the transcendence of Dasein is by no means equivalent to the ontical derivation of the entirety of non-Daseinal from Daseinal being. (Heidegger 1969, pp.95, 99)

The alleged 'residuum' in the ontical derivation of the entirety of non-Daseinal from Daseinal being may be traced in Heidegger's extensive reference to Kant's *Critique of the Pure Reason* in that rather than concentrating on the object itself or to to modes it is experienced or on both, we should move beyond and get to know the *Zwischen* (between) man and thing which "exists only while we move in it" and moves ahead of things in anticipation while reaching back behind us. This typically Heideggerian conceptual play means that things are neither supposed independently as such nor as mere human products but as implying a 'between' that founds itself as 'being' 'in advance' of things and conjunctively thrown back behind us and our 'surface' (Heidegger 1984, pp.245-246, *engl. transl.*, pp.243-244). Further as a reminder that one may enter an ontological 'no man's land' is Heidegger's view of the finitude founded, as constitutive feature, in the transcendence of Dasein vis-à-vis the world,[3] which makes that it is meaningful to talk about a residue of non-Daseinal being that would remain necessarily concealed in the project of the world, "if projecting Dasein were not already in the midst of it as projecting". I point out that in the Heideggerian sense the meaning of 'Dasein transcends' is that by essence Dasein is *Weltbildend* (i.e., it forms the world), in the sense that it lets the world happen and through the world provides itself with an original view which, even though it is not expressly grasped, it still serves as a re-presentation for all of manifest being, the Dasein itself included.

The totality of being as presented with regard to the 'surpassing' toward the world

of Dasein should not be thought of within the explicit grasp of Dasein in its completeness, namely, the whole of manifest being in its peculiar connections, area and strata (Heidegger 1969, pp.88-89, 83-84). In this respect, Heidegger has been adamant to state in another place that "what must be thought about, turns away from man. It withdraws from him". He argued further that this kind of withdrawal, far from being nothing, is an event that could be most present in all our present and yet infinitely exceed what is actual in actual presence, in a way that this very presence makes us 'inattentive' to what touches us in the mysterious way of eluding us by its withdrawal. Man by essential nature is drawn into what eludes him in terms of objectivity, as concrete actuality, in such a priori essential way that Heidegger attaches to him the predication 'sign', without further interpretation, rather than the predication of 'one who points at' (*Zeichen statt Zeigender*), to show precisely the transcendental non-objectivist character of man's 'pointing at' what eludes him (Heidegger 1954, pp.5-6, *engl. transl.*, pp.9-10).

Moreover the essence of Dasein, the perennial elusiveness of its ontological character in Heideggerian thought notwithstanding, is regarded the ultimate source, the fundamental occurrence of the original pre-logical manifestness of beings as underlying their positability in virtue of objects of logos. This fundamental occurrence is characterized by what makes possible the coming together toward oneself of things as bindness toward completion and also what reveals the being of beings, that is, essentially what forms the world and yet does not exhaust it, insofar as the pre-logical manifestness of beings has the character of 'as a whole', i.e., everything that is there in such and such way and also in the most undifferentiated universality (Heidegger 1983, pp. 511, 513, 515 *engl. transl.*, pp.352-353, 354).

This way we may be thought of as being an 'oscillation' that cannot be reduced neither to what it tends to (the wholeness of the world) nor to what it has originated from (being-in-the-world as Dasein), consequently, in the latter case, what by this virtue defines our finitude and in a concomitant fashion the individuation of man with regard to his Dasein. Ultimately Heidegger, for all his labors to demonstrate the preponderant role ascribed to the Dasein as a transcendental presence in-the-world, was to face questions about the world, about finitude, about individuation, as reaching back to the question concerning the essence of time, the latter as their unifying link that accounts for the fundamental question of metaphysics. Namely the question of being as inseparable from the question of time as co-constituted. In a certain sense this was also to be Husserl's ultimate phenomenological transcendence. Absolute ego as time constituting.

The question of whether the deprivation of Dasein of certain possibilities toward the world solely by virtue of its own facticity, its transcendence toward the world notwithstanding, has anything to do with Heidegger's 'shocking' statement in *What is Called Thinking?*[4] that there exists an unbridgeable gulf between thinking and sci-

ences, will be dealt with in a more phenomenologically orthodox sense in the following section.

2. What relevance phenomenological thought may have with the modern epistemological paradigm?

If phenomenological thought has a chance to influence the ontological discourse fomented by the content and scope of contemporary epistemology, by this token it seems that its 'antipode', analytic philosophy, in its various versions, may lose ground in the quest for providing a viable interpretative context to account for the ontological residue left over in talking about the world in terms 'non-homogenous' with the world. For example, in the factored ontologies approach to quantum field theory (**QFT**), P. Simons, in Simons 2002, talks about basic factors as formal invariants among different theories and about the collection of them and their legal combinations as the basic field (not to be confused with field in the physical sense) in terms of which a simple fundamental entity or element is constituted when a suitable combination of basic factors is realized together as a being.

Yet while the combination of basic factors is characterized as something not to be decided a priori but only by a complex process where the data from physical theories is accounted for as part of the testing material, there are factors applicable beyond physics, e.g., being one vs being many, being fundamental vs being dependent, being continuant vs occurrent, which, for Simons, belong to what Husserl called formal ontology (Simons 2002, pp.46-47). Formal ontology, in turn, in the Husserlian sense has as a non-eliminable origin, the constituting transcendental ego as world and meaning forming, where the objects and relations in the realm of formal ontology are thought of as phenomenological evidences ultimately accountable with respect to each ego's non-contingent, constituting features, e.g. intentionality toward something-in general without the need of the physical presence of this latter. As a matter of fact Husserl characterized as part of formal ontology traditional formal mathematics, like formal analysis, that is, the mathematics of sets, of cardinal numbers, of ordinal numbers of various ranks, reaching to the not so traditional concept of multiplicities with their well-known forms whose elements may not be called numbers in the sense of natural numbers since the forms of these multiplicities 'derive their sense from the definitions of the multiplicities to which they belong' (Husserl 1992, pp.81-82, *engl. transl.*, pp.77-78).[5]

What is radically new in Husserl's approach is that non-apophantic mathematics as these mathematical constructs are thought to be, contrary to the Aristotelian analytics that condition predicative judgments and predicative calculus as apophantic, are formal in the sense of having as fundamental concept, the concept of 'anything-

whatsoever', (*Etwas-überhaupt*), with all its possible derivative formations, leaving out of consideration any material determination of this latter. This kind of 'general-somethings', regardless of any objective-materialistic considerations, to the extent that all their derivative formations and their re-iterative products *ad infinitum* are expressly characterized as a priori originated, witness to the fact that they must belong to the sphere of phenomenological evidence as associated with intentionality of the subject, in turn unconstrained from any objectivist-materialistic considerations.[6] Yet, while formal ontology was to be, for Husserl, a characterization of formal mathematics as an a priori theory of objects related with the pure modes of the content-free 'anything-whatsoever', and consequently seemingly irrelevant with physics as primarily bearing with physical observation, it can still open new insights as to the ways the supporting mathematical substructure may delimit the content and scope of a physical theory. A case in point is the idea we have of mathematics as containing a surplus structure in view of a corresponding physical theory, thought of as a kind of useless and meaningless formalism, which, however, in gauge field theories includes gauge potentials and ghost fields "that can play a curiously active role in constraining the structure the physical field theories can take". This raises the question of the influence surplus mathematical structure bears in a very concrete sense on our understanding of the physical world, together with "the ontological status of this surplus structure and about the semantical issue of how the structure gets its meaning" (Kuhlmann, Lyre and Wayne 2002, p.19). Generally the relationship between physical or physically reflected quantities, like spacetime geometrical characteristics, field quantities and other physical magnitudes and the mathematical structures used to represent them, ineluctably points into a philosophy of the application of mathematics to physics, which is a broad, largely untraced field ahead which

> no philosopher, mathematician, physicist, or hybrid specialist, has come close to a complete solution. Theoretical physicists may become so adept at using mathematical formalism that they may think that the mathematics they employ is a transparent representation. It is not: no representation is wholly transparent, and the facility by which physicists can wield mathematical representations to represent physical situations is in need generally of explication. (Simons 2002, pp.49-50)

I offer below some clues from quantum field theory just to point to the ways mathematical substructure intermingles and ultimately influences the physicalistic content of the theory as implied by the domain and the limits of human 'observation'. Of course quantum theory and *a fortiori* quantum field theory are not the easiest stuff to digest, especially for a purely philosophical audience. Yet my reference to these theories is not exigent of any particular technical knowledge of them except for the mostly intuitive contact with the fundamentals. These theories, in particular, raise in a most conspicuous way questions that reach beyond the strictly epistemological

context germane with these theories, that is, they raise ontological issues associated with human observation in the most broad sense; for example, the question of the identity of an electron in the set up and realization of an experiment, the questions on the content of such notions as sameness, thingness, re-identification, essence invariability, etc. Further, as alluded above they feed the discussion on the ways mathematics as the supporting substructure may influence the shaping of these theories as physical ones, associated in real terms with observation-in-the-world, while in a next philosophical leap they may motivate a kind of holistic approach to a possible extra-theoretical, subjectively founded context that can serve as an interpretative tool for both the mathematical and physical parts. In that case the phenomenological approach in a broad sense may prove to be of a genuine appeal.

Just to be a bit more specific, if we consider local fields as particular individuals represented by two general concepts, the numerical identity represented by x as indexical variable (temporal or spatiotemporal variable) and the operator $\psi(x)$ as denoting possible properties represented by ψ over x, then $\psi(x)$ represents a single set of entities, the local fields, each one identified by a definite value of the spatiotemporal parameter x. In these terms x is the independent variable, e.g., in Dirac's equation for the electron field or in Shrödinger's linear wave equation, and ψ the dependent variable. The electron field, for instance, is a dynamical system consisting of infinitely many dynamical local fields,[7] each identified by a value of the spatiotemporal parameter x and in this virtue is a particular individual. To distinguish it from other local fields with identical state spaces,[8] we opt for its numerical identity, say x_i. This abstract conceptual analysis however should not be confused with physical decomposition. The state space and numerical identity do not refer to existing physical entities or properties. They are concepts that jointly underpin the notion of a single local field (Auyang 2002, pp.119-121). The value x_i invariably identifies the same local field $\psi(x_i)$, independently of the state of the local field and the value ψ it assumes since a differential operator operates on the field state ψ but not on the variable x which retains its indexical role meaning, in turn, the latter may well be mathematically rather than physically existent. If we dare to go further, we could wind down accepting for this kind of indexical variable the role of the Husserlian 'general something' (or 'anything-whatsoever') as the irreducible content-free individual founded solely on account of a subject's intentional directedness in indefinite re-iteration.

Auyang goes as far as posing the numerical identity represented by each value x_i, for the corresponding local field, as underlying the ontological status of the space or spacetime regions. For if the predicates that can differentiate one spatial region from another point to the capacities of a descriptive reference, this ends up by "smuggling back the concept of numerical identity that it claims to discard" (Auyang 2002, p.117).

Another issue that has been the persistent focus of theoretical debates among quantum physicists for some decades now is the attribution of a consistent meaning to the notion of individuals and the relation they bear to concrete particulars especially in the quantum realm where the field of application of these concepts can be quite murky. For instance, there is an extensive literature on the content and conceptual differences between the concepts of primitive thisness and descriptive thisness, bearing on quantum individuality, as applied to quantum objects. These theoretical controversies cannot but bear their influence on ontological questions pertaining to quantum theory itself, e.g., which should be considered as the basic entities in the ontology of quantum mechanics. The question of particle individuality is one of the conundrums of modern physics that is revelatory of the ontological relevance of the epistemological issue in question and at the same time may implicitly call for an interpretation that takes into account the constituting capacities of a conscious 'observer'. More specifically, in the face of the conceptual difficulties to provide a content to the notion of a particle individual that would be consistent with the experimental context, many theoretical physicists have opted for the concept of primitive thisness (or transcendental individuality), one that may transcend the physical properties of the quantum particle in question. The rationale behind this assumption, irrespectively of any phenomenologically motivated considerations, is based on purely intertheoretical considerations.

To take stock, the trajectory of a quantum particle involves a spatio-temporal continuity of the underlying points of the field which means that the latter must be themselves individuated since in field theories space-time points play the role of individuals of the theory. If in general relativity theory space-time points are individuated by the fields they carry, even as this demands the application of the Leibnizean law of the identity of indiscernibles, this is not the case in quantum mechanics where individuation of space-time points is not available. Consequently, if quantum particles are to be treated as individuals a kind of transcendental individuality (**TI**) must be assumed. However even on this assumption the observational context, due to vacuum fluctuation phenomena, makes that the particle picture, presumably guaranteed by **TI**, is not adequate to Quantum Field Theory which is better understood in terms of quantized excitations of a field.[9]

It is remarkable that the capital issue of providing a solid ontological foundation for the concept of quantum individuals has brought to the fore the possibility of reducing individuality as physically 'observed' to individuality as mentally re-presented and further, unfettered by objectivist-physical preoccupations, as reducible to the a priori capacities of a subject's constituting absolute consciousness. Of course the esoterics of transcendental phenomenology is not to everyone's taste in the physics or generally the scientific community, yet the sheer fact is that the concepts of individuality, concreteness and particularity will continue to be highly debatable issues in

today's epistemology with all the relevance they have acquired, both in their physical and mathematical aspects, within a broad ontological context. To cite a concrete case, epistemological concerns about identifiability and re-identifiability in terms of quantum 'observation' have entered the ontological debate about identity and individuation in ways that the metaphysical question about which entities are ultimately real may be juxtaposed with the question of which entities are ontologically basic and autonomous. On top of this, there have been raised claims that the predominance of sortal nouns in Indoeuropean languages has been ontologically misinterpreted 'as establishing a link between countability and individuality' (Seibt 2002, p.53). It is very suggesting, to remind my position, namely that the mathematical substructure intermingles and ultimately influences the physicalistic content of a theory, that due to the just mentioned difficulties to attribute a sound ontological content to the concept of quantum individuals, some quantum theorists or philosophers of physics have opted for other basic entities to ground an ontology of quantum mechanics, e.g., Seibt's notion of free processes, in Axiomatic Process Theory (APT), in the sense of individuals which are concrete (i. e. occur somewhere spatiotemporally) but are not particulars (Seibt 2002, pp.82-93).

As with A. N. Whitehead's introduction of the notion of the actual processes as the basic ontological entities in his philosophy of organism, there is also, *mutatis mutandi*, no satisfactory explicit description and definition of the assumed basic processes in Seibt's scheme insofar as the logical-mathematical part leaves in a non-eliminable sense its imprint intact on the physical description. One need not be, for example, a mathematically-minded physicist to ask for a precise (i.e., non-approximative) description of the mathematical structure of the set of processes given that in the bottom line a process has as basic prerequisite two events in a phase space and a unitary time evolution operator.[10] To the extent that the latter is bound to the conventional mathematics of infinitesimal variations where time serves as the indexical variable in the mathematical elaboration, it is reasonable to raise doubts as to whether Seibt's notion of free processes would serve as an ontological alternative to the quest for quantum theory's or quantum field theory's fundamental entities.

I close this section by pointing to another argument to show how the scope of modern epistemology as affecting ontological issues has made analytic philosophy insufficient to come to terms with the epistemological paradigm of our time. To the extent that the notion of a concrete particular is dependent on the concept of numerical identity, it is a legitimate question whether we can posit bare particulars or empty spacetime regions to answer for the concept, which means independently of any spatiotemporal or other objectivist concerns. If we do, logical empiricism and *a fortiori* scientific realism will be at a loss to show how we individuate and refer to those empty spacetime regions since any concept of differentiation applying to bare particulars presupposes the possibility of differentiation within spacetime regions by

the material features in them. Given that we cannot refer to them descriptively, because they are all identically featureless, the only remaining way is to do so directly which implies a presupposition of the the notion of numerical identity. It follows that the only way to have a notion of numerical identity unconstrained of objectivist-materialistic concerns, eliminating any other interpretations bordering on metaphysical mysticism, is to perform a reduction to the mental constitutional capacities of a conscious 'observer' that would not lead, however, to a kind of physical reductionism which would do no more than end up in an interminable chain of circularities. In more than one place Husserl reduced the identical X, as bearer of the numerical identity 'attached' to it, to the consciousness of the identifying unity of any distinctive such label X, in the continuity of kinesthetical sensations (*kinästhetischen Empfindungen*), characterized as ultimately inexpressible.[11] More generally, for Husserl the phenomenological unity of the fulfilling consciousness (as fulfilling meaning-intention) was the essential condition of the knowledge of an object which by this token conditions also the foundation of acts of signification and intuition. In these terms **can be** founded the objective identity as the phenomenological unity of identification and further the unity of knowledge, in the strictest sense, as finding their origin in the sphere of objectifying acts (Husserl 1984, pp.206, 217, *engl. transl.*, pp.567, 584). In the phenomenological attitude, in turn, the latter acts involve the 'special' presence in the world of the subjective factor whose a priori eidetic attributes and its constitutional modes are non-eliminable by any physical reductionism.

Does the Husserlian transcendental phenomenology offer a way out of the epistemological turned ontological impasse involving the identity of objects? Yes, for by the transcendental reduction the 'essence' of numerical identity is reducible to a subject's presuppositionless, a priori intentional directedness to a content-free 'general something' akin to the Aristotelian τόδε τι. Is it exempt of ontological gray zones? No, for transcendental reduction itself, as well-known to any person well versed in phenomenology, can be a slippery turf to tread on, for it involves a new kind of transcendence, not the one traditionally juxtaposed as external to the immanence of human subject, but one that re-appears under the denomination of absolute ego within a subject's immanence itself.

Actually it is in the extremes of phenomenological thought, in the realm of transcendence as immanently founded, that the Husserlian and Heideggerian doctrines acquire a measure of conceptual affinity and by this standard offer a radical alternative to various forms of analytic thought, especially in view of the modern epistemological paradigm. Just for the sake of argument, Heidegger referred at some point in his magnum opus *Sein und Zeit* to the need of thinking not in naturalistic and rationalistic modes while, at the same time, not being lured to the ontology of the substantial.[12] In this respect he characterized as positive Kant's twofold analysis in which, on the one hand, considers the ontic reduction of the ego to a substance as

impossible and, on the other, he asserts the ego as being a thinking ego, (*Ich denke*), that always thinks 'something' (reminiscent of Husserl's intentional directedness). At the same time Heidegger criticized Kant's repositioning of the ego to the place of the subject in an ontologically inappropriate way that implies a sameness and constancy of something already there (*schon Vorhandenen*), instead of the selfhood of ego qua ego. Of course the issue of temporality, as undetachable from the mode of being of ego (or Dasein), is another point of convergence, in a broad understanding, between the Husserlian and Heideggerian thought, one that substantially differentiates phenomenological from analytic thought in terms of the respective approaches to ontological and epistemological issues. It is of **a certain** importance to note that Heidegger challenged the view that *Sein und Zeit* works from an 'anthopocentric standpoint', by pointing to the ecstatic-horizontal structure of time as temporality in *Sein und Zeit* (Heidegger 1969, pp.98-99). I quote from *Sein und Zeit* just to show how temporality is put as a correlate of the transcendence of Dasein in a way that is reminiscent of the Husserlian coalescence of temporality with the mode of 'being' of absolute ego as pure transcendence.

> Only because Dasein is determined as temporality does it make possible for itself the authentic potentiality-of-being-a-whole of anticipatory resoluteness which we characterized. Temporality reveals itself as the meaning of authentic care. [...] The totality of being of Dasein as care means: Ahead-of-itself-already-being-in (a world) as being-together-with (beings encountered within the world). [...] The primordial unity of the structure of care lies in temporality. (Heidegger 1967, pp.326-327, *engl. transl.*, pp.300-301)

3. In what sense Husserlian phenomenology may be vindicated as a rigorous science in view of contemporary epistemology?

Before entering into a discussion of this topic I must state that by the term epistemology I basically mean here and throughout the whole article the philosophy of science and more particularly the philosophy of mathematics and physics. Of course there are phenomenologists who are against any idea of mixing phenomenology and especially transcendental phenomenology with epistemological issues, considering this as a way of inappropriately 'naturalizing' phenomenology contrary to its vocation as the science of pure essences and eidetic intuition allegedly extraneous to any kind of facticity.

Yet there are numerous examples in which Husserl indicated his desire to apply to the natural sciences the absoluteness criteria of validity and truth first reached in the phenomenological analysis of absolute objectivity as reducible to the 'essence'

and the modes of transcendental subjectivity. A glaring example of it is his major last published work, *The Crisis of the European Sciences and the Transcendental Phenomenology* (Husserl 1976), having also in mind the way he envisaged mathematics and logic as a global science in the form and (absolute) content of a formal ontology in *Formal and Transcendental Logic* (Husserl 1992). Moreover it is the positive sciences Husserl had in mind when he sought phenomenological analysis to determine the very essence of science by yielding the absolute knowledge of objects as constituted immanences irrespective of place and time, since no existential position of objectivity can count, therefore transcending what facticity and observational or any other technical capacities can achieve. In these terms only philosophy as a rigorous science can achieve absoluteness of knowledge in the positive sciences to the extent that it sets such norms of scientific thinking as they are not constrained in any way by the fetters of contingency implied by the objectivist attitude. Of course, phenomenology cannot ignore contingent facts yet, on the level of constitution, it cannot refrain from considering them as appearances in the continuous unity of their profiles which in the next stage of transcendental reduction are assessed as correlates of absolute consciousness in the a priori modes of their noetic-noematic constitution and so on. By disposing of all contingent facts and passing to the reflection on their subjective constitution as objects such and such in original presence in front of the reflecting ego, transcendental reduction can accede to an apodictic grasp of essences like no conventional positive science can do. Further, transcendental phenomenology is made a unified body of knowledge by the sheer fact that all truths are linked together in their source, this being the universal a priori of transcendental subjectivity, whose constitutive norms are invariant throughout all concrete subjects. In this motivation Husserl ends up *Philosophy as Rigorous Science* (published in 1911 in the interval between his pre-transcendental *Logical Investigations* and the purely transcendental *Ideen I*) in the following upbeat mood:

> [...] Thus the greatest step our age has to make is to recognize that with the philosophical intuition in the correct sense, the phenomenological grasp of essences, a limitless field of work opens out, a science that without all indirectly symbolical and mathematical methods, without the apparatus of premises and conclusions, still attains a plenitude of the most rigorous and, for all further philosophy, decisive cognitions. (Husserl 1965, p.147)

Yet, for all the insights and the scope of the talk about absolute being and absolute knowledge that Husserlian phenomenology offers, it is not exempt of its own weak points, as alluded in Section 3, in presenting itself both as more authentically transcendental with respect to the Heideggerian doctrine and *a fortiori* as ontologically and epistemologically far more illuminating than the analytic school of philosophy. However to the extent that phenomenology, in a more inclusive sense that takes

also into account under a critical stance the Heideggerian and Sartrean 'deviations', brings into the fore of philosophical inquiry the *Sosein* rather than the *Sein* of things-in-the-world with absolute criterion the 'essence' and the modes of enactment of the transcendental subject, gains the edge over analytic philosophical thought, this latter leaving virtually out of discussion any non-objectivist consideration in its conception of language and logical construction.

Without intending to go at lengths in discussing certain ambivalences of transcendental phenomenology, I just point to two controversial cases: the first concerns the confusion concerning the Husserlian concept of intersubjectivity, that is, concerning the ways a transcendental subject, as subjectively constituted, may objectify another transcendental subject to the extent that the latter is not an object properly meant. It is known that Husserl has pointed, in the three volumes on intersubjectivity, to a kind of empathy (*Einfühlung*) of one transcendental subject toward another in coming to terms with the process of objectification, however this is a notion involving a new kind of transcendence. By any measure, though, it seems the thorniest issue in the Husserlian transcendental phenomenology was and remains the capital issue of the 'essence' of absolute subjectivity, in other words of the absolute ego. For all of Husserl's efforts to the end of his creative life to clarify the notion of absolute ego as original source of inner temporality and of all the consequent constituting and meaning activity, he was only able to settle for a transcendence virtually out of this world and at the same time the origin, the *prima causa* of everything the human subject apprehends as being-in-the-world. It is very characteristic that in the *Lessons on the Phenomenology of the Consciousness of Internal Time*, concerning the absolute subjectivity, Husserl offered the metaphorical picture of a flux named as such in conformity with what is already constituted, a 'flux' which is nothing temporally objective, and yet in the experience of actuality we have the primal source point and a continuity of moments of reverberation (Husserl 1966, pp.74-75, *engl. transl.*, p.79).

One might even say that the eventual recourse to a transcendental origin of temporal consciousness, reached in terms of immanence, is the inevitable logical consequence when one is faced with an indefinitely recurring sequence of reflections in the mode reflecting-reflected. A particular example in which a kind of infinite regression makes itself evident is the foundation of the irreal (not objectively real) nature of objectivities as intended senses in *Experience and Judgment* (Husserl 1939). Sense as intended content is thought, in terms of a formal ontology, to be in extremis a meaning-objectivity (*Sinngegenständlichkeit*) in the sense of a 'something in-general' devoid of any 'thingness' content, prone to objectification and accordingly made substrate of a judgment and of a predicative act of identification and explication. It follows that it may acquire a sense of a second level which means that it may be objectified in having a sense and by virtue of being objectified entitled to a sense anew. This way one is led to an infinite regression insofar as the sense of a sense (the latter

as objectified) can in turn become an object, then have a sense of its own and so on indefinitely. Consequently one can deduce that sense cannot be a real component of an object as it finds itself always in a non-eliminable deficiency with regard to its own ontification (Husserl 1939, pp.323-324, *engl. transl.*, 269).

In parallel terms by virtue of an interminable regression reflecting-reflected one can always reflect on his own pure transcendental ego which then becomes its own 'mirror reflexion', though it is obviously not its authentic self as it would be already objectified. In the Bernau manuscripts (Husserl 2001, pp.184-188). Husserl was faced with the difficulties emanating from this kind of infinite regression, yet he tried to circumvent the problem by searching the possibility of talking about a process of living experiences (not of temporally constituted experiences of the first degree) which advances as a living flux (*Lebensstrom*) without being itself knowable as a temporal object and without being constituted by temporal constitution. However one may put into serious doubt the validity of the expression 'constituted prior to any reflection', as it seems utterly meaningless without the 'attentive' regard of a time-constituting consciousness. It follows that it is either nonsensical to talk about the possibility of a process prior to any reflection or else generate an infinite chain of circularities founded on the very presence of a temporality-constituting consciousness.[13] It seems an imperative necessity to postulate an 'outworldly' transcendence of the absolute ego elusive of any sort of objectification and yet this latter acting-in-the-world to break an indefinite regression of reflecting egos in the first place.

Lastly, it should not go unnoticed that the Husserlian transcendental reduction leading to the absoluteness of ego has not been spared of criticism as to whether it is authentically transcendental itself or whether it might be imbued with elements of mundaneity that would vindicate an argumentation against transcendental phenomenology.[14]

Be what may regarding these gray zones of transcendental phenomenology, it seems an undeniable fact that the philosophical rigor Husserlian phenomenology has invested issues of the epistemology of our time can be measured by the ways it has turned the discussion on the content and limits of observation within-the-world to the scope and limits of human apprehension of things/events in the world as phenomena such and such immanently constituted through the self-constituting temporality and the a priori constitutive modes of absolute subject. Coupled with the concept of eidetic intuition as a complete, apodictic grasp of essences that is not a mere invariance among repetitive mental representations, the merits of transcendental phenomenology may be primarily thought to be the clarification and further elucidation of the modes of being-in-the-world on account of the constitutive role of the transcendental subject which is part of the world and yet not reducible to the objectivist standards that account for the rest of the world. In the final count, and in a more general sense subjectivist philosophies that are founded on a kind of transcendence 'immanentized'

within the subject with respect to the objectivity of the world, may help the epistemological edifice of our time get a more wide angled and certainly more radical view into the non-eliminable residue between the world as independently being as such and the world as appearing and objectified in being re-presented.

In other words, one may orient oneself from a more advantageous philosophical position toward assessing the kind of independent reality in the sense of D'Espagnat,[15] namely a reality level whose ontological being per se is elusive and one that cannot be conceived as embedded in space and time, in contrast with empirical reality in the sense of the reality we live in in objective, commonplace terms. Even if D'Espagnat's independent reality view seems a bit far fetched for a logical empiricist (or a scientific realist), still no one can doubt that the quantum measurement process poses by itself the possibility of a supposedly co-constituting role of the consciousness of an 'observer' to account for the ontological 'vacuum' in the elapsed time between the *ante* and *post* phases of a measurement. And of course this state of affairs brings, epistemologically, into the forefront the contradiction between the dynamics of the situation and the postulate of collapse insofar as:

> [...] the postulate of collapse seems to be right about what happens when we make measurements, and the dynamics seems to be bizarrely wrong about what happens when we make measurements, and yet the dynamics seems to be right about what happens whenever we aren't making measurements. (Albert 1992 in: French 2023, p.4)

4. Why analytic philosophy is deficient on account of the contemporary epistemological paradigm

So long as it is true that analytic logic is traditionally associated with philosophy it is also true that especially in modern times logic has become increasingly involved in questions pertaining to epistemology and metaphysics. This often touches on a kind of applied logic apt to describe the basic laws of scientific thought as traditionally anchored in the principles of analytic logic while also engaging in metaphysics as investigating the most basic structures of the world, thus providing a kind of logic of reality (Mormann 2020, p.135). This trend could break with the traditional view of logic as referring to the art of correctly manipulating logical symbols based on certain principles of analytic logic. Instead logic, in a mutual influence with cognitive theory and epistemology, e.g., in facilitating methods of inductive inference from observations rather than engaging in mere symbolic manipulation would inherit "meaning from patterns of bodily interaction that involve essential correlations of space and quantity (hence, of geometry and algebra)" (Peruzzi 2000, pp.169-170, in: Mormann 2020, p.136). Of course this viewpoint should reach out to what is implied by the as-

sertion that logic 'inherits meaning' from patterns of bodily interaction that involve space and quantity, insofar as the roots of logic and cognition might consequently lie in our presence and activities as living beings of a special 'architecture' within the world. In such terms human beings have to cope with the various challenges of a spatiotemporally structured material world in which they have a kind of special presence by being parts of the world and yet having a mutual relation with it irreducible in reductionistic physical terms.

It is true that the phenomenological doctrine, particularly in connection with natural science, was not running currency in the beginnings of the twentieth century. Logical positivism as represented mainly by the famous Vienna Circle promoted the view that all philosophy should aim at is to analyze the structure of language and of scientific theories without touching on the ontological core of the specific sciences themselves. Consequently insofar as the contents of special sciences are concerned, philosophy would have virtually nothing to contribute, except for the analysis of the semantical and syntactical machinery of theories according to the early proponents of analytic philosophy. Yet around the 1950s and 1960s analytic philosophers such as Quine and Strawson, among others, opted for a revival of traditional ontological questions in an analytically based way.[16] This trend spawned a new field of research, called 'analytic ontology'. More concretely these developments include:

> Quine's criticism of the analytic-synthetic distinction, Strawson's presentation of the metaphysical assumptions underlying our ordinary ways of talking and thinking, and Barcan Marcus' defense of modal reasoning. By the early 1970s, Saul Kripke's account of necessary a posteriori truth and David Lewis' analysis of counterfactuals had the important effect of encouraging philosophers to entertain the possibility that metaphysical theses should be evaluated independently of theses in the philosophy of language or epistemology. (Symons 2010, p.350)

Even as analytic ontology is of a certain value in the investigation of ontological aspects of 'erratic' physical theories, as it is the quantum field theory I have talked about, to the extent that, on the one hand, it is involved in the evaluation of empirical sciences in logico-philosophical terms and, on the other, apt for analyzing highly formalized theories of physics due to the emphasis on formal-logical structures in the analytic tradition, it still seems to fail to accede to a complete description of being-in-the-world as phenomenon. As a matter of fact the analytic tradition's focus on language and logic sometimes had a negative impact in the process of putting in proper context and in the clarification of ontological questions. Even though ontological questions were of some concern at the beginning of the twentieth century to the philosophers of the analytic camp, including the logical positivists of the Vienna Circle, the interest in the philosophy of language in the middle of the century

was followed by a general distrust of ontology, only for the interest in this latter to reawaken in the late 20th and the running 21st century.

The prevalent impression and the accompanying criticism however is that analytic philosophy is narrowly focused on language, logic or conceptual analysis at the expense of ontological or metaphysical investigations. Yet in spite of the fact that ontological questions were of some concern for well known figures of analytic philosophy, think, for instance, Wittgenstein's Tractatus held in high esteem by the members of the Vienna Circle, for a major figure of analytic philosophy as was Carnap, philosophy was to be purged of metaphysical claims by means of the development of a logical syntax which was to serve as the logic of science.

For Carnap the logic of science is nothing else than the logical syntax of the language of science in which case the logical syntax of a language was meant to be the formal theory of the linguistic forms of that language. In Carnap's version of structural reductionism, by permitting possible transformations of various kinds, e.g., statements about rational numbers can be transformed into statements about natural numbers, the structural features of logical systems help to gain insight into the essential character of scientific inquiry and should no longer be distracted by the non-relational features of scientific discourse (Symons 2010, pp. 364-366). As it is known Carnap's logical construction, concerned with the purely formal properties of relations between objects as well as the dominant position he attributed to the syntax of language in the formalization of scientific knowledge, was famously criticized by Gödel as leading to a non-terminating regression of syntactical rules to catch the kind of elusive 'residuum' of meaning in the construction of a formal system of knowledge. For Gödel, in view of the mathematical realm, the mathematical essences we intuit cannot be in an essential way linguistic conventions. One might even say that the content or meaning associated with mathematical concepts will be abstract relative to the rules of syntax and these latter deficient in relation to the former. In Gödel's own words:

> [...] instead of clarifying the meanings of the non-finitary mathematical terms by explaining them in terms of syntactical rules, non-finitary terms are used in order to formulate the syntactical rules; and, instead of justifying the mathematical axioms by reducing them to syntactical rules, these axioms (or at last some of them) are necessary in order to justify the syntactical rules (as consistent). (Feferman et al. 1995, p.342)

I remind that Quine, questioning in the *Two dogmas of Empiricism* the sharp distinction between analytic and synthetic propositions, drew attention to the inevitability of a no non-circular definition of analytic truth, insofar as if one considers analytic propositions as true by virtue of their meaning the next question would involve the definition of meaning. Yet Quine's account of ontology was always bound to a significant extent with his views on the nature of language and truth. For instance, it is

well known the kind of ontological commitment he attributed to existential quantified sentences in a first order formal system to the extent that they always guarantee the existence of a concrete object in the place of the bounded variable.

In the bottom line, for all the recent or earlier bent of analytic philosophy to ontological issues, the truth is that it has never caught the umbilical cord with the analytic logical part as influencing the structure of language and associated meanings regardless of any consideration for the constitutive role of the subject and in disregard of any circular physical reductionism. For instance, the notion of intuition, as mostly referred to in Kripke's *Naming and Necessity* and elsewhere in roughly mundane terms akin to an ordinary commonsense level of thinking, is at odds with the prevalent status it has acquired in phenomenological thinking in rigorous non-reductive terms.

Moreover if language itself as a phenomenon within-the-world may have an 'interiority', possibly thought of as the residuum left over after the elimination of all acts and apprehensions taking place in the objective sphere and expressible in standard linguistic forms, then this 'interiority' may be possibly reduced to the 'interiority' of the self as the absolute, constitutive and meaning attributing factor. In fact, on the level of natural science a concrete quantum mechanical situation may prove a terrain of predilection for providing a convincing argument for such a claim, especially if a specific state-of-affairs tests *in extremis* the capacity of language to express by the linguistic means available the process of being in being-objectified, referring in physical terms, e.g., to the implementation of a quantum measurement. On the other hand and on the level of a formal mathematical theory, which at least in a first reading has nothing to do with physical observation, one has reasons to be reserved about the capacity of language to represent such categorial objects of mathematics, as the infinite sets of various cardinalities of a formal mathematical theory, in the Husserlian sense of formal-ontological objects, as completed objects in actuality immanently generated by a process of subjective constituting activity irreducible to purely objectivist terms. These phenomenological concerns lead, for example, to the essential origin of the invariant identity of objects of 'observations', transformable to linguistic ones, in the unity of their profiles in their mental re-presentation, which implies in turn the involvement of inner temporality as correlate of the absolute subjective factor. On this account, the absolute (or transcendental) subject, which can confirm the 'being there' of its transcendental self as an unambiguous evidence in the actual present and in the modes it constitutes objects as phenomena-in-the-world, may be able to found an ontology of the situation compatible with epistemological concerns both on the level of physical 'observation' and, to the extent that a formal theory as a supportive substructure is a highly specialized linguistic activity, also on the level of language and the meanings involved thereof.[17]

Actual present in the Husserlian sense of living present, meaning in effect the only possible means of 'appearance' of the transcendental ego within the world, may

be viewed as a clue to comprehend the 'residue' between acting-in-actuality and reflecting upon acting-in-actuality. After all, applicable in quantum terms the kind of ontological vacuity between the being-in-entanglement of a compound quantum state and its post-measurement disentangled objectified state may eventually prove non-eliminable due to the exclusively objective means available to put it into evidence. And by this measure the linguistic means available, to the extent that language amounts to a kind of normativity with regard to what has already been there in unambiguous and full objectification, are most probably bound to leave the 'interiority' of language as mentioned above uninterpreted and the self-imposed limits of language toward the world inalienable and immutable. Consequently, to the extent that analytic philosophy is inalienably associated with the logic and structure of language and remains estranged from any subjectivist considerations in a non-physically reductive sense, sets by itself the limits of its accessibility toward a complete description of being-in-the-world.[18]

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Notes

[1]In my view these human faculties are prone to a slow stepwise evolution in a feedback or even in a prospective merge with AI.

[2]An interesting exposition of the ways transcendental phenomenology can account for questions involving the role of the transcendental ego in the context of quantum measurements, an inquiry fist taken up by F. London and E. Bauer in the 1930s, is S. French's book *A Phenomenological Approach to Quantum Mechanics*, French 2023. Another one with the same topic is H. Wiltsche's and P. Berghofer's *Phenomenological Approaches to Physics*, Wiltsche and Berghofer 2020.

[3]Heidegger notes elsewhere that: 'even though the world is formed in Dasein, access to the world is denied Dasein on nonfinite terms' (Heidegger 1969, p.95).

[4]See Heidegger 1954, pp.4-5, *engl. transl.*, p.8.

[5]Husserl was obviously referring to transfinite magnitudes in the Cantorian sense, magnitudes that we call today infinite cardinals of various ranks, e.g., measurable or supercompact cardinals, etc., generated by purely formal definitions within the set-theoretical universe and usually involving the existence of cardinals of a lower rank.

[6]An interesting work on the ways objectivist-materialistic considerations are irrelevant with phenomenological-transcendental ones in a description of the living experience in the world is E. Straus' *Vom Sinn der Sinne - Ein Beitrag zur Grundlegung der Psychologie* (Straus 1978, esp. p.54).

[7]Generally fields in physics refer to quantities, e.g. strength, potential, flux, etc., with values associated to spacetime points, which combined with modeling and calculation purposes that apply the concept of infinitely many degrees of freedom, testifies to the fundamental role of (underlying) mathematics in shaping the physical picture. It may lead moreover to conceptual problems regarding the physical part of **QFT** theory by the occurrence of infinities and the need for various renormalization procedures.

[8]State spaces are not physical spaces but mathematical entities or rather sets of mathematical entities endowed with a certain structure.

[9]See for more Redhead 1988, pp.10-18.

[10]For instance, a local field $\psi(x_i)$ actualizes the state w_i. Its neighbor $\psi(x_j)$ actualizes another possible state w_j. In between, the variation of the actualized states among local fields

is not arbitrary but is determined in terms of the field equation, more specifically through the operation of the differential operator $\frac{\partial}{\partial x^{\mu}}$.

[11]See, for instance, Husserl 1973, p.243.

[12]Husserl in his *Philosophy as Rigorous Science* (Husserl 1965), characterized naturalism as the doctrine that recognizes as real only the physical. As such (i.e., as the science of the factual) either refuses any reality to the ideal or 'naturalizes' it by bestowing upon it physical attributes. By this token, that is by naturalizing consciousness and ideas, naturalism fails.

[13]For further reading on this issue, see also Livadas 2019, pp.578-581.

[14]As a matter of fact one of Husserl's disciples, Eugen Fink, had pointed to the impossibility of transcending the life-world even after the transcendental epochë: 'The transcending of the world which takes place in performing the phenomenological reduction does not lead outside of or away from the world to an origin which is separate from the world'. For more on this matter see Livadas 2023a.

[15]For a detailed exposition of the concepts of independent and empirical reality in the current epistemological context of quantum physics, see D'Espagnat 2003.

[16]I point out that Quine, even though generally considered as belonging to the camp of analytic philosophy, has been quite critical as to the limits of analyticity in truth statements of science, and has moreover drawn attention to the blurriness of the bounds between analytic (true what may) and synthetic (true based on facts) statements. See, e.g., the *Two dogmas of Empiricism* in Quine 1963.

[17]From the time of *Logical Investigations*, that is well ahead of Husserlian phenomenology's transcendental stage, Husserl arguing against logical psychologism as committed to an epistemic empiricism about logic, had indirectly pointed to a kind of a priori foundation of pure logic in relation to the rational subject in these terms: "insofar as the laws of pure logic are conceived as supreme constructive categorically normative meta-principles for constructing all lower-order exact sciences, then it follows that pure logic is the necessary a priori condition of the possibility of any explanation or justification whatsoever, in the sense that it is innately constitutive of human rationality" (Hanna 2021, p.45).

[18]The interested reader may look for further argumentation on this issue to Livadas 2023b, pp. 25-30.