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Towards Constituting the Identity of the Universe: Apophaticism and Transcendental Delimiters in Cosmology

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The paper discusses the limits in knowability of the universe in modern cosmology which arise from the human condition. We argue that the alleged identity of the universe as a whole can only be approached apophatically, that is refusing exhaustibility of truth through either positive or negative assertions of this identity in the scientific discourse. Thus any commitment to realism must be abandoned and the objectivity of the universe can acquire no more than a "weak" sense of a construct, that is of constituted reality. Seen in this way the discourse of the universe becomes involved in historicity of the human rationality, so that the reality of the universe can only be understood as having its origin in its historically contingent disclosure by human beings. The fundamental incommensurability between the universe and embodied humanity, as well as intrinsic non-attunement of humanity with the universe, are manifested in communion with universe through existential anxiety of being displaced in it. It is from within this anxiety that one can identify transcendental delimiters which act in cosmological knowledge. In particular, we discuss the meaning of the cosmological principle as a transcendental principle of explicability of the universe related to the inherent ability of human rationality to grasp the presence of the finite infinitude. We point out that this principle, being methodological for cosmological research, has some teleological overtones (linked to the active telos of cosmological explanation) related to the essence of the human condition.

Keywords: universe, identity, knowldge, explicability, apophaticism, transcendentalism, teleology.

> *For cosmic thought to be possible, thought must find the means to separate itself from things, to gaze beyond their appearance, to transcend the visible towards a non-visible that is irreducible to the visible and yet the condition of it. A speculative transcendence is required.*
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> *J. Ladrière, Language and Belief, p. 150*

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Introduction

It is a fact of contemporary science's sociology that cosmology reveals better than any other physical study a constant advance of theory and observations which rapidly extend and revise our views about the universe, especially its mysterious early stages which allegedly gave rise to the present astronomical display. Cosmology makes all its statements using affirmations which attempt to approach the universe in its totality in terms of references, imported from the earthly physical world and astronomical cosmos. The maximum that cosmology can pretend to offer is a set of *cataphatic* (that is, affirmative) statements about general properties of the universe, as they are related to the world we live in. It seems reasonable to suggest, because of the physical incommensurability between human subjects and the universe as a whole, that this set of statements as definitions is open-ended and cannot hope to terminate at any final stage.[1]

Small details about the universe, the technicalities of its theories, contribute towards our perception of "pieces" or "moments" of the universe whose *identity* as a whole is anticipated by cosmologists as the *pregiven*, inherent and non-relational (with respect to these "pieces" and "moments" as well as to anything hypothetically "outside" the universe) in-itself, having a character of either an entity or a logical subject.[2] The identity of the universe, for example, appears as an *idea*, similar to the idea of the *world* in a Kantian sense, that is as an accomplishing term of the series of causation in the realm of the conditioned "jumping" from the empirical "pieces" and "moments" to the inferred mental fullness. This jump exhibits a belief that there must *be* a united and unconditional all to which one belongs and in which one somehow participates. However, this "be" proceeds in our mind because we are *given* the conditioned (finite things), and we believe that we must in the same way have a capacity to be *given* the unconditioned. [3] This is not the case as the unconditioned itself can only be taken as an infinite series of conditions. However, this demand of reason seems to be impossible because the entire series of conditions in the universe is not given to us. The universe in space and time is not something which one can encounter in experience. Correspondingly, the universe's ontological status becomes uncertain (as Kant would say: the universe does not exist in itself as if it would have a determinate magnitude (Kant, 1933, A503-5/B532-4)). Hence, and this is natural, the universe as a whole "emerges" as a *rational* idea (as distinct and different, in a Kantian classification, from an *aesthetical* idea, that is an idea of a beautiful arrangement – *cosmos*) with a certain regulative use. This idea has a minimal perceptible intuition and never becomes cognition (that is, a never fulfilled intentionality). The famous Kantian antinomies of reason associated with the notion of the world, which never disappear if the universe is approached through the categories of the understanding, demonstrate that if cosmology dealt only with such an abstract (*a-priori*) notion of the universe, all talks about the identity of the universe would have sense as no more than philosophical rhetoric.[4] In the present, Kant's insistence that cosmological questions can only be settled a priori, that is with no recourse to experience, seems to be inadequate, because at least some cosmological hypotheses on the age and size of the universe can be subjected to empirical verification or refutation. However, if this claim can be made without encountering the universe as a whole, still the question of the universe's identity as related to its whole remains effectively unchanged through the progress of science. But, once again, the advancement of science teaches us exactly that which Kant was asserting on general metaphysical grounds, namely, that scientific progress will never accomplish the disclosure of the universe's identity; the idea of

the universe as a whole with a certain identity has a perfectly legitimate, practical, that is regulative use which can lead us to search for the conditions of the universe's explicability and increase our knowledge and understanding of it (Kant, 1933, A307/B364, A508-10/B536-8). Then one can talk about the universe as the totality of space and time as if the universe as a whole and its identity existed. In this case antinomial scepticism would be overcome and Kant would approve such a usage of the notion of the universe and its identity.[5] The universe, treated as "a particular" ever-escaping precise definition and exhaustion through its signifiers, becomes a subject not of understanding but judgement. To understand the universe one must judge whether it exists or not. But judgement can be reflective and not determinate, so that it is this judgement which vindicates cosmology as the research of the universe as a whole.

Correspondingly, in actual cosmological research, which is not a philosophical discourse, and which must find a way out from the antinomial scepticism, the sense of identity present behind the term "universe" is rather an expression of that gradual substitution of the material accumulated from observations and theories for an inherent intuition of the universe as totality of all, thus following a path to objectivity through coordinating phenomena and theoretical constructs into a strata of invariants across a variety of subjective and instrumental circumstances.[6] In other words, in physical cosmology, the "identity of the universe" is not an a-priori inherent and immutable in-itself, but involves constitution and does not imply that the sense of identity of the universe disappears from a cosmologist's subjectivity; it implies only that this sense is not determinate in actual research. It is because of the finitude of the human scientific understanding that the notion of the universe as a whole acquires features of an open-ended construct[7] in the conditions of a hidden belief in ultimate convergence of the correspondence rules relating constructs to the alleged reality.

There is one particular feature in the constitution of the universe which demands its identity: namely, its *identity through time*. Indeed, for cosmological research, in order to assert that it deals with physical reality, there must be some *stability* in the "object" studied through time pertaining to the universe itself. Then the question is: what is that referent in physical reality which sustains such a stability. The answer is nearly obvious: the material content of the universe, a physical composite of fields, particles, macroscopic structures and other theoretically predicted but allegedly physical components. However one cannot claim that this substance is that which pre-exists the very process of investigation of the universe because it itself demands constitution through the irrational, experientially identified, resistance to any attempt to disclose its identity.[8] This is the reason why the required stability of cosmological constituents has to rely on mathematical assertions. For example, "dark matter" and "dark energy" are mathematical predictions (following from the demand of consistency in cosmological theories and observations) but their ontology remains, up to now, hanging on some implicit belief-based commitments to the realistic nature of their mathematical constructions. In this case, does the ontological status of the identity of the universe receive elucidation from the conviction that its intelligible pattern is devoid of mutability? Since mathematical physics appears as a leading technique of thematisation and objectification of the universe, can it fulfil the function of bringing the alleged identity of the universe to unconcealment (bearing in mind that there are probably other ways of communication with the universe)?[9] The reference to the intelligible realm becomes a natural shift in ontology of

the identity of the universe, because it avoids problems with the stability of this identity in terms of temporality. Indeed, since the universe as a whole is thought as being beyond any worldly causality and temporality, it is primarily posed by consciousness in the intelligible realm stripped (by means of phenomenological reduction) of any specific facts and particular theoretical predictions. In this case the universe appears to humanity as the unconditional *coming to truth* of the *visible* (sensible) and *invisible* (intelligible) *being*, manifested in life itself.[10] The universe is now intuited not as a rational idea, but as an aesthetical idea, and this in turn manifests that the different means of communion with the universe have been invoked.

The universe is reaching us not only through optical images in telescopes, radio signals in receivers and through counting devices in cosmic particle chambers, etc. The universe is not only the manifold of different sense impressions which come from the sky, synthesised in the human mind. It is also the beautiful *kosmos* of ancient philosophers, where the universe entered human life *ethically*, as a category of *personal relationship*, rather than spatial or temporal extension (*diastasis*).[11] Being reminiscent of this ancient approach to seeing the universe, contemporary physical cosmology, in spite of its objective to study the universe as a structure extended in space and time, anticipates the universe not only as a manifold of observations and theoretical constructs, but as a singular (physical) unity which possesses some inherent *logos* which is not manifested fully through the variety of astronomical facts. Thus any reasoning about the identity of the universe implies that the *reality* of this identity must be secured by bringing out the fact that it is different from its manifold presentations and showing that, despite its uncertain status, it is truly a component of what we experience: the universe is presented to us through its "pieces" and "moments" (places and eras depicted in numerous cosmological diagrams[12]), but the identity of the universe (not only as the *name* of its facticity (Munitz, 1990, p. 175)) is empirically *absent* (the identity of the universe by definition escapes rubrics of extended space and time, thus being trans-temporal not only as persistent in time) so that we deal here with a situation of "presence in absence".

One may clarify the sense of the identity of the universe as it stands in the context of "presence in absence" by referring to some general phenomenological stance on the identity of objects. The identity of an ordinary object is formed through the object's presence and absence to a particular consciousness, so that the object appears in its identity as the unity of its profiles and impressions available to the public mind.[13] One particular feature of constituting the identity of an ordinary object is that it can be formed through consciousness of its absence, that is, its potential non-existence. For example, while experiencing the beauty of a flower one appreciates it without clear understanding as to why this particular kind of beauty came into being and be appreciated if anyone were not to be there. The identity of this flower (apart from an obvious synthesis of pieces and moments) can implicitly enter consciousness from the perspective of its possible non-existence, so that the very factual beauty of it (as identity) is weighed against its potential (eidetic) non-existence. Alternatively the identity of a beautiful flower can be judged from the perspective of existence or non-existence of a subject of its cognition, that is of that agency which could or could not appreciate the beauty. If nobody were present this beauty would not be detected and appreciated: thus the beauty of the flower as its identity constitutes, in a mediated way, our subjectivity as identity which either intends the flower or intuits it. The same is true with respect to another human being: we identify

this being as finite, and mentally and emotionally homogeneous with us. The distinctiveness of "me" from "him" is determined by the multitude of human beings who are all different. Thus the synthesis of one's identity ultimately originates in relationship, which, hypothetically, allows one's absence or even non-existence.[14] The anticipation of the identity of the other constitutes one's identity as different from the other. The disappearance of the other from the horizon of one's life thus affects one's own identity. It is crucial here that, unlike physical objects, it is extremely difficult to achieve a clear consciousness of one's own absence for oneself, that is, non-existence of oneself for oneself. However, the intending of this strange condition cannot be entirely empty: it still contains the presence of one's subjectivity as that one who intends its own non-existence. A similar thing would happen in cosmology, where any attempt of constituting the notion of the universe as potentially non-existent is intrinsically contradictory, for it eliminates with itself that embodied consciousness which thinks of the universe.[15] Whereas Kant was critical of the notion of the world as a whole by pointing out that the difficulties of reasoning about it clarify the limits of reason, thus contributing towards the constitution of subjectivity, one can say that the ideation of non-existence of the world creates a similar contradiction by revealing the absolute preconditions for any reasoning in rubrics of embodiment: there must be the universe in order to think of it, for it is through consubstantial embodiment that the existence of reason is linked to existence of the universe, so that any eidetic annihilation of the universe must logically entail the cessation of consciousness itself. One understands however that the contingent facticity of this consubstantiality (as reflected in subjectivity, that is as a transcendental notion), as well as the facticity of consciousness, remains an ultimate mystery.[16]

The contemplation of the identity of the universe in the conditions of its empirical absence constitutes the core of the human condition pointing again to the twofold presence of humanity in the universe.[17] The sense of identity of the universe comes into existence from within humanity as a special formation of the universe, small in scale and at the same time powerful in terms of its intellect.[18] Then it is natural to suspect that the anticipation of identity of the universe represents a particular intentionality of human subjectivity which has its origin in the singularity of every human being-in-the-world (Heidegger), existence-in-situation (Marcel), or hypostasis (Levinas). The very mode of conscious life implies the sense of immanence *with* the universe through communion (as embodiment and articulation). This communion is drastically different in comparison with the view of scientific cosmology which considers the universe as a composite of different eras, domains and ingredients, that is as a structured and complex system which in its spatial and temporal vastness dominates with its "realms" of the non-existential and non-human.[19] The universe rather appears here through an *instantaneous intuitive synthesis* which accompanies the very fact of life as existence in the universe which forms pre-predicative experience.

The anticipation of the identity of the universe at the pre-predicative level represents, in fact, a *transcendental* requirement not only for its knowability (within discursive reason), but also for its accessibility by human subjectivity in general. This requirement originates in a trivial fact that the identity of the universe is not a "regular particular" which escapes the exhaustion through signifiers pertaining to the understanding. When this conceptual item extends human thought beyond the limits of possible experience, theoretical knowledge becomes impossible, and one must look for the special conditions that adjust

our thought to fit this idea. The understanding is not precisely suitable for this purpose, for it determines (through application of its categories) only those particulars that are given in sensible intuition. Judgment (which, according to Kant, is a faculty distinct from understanding and reason), however, requires that all particulars be subject to understanding, that they be rendered intelligible and explicable under some law or other. In respect to the universe, our limited cognitive capacity makes it impossible for us to fulfil the demands of judgment in any theoretical way: knowledge remains apophatic, that is incapable of exhausting the reality of that which it signifies[20]. In spite of this we are able to think (within the demands of mathematics) that the universe is organized so that we will be able to understand it. This presumption, or better, a certain belief-based commitment, establishes the intrinsic *teleology* of research: the research aims towards its *telos*, that is to the object of the concept of the universe as a whole, its alleged identity.

Nevertheless reason must discipline subjectivity in apprehension of the universe as a whole, and the intuition of the identity of the universe as a teleological commitment exactly fulfils this function: it not only provides us with the assurance that the universe *is*, but it ultimately ordains the methodology of physics to be applied to its study. Physics and mathematics based in the analytical faculty of reason heroically overcome the lack of empirical evidence for the identity of the universe by employing creative imagination (variation of the empirical carriers of essence) and extrapolating sensible images of reality, as well as local physical laws through space and time, summarising them in a kind of unity, which is intended by cosmologists as potentially graspable[21]. In this case the intentionality pertaining to physics and mathematics, being based in the anticipation of the wholeness of the universe through the instantaneous synthesis, serves as a delimiter in knowledge of the universe: it does not cover all aspects of the universe which are implied by the instantaneous synthesis. Characteristically, the limitation of knowledge follows exactly from an attempt to express symbolically the unity of the actually infinite universe.[22] Indeed, the visible universe is limited by cosmological horizons[23] whose very existence is inferred from the supposition of the global space-time structure (as a symbol of the universe's unity) exceeding this horizon. The universe as totality of space and time is seen as filled with a uniform "cosmological fluid" (made of clusters of galaxies) [24] characterised by functions of time which describe the average distribution of matter for the whole space-like surface thus disguising all differences in particular spatial objects. This description of the universe as uniform in space and in terms of matter can be treated as a symbol of identity of the universe, as a construct and intellectual achievement based in an instantaneous synthesis (judgement) and not in a successive induction (that is, analytic derivation). The diagrams which represent the wholeness of space and time thus can be seen as pictorial symbols of the sought identity of the universe having not an inferential, but intentional origin.

As we mentioned before the anticipation of the universe as a whole, or its identity, implies a particular transcendental assumption[25], known as a "cosmological principle". Its transcendental dimension originates in the observation that if the universe changed radically in *space* one could not apply physical principles discovered locally to other parts of the universe. To guarantee the universal validity of physical laws, at least related to the observable forms of matter the universe must be uniform in space, or in different words the universe must look isotropic from every possible location in it. This principle postulates the uniformity of the universe in space, as if one

could reposition oneself from one point in space to another and to see the universe as statistically the same.[26] The effect of this postulation is that the uniformity of the universe thus becomes that all-encompassing circumscription of the universe tantamount to the instantaneous synthesis. There are different things that can be said on the justification of this principle. As already mentioned, cosmology as a scientific discipline would not be possible without this principle: we could not construct physics which would describe different, non-homogeneous parts of the universe.[27] Alternatively, based on the observed isotropy of the universe from the planet of our habitation, and in order to avoid any inclination to *teleologism*, related to the selected nature of our position in the cosmos one postulates the same isotropy from all other possible positions in the universe, which is tantamount to its spatial uniformity.[28] The cosmological principle as a transcendental assumption naturally appears in the Kantian stance on space as an a-priori form of the sensible experience. His apriorism demanded that space is Euclidian. The cosmological principle in the Kantian view of the universe follows simply from the fact that the Euclidian space is uniform. As to the distribution of matter, its uniformity, independent from that of space, follows from the Newtonian gravitational dynamics in the infinite space. However, it seems reasonable to claim, that in all possible scenarios the cosmological principle emerges as a natural consequence of the transcendental requirement of the explication of the wholeness of the universe (its anticipated, through the instantaneous synthesis, identity) expressed in terms of a successive *diastatic* spatial and temporal synthesis, where the instantaneity is effectively reduced (because of the limitations of the physical and mathematical sciences) to the mental spatial uniformity of the universe.[29]

However, by explicating the instantaneous synthesis, the cosmological principle brings with itself a fundamental difference: the instantaneous synthesis is personal, hypostatic as related to the fact of life, whereas the cosmological principle, by its function in theory, advocates the universe at the impersonal, anonymous level. While in the instantaneous synthesis the universe is personified, or enhypostasised, by human agents, in the cosmological principle, where home places are shifted and intelligent agencies are "placed" around the universe, the universe becomes an "intelligent" entity (and thus intelligible) but with no "face" of its own. The "face" of the universe and its name are still allocated by human beings on Earth not by the way of abstract definitions, but through ecstatic meetings with the universe manifesting the unconcealment of being in general; it is this allocation that demonstrates that the instantaneous synthesis is still in place in the very foundation of the cosmological principle.[30] Thus the universe's identity reemerges through the cosmological principle acting as a transcendental requirement for the explicability of the universe (anticipated in its immediate givenness from the instantaneous synthesis). In fact, as we mentioned above, the cosmological principle allows one to use an imagery of the universe, depicting it through diagrams representing the universe as a whole. These diagrams become another way of expressing the instantaneous synthesis of the universe. Correspondingly one can say that the cosmological principle forms the fundamental transcendental requirement for the explicability of the universe which effectively reduces and delimits the sense of the instantaneous synthesis of the universe to what is expressible in words, formulas and graphs. It is within these transcendental limits that some cosmological theories pretend to model and give an image to the identity of the universe. For example, if the universe is thought to be closed and finite in space and time, it is depicted as a curvilinear cylinder with two apices symbolising Big Bang and Big

Crunch. But here the universe acquires a kind of identity as being "created" by consciousness: the identity of an image is supposed to originate from the identity of an "artist" who produced this image. The image of the universe as a curvilinear cylinder is an anonymous geometrical shape, created for communicating it within the scientific community, which, because of its collective nature, does not bear any signs of personhood.[31] Hence one can speak of reduction of the identity of the universe from personal communion to its intersubjective and impersonal representation following from the transcendental requirements for its explicability. By its constitution within these transcendental limits the identity of the universe functions as no more than a *signifier* of that which is aimed at to be the identity through the instantaneous synthesis. However, since such a representation of the identity of the universe does not extend beyond its signifiers, it has the sense of an *apophatic* identity: it tells us what the identity of the universe *is not*,[32] and this is the *negative* reason why this image is *valuable*.[33] It is valuable because it confirms a perennial issue that the universe as a whole can be known only in the so called *negative certitude*, the certitude of a philosophical kind which does not change considerably in the historical development of humanity. The positive certitude of experimental or theoretical sciences dealing with the conditioned part of the world contribute to our knowledge of the universe only apophatically, that is only by means of abberations and approximations to the reality of what is sought.[34] It allows us to differentiate between the ever mutable results of eidetic variations of the empirical (which can be expressed through images) and that intrinsic sense of immanence (and thus stability, although not attunement) and participation with being (as an ecstatic co-relation of the universe to a person, or the ecstasis of a person as a transition from concealment to unconcealement, or as experience of things as related to persons), which cannot be excluded (reduced) from subjectivity at all.

One can go even further and trace the origin of the cosmological principle as a transcendental delimiter in knowledge of the universe to the initial fact of life as finite embodiment. The adjective "finite" plays here a pivotal role: any attempt to think of the universe places this thinking in the conditions of the impossible, namely of how to access the actual infinity of the universe from within its finite formation. On the objectivistic side, if this access is thought as possible, the universe must be thought as having in itself that originary foundation which makes possible the infinitely progressing self-representation of the universe from within its own finite formation. On the epistemological side, this is a transcendental requirement, because it follows from the postulate of the universe's knowability as epistemological commensurability with it: to know the universe through the locally and historically contingent fixed astronomical phenomena and established physical laws one must postulate a nomological uniformity of the universe. This uniformity bears an intelligible character: all parts of the universe are subject to similar laws and thus, as uniform intelligible entity, the universe is accessible to the human intelligence as a stable and self-identical pattern. The postulate of the uniformity of the universe demonstrates the transcendental ability to displace itself in the intelligible space in order to stretch consciousness across the whole universe, the universe which is now treated not only as the outward *intelligible* entity but also as the *intelligent* entity (as a multiplicity of potentially possible and spatially separated, but transcendental observers). However, this displacement (interchange of home places), being eidetic in its essence, does not imply any interchange of spatial hypostatic embodiments. So that, postulated as an intelligent entity, the universe does not acquire the status of a home for

humanity: the cosmological principle makes the universe uniformly intelligible, but anonymous and impersonal, for the intelligibility of the universe does not entail the embodied presence of human beings in the physical universe. In this sense the personal instantaneous synthesis of the universe as a whole through sheer living communion with it, as it is experienced here and now (on the planet Earth), and which has a distinctively human character, is replaced by the anonymous and impersonal discursive representation of the universe as uniformly extended in space and time.

The intuition about the identity of the universe as its instantaneous synthesis can thus be treated as a deposit of personhood in perception and articulation of the universe. This does not imply that the content of this synthesis is somehow exhausted by a person on their own as if personhood mimics some innate and non-originary (with respect to the universe) modes of apperception. It just says that this instantaneous synthesis, as an ecstatic movement towards being, receives its manifestation in a human person, and in no way the sense of the identity of the universe is reduced to the rubrics of the "I" or that this identity acquires explicitly any hypostatic features different from those deposited by the carrier of its enhypostasisation. The universe does not become hypostatic, whereas its encounter with human persons results in its being presented through such metric properties, which, by their constitution, are enhypostasised. However, one cannot exclude that cosmological research, as human activity, forms the idea of the identity of the universe in a "quasi-hypostatic" sense, when the very impetus of research becomes an interaction with yet unknown and fundamentally open-ended "being", which while being manifested to a cosmologist through multitude of appearances is resistant to any accomplished comprehension. [35] Then, seen from a philosophical perspective, a theoretical exploration of the universe can be interpreted as an attempt to enter communion with another para-hypostatic being by means of discursive thinking. In this case the fundamental irreducibility of para-hypostatic being to its "pieces" and "moments" (one cannot know a person by dissection) confirms our previous intuition that the cosmological research (as related to the universe as a whole) is a fundamentally open-ended, and thus an apophatic enterprise, resembling in its existential objectives the aspiration by humanity to establish the sense of its existence and its identity in the world.[36]

Unlike phenomenology which allocates a special place to the idea of the world (or the universe) as the "horizon of all possible horizons"[37], thus introducing the knowing subject in the heart of the constitution of the world, scientific cosmology, as a particular physical discipline, is interested not in identifying the universe as the horizon of all possible horizons in an existential sense but rather in the integrity of the universe as the sum total of physical being and, in particular, in its origin as the antecedent of this integrity.[38] The identity of the universe for a cosmologist forms a subject of his intended ideal: to find the ultimate formula or set of formulae (ultimate theory) which will express the physical law behind the origin, uniqueness and concreteness of the universe which we perceive through the symbolism of the night sky; in this sense cosmology is naturally prone to foundationalism, as a tendency to establish the ground-grounded relationship between the visible universe and some underlying reality. This desire reflects humanity's anxiety about the contingency of its own existence and desire to rely on some stability and assurance in the midst of the natural world. The anticipation of a certain stability of personal existence as following from the integrity of the world is always *present* in our epistemic horizon, but has a deficit of explication so that the ways of expressing this integrity in

scientific cosmology represent mere metaphors and symbols of the unknowable; the search for the sense of hypostatic existence is transferred to the universe as that other under the pressure of which (manifested in the instantaneous synthesis) the very incarnate ego is constituted.

The issue of identity of the universe may be approached from a different angle. The paradox of human embodied subjectivity represents a certain perception and expression of co-inherence, that is of mutual indwelling of human hypostatic beings and the universe, on the one hand, at the level of their consubstantiality (human beings are part of the physical cosmos, so that they are contained by the universe), and then at the level of "hypostatic inherence", as articulated givenness, in human subjectivity (the universe as manifestation, as an articulated image, is contained in human subjectivity); humanity is the voice (hypostasis) of the universe.[39] In this sense the universe turns out to be an indispensable part of the event of communion understood as totality of life.[40] Co-inherence denotes here such a mode of communion with the universe which makes any description of the universe in terms of its gradual stages of formation psychologically irrelevant: the sense of the entirety of the universe as co-present to a living human subject enters into an existential contradiction with an object-like vision of the universe's parts and phases of development. Co-inherence suspends the perception of the universe as being extended in space and time. This mode of communion can be paralleled with thinking of a person who is not empirically present: this is communion with a person who is present in absence in which any notion of space as separation is suspended.[41] The universe as a whole is present to the subject of intellection, but as "present in absence", for there *is no place or space* (*horos*) can be allocated to this presence. This presence is rather hypostatic as belonging to that who enhypostasises the universe as a whole and represents rather a standing in front of the universe, and communion as an unavoidable fact of embodied existence. Seen phenomenologically the act of thinking of the universe as a whole implies the reduction of its varied content to a single consciousness which suspends space and time.[42] However this intentionality with respect to the universe as a whole remains unfulfilled, for it differs fundamentally from any intentionality directed to any particular being whose factual "presence in absence" can actualise eventually in "presence in presence". The universe as a whole is unknowable not in the sense that it can not eventually become knowable, but in the sense that there is an inherent unknowability and ineffability of some aspects of the universe which follow from the human beings' finitude, and hence their non-attunement to it[43]. The universe is always given in excess. The contemporary explosion of cosmological theories and their precarious character demonstrate a simple truth that the more we know about particular facts of the universe the less we understand its sense and the ground of its facticity.[44] Cosmological theories and their perception by the public mind thus represent an endless hermeneutics, and endless "exegesis" of the available experimental and theoretical texts about the universe.[45]

The idea of the universe through communion allows us to conjecture that to grasp the sense of this communion and thus to initiate physical research one must be prepared for an *open* ended epistemological adjustment in the course of the unfolding dynamics of the reality of the universe, which as acting upon subjectivity creates a proper epistemology in order to grasp this reality. First of all, the openness of epistemology follows from a simple truth articulated above that "the universe as a whole" if it is considered as an a priori object of research does not exist. The term "the whole universe" does not constitute a name for some object which exists antecedently with

respect to the human enquiry which as such aims to constitute its sense. One cannot define this "object" discursively before the actual process of its study by embodied human beings begins and thus characterises and outlines "it". Since the definition of the universe as a single unique object would require an indeterminantly large number of sentences (Munitz, 1975, p. 337), not only related to distinct parts or structural units, but also related to the open-ended advance of knowledge in which description not only accumulates sentences but qualitatively changes in time due to the changing character of interaction between man and the universe. There is no preconceived and universal (in terms of historical time) methodology of cosmological research: this methodology as part of knowledge in general is open-ended. The methodology used in modern cosmology is historically contingent and, by definition cannot pretend to universal status. In this sense the definition of the universe implies not only statements about facts and physical realities, but theories and models of the universe as those tools which hover over the intelligible part of the universe being intrinsically its own part. In other words, the expression "the universe as a whole" implies the need to explain what language of saying and what sense of the term is used in this case, that is to indicate what theory or symbol of the universe is used. The historically contingent fullness of the notion of the universe is then achieved through the complex of theory and its constituted correlates. However, as long ago pointed out by Munitz, the "relativity" or fragmentary nature of such symbolic complexes does not remove the major unavoidable fact of the universe as communion, common to all theory makers (Munitz, 1957, pp. 69-70). In this sense the second important aspect of the apophatic approach in cosmology emerges: namely as a certain logically consistent or coherent freedom of expressing the experience of the universe through scientific discourse while ascertaining that there remains the basic rule of comprehension of the universe as containing embodied agents of subjectivity disclosing the sense of the universe. Let us employ an analogy: we mentioned above that discursive knowledge of what is meant by saying "person" is problematic and needs an apophatic approach; however, this same person as an experiential being is always in place as the dative of manifestation and nominative of disclosure. Similarly it is one thing to pronounce emphatically "the universe as a whole" and then expect the incessant difficulties in explicating the meaning of this proclamation of something which is present in absence, and it is completely different to affirm the universe as the silent medium of any hypostatic existence which is always present in spite of all differing ways of its description in scientific cosmology. The universe as a whole is that which can be discursively subjected either to propositional affirmation or negation thus forming a sort of "antithetic dialectics". [46] However, in all assertions, either positive or negative, the universe manifests itself as the constant and unavoidable factor of embodiment of humanity in this universe which exhibits the paradoxical standing of human beings in the universe in the conditions of physical and biological finitude and psychological non-attunement in space and time on the one hand, and in possession of a non-local and transcending insight of subjectivity on the other hand (regarding themselves as standing in a God-like epistemic relation of creative intellectual determination to the world), In view of this the constant balance between the fantasising tendencies of any theoretical cosmology and the inevitability of biological embodiment remains untouched and as such represents a stabilising factor of any cosmologising, making doubtful and unprobable all theories of the universe which diminish or disregard the presence of humanity which articulates the universe. [47]

Coming back to the issue of the identity of the universe, as a result of our discussion, one can conjecture that the sense of identity of the universe through communion can be defined as the enhypostasised mode of the universe's inward existence in human subjectivity which does not need a spatial and temporal representation (another way of expressing the instantaneous synthesis). It is then clear that such an identity is not an abstract philosophical notion, not an impersonal substance or the totality of all convergent sense-impressions (or convergent rules of correspondence) and their objective correlates, but a transferred feature of subjectivity, its response to the pressure of existence in the world, under which the identity of the "I" is being constituted. The contemplation of the identity of the universe is similar to the contemplation of the identity of one's "I" as the break through the anonymity of existence and its solitude (Levinas, 1987, p. 41)[48], its ecstatic rupture towards the unconcealment of being. This contemplation can be compared with experience of life as existence in solitude, that experience which does not dissolve in social tasks and objectives, but rather corresponds to a child's perception of being, given in its sheer facticity, as mystery with no beginning and no end. Life as communion creates the sense of its co-inherence with the universe (*coaevus universo*), its fundamental attachment to the universe when the universe exists only in so far as a hypostatic communicant exists. This pre-predicative mode of perception obviously does not enquire about the grounds of the universe's facticity, for if it were to do so, it would be tantamount to enquiring into the facticity of one's "I". As a consequence, in this attitude, the question about the origin of the universe in an objectivistic sense does not arise, because the universe is not an object, but communion.

Communion implies that the universe exists for me only through my body, so that my body turns out to be the centre of disclosure of the universe. But my conscious contemplation of my body is not a simple act of depositing and treating my body as *ad extra* to my subjectivity. My body and consciousness co-inhere, so that any separation of my body from me as identifiable self, in thought, has the sense of a crude abstraction with no existential meaning. The immediacy of this co-inherence, since it takes place only in so far as life continues, has no spatial and temporal dimension: I exist only as my body.[49] If, in thought, my body is abstracted as an external thing, as a physical object, in a similar way, the universe, as an overall context, including my body, is abstracted as a thing among other things and is treated as an object. This is what G. Marcel called the cutting of the umbilical cord: "the more I insist on the objectivity of things, cutting off the umbilical cord which links them with my existence, that one which I call my organo-physical presence in me, the more I affirm the independence of the world with respect to my I,… more the world thus proclaimed as the only real, would convert into an illusion, a documentary produced for my curiosity, but which in the long run self-annihilates by a simple fact that it ignores me."[50] The "cutting of the umbilical cord between human subjectivity and the universe", exercised mentally, when the primary "contemplation of the fullness of life and its co-eternity with all being" stops, leads one to enquire, along the lines of the natural attitude, into the origin of things: where they come from, are they finite and where they go as if this "where" would be an anterior or posterior something possessing the phenomenality of objects. Such a consciousness starts to enquire about the sense and origin of the object-universe, for to understand it as *an object* one should know its origin, where it comes from: what is that antecedent something which was the originary for the universe. In this sense the form of enquiry into the facticity of the universe which

presupposes the explication of its antecedents represents a general transcendental condition for studying the universe which follows immediately from the infinite tasks of humanity: in this sense the rubric of study of the genesis of the universe contains intrinsically a teleological motive, namely to conduct research in order to explicate the sense of human existence.

The just mentioned teleological condition entails the entry of temporality into the discourse: the universe as an object of research is possible only if it can be expounded in terms of its consecutive stages of appearance which in turn entail (as we know from cosmology) the presence of such a "moment" in its allegedly existing originary past where all, which is in the universe, had its ultimate origin. In different words, to know the universe as it is, is to know its history. This is a transcendental condition similar to that which is present in the field of the human sciences: namely, to know humanity, that is human beings, means to know its history, sociology, sociology of scientific enquiry etc. It is interesting to note, however, that the presence of the originally inherent "identity of the universe" as its unity (present in the instantaneous synthesis) in human subjectivity does not disappear when the non-egocentric intentionality of physical cosmology prevails and subject-object dichotomy becomes very acute. The integrity of the universe is seen not through the variety of different objects, whose mutual coherence is not available to the human grasp here and now, but enters human subjectivity under the disguise of the universe's antecedent unity, its origin. The idea of the origin of the universe becomes an inevitable result of the naturalising tendencies of consciousness to project the inherent instantaneous synthesis outwardly, making it explicable in non-hypostatic, impersonal form. The hidden nostalgia for the identity of the universe, inherent in the primary instantaneous synthesis, transcends the circle of its interiority and manifests itself in the search for the remote origin of "all in all"[51], in the Big Bang positioned in the past as the antecedent unity of the whole. However, the notion of the Big Bang in cosmology is ascribed the phenomenality of an object, being an exteriorised effect of the instantaneous synthesis. The very urge, pertaining to the use of non-egocentric intentionalities, in their attempts to express communion with the universe (and co-inherence with it) in an objectivistic language, leads a cosmologist to an idea of the ultimate origin of the universe, which connotes with the issue of the origin of cosmologists themselves. In a way, to enquire into the origin of the universe, is psychologically to mirror the problem of one's own origin, and to comprehend the very moment of inception of that incarnate hypostatic existence which experiences the ineffable link with the universe.[52] It is reminiscent of G. Marcel's assertion that the problem of the origin of the universe and that of one's "I" is one and the same fundamental metaphysical problem, the problem of facticity of being which represents a primary existential fact and whose mystery is insoluble (Marcel, 1965, p. 24). It is this mystery, that is the perception of personal identity as unique and monadic (Levinas' language) existence, as that centre of disclosure and manifestation from which all is unfolded in its articulated mode, in rubrics of which all types of thematisation of distinct objects in the universe take place. [53] The working of the initial instantaneous synthesis promotes itself through the fact that it remains an ultimate transcendental delimiter of the constitution of the universe in its outward, object-like phenomenality.

Constitution of the universe: a general analysis

In everyday life and in all aspects of scientific experience where classical physics is applicable, to deal with objects as they have been

"constituted" may sound a bit odd, for to deal with the constitution of objects is the prerogative of a philosophical consideration which is no way an objective of physical cosmology. Indeed, if such a constitution had taken place, it was in the ontogenic past of human beings (in every individual person this constitution is transferred through social practices as a matter of the fastest adaptation to the social and physical conditions of living). In this sense the basic conditions of the constitution of objects have been at human disposal since those original times and they need not be questioned. Consequently the classical sense of objectivity as referring to material objects out there is accepted as already given.

But in cosmology things are different. The basic condition of the constitutions of objects in macroscopic space-time are no longer available and hence we are forced to think about cosmology not in terms of objects, but the ways its subject matter, that is the universe as a whole. is constituted. If one refers back to classical physics one understands the conditions of constitution in space and time in terms of two major requirements: the continuity and reversibility of the temporal sequences of phenomena. If they are implemented in a particular situation they give ground to the idea that there is something permanent and substantial preserving its *identity* across space-time, something which is endowed with properties (attributes) and which can be involved in a physically causal manner into sequences of events. But none of these conditions can be enforced on the mega-scales, that is, on the scale of the universe as a whole.

Since by definition the universe encompasses all space and time, so that its "trajectory in space and time" cannot be constructed and the universe's identity cannot be tested "across space and time" (unless in a "superspace" of the Multiverse), the universe is not an already constituted object and its identity manifests in constantly renewing contingent events of knowing which include beliefs in continuity and stability of the universe as a whole within human historical temporality as well as beyond it, that is in the non-human. One can speak about the identity of the observable cosmos as enduring through the ages of civilisation, but this is not an identity of the object subjected to the repeated tests of classical physics. The universe is unique and cannot be rerun. This naturally entails that the criteria of reproducibility of phenomena across a large range of variations of perceptible and experimental histories does not stand in cosmology. One can admit that there are some given aspects of the visible universe which constitute a common already given background for all historically consecutive, although contingent, observations (some aspects of our galaxy, for example). The important thing is that the universe as a whole is subject to advancing redefinition of its constituents through changing the transcendental conditions of its observability (related to the advance of embodiment through technology) and demand for its mathematical expressibility. In this sense the universe's constitution is effectively an open-ended mode of being of the universe itself, or, as Heidegger would say, the constitution of the universe is bringing it forth into unconcealedness, into openness of disclosure.

The anomalies with the constitution of the universe (in contrast with ordinary objects) can be elucidated through the appeal to the Kantian distinction between the principle of mechanism and the maxim of teleology which can be applied in the study of nature. According to the mechanistic methodology the scheme of constitution based on ordinary causality requires free substitution of well-defined antecedent conditions in order to check that a certain effect is determined by a certain antecedent. In cosmology this definition of causality cannot be applied to the universe as a whole unless theoretically, that is on the level of

eidetic variation of that which is given. Indeed, in order to describe the given contingent state of affairs in the observable universe one can produce, depending on models, many versions of the initial conditions which are supposed to launch the evolution of the universe towards the present. The freedom of constructing these models in order to explain away the contingency of the present, points out, in fact, that the implied physical causality is a constructed causality, the causality of the reversed temporal order, where the antecedent conditions are in fact postcedent and it is the past of the universe which is reconstructed on the grounds of the present.[54] The efficacy of physical causality in the allegedly "from-past-to-present" temporal order is manifested in the movement of its reconstruction, the reconstruction which as such takes place in the opposite, that is, "from-present-to-future" order. In other words the constitution of the physical causality in the past takes place through a *teleological* move of thought as directed to the future, where the *telos*, the goal of cosmological explanation is exactly that sought physical causality of the past. Thus the very possibility of applying the principle of mechanism to study of the universe in its frozen past is ordained by a hidden teleological requirement for the explication (expressibility) of the universe.

The transcendental sense of what is meant by constitution arrives from a Kantian stance on it: a constituted object is neither isomorphic to a real object existing in itself, nor reducible to a figment of imagination. An object appears as an intentional correlate of subjectivity subject to two essential things: first, there must be a structural framework which makes intention semantically significant and communicable and second, the intentions must imply fulfilment, that is, they are not empty. Objects are by no means construed as part of external reality in the strongest sense (this would make the intentions unfulfillable, for the grasp of this reality through mathematical synthesis would be contradictory to the finitude of humanity related to embodiment (Moore, 1992)); yet objects are independent of particular subjects: they donate themselves to subjects in such a way that not everything in this donation is controlled by the subject and thus not everything is subject to mathematical synthesis (one speaks here, using again the Kantian terminology, of "particulars" which escape exhaustion through discursive definitions; elsewhere these particular were named "recalcitrant" (Butts, 1990, p. 2)).

The situation with the universe as an object of intention is aggravated by the fundamental inaccessibility of its alleged totality[55] which makes all intentions to be fundamentally unfulfillable (not only on the grounds of impossibility of a mathematical synthesis). In this sense the constitution of the universe as an "object" is never accomplished and thus is being taken as in an ongoing present continuous tense. In fact, one cannot talk about constitution as an ever accomplished act, but one can talk about constitution as never-ending fulfilment of the intention to have the sense of the universe. Correspondingly, the objectivity in cosmology no longer means a complete detachment of entities and properties of its constructs from the constructing cognitive faculties, but the coordination of phenomena associated with the visible universe (as well as theoretical models of universe as a whole) across a variety of instrumental and communal theoretical circumstances.[56] The invariants introduced through this coordination exceed the manifest modalities of contingent objects and their theories and refer to some basic structural properties which are present in all cosmological theories and representations and which form the conditions of knowability. For example, the basic geometrical structure of space time adopted in the standard cosmological model corresponds to the belief (called "cosmological principle") in

the spatial and substantial homogeneity of the universe. This belief comes forth as one of the signifiers of the universe's objectivity. For naïve physical realists or empiricists this claim for the objectivity of the universe through the geometrical structure would not be convincing since this allegedly existing structure cannot be verified because of a limited observational access to space of the universe along the past light cone. [57] They would demand an element of reality available to empirical verification. To avoid the naivety of any straightforward ontological commitment it is reasonable to treat the cosmological principle as a transcendental requirement for knowabilty and mathematical expressibility of the universe.

Thus transcendentalism naturally enters the discourse. First of all the stance of realists in their ambition to have reality available as "present in presence" is replaced by a neutralisation, namely, that any conceptual *structure* representing the universe is not obliged to represent the universe as it is really in itself. Realism in a transcendental sense claims only that the universe is being constituted through employment of these structures and thus its reality is the reality of this constitution. The major requirement here is that the structure must avoid paradoxes, so that its elements form a *coherent* set; this structure is generic as much as possible and then it is able to unify the largest volume of cosmological knowledge at a given historical segment. In cosmology, the invocation of such a structure implies an appeal to metaphysical propositions about the wholeness of the universe, which resemble beliefs. In this sense the coherence of the elements of a structure follows from the coherence of beliefs. The sense of reality is thus based not in a straightforward correspondence with that which is available to the senses (which is not possible anyway in the case of the universe as a whole), but on the relative stability and coherence of the adopted representation of the universe related to communal beliefs (that is to community of cosmologists). The sense of reality of the universe is related to the historicity of its constitution and to the community of those who claim its objectivity. The individual subjectivity is replaced by intersubjectivity in a transcendental sense, that is in the sense of general conditions of knowledge formulated on the level of the community of cosmologists.[58]

By invoking the idea of structures in cosmology one naturally implies the employment of mathematical physics, bearing in mind its historical advance in the last two centuries which extended the transcendental stance in physics beyond its initial Kantian scope. It is mathematical physics which implies the introduction of "mathematical constructs", that leads to the transcendental problematics[59], and is concerned first of all with the general-relativistic extension of classical mechanics by means of mathematical representations of space and, in particular, their *symmetries* which lead to conservation principles and corresponding observables. Through the idea of a global symmetry of space that transcendentalism enters into cosmology in an unexpected way, namely through postulating a principle of *non-observability* of absolute kinematical magnitudes related to the large-scale structure of the universe. These quantities can be used for the explication of the behaviour of the unverse but they cannot be observed and measured.

For example, by postulating the cosmological principle, that is the uniformity of space in the universe one reduces to non-sense and hence to non-observability any particular physical location. This non-observability reduces the description of the universe to a minimal number of parameters thus making possible its description in terms of variables related to the overall structure. The form-invariance of metric, as well as other cosmological quantities

demanded by the cosmological principle entails the possibility of introducing such global parameters as the expansion scale factor, energy density and pressure of the global cosmic "fluid" related to clusters of galaxies. These parameters are related to the totality of the universe in space and thus contain only dependence on cosmic time. We do not observe the structure of space: it is homogeneous (uniform) and hence effectively non-existent, that is the notion of "location in space" is deprived of any physical meaning [60] (loss of information). At the expense of this we describe cosmological evolution through functions which satisfy some equations but whose values can be established only at the point of our location; they are non-observable at the global scale, because of the constraints of physical causality.[61] In this sense the cosmological principle as a principle of non-observability of space acquires the status of a transcendental principle: the non-observability of absolute kinematical properties of objects in the universe entails their theoretical explicability. This explicability can easily be illustrated by reference to Noether's theorem which links space-time symmetries with conservation laws, that is with the integrals of motion and hence with observables, or, expressed differently, the observability of the conserved magnitudes at the expense of loosing information about their absolute location in space. According to the proponents of the so called formalized (scientific) epistemology Noether's theorem made evident that the loss of some information due to the symmetry properties "entails a gain of determination for the physical system itself by exhibiting the corresponding invariant quantities which contribute strongly to its identity" (Bailly, 2003, p. 378). While this is true for individual objects, in cosmology the space-symmetry implied by the cosmological principle, does provide us with the global parameters which describe the universe, that is constitute its identity, but these parameters are not conserved: they satisfy Einstein equations which describe them as functions of time. Still one can claim that the implementation of the cosmological principle assigns some identity to the universe through these functions.

Here transcendentalism exercises itself in a mode which, being intrinsically Kantian, ultimately leads to an effect which is inverse with respect to that of Kant: the cosmological principle starts by abstracting from the intuitive content of experience of the visible universe by subordinating it to the principle of unity expressed through the uniformity of the universe. However it is this invocation of the unity which ultimately leads the way to the introduction of the analytical properties of this unity (scale factor, for example) which are subject to mathematical synthesis which represents a movement from the initial conceptual unity of the universe to its referents which are subject to investigation in mathematical equations and calculations. One cannot say that this movement leads directly to the intuitable manifold since the cosmological functions, in spite of mathematics' manipulations with them are not observable and empirically sensible. Still these referents contribute through computational operations with them to the constitution of the universe beyond the purely metaphysical assertions of its unity. Thus we see that the transcendental stance in cosmology does not imply an appeal to some abstract compendium of the cognitive, intellectual faculties of cosmologists which predetermine in advance the scope of their observations and theories. The transcendental dimension of the cosmological enquiry enters as a component of the philosophy of constitution, that is as a natural mode of phenomenological appropriation of cosmology.

As we mentioned before, a theoretical explicability of a transcendental kind does not require that theoretical constructs correspond to empirical (sensible) reality. The constitution of

objectivity is achieved through the generic nature of these constructs and their mutual coherence, accompanied by some metaphysical requirements. The cosmological principle is an example of such a requirement. In this sense the constitution of reality is its theoretical explicability, but with no simplistic ontological commitment. The latter thought becomes even more clear if one realises that the demand for non-observeability represents a form of "applied apophaticism", that is a conviction that the signifiers of reality (that which is to be explicated) do not exhaust the reality of what is signified (explicated) simply because some (contingent, that is non-relative (and in this sense absolute)) aspects of this reality cannot be seen. In this sense the enterprise of constitution based in theoretical explicability and its coherence is intrinsically apophatic (incomplete, unaccomplished) because it is related to the historically contingent communal agreement on the coherence of explicability.

The fundamental question which one now faces is the status of mathematical constructs related to the theoretical explication and hence constitution of objectivity in cosmology. The pretence of some adherents of a radical mathematical realism that mathematical explication, thematisation and objectification lead to a realistic ontological commitment[62], runs against the transcendental stance on the neutrality of the constituted nature with respect to ontological commitments, as well as against the claims of the justification schemes based on coherence of explanation. Making the argument more precise, the question is: where, in what particular place does the persistent ideal identity of the invoked mathematical entities becomes insufficient in order to claim that a whole theoretical explication by means of these entities does not reach its ontological objective and remains ever incomplete. One can look for an answer by making a distinction between the operation of sheer abstraction from the manifold of intuition, which can be mathematical and whose ontological commitment remains uncertain, and a mathematical synthesis of that which is constituted through calculations and computations adjusted through the rules of correspondence with observations. This distinction suggests that physical objectivity cannot be tantamount to an ontology of some independent substantial reality simply because the computational synthesis is rather a prescription for how to understand the universe and correspondingly what can be known of it. Since mathematical physics is linked to the computational synthesis its very possibility is restricted by the conditions of experimental accessibility and by the intellectual criteria of coherence of constructs. These conditions of observability and selection of mathematical constructs on the grounds of communal metaphysical requirements are therefore constitutive of the very concept of a physical object. Then, the concept of the universe, that is of that which is donated empirically and in rubrics of non-contradicting thought, cannot imply the objectivity of an independent reality, that is an ontology; rather one speaks only about a "weak" objectivity.[63] Seen in this way, the mathematical synthesis is an open-ended enterprise, an asymptotic approximation of reality, in particular if it is related to the universe. The possibility of a mathematical reconstruction of such an ontological reality would ascribe the human mind excessive intellectual capacities which transcend its finitude related to the limits of embodiment.

However, in spite of the fact that physical objectivity established through mathematical physics is not ontological, it is not entirely subjective either; the latter follows from the fact that this objectivity is not descriptive, but prescriptive, because it uses the conditions of accessibility to the realities which are beyond sensible experience, as well as to certain metaphysical ideas and ways of their mathematical

expressibility. The way such a prescription is done encodes a paradox which is intrinsic to how the sense of physical reality is constituted. Indeed, by taking into account the conditions of empirical accessibility and mathematical expressibility of universal metaphysical ideas, this prescriptive procedure does not include the "theory" of structures of subjectivity (which makes possible both reference to empirical and intelligible reality, as well as to metaphysical ideas) into the theory of the physical universe. In other words, a predication of the universe does not reflect explicitly the underlying conditions of this predication (not only physical, but mental). One can suggest that this paradox in a way explicates an essential feature in the constitution of human subjectivity, namely that this subjectivity is *meaningfully defined* (apophatically) through the extent that it cannot be included into its own product, namely cosmological theory.[64] The working of subjectivity in this ambivalent way, when its contents as manifestations of its working do not contain explanations of the very possibility of this working, represents a fundamental movement of disclosure, which is nothing other than the pure emergence of the meaning of this very subjectivity, that is its constitution.

Then, when we come to categories and principles of physical objectivity in cosmology interpreted mathematically, the conditions of accessibility to metaphysical ideas and corresponding references to empirical reality are incorporated in them. For example, when cosmology invokes the notion of the universe in terms of "totality", "unity" and "wholeness", notions which are metaphysical rather than physical, this invocation includes the conditions of its semantic explicability and mathematical expressibility of what is predicated. The cosmological principle as a product of a reasoned metaphysical and coherent convention among the community of cosmologists generates the sense of a weak objectivity of what it attempts to describe, that is the universe as a whole. Combined with a theoretical model of the universe's expansion the cosmological principle makes possible a pictorial representation of the universe as a whole in spite of an a-priori philosophical conviction that any such representation is precarious and in the best case iconic.[65] This confirms further the transcendental nature of this principle: it makes possible the graphical symbolism of the universe as means of its manifestation. Certainly this symbolism, being only a form of signification, does not exhaust the sense of that which is signified. Nevertheless it generates the sense of identity of the universe in spite of the fact that the sense of this identity is only the enhypostasised form of identity in itself.

The transcendental move towards explication of the universe in the context of the cosmological principle gives an example of how reason proceeds from complexity (and contingency) of the given (empirical particulars) to the simplicity (and necessity) of representation of groups of objects subjected to high symmetries. To explain something means to overcome the facticity of the contingently given by reducing its phenomenality (or appearing) to a minimum and by replacing it by an intellectual intuition of that which is allegedly necessary. The structure of the global space in cosmology cannot appear, so that its phenomenality is impossible. What appears is predetermined by physical causality which, by means of the past light cone corresponding to the home place, selects a particular fragment of the universe (its particular phenomenality) which is seen as cosmic display. The transcendental nature of the cosmological principle is strengthened by the fact that the homogeneity of the universe in space cannot be extrapolated from observations. What one sees in the universe as uniform (or, more precisely, isotropic), *de facto*, belongs to different temporal eras because of the causality based in

the finitude of the speed of light (light cone). That piece of the universe which we see from our home place contains objects belonging not only to different locations with respect to us but also to different times. However, physical cosmology teaches us that the universe is not homogeneous in time: it evolves and observations point towards this. In this sense the universe manifests contingency not only in terms of space (our space as related to home place) but also in terms of time (the era when human beings exist).[66] And if the spatial contingency is removed through an appeal to the cosmological principle (and as we have said this principle guarantees the explicability of the universe), the contingencies related to time are tackled differently by constructing the dynamics of properties related to the subspaces of space-time corresponding to fixed moments of time. In other words, unlike the cosmological principle which acts as a metaphysical postulate (having in itself some teleological connotations related to expressibility and hence to the purposiveness of research), the requirement for the existence of a universal temporal dynamics of global cosmological parameters represents another type of transcendental requirement for the knowability of the universe as a whole which contributes to the universe's constitution and its "weak" objectivity.[67] If such a dynamics exists, then the cosmological principle is implanted in it, first of all as the very possibility of mathematical expressibility of this dynamics (equations for the scale factor $a(t)$ and energy density $\rho(t)$), and secondly in the initial conditions of those dynamical principles which drive the universe. The dynamical inhomogeneity in time through the laws of evolution of the main cosmological parameters does not remove the problem of contingent facticity of the observable universe: it just transfers this problem to the allegedly existent remote past, that is to the contingent initial conditions.[68] This move reveals itself as another transcendental constraint on expressibility of the universe as a whole in terms of the mathematical (related to the initial conditions) and thus as a condition of its constitution. This transcendental constraint pertains to all cosmic mythologies which retrace the generative steps that have led from the primordial past to the present. The schema of representation is the movement from the undifferentiated unity (the initial condition, the Big Bang) to a qualitatively differentiated multiplicity in a way such that initial origin is saturated in that it precontains the entire process of formation of the diverse structure of the cosmos. Thus all particular cosmologies which follow these steps represent theories of constitution of the universe. Constitutive thought re-enacts the production of the visible things, their manifest being, from the origin. The intelligibility achieved in constitutive thought of the universe reproduces in its own development the original unfolding which posits the universe as the universe and in which (that is in unfolding) the universe itself consists. In other words, when in thought one enquires into the beginning of the universe as its origin, this thought ultimately enquires into its own beginning. Understood in this key, the conditions of accessibility to and explicability of the universe are ultimately implanted in the embodied subjectivity; in other words the universe, by allowing human beings to come into existence, predetermines the possibility of its own explicability and constitution. This last point brings us to assert with a new force that cosmological discourse as constitution and explication of the universe is inseparable from the problem of explication of human subjectivity.

Transcendental delimiters and human subject

There is a fundamental philosophical presupposition which lies in the foundation of all speculations about the universe, namely that

the cosmos is observed, articulated, described, and glorified by human beings who have the cognitive faculties and abilities of doing so. In particular, the description of the cosmos is linked to the human capacity of transcending the realm of the immediately given and through intuition and imagination to wander across the whole universe. The position of humanity in the universe is fundamentally ambivalent: while being a miniscule part of the cosmos, the universe as a whole is articulated by this part.[69] One can then assert that the image of the universe (empirical and intelligible) is the anthropic image, so that it is natural that the universe conforms to the fact that there exists humanity, and the picture of the universe includes humanity as its author. Humanity intrinsically enters all cosmological propositions because the universe, being a subject matter of cosmology, implies the presence of humanity as cognising subject. The universe cannot be considered as an object in the sense of classical physics, that is a corporeal entity invariant with respect to space and time. In this sense the famous Copernican "turn" in description of the astronomical universe (through denying the selectiveness in a particular view of the universe) represents a certain attempt to ascribe bodily character to the universe by transferring this quality from the immediately accessible Earth to the remote cosmos. Humanity is earth-centred, so that the universe is weighed not only against humanity as such, but as corporeal and earthly existence. In the words of E. Husserl the transcendental argument in constituting the universe is: "if the earth is constituted with animate organisms and corporeality, then the 'sky' is also necessarily constituted as the field of what at the extreme can be spatially experienced for me and all of us – and that happens on the basis of the earth-ground" (Husserl, 1981, p. 227). It is this type of transcendental reasoning in anticipation of the universe as a whole which gives rise to a kind of "identity" although of a non-classical type of "object" whose spatio-temporal objectivity is replaced by the weak objectivity of a transcendental type, which does not imply detachment of entities and properties from the forms of subjectivity, but instead implies the coordination of new phenomena and theoretical essences into the patterns of epistemological invariants which hold across historical and instrumental circumstances. These circumstances are linked to the conditions of embodiment: human beings are consubstantial to the visible part of the universe and it is because of this consubstantiality that the universe allows the generation of the set of historical and instrumental contexts of that to which humanity is consubstantial. Embodiment through consubstantiality forms the nature of humanity with respect to the universe. Human beings carry with themselves all those properties of the universe that allow life to emerge and exist. The actual knowledge of the universe is then seen as an ongoing embodiment of humanity in the universe. Correspondingly, the sense of the wording "the universe as a whole" cannot be abstracted from the delimiters of the historically advancing transcendental subject. The very word "universe" is of human origin[70], so that cosmology even if it pretends to describe the universe as some "physical out there" devoid of humanity, is still imbued with the human presence, although implicitly and in an inarticulate form.

The ongoing embodiment of humanity in the universe through which cosmology unfolds and thus the universe enters the definition of human nature manifests itself as sheer contingency. In this sense the universe as a phenomenon of consciousness appears of itself: the gaze at the night sky delivers to a human being the sense of a picturesque display of varieties of patterns and shapes that bedazzle observers in the inexpressible mystery of their givenness. As a pre-predicative phenomenon, the universe

is here and now, so that its totality is connected with the totality of the perceptive and intellectual experience, rather than with the totality, as a result of mental accomplishment invoking the sense of extension in time and space. This attitude to the universe corresponds to the ancient appreciation of it as "cosmos" (order) in terms of beauty, personal relationship and communion. In this sense the universe was always and will be an existential horizon of humanity itself. To this so called *a-cosmic* vision of the universe one can contrapose the alienating *diastasis* (extension, separation), which is typical for a *cosmic* representation of the universe as shifted home-places: here the objects in the universe are not considered anymore as phenomena, or perceptible data, but rather as possible places for the habitation of potential observers. In other words the interpretation of different stars and galaxies as distant objects and bodies is based on the *hypothesis* of a formal interchange of home-places having a counterpart in a physical reality (c.f. Kerszberg, 1987, p. 206). In this sense the cosmic representation which entails a spatial extension (in spite of an obvious natural attitude) remains hypothetical. In this representation the universe acquires the property of being the place of things extended in space and is seen as global space and time with some corporeal connotations reminiscent of the ancient receptacle idea.[71] As a result a body-like image of the universe, as a certain substance contained by this receptacle, emerges.

It is only in the *diastatic* vision of the universe that it comes to mind that humanity occupies one particular place in it and that the meaning of this place was articulated differently during the history of astronomy and cosmology. However the awareness of our position in the universe forms a transcendental condition of knowing the universe in principle: the universe must be extended in space and time in order to be cognisable. In this sense the very notion of consubstantiality to the universe through embodiment is a transcendental notion which implies a subjectivity that transcends the pre-predicative consubstantiality towards its articulation as extension in space and time, where consubstantiality becomes the spatial (or temporal) uniformity.

Historicity of cosmological research and human consciousness

The reification of a transcendental stance on cosmology comes through a strong affirmation that physical objectivity generally originates in contexts of historicity and instrumental situations. The ability to see what we see in the universe is selected not only by our particular location in space, but also by some general epistemological delimiters, such as our primary cognitive faculties and capacities of intellectual synthesis.[72] Something similar is asserted in the so called Weak Anthropic Principle (inference), namely the one we observe in the universe is related to the conditions of observability linked to embodiment[73]. It is important to understand, however, that these conditions of observability, as general epistemological delimiters, do not restrict the methodology of research, so that the limitations of research are rather related to the overall path of knowledge, rather than to a particular state of affairs with the fragment of this knowledge here and now (Roush, 2003, p. 33-35). Humanity in its advance of theoretical science and technology extends its ability to penetrate into nebular phenomena through special equipment and devices. The overall view of the visible universe is limited by our capabilities to receive signals from the cosmos via particular physical equipment that, as we can observe, is linked to the particular historical conditions of the civilisation and its advance of technology. This means that when books on astronomy or cosmology present colourful

pictures of stars, galaxies and other objects in the sky, as well as producing generalisations towards the invisible universe, they deliver to the reader the cumulative result in a vision of the universe as related to a particular historical dimension of the constitution of the universe up to the present moment. Indeed, the history of cosmology is not very long: on the scale of forty-fifty thousand years of the existence of self-conscious humanity on the planet Earth, humanity, for the first time in history, within a very short period of, let us say, a hundred years, is capable of making complex cosmological observations relying on the various advances of technology. Here we have an interesting "methodological" situation: a science which effectively developed within last hundred years attempts to predicate the universe in the wholeness of its temporal span.[74] If in the background of a sheer human history our present observation of the universe is *historically* contingent (as related to the advance of science as a historical process) this implies the *historical* contingency of what is seen in the sky and what is thought of the universe.[75] The view of the universe as being an objective invariant with respect to the observational methods, and the affirmation of its intended identity being established by these methods, is nevertheless fundamentally historical, depending on the whole path of the history of science. Thus the alleged objectivity and neutrality of physical cosmology with respect to epistemic claims is of a conditional kind: cosmology fulfils itself only in the framework of one particular "trajectory" of humanity's history which is linked to a technological advance. Cosmology is based on *observations* (and not *controlled experiments*, as in nuclear physics, for example) that imply the extension of humanity's means of perception through technology and thus humanity's further embodiment in the universe; whereas the universe, in spite of its intrinsic resistance to disclosure, defines and constitutes the form of this embodiment. Thus cosmology, as a human scientific enterprise, represents a mode of the mutual interpenetration of the senses of humanity and the universe. Being intrinsically transcendental, cosmology represents an endless hermeneutics of humanity's interaction with the universe thus manifesting cosmology's intrinsic connection with anthropology, not only in trivial anthropic inferences based in consubstantiality, but in a more profound philosophical sense, namely that it is through cosmology that humanity comes forth as a measure of unconcealment, that is truth of being.[76]

Cosmology, being historically contingent but, at the same time, dealing with the architectonics of the universe as originating from the past, exhibits a similarity with historical research proper (as related to human history) that deals with artefacts and testimonies but not with repeated experiments. In cosmology all artefacts are *images* (in a widely understood sense, being an optical, radio or other type of material carriers of signatures of the cosmos) that are collected, classified and interpreted. The collection, classification and interpretation are humanly made from a vantage point of here and now, according to principles of a reason that pertain to humanity. It is because of this that reason discloses the physical laws in the earthly environment and imposes these laws (by the way of transcendental argument) on the whole universe thus transferring to it some properties of the embodied subjectivity (here the *hypothesis* of a formal interchange of home-places having a counterpart in physical reality is implemented once again) and thus making the universe realistic, not in a naïve sense of a thing-like objectivity, but as an invariant of unfolding quests and contexts appearing through the ongoing embodiment of humanity in the universe.

If one makes a cosmic assumption about the universe as representing, through its celestial image, a spatial extension of entities standing

behind their images in the overall space, and extrapolating the principle of finitude of the speed of light (as an experimental fact of the earthly physics) across the whole spatial continuum of the universe, one effectively introduces the idea of a temporal order in the universe: different objects projected on the same celestial sphere are not equidistant because it takes different time for the light emitted from them to reach us; through the latter the most obvious and basic construct of space-time continuum is introduced: whatever we observe in the sky in this cosmic attitude represents a frozen image of the *diastatic* totality not only of space, but of time![77] Thus one asserts that the picture of the visible universe, as projected in the celestial sphere, is not local in time but constitutes the accumulation of data coming from objects belonging to distantly separated pasts. In geometrical terms (of special and general relativity) this corresponds to the statement that human observers receive electromagnetic signals from those parts of the universe which are intersected by the past light cone associated with our present position in the universe. This means that in spite of the theoretical assumption of the global space-time structure of the universe, what is observed by us is *selected* by the position of humanity in the universe (which is contingent but subject to some cosmological restrictions), that is, what we observe is not the whole of the universe, but a very particular "slice of spatio-temporal reality" whose quantitative measure is infinitely small in proportion to the potentially infinite volume of space which is envisaged by the modern cosmological theory. In general, cosmological observations are subject to selection and represent a certain fraction not only of the universe as a whole (including its remote past), but also of the universe principally available to observation in that realm of the unconcealed which is measured by 4% of the invisible and visible atoms. The cosmological principle makes an effort to correct this pessimistic conclusion only with respect to the geometrical aspects of the universe by advocating that our fraction of geometrical visibility is, in fact, typical of the whole universe, so that its unobservabillity beyond the past light cone is not an obstacle to making inferences about the universe as a whole. However, at least at a modern stage of cosmological theory, one cannot avoid the fraction-like accessibility to a view of the universe related to consubstantiality with the stardust. The remaining 96% of the matter in the universe, which is not visible and constituted theoretically, remains fundamentally non-observable and thus effectively constitutes the conditions of the contingency pertaining to our view of the universe.

Assuming (in the natural attitude) that the universe has its own history which is extended backward and forward beyond that of humanity, one must admit that cosmologists (not simply astronomers) possess only that information about the distant universe which is gathered in the last one hundred years (this corresponds to the recent technological advance). In spite of the fact that to a great extent cosmologists see the frozen image of the universe's past, this image is still contingent upon the conditions of its observation at present. In other words, cosmology deals with that past which can be qualified as *the past of the present*. Correspondingly, cosmology models the universe as a whole (that is as a global extended space and time) by using observations and physical theories developed in its infinitesimal part, that is on the planet Earth, and within a tiny period of time with respect not only to the age of the universe, but to the history of humanity as well. Correspondingly, it is interesting to raise a question as to what philosophical convictions could justify such a "scientific" methodology which attempts making claims about the totality of all from within an infinitesimal part of it?[78] This question has two dimensions: the first one

can be called historical, that is, whether it is really possible to reconstruct the historical past from within the present and what will be the status of this past: will this be *past of the past*, or rather it will *past of the present*? The second dimension raises a most general epistemological problem: how and why the physically and biologically local position of humanity in the universe makes it at the same time fundamentally non-local in its all-encompassing grasp of the universe? The first dimension would require from us an attempt based in an analogy between cosmology and all other historically based natural sciences such as geology, paleontology or biology (the issue of history as a human science represents a slightly different matter, because of the nature of disclosed facts). Whereas addressing the second dimension leads us back to the general philosophical problem of the ambivalence of the human position in the universe which is encoded in the paradox of human subjectivity. To address this last dimension is to attempt to shed light on the nature of the paradox of subjectivity. This in turn brings us to the perennial question of human consciousness and possibility of knowing the universe in general. In naturalistic terms human consciousness transcends the realm of its embodiment becoming non-local in space and time. Cosmology has to rely on this property of consciousness and it represents the universe through mental images and constructs by this consciousness. The ability to create constructs and to associate them with a physical reality is deeply based in the same *hypothesis* of a formal interchange of home-places which we have mentioned before, but now having a counterpart not in physical reality but in the intelligible (*cosmos noetikos*). Thus the transcendental constitution of the universe naturally requires the extension of the cosmological quest to the intelligible realm thus extending the very body of the physical cosmology beyond the physical as such. The physical itself becomes a matter of constitution appealing to some general rules of the understanding and reason that is to the principle of human rationality.

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[1] Cf. (Munitz, 1975, pp. 337-8). The list of definitions which attempt to circumscribe the notion of the universe can be continued indefinitely so that it will never exhaust the content of what our intuition calls the universe or sum-total of physical things. The advance of knowledge about the universe can be described by the series of accumulated facts and theories which must be treated as intellection which inheres as a quality in apprehending beings, i.e. in hypostatic human beings who call the series into being. Assigning to these "facts" symbols A, B, C, D etc. one can represent the advance of knowledge by a sequence ABCD .... X, where X stands for the infinite unknowable remainder pertaining to any particular stage of cosmological knowledge and reflects the presence of the in principle inconceivable element in our knowledge of the universe.

[2] The notion of the universe as a whole implies some particular features of what is predicated which immediately put this notion in a sort of difficulty. First of all the universe as a whole, by definition, constitutes a principle of existence (and in this sense as foundation) which does not allow one to use any definitions based on the ontology of distinct physical events, i.e. as taken as parts and pieces of the universe as a whole. Secondly, it is impossible to talk about the universe as a whole in terms of its origin (One means here not temporal origin (as it is in physical cosmology) but an absolute ontological origin as facticity of being), because there is nothing beyond the universe (in terms of space and time) which could determine its origination (one can speak of the non-originary "origin" of the universe). (By historical analogy one can appeal to the witness of Descartes who, while making a careful distinction in application of the terms of "infinity" and "limitlessness" to the universe, notices that "we must not be so presumptuous as it seems we whould be if we supposed that the universe has any limits without being assured of it by divine revelation or, at least by very evident natural reasons; because it would [mean] that we want our thoughts to be able to imagine something beyond that to which God's power has extended itself in creating the world.." (Descartes, Principia Philosophiae, part 3, $ 2 quoted in (Koyre, 1957, p. 109)). Following Descartes'

thought one could add that in speculating about the origin of the universe's facticity human beings transcend their embodied consciousness, and enquire into the ultimate sense of things, as if they could possess the "mind" (or logos) of that agency which brought the universe (with its physical laws) into being. That is why the universe as a whole (intellected not through its manifestations in pieces and moments) is non-spatial, a-temporal, beyond space and time. Thirdly, the universe as a whole is not accessible to our grasp as part of a causation from one "thing" to another in time because even the visible universe represents a frozen compendium of temporal eras which are linked to each other but which cannot be related to anything beyond them. In other words, relational logic cannot be applied in order to affirm anything about the universe as a whole if one attempts to do so through a series of causations starting in the astronomical cosmos. Ages, times and places belong to the category of relationship, and consequently no object necessarily associated with these things can be other than relative. The universe as a whole transcends the category of relationship; for nothing else whatsoever is necessarily associated with it. Relational logic can be applied to all things which are in space and time, it can also be applied to our, human, relationship with the universe. But since the universe is beyond any relationship, our participation in it does not affect its being, in other words our intellection about the universe as a whole does not provide us with any knowledge of the universe as it is in itself. We are in relationship with the universe, but this relationship does not allow us to penetrate its mystery independently of our participation in it.

[3] (Kant, 1933, A332/B388, A409/B436, A497/B525). Kant's criticism of this view can be found in A498/B527.

[4] Indeed, in this the notion of the universe as a whole would have a crypto-theological meaning implying a corresponding language which does not have references in the mundane world. In this case the universe would be defined in an abstract way something like this: the universe as totality is one, incomprehensible, possessing completely the total potentiality of being, excluding notions of when and how related to its wholeness, and not to be known through natural image.

[5] Cf. (Kant, 1933, A223/B380, A670-2/B698-700, A685/B713).

[6] In this case, together with M. Munitz, one can formulate a thesis that the universe appears as a constructive achievement, rather than discovery (See, e.g. (Munitz, 1990, p. 141)). This thesis confirms a general conviction formulated in the phenomenological stance on science, namely that there must be made a distinction between nature as it appears in primary perceptual experience and nature-for-physicists (that is "nature"), which is a *mental accomplishment* ("hypostasis of mental creations") as an ideal limit of convergent sequences of "images of nature" which are constructed by physicists in the course of history (see more in (Gurwitsch 1974, pp. 41-6). One must also mention a physicalistic attempt of J. A. Wheeler to promote a similar view that the universe is not a pregiven clock-wise mechanism, but the world of existences which is constituted by human observers-participants. See e.g. (Wheeler, 1994, pp. 112-131, 295-311), and numerous papers cited therein.

[7] By constructs, we understand, in analogy with (Margenau, 1977, pp. 69-72) the entities through which the empirical perceptions and presentations receive their theoretical explication. Constructs, sharing in their function something from concepts and something from ideas, submit themselves to logical procedures to a much fuller extent than to the immediate astronomical data.

[8] We refer here to a fact of common-knowledge that modern cosmology predicts that 96% of its material content is formed by the so called dark matter and dark energy, whose physical nature is not known yet: theoretical prediction experiences resistance from nature to be disclosed in terms of experimentally observed and identified fields and particles.

[9] The answer to this question will be given later, when we connect the mathematisation with an idea of the computational synthesis. Here mention that this question connotes with a general issue of mathematisation of nature and whether it exhausts the sense of reality. In a historico-philosophical perspective one must refer to E. Husserl who critically assessed it in his *Crisis of the European Sciences* (Husserl, 1974). There are some secondary sources related to phenomenology which deal with a similar problem see, for example, (Kockelmans, 1970), (Gurwitsch, 1967, pp. 395-401), (Cassirer, 1967), (Kvasz, 2002a,b). In a different direction a discussion of the mathematisation of nature can be linked to the question of mathematical realism as it is understood in modern philosophy of mathematics. The literature on this topic is vast and reflects different positions with respect to the relation between mathematical entities and physical world. As a matter of example one can point towards a phenomenological position with respect to mathematical objects which is similar to the idea of "weak objectivity" supported in this paper (Tiesen, 2005)), and to another trend called structural realism advocated in (Resnik, 2005). This latter structuralist trend asserts that the physical domain of cosmological theory represents an instant of a mathematical structure; see in this respect a paper (McCabe, 2004-5) in which the whole edifice of modern cosmology is interpreted through such a structuralist vision. In a way the structuralist view positions itself as a radical form of mathematical realism which asserts that everything is mathematics; see e.g. (Tegmark, 2008).

[10] Paraphrasing P. Brockelman, the universe is not this chain of mountains or that galaxy or solar system, but the continuous eruption of myriad forms, the active *that-ing* or *is-ing* of everything which emerges into experience of life (Brockelman, 1999, p. 79).

[11] The *kosmos* of the Greeks, unlike that which is understood by the "cosmos" in cosmology denoted the way by which the natural reality is being in being. It denoted not that which was related to the question "What?" of created nature but rather to the question "How?". *Kosmos* thus is the "ordered" revelation of the existent, that is the notion related to beauty. But beauty is the matter of personal judgement and observing distinctions which can be justified only within relationship, that is communion. It is because of this that Plato summarised all presocratic views in his teaching of *kosmos* as living unity, "animate and intelligent being" (Plato, *Timaeus*, 30 b6-8.), living totality of animate creatures and inanimate things, gods and people. "Wise men say…that the heavens and the earth, gods and men, are bound together by fellowship and friendship, and order and temperance and justice, and for this reason they call the sum of things the 'ordered' universe (*kosmos*), …, not the world of disorder or riot." The overcoming of disorder and riot as such reveals itself as life so that *kosmos* unfolds as a living whole, the "visible living being". (Plato, Timaeus, 92c 5-9.) Since life implies soul, the "body" of the *kosmos* is harmonised in the "spirit of friendship" of that who brought it into existence. But then the beauty of the

world, that is the world as *kosmos* reveals itself as a mode of the living, animated organism whose soul is also intelligent: the order of the world, its measure and commensurability which reveal the beauty of the world also manifest the intellect. (Plato, Timaeus, 30b 1-6.). Correspondingly the beauty of the universe reveal itself not only though the world being animated, but also through its intellect. One can say that beauty of the universe is not that which is manifested, but the universe as manifestation. It is the "how" of the universe but not its "what".

[12] See, for example, a typical diagram called "The Cosmic Spheres of Time-Our Visible Universe" in the book (Primack, Abrams, 2006, p. 135).

[13] See on a general phenomenological analysis of identity in absence (Sokolowski, 1974, pp. 8-56). (See also a simplified version of the same exposition in (Sokolowski, 2000, pp. 17-21).

[14] According to a famous passage from Sartre's *Being and Nothing* the immediacy of the personal relationship and identity of someone originates in the acute experience of this one's absence or non-existence. (Sartre, 1943, pp. 43-5). G. Marcel wrote that there is an active denial of space as separation at that very moment when one remembers another. In this sense denying space is a radical denying of death. By remembering someone and overcoming a spatial, or any other, separation one naturally affirms himself *in* oneself, thus contributing to its own self-identity through the actual non-existence of the other. See (Marcel, 1965, p. 37-8).

[15] Here an analogy can be drawn with the theology of the living God which claims, that the elimination of God in consciousness leads to cessation of this consciousness. To understand the problem one refers to the famous $ 58 of Husserl's *Ideas I* (Husserl, 1998, pp. 133-4) where Husserl argued that the notion of the transcendent God who allegedly transcends both the world and the field of "absolute" consciousness and thus is posed in the natural attitude as existing objectively out there, that notion must be subjected to the transcendental *epoché* (phenomenological reduction) so that the question about its reality is suspended and thus the very theology of a transcendent God is brought to a methodological halt. It is important to realise here that "transcendency pertaining to God" (p. 134) takes place not through an ascending series of the world phenomena but through observing "marvellous *teleologies*" (p. 134) in Nature which characterise the activity of consciousness. Then arises the question about the ground of facticity of this same constitutive consciousness as the source of "endlessly increasing value-possibilities and value-actualities", the ground "which naturally does not have the sense of a physical-causal reason" (p. 134). Husserl intentionally avoids any attempt to approach this issue from the side of an a-priori religious consciousness, that is to affirm divine being which is transcendent to the world as well as to that consciousness which seeks for its own foundation. The important thing is that, according to Husserl, this "divine" would be "therefore an 'absolute' in a sense totally different from that in which consciousness is an absolute, just as it would be something transcendent in a sense totally different from that in which the world is something transcendent." Unfortunately Husserl does not explain precisely the meaning he ascribes to this difference between absoluteness of the divine and absoluteness of consciousness. In spite of this, by proclaiming the transcendence of God to consciousness his next step is to *reduce* thus affirmed God and to remove the whole subject of the Divine from the phenomenological project. The major problem in this procedure is exactly theological: it does not discern between God as a mental construction which is subject to any possible operation of consciousness, such as reduction, for example, and the living God of faith whose presence in consciousness is exactly that ontological link which makes this consciousness possible at all and which can be cut off only in abstraction. It is clear that the "absolute" consciousness of Husserl, which through the very mode of its being expresses our existential participation or communion with God cannot bracket or reduce the living God because by so doing this consciousness attempts the impossible: to deprive itself of its own foundation and hence, *de facto*, to destroy itself as consciousness in God. Here, by using a religious language, consciousness degenerates and falls into an illusion of its might. Jean-Luc Marion writes in this respect: "Husserl submits what he names 'God' to the reduction only in so far as he defines it by transcendence (and insofar as he compares this particular transcendence with that, in fact quite different, of the object in the natural attitude); and yet in Revelation *theo*-logy, God is likewise, indeed especially, characterised by *radical immanence to consciousness, and in this sense would be confirmed by a reduction*." (Marion, 2002 p. 242-43; See also n. 4 at p. 343). This is the main point of analogy: human beings are immanent to the universe through consubstantiality so that the hypothetical removal of the universe must inevitably lead to the cessation of the conditions of conscious embodiment. One must point out, however, that in a different treatise, his "First Philosophy" (Husserl, 1959, p. 73) Husserl himself was preoccupied with a problem of nullification of the world, namely whether the pure ego, the subject disappears if the world as such is reduced to nothing through a so-to-speak epistemological nullification. His answer was that "not", that is, what is subject to nullification is the empirical ego which is indebted to the world. However if one supposes the existence of a non-physical centre of human existence, the pure "I" of experience, which is beyond the worldly delimiters, then this "I" does not disappear and, in fact, it is the reduction of the world which allows to proceed from here to the discourse of the "I" (See more discussion in (Faber, 1963)). This last note points to another possible meaning of the apophaticism of cosmology: indeed to understand human beings in the universe, the discourse must be cleared of all properly cosmological (naturalistic) insights and thus to be open to the enquiry into the depths of subjectivity. Thus, cosmology and "anthropology" are inseparable in a very delicate phenomenological sense.

[16] By using the term "incarnation" G. Marcel calls conscious existence in the conditions of consubstantiality the central datum of metaphysical reflection (Marcel, 1965, pp. 14-16, 24); (Marcel, 2002, pp. 11-37).

[17] The paradox of human subjectivity was discussed at length in (Nesteruk, 2008, pp. 175-8). For general reference see the book (Carr, 1999).

[18] This intellectual might implies that we have a rational concept of ourselves as existing in the universe which is the unconditioned (self-sufficient) united totality in a metaphysical sense, so that all conditioned aspects of our embodiment are considered, so to speak, as parasitic features on the unconditioned whole. Cf. (Kant, 1933, A322/B379, Bxx).

[19] This point explicates further the paradox of human subjectivity in the universe as "presence in absence". What subjectivity describes in the universe with a great efficiency is those realms which can be subjected to "mechanistic" description, that

is reduced to a limited phenomenality. If the universe would be a living organism in Plato's sense, its description would be fundamentally problematic at the same level as the description of personhood in anthropology.

[20] See on the principle of apophaticism in modern metaphysical extension of science in (Yannaras, 2004, p. 84). The general definition of this principle which historically originates in theology can be found in another book of (Yannaras, 2005, pp. 59-60); according to Yannaras apophaticism can be defined "as the abandonment of all claims to an 'objective' assessment of truth, or the denial that we can exhaust the truth in its formulation. Abandonment or denial does not mean here a rejection or overlooking of the possibilities for knowledge represented by a rational formulation of knowledge. Apophaticism is not to be identified with irrationalism, or indifference to the rules of logic in the formulation of knowledge – for these rules represent the possibility of communicating and sharing in knowledge. Nor may apophaticism be confused with self-centred mysticism, the flight to private emotional certainties. The apophatic way or position presupposes the prior acceptance of the methods of philosophical epistemology – the acceptance, for instance, of both the way of affirmations and the way of denials – as potentialities for attaining knowledge. It is precisely the emphasis on the *possibility* of knowledge that sets apophaticism apart from any *positivism* about knowledge, that is to say, from any form of absolutizing of the rules or presuppositions needed for ascertaining the validity of any formulation of knowledge."

[21] The teleological commitment which is implanted in the belief that the whole of the universe can be grasped is manifested in particular through diagrams pretending to symbolize the universe as a whole. What is characteristic for all these diagrams is that they depict the universe as if this universe is somewhere outside of the reflecting consciousness, as if this universe were a geometrical object which could be analysed outwardly. Certainly, since Kant, knowledge of the universe (judgment of it) is only possible if, the presupposition that universe's empirical laws are related in the form of a deductive system is fulfilled (see (Kant, 1965, p. 215)). Cosmological diagrams manifest in their imagery the fulfilment of such a deductive system.

[22] However it is important to realize, that the limits of knowledge which proceed from human finitude, contain in themselves a potential for grasping the infinite, at least at the level of a simple thinking or imagining this infinite. Indeed, if one's own finitude sets limits of how much one can take in in the sense of how much this one can be affected by that which is out there, then the taste of the infinite, that is of the self-explanatory and unconditioned (the universe as a whole or its identity), can only be achieved if one is a priori aware of it, so that this one has to become infinite as being absorbed by the infinite. Certainly this thought runs through the famous paradox of the human subjectivity in the world expressed here as a paradox of grasping the infinite in the conditions of the finitude. Cf. (Moore, 2001, p. 231).

[23] Whatever we see in the sky represents a frozen image of the past, since the signals we receive come from the different distant objects. In this sense what we observe as the universe is limited to the so called past light cone which, in its contingent facticity, constitutes one possible observable configuration among the infinite number of possible, subject to the condition that the universe is considered as extremely large in its actuality. It is interesting that most of possible observable configurations are causally disconnected apart from the very early universe, where the smallness of the universe and its short-lived history had not allowed it yet to decompose on physically disjoint regions.

[24] The uniformity of space and distribution of matter, as we will see below, is a major transcendental delimiter in cosmology, following from a judgment that the universe must be knowable. In this sense, in spite of its "anti-teleological" pathos (see (McMullin, 1993)), the cosmological principle represent a sheer manifestation of a teleological commitment in study of the universe which ordains the mechanistic-like explanation on cosmology. Teleology here refers first of all to the telos of explanation, which is the unity and integrity of the universe.

[25] This assumption differs from assumptions of the authors of the so called Steady-State cosmological model, which is commonly rejected nowadays on the observational grounds, who argued that in order the physical laws be universally valid and there be guarantee that the laws of physics discovered here and now could apply to the distant past of the Universe one must postulate the "perfect cosmological principle" which demand the uniformity of the universe not only in space but in time (Bondi, Gold, 1948), (Hoyle 1948). See the discussion of the transcendental nature of this reasoning in (Balashov, 2009). For a discussion of the methodological foundations of the Steady State cosmological model see (Balashov, 1994). For a history of the big bang-steady state controversy, see (Kragh, 1996)

[26] This, using the terminology terminology of Husserl, implies the interchange of the "home places". See (Husserl, 1981).

[27] As was asserted in (Hogg, 2009, p. 9) the idea that the universe is not homogeneous makes no quantitative predictions an explains nothing, so that it cannot be a scientific contender with the present observations: "An inhomogeneous universe is so intractable that there is almost no near-term future in which we are likely to be able to either observe or compute anything interesting in this area".

[28] One can argue, however, that the cosmological as such still represents a certain trend of teleology related to the process of research. Since the aim of research is to explicate the whole universe, there must be an assurance that there is the object of research as well as its possibility related to the harmony between the varied manifold of phenomena and their integration in the human subjectivity. The cosmological principle plays exactly this role: it effectively postulates the possibility of knowledge of the universe and in this sense it also functions as a transcendental principle.

[29] One must be careful, however, in understanding of the aprioristic overtones which naturally accompany any reference to Kant. The cosmological principle is not *a priori* in a Kantian sense of a truth established before observations. Rather, as inferred from the observational isotropy in the distribution of matter as it is seen from the Earth, this principle is rather *a posteriori*. However, historically, being implemented in the scientific practice of cosmologists, this principle acquires some features of "methodological inevitability" thus quietly transforming in the "law of thought", that is delimiter of a transcendental kind. (As a historical reference, a similar thought related to attempts of physics to acquire an axiomatic form starting from the most general principles (similar to the cosmological principle) was expressed in the work of E. Whittaker (Whittaker, 1941) and later quoted by J. Jeans (Jeans, 1945, p. 80). Whittaker called these general principles "the principles of impotence", that is statements which assert the impossibility of achieving something. For example, in

the case of the cosmological principle, one cannot achieve knowledge of an absolute position in space: space is uniform, so that any information about such a position is lost. On the importance this discussion in building the methodology ofmodern cosmology see a paper (Gale, Shanks, 1996, pp. 290-3).

[30] The centrality of the Earth for the overall comprehension of the universe is characteristically accentuated in patristic theology, in particular in the concept of the incarnation of the Logos of God, the Son of God, on the planet Earth in the human form. The paradox of the incarnation, formulated by early Greek Fathers, explicated a non-trivial topological relation between the universe which was created by and through the Logos and the universe as it was accessible to Jesus Christ in his Earthly place. Indeed being in a body on the Earth, the incarnate Logos was present everywhere in the universe because he did not give up his place at the right hand side of the Father. Being at the planet Earth he controlled the whole universe by retaining his divine nature. But the latter implies that the universe, as seen through the "eyes" of the Logos does not have any diastatic extension and is uniform because of its "absolute simultaneity" for the Logos. From a human point of view the presence of the Logos in all places of the universe indicates that the universe is at least *theogenic*. A theological affirmation of the unique position of the incarnate Son of God though being in body at a given point in the vastness of cosmic space and, at the same time, still being co-inherent with every point in space because provides an implicit principle of order in the universe which ensures that every place in the universe, as a place of the 'presence' of the Word, is co-inherent with the place where God is bodily incarnate, i.e. on earth. (The interplay between the concept of the Incarnation and space is discussed in (Torrance, 1997). This in turn implied, in the view of the Christian scientists of the time, that there was a uniformity in the laws of nature (which were known from their experience on earth) throughout the whole of the cosmos. This intrinsic rationality in the world, according to Athanasius of Alexandria, is maintained by the creative Logos of God, which is not an immanent principle of the world, but the transcendent artificer of order and harmony in created existence , which is thus contingent upon the transcendent rationality of God; see e.g. Athanasius, *Contra Gentes*, 40:1. Two implications of this theological development for physics were realised by a Christian thinker, John Philoponus of Alexandria (died *ca.* 570). He recognised that any true order in the universe must be universally valid and inferred from the colours of the stars that the same laws govern the stars and bodies on earth. See e.g. (Jaki, 1990, p. 69).

[31] This point can be easily illustrated by pointing out that the whole edifice of physics, while being produced by particular historical persons, represents an effort of anonymous and collective subjectivity which is not interested in contingent incarnations of this subjectivity in historical beings. In spite of the fact that a scientist works in a particular historical situation which forms the immediate existential horizon, his activity is directed toward the infinite horizon of omni- and trans-temporal truth, that truth which is accessible in principle to everyone and hence this truth transcends the relativity of any truths achieved in a historical situation connected with a particular person. But this omni-temporal truth, as an "infinite" task, is not achievable by one particular scientist. This or that scientist should participate in collective activity of the many by submitting his individuality, to the interests of the open-ended collective of scientists which outlines the tradition in which all scientific accomplishments acquire a certain sense. It is in this sense that the presence of a particular scientist who advances a general view of reality is important only as a contributing factor to the overall tradition. Paradoxically a particular historical presence of this scientist (who is a person) is crucial for the advance to be made; however his or her personality is not important in the context of the knowledge achieved, the knowledge which since its first articulation by a scientist and its appropriation by a community enters so to speak the realm of a-temporal ideas to which everyone has access. One observes here an interesting transformation of *personal knowledge* into an a-personal and anonymous compendium of knowledge whose ultimate subject, is the de-personalised, that is anonymous transcendental subjectivity. It is now clear why, when a scientific fact or a theory are "downloaded" on a routine basis from the compendium of ideas, it is unnecessary to enter *communion* with a person (we mean not just to know about persons as historical figures), who brought them into existence and which is, in a way, still present behind them. The memory of this person will enter the discourse only as labels of past historical discoveries and it is this that happens in science. At the same time in order to understand science as an overall process one should study its history (not as chain of contingent facts and persons) as the open-ended unfolding horizon of meanings which simultaneously serves as the delimiter of science: "to understand a science one must understand it from the ground up and gain an insight into the founding action which originally instituted it, into the process by which its fundamental concepts were created, and into the original *spiritual motives of its creation*." However these spiritual motives (which can be linked to the very motto of science, its infinite *telos*) are not explicitly present to scientific reason because persons as existential centres of these motives do not show themselves: they are present in absence. One can argue that the action of the ultimate *telos* of science upon history always takes place in the conditions where science fails to account for personhood while being its mental creation.

[32] As was suggested by D. Bohm and D. Peat, who referred to famous paintings of R. Magritte which, while depicting such objects as "pipe" or "apple" were named negatively as not being "a pipe" or "an apple", each scientific theory bears the inscription "this is not a universe" meaning that "every kind of thought, mathematics included, is an abstraction which does not and cannot cover the whole of reality" and this is why "perhaps every theory of the universe should have in it the fundamental statement 'this is not a universe'" (Bohm, Peat, 1987, pp. 8-9).

[33] The *apophatic* stance in cosmology does not mean that thinking of the universe in the negative certitude values physical cosmology only for being, de facto, a *negative cosmology.* The characteristic feature of the apophatic approach consists in that, while employing the language of physics, it honestly states that physics has been used as a tool, exercised in its extreme, in order to express the human aspiration and hope for the things unseen. But, *apophaticism*, above all, is such an attitude of the thinking intellect which refuses to form concepts about the universe as a whole as accomplished truths: it rejects the claims of exhaustibility of knowledge sometimes made in scientifically "enframed" cosmology which would adapt all mysteries of the universe to human ways of thought. The "apophatic knowledge" brings the person who exercises this knowledge to a direct experience of the universe as communion so that the intellectual knowledge of the universe is ultimately grounded in the experience of the universe in life.

[34] Once again, the meaning of this assertion that the only certain knowledge of the universe is available in the negative mode can be illustrated by an appeal to the theological discourse. For example, according to J.-L. Marion, the boundary between possible and impossible has sense only for the limited rationality which pertains to human beings. As to God, he can be characterised by the *impossibility of impossibility*. This is a striking characteristic of Deity: God is in a certain sense the Lord of the very impossibility. From the point of view of the conditioned cognitive faculties of human beings there is indeed the impossibility of the objective truth of the divine so that one can only exercise the "negative certitude" with respect to it. It is this certitude which is opposite to the positive incertitude which is typical for the sciences which study objects. Science provides us with some provisional and precarious data of objects which are subject to correction and improvement in the course of scientific advance. The paradox of science is exactly that this incertitude and constant correction of its results forms the very condition of the possibility of science. Another aspect of science is that it incapable of knowing things in the overall worldly context: it knows things in a fragmented way within a narrow horizon determined by the historical situation. Whereas in philosophy, in what concerns its perennial questions about the world as a whole, there is practically no progress, so that it is able to speculate about the world only in rubrics of the *negative certitude*; see details in (Marion, 2010).

[35] The situation here becomes analogous to comprehension of a human person. Namely, that human person cannot be fully understood and knowable as a physical or biological object. Metaphorically the discursive method of apprehension of human beings in terms of labels and external parameters provides access only to their bodies, or, as some philosophers said, to their corps. Human persons cannot be known and the sense of their existence exhausted though knowledge as subjugation to the judgement of the other. Indeed it is possible to *communicate* with persons, but it is impossible to dominate them. See a vast discussion of this issue in (Yannaras, 2005) and in (Clément , 2000) in particular pp. 25-33, as well as in (Berdyaev, 2003 pp. 126-34). Hence the analogy in cosmology: in the same way as any other human person (as a modus of unique and incommunicable being) cannot be known by using syllogistic faculties of the cogito, the universe, as being perceived as a quasi-hypostatic being (in theology enhypostasised by the Logos of God (See details of this concept in (Nesteruk, 2004)), cannot be exhaustively known by means of simple observation, analysis and theorising. In other words, what cannot be known is the intrinsic way of existence of the universe. Whereas in cosmological syllogistic thinking the identity of the universe is posed as that aspect of the universe which allegedly can be described outwardly.

[36] The intuition that cosmology and anthropology represent two aspects of one and the same book, whose reading requires engagement in both of them (De Laguna, 1966, pp. 81-2) is confirmed through a historical and ethnological observations related to ancient and modern tribal cultures; see in this respect, e.g., (Mathews, 1991). Cf. also (Ladrière, 1972, p. 186).

[37] This is terminology of Husserl; see, e.g., (Kockelmans,1994, pp. 331-37).

[38] In this sense contemporary cosmology did not go, in its objectives, too far from ancient mythologies which intended to provide an account of cosmogenesis; see, for example, (Ladrière, 1972, p. 153, 169) and (Alfvén, 1977, p. 13).

[39] The idea that humanity is the "voice" of the universe, that is the agency which makes the universe palpable and self-conscious, has definite theological connotations originating in the concept of *Imago Dei*. See more details in chapter 7 of my *Light from the East* (Nesteruk, 2003, pp. 194-248).

[40] See note 6.

[41] See note 11.

[42] In respect to what we have just said once can raise a question of the sense of that single consciousness which integrates all pieces and moments into the wholeness of the universe, and contemplates the universe as an event, a flash of memory. This question arises if one compares human history with cosmic history. One cannot achieve the presence of historical facts literally, but one can establish a kind of inference, re-enactment, through the chain of witness in the continuity of collective human subjectivity. The re-enactment of historical events assumes their invocation in the condition when the actual temporality of these events is suspended and integrated in the consciousness of the present. This suspension of time reveals itself as an inherent property of transcendental subjectivity which one usually calls memory. Then one can enquire whether the suspension of time in the invocation of the whole universe represents a particular archetype of human memory which could be called as memory of "all in all". This memory would correspond exactly to that standing in front of the universe or communion with it which is implanted in the very fact of our conscious consubstantial embodiment in it. In fact one conjectures that by invoking the image of the universe as a whole we effectively re-enact this hidden memory through its progressive unfolding in numerous theories of the universe.

[43] Here, however, human beings function in a paradoxical condition, as was described by A. W. Moore: "Given their self-conscious awareness of their own finitude, humans neither want nor are able to represent themselves as infinite in a full and unbridled sense. And it is this distinctive combination of hubris and restraint which most fundamentally shapes what they are shown. While regarding themselves as standing in a God-like epistemic relation of creative intellectual determination to the world, they also, by that very same token, regard the world as limited by how they determine it, just one possible world among others… While identifying themselves with the world as an infinite whole, they at the same time identify the world with themselves as a finite whole.…They aspire to be outside the world holding it all together; and for this the world has to be circumscribed. It does look modest for humans to take the ultimate deliverances of their physics, say, and to suggest that they are really just descriptions of the world from a human point of view. But the suggestion can be turned round in a way that makes it look less modest: that humans, even in describing the world from their own point of view, are able to attain to the ultimate deliverances of physics. Still, this is the kind of thing that they would say if trying to give voice to their inexpressible knowledge." (Moore, 1992, p. 433).

[44] By paraphrasing Meister Eckhart's famous citation of his favourite text from (Isa. 45:15) concerning the ascension to the knowledge God ("The More one seeks you the less one finds you", Sermon 15) one can state, in cosmology, that "The more one seeks the universe the less one finds it". In a weak form the same thought was expressed by R. Penrose in the conclud-

ing section of his book *The Road to Reality* titled "Deep questions answered, deeper question posed" (Penrose, 2005, p. 1043-5).

[45] This endless hermeneutics in cosmology, de facto, manifests the endless commitment to a theoretical task which does not allow any procrastination since each experimental and theoretical result in cosmology is temporary and must be kept aside while looking for the successive result, believed to be the limit of convergent theoretical approximations. This endless commitment in turn reveals an intrinsic teleology of cosmological research as an endeavour to understand meaning as related to their *telos*. Indeed, the answer to a perennial philosophical question "What is man's goal?" clarifies the answer to another question regarding the nature of man. Correspondingly, the inherent teleology of cosmological research being related to the infinite tasks of humanity and directed towards the clarification of the question of the origin of the universe, as its ultimate foundation, clarifies not so much the question on the nature of the universe, but the nature of man. See on telos of cosmological explanation as related to the question of humanity's origin my paper (Nesteruk, 2012).

[46] The meaning of the phrase "antithetic dialectics" can be illustrated as follows. Through empirical manifestations of the universe we can grasp the fact that the universe is. Not *what* it is, because the universe as a whole is above all that we know about it. It is important however that we are not interested in apophatic expressions as such as the right way to express the wholeness of the universe, but rather the maintenance of a strict distinction in knowledge between the universe as a whole and some particular physical aspects of it. The method of negation does not bring us to its goal, for nothing meaningful can be defined through negation only. In this sense the negative way is therefore not more effective than the affirmative (cataphatic) way, since the essence of the universe as a whole remains inexpressible. In a way similar to that of theological predications of God one can assert that the universe as a whole is above both cataphatic and apophatic definitions; it is not close to anything else which is or which is expressible, nor is it close to anything else which is not or is not expressible. If one theorises in an affirmative or cataphatic manner, starting from positive statements about the universe, the universe is appropriated through flesh, for one does not have other means of knowing the universe except from what is visible and tangible. If one theorises in a negative or apophatic manner, through the stripping away of positive attributes, one makes the universe a pure thought as that identity which is in the principal state with itself. Here the unavoidable facticity of the universe, its presence in absence transcends its unknowing pointing to the source of its embodied identity in human persons. (See more details on antithetic dialectics in theology and its dialogue with science in (Nesteruk, 2003, pp. 75-91).

[47] The ultimate truth of the universe, which is experienced directly in the fact of life and affirmed in existential faith, and which is inaccessible to precise grasp by the discursive reason, leaves only a trace of its presence with no definite logical location "between" the affirmation and negation of the universe. Thus the *form* of antithetic propositions, as a pair of theses and antitheses, shapes constructively the operation of *open* epistemology in philosophical cosmology: all statements about the universe as a whole are always mysterious and 'contradictory', leading human reason to incessant wonder between the poles of conviction and doubt. When the reason is tired of this wonder it submits itself deliberately to the silence of faith in being existent, as a truly the knowledge of the universe in the negative certitude.

[48] Similar to Levinas, this breakthrough towards one's identity and hence the universe's identity cannot be achieved either through knowledge or ecstatic transcendence towards the universe (which would imply one's disappearance as person). Thus when we speak about the universe as communion we mean that solitude can be exceeded while the identities of both a human being and the universe are preserved as distinct.

[49] G. Marcel calls this a primary metaphysical mystery of the incarnate existence (Marcel, 1965, pp. 15-16).

[50] And Marcel adds to this: "I mean that the universe tends to disappear to the extent it overwhelms me. And this, I believe, is that which is forgotten every time when one attempts to crush man by the weight of astronomical facts." (Marcel, 1940, p. 32).

[51] C.f. (1 Cor. 15:28)

[52] See a detailed discussion of this parallel in my paper (Nesteruk, 2012).

[53] In a theological context one could add that, the identity of the universe reflects not only monadic being-in-the-world, but also the love to the universe which stems from the ecstatic predisposition to love God. It is the divine kenosis as particular creation which reveals itself in incessant urge to search for the foundation of humanity's facticity as the source of life, and which inevitably goes through the stage of implicit "personalisation" of the universe.

[54] The Big Bang, that is allegedly the past of the universe, being reconstructed from the present appears to be the *telos of cosmological explanation*, the *telos* not as *nexus finalis* in a Kantian sense, but as an intrinsic purposiveness of human action in cosmological research. See more details in my paper (Nesteruk, 2012).

[55] The affirmation of the inaccessibility of the totality of the universe nevertheless implies a certain grasp of this totality. This creates a paradox of that the infinite is show to us in the conditions of our finitude. See more discussion on grasping infinity in (Moore, 2001, pp. 218-33).

[56] In my paper (Nesteruk, 2011) on the demarcation between the dimensions of the human and natural sciences in cosmology it was already mentioned the inseparability of the subject of cosmological research and its object on the grounds of communion. Here we deal with a refinement of the general statement of inseparability which cascades towards a particular transcendental strategy if one dares to express communion discursively.

[57] The uniformity of the universe can be a result of special initial conditions which, however, cannot be empirically verified because of the limited causality to which our observable universe is related . See, for example, (Albrecht, 2003, p. 375).

[58] Coherentist epistemology is sometimes described as knowledge without a foundation of certainty. In this sense it stands in sharp contrast with the foundationalist approach which demands that the knowledge of the actual, and even of the probable (so far intelligible), requires a foundation of certainty. The characteristic feature of this epistemology is that it is social, that is emphasising the fundamentally social nature of human knowledge. See, for example, (Rescher, 1989, pp. 316-33).

[59] C.f. with the "Introduction" to the book (Bitbol et al. 2009, p.3) where the authors associate the Kantian "mathematical construction" with that which in modern terms can be called "computational synthesis".

[60] Certainly this point is also strengthened by the fact that the space described by metric in relativistic cosmology looses its independent property of being a "background structure", acquiring the features of a dynamical variable.

[61] The fact that we observe the universe along the surface of the past light cone implies that we have an astronomical access to large-scale cosmological parameters only in their past values.

[62] See in this respect, for example, a provocative paper of (Tegmark, 2008).

[63] The term "weak objectivity" was used, for example, in (Bitbol et al., 2008, p. 4). A phenomenological sense of this term can be illustrated through the reference to J. Ladrière: "The theoretical apparatus is thus not a description in the ordinary sense, as presentation of an entity, supposedly given, and of its properties, it is the characterisation of something which is not a thing, but a *structural path along which a thing comes, from the ultimate horizon of every givenness, to the actual presence in which it is effectively given to apprehension*" (Ladrière, 1989, p.138) (emphasis added). P. Heelan approached the concept of reality as being naturalistic and evolutionary and it is "people and praxis what provide it with the categories of the real" (Heelan, 1988, p. 524).

[64] In this sense the statement of B. Carr on the lack of description of consciousness in physics, namely: "Yet one feature which is noticeably absent from this model is the creator, man himself. That physics has little to say about the place of man in the universe is perhaps not surprising when one considers the fact that most physicists probably regard man, and more generally consciousness, as being entirely irrelevant to the functioning of the universe. He is seen as no more than a passive observer, with the laws of Nature, which he assiduously attempts to unravel, operating everywhere and for all time, independent of whether or not man witness them" (Carr, 1998, p. 152) can be considered as a *negative*, but useful definition of that how subjectivity works in cosmology. M. Bitbol characterises the absence of mind from our scientific picture of the world in terms of progressive "self-dismissal" (Bitbol, 1993, p. 92). However, this progressive self-dismissal is inherent in the very logic of scientific view of the world, because, this pictures itself is exactly what we call mind. The definition of mind, its content, is explicated by the scientific view of the world. In this sense one cannot define mind prior to this picture, because its very definition would require mind to exists prior to it. As E. Shrödinger expressed a similar thought: "The reason why our sentient, percipient and thinking ego is met nowhere within our scientific world picture can easily be indicated in seven words: because it is itself that world picture." (Shrödinger, 1992, p. 128). In a phenomenological context the problem discussed here is related to the fact that predicating objects science ignores the paths that led to the structure of relations pertaining to objects. And phenomenology since Husserl argues that these paths which manifest the human activity lie precisely in the ontological ground of objects (See, for example, (Kerszberg, 2003)).

[65] The graphs which attempt to express the wholeness of the universe related to its infinitely small observable segment can be found, for example, in (Harrison, 2000, pp. 375-86).

[66] It is interesting to point out that this contingency is however a special one for it corresponds to our presence in the universe and the very possibility for the universe to be observed as it is. See (Primack, 2006, pp. 117-18).

[67] As it was expressed in the paper (Albrecht, 2003, p. 384): "The arrow of time, as it is currently understood, simply has to be used as an 'input' to any theory of the universe". One must not think, however that the cosmological expansion provides a complete inclusion of the arrow of time in theory. As was argued by Penrose as far back as in 1979 cosmological expansion, being governed by the dynamical equations does not describe the irreversibility of time and does not justify the second law of thermodynamics (Penrose, 1979). The problem with the arrow of time originates in the special (non-generic) conditions of the universe. Correspondingly in order for the arrow of time to manifest one should to have a temporal span, so that the universe must be presented as evolving in time.

[68] It is interesting that theoretical cosmology always wants to get rid of the contingency of the initial conditions by developing theories of origin with most generic initial conditions. However, as it is understood nowadays, if cosmology wants to give account of the arrow of time the initial conditions must be non-generic.

[69] On the one hand human beings are consubstantial to that portion of the universe which contains stardust from which human bodies are made, on the other hand human beings transcend this very consubstantiality by articulating the universe in its entirety including those aspects and eras which are incompatible with the human existence.

[70] Cf. with a similar intuition of J. Wheeler that the very word "time" is a human invention (Wheeler 1988, p. 13). So that event the word "timelessness" which, according to Wheeler, pertains to being as the 'world of existences", intrinsically contains the traces of humanity. The definition of universe as a whole, as that totality which is devoid of temporality, still contains the presence of humanity who defines this universe by means of a simple dialectic denial of attributes (such as time) which pertain to the visible universe.

[71] See a very nice review of ancient concepts of space, including that of a receptacle, in (Torrance 1995).

[72] This is a well known Kantian position on the possibility of knowledge: we can know only those things which can be adequated with our capacities of sense and understanding. This general transcendental stance was mimicked in some works related to astronomy and cosmology whose authors argued that human cognitive faculties and instrumental arrangements influence the way the universe appears to us. See, for example, a book (Harwitt, 1984) and a related paper (McLaughlin, 1985); as well as papers (Barrow, Bhavsar, 1987), (Barrow, 1989), (Bishop, 1986).

[73] As asserted by Bitbol, the Weak Anthropic Principle "establishes a retrospective link between two sets of phenomena: the universe and the human body." (Bitbol, 1993, p. 100).

[74] This is a different dimension of the paradox of human subjectivity.

[75] This contingency has a profound meaning: it is not only contingency in space, as related to the human position in the universe, but, what is most important it is contingency in time as related to the overall evolution of the universe. The latter one can be expressed along the lines of the anthropic inference which deals with the necessary conditions for humanity to appear on the planet at a particular cosmological era. However there is another, so to say, an epistemological aspect of this contingency linked to the fact that the distribution of the constituents of the universe at present is such that we can

now observe its structure in order to infer to the underlying sense of the universe. This is mostly related to the proportions between dark matter and dark energy: in the future, for example, when dark energy will prevail the large-scale structure of the universe will become effectively invisible, so that our ability to create theories on the basis of observations would disappear at all. One can talk about a "window" in time when human intelligence is capable of disclosing the nature of the universe. In other words we are talking here about contingent facticity of the very possibility of cosmology. As was expressed in (Krauss, 2009, p. 15) "We appear to live in a very special time: the only time when we can observationally verify that we live at a very special time!" (Cf. (Krauss, Scherrer, 2008, p. 689)). See also on this point (Primack, Abrams, 2006, pp. 117-8) where the authors speak of "the midpoint of time" which correspond to that time in the evolution of the universe when the galaxies have already been formed to be observed and, at the same time, have not yet disappeared from our view because of the acceleration of the universe.

[76] Cf. Heidegger's treatment of the famous thesis of Protagoras on "man as a measure of all things" (Heidegger, 1991, pp. 91-95).

[77] Here appears a replacement of the old Medieval static heavenly sphere by the so called sphere of time, where humanity is indeed in the centre of this sphere in a profound epistemological sense. The universe then seen as a frozen image of the whole span of time from the Big Bang to nowadays. See a typical diagram in (Primack, Abrams, 2006, p. 135).

[78] Hannes Alfven as far back as in 1978 expressed his doubts about the scientific status of cosmology that dares to predicated realities of the early universe: "…it must be absolutely clear that if a scientist makes a guess about the state of the universe some billion years ago, the chance that this guess is realistic is negligible. If he takes this guess as a starting point of his theory, this is unlikely to be a scientific theory but very likely will be a myth" (Alfven, l977, p.13).

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Конституирование идентичности вселенной: апофатизм и трансцендентальные ограничения в космологии

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В статье обсуждаются ограничения познаваемости вселенной, вытекающие из специфики человеческого состояния. Проводится точка зрения, что в отношении так называемой идентичности вселенной можно установить лишь апофатический подход, состоящий в отказе от попыток исчерпать истину космологических определений в строго научном дискурсе. Это влечет за собой необходимость ослабить требование строгого реализма в космологии. Реализм может получить статус «слабой» объективности, содержащей в себе условия и сам процесс конституирования реальности вселенной в космологии. Раскрытие смысла вселенной оказывается неразрывным образом связанным с историчностью процесса познания, его случайностью. Познание вселенной характеризуется принципиальной несоизмеримостью человека и вселенной, а также его не-сонастроенностью со вселенной, выражающейся в экзистенциальной тревоге и отсутствии онтологической привязки во вселенной. Именно такая тревога порождает ограничения на познание вселенной. Само желание эксплицировать смысл человеческого существования становится целью космологического исследования: для того, чтобы познать человека, нужно познать смысл его места во вселенной, то есть смысл самой вселенной. В статье проводится детальное обсуждение так называемого космологического принципа, в отношении которого показано, что он является трансцендентальным ограничителем на познание вселенной, имеющим телеологические коннотации, присущие человеческой активности и, в частности, устремленности человека во вскрытии смысла вселенной.

Ключевые слова: вселенная, идентичность, познание, эксплицируемость, апофатизм, трансцендентализм, телеология.