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Institute of Physics and Technology
Moscow

Yuri V. Balashov

PHILOSOPHICAL ROOTS OF THE ANTHROPIC PRINCIPLE

1. INTRODUCTION

The relevance of this topic to the present meeting is partly due to the fact that almost two decades have elapsed since an astrophysicist, Brandon Carter, had first introduced the Anthropic Cosmological Principle. This has taken place here, in Cracow, at the special Symposium of the IAU devoted to the anniversary of Nicolas Copernicus (Carter 1974). In recent years the Anthropic Principle (AP) has became a matter hotly disputed in the physical, philosophical and theological literature. The constantly increasing interest of the humanities community in the AP may testify to the conjecture that this principle is no accident in the history of ideas. Besides immediate scientific prehistory it may have a substantive philosophical background. And anthropic reasoning may be somehow related to certain aspects of the human cognitive faculty. My claim will be that there is indeed a general predisposition to a particular sort of inference, inherent in our cognitive faculty, which makes it fit for the modern anthropic arguments. Philosophically, such a predisposition is rooted in the transcendental stance, as established by Kant and Husserl. I shall give reasons for this claim, beginning by recapitulation of the rationale of the AP.

2. EPISTEMIC NATURE OF THE ANTHROPIC PRINCIPLE

Put simply, the AP states that we observe around us not some arbitrary state of affairs but that which is compatible with our presence as observers. For that reason alone, observations submit to an overall self-selection, due to the very fact of their observability by complex physico-chemical beings whose existence critically depends on the particular state the Universe happens to be in.

The *weak* AP concentrates upon the privileged spatio-temporal location of

intelligent observers in the evolutionary Cosmos; they find themselves at a rather specific site (near a radiation-supplying star but not very close to it), and at a later stage of the Universe's physical history, after a certain sequence of events, making their existence possible, has successfully occured. (This sequence includes, for example, the production of heavy elements, beginning from carbon, in the final moments of stellar life-careers lasting, on the average, ten billion years). No wonder we discover the Universe to be that old: it had to age enough to be discoverable by anybody at all.

The *strong* AP points to the specificity of the entire Universe needed for the creation of human observers at least at some stage and place within it. The physics of our world must be *fine-tuned* with great accuracy for that. Even tiny disturbances in the hidden harmony of the laws of nature, say, small variations of the fundamental constants of physics would lead to a sterile world incapable of creating the complex building units of intelligent life. The fact that we detect the particular set of fundamental physical parameters of the Universe may be due not to some still deeper links of nature, but solely to (strong) anthropic self-selection *correlating* the presence of observers with very specific properties of reality observed by them.

In the weak case the AP selects the populated spatial fragment, or the inhabitable cosmological epoch, of the *single* Universe, while in the strong case it is the Universe as a whole that is self-selected. To make such a global selection legitimate there should be that from which to select. This is provided by the *world ensemble hypothesis*, an indispensable part of the strong anthropic inference. The concept of the world ensemble, or of multiple universes, is based on certain present-day cosmological ideas elaborated independently of the AP (see e.g. Gale 1990). They all depict the Cosmos-At-Large as consisting of many physically disjoint domains governed, more or less, by their particular physics. Ideally, all possible physical arrangements must be realized in universes comprising the ensemble. At least some universes will, in this case, be suitable for life and intelligence. And to explain why we find ourselves in such a well-designed Universe, with all its specific laws of nature, initial conditions, spatial topology, etc., we have to apply the strong AP rendering our existence in any „badly" designed universe impossible.

The rationale of the anthropic self-selection cosmological principle in thus twofold. First, it warns one against abstracting from the presence of an experiencing subject in interpreting physical data. Otherwise the interpretation may go in the wrong direction, by mistakenly attributing those features of experience that may be due to anthropic self-selection alone, to some alleged underlying principles having no counterparts in nature. The subject therefore

must find its essential place in the explanatory patterns of science (see Fig. 1). Second, the AP *directs* one to what is beyond the scope of immediate perception. To explain the intricate features of the observable domain of the Cosmos one has to postulate a whole variety of the uninhabitable and, hence, unobservable regions transcending the actual physical horizon. Reality turns out to be much wider and richer in scope than that particular „aspect" thereof with which we, in principle, can be *correlated* as cognizing subjects. Though we cannot actually perceive those aspects of what-is-in-totality that are incompatible with our being, we come to recognize their probable reality via contemplating the fine-tunings of our own anthropic domain.

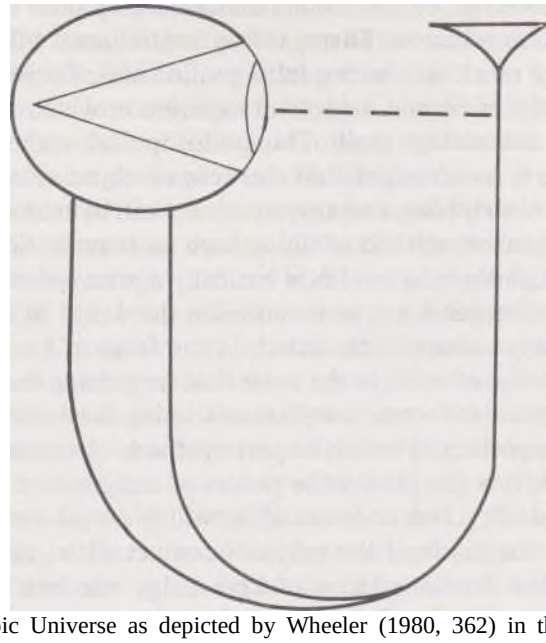

Fig. 1. The Anthropic Universe as depicted by Wheeler (1980, 362) in the radical obser- ver-participancy context. In the moderate self-selection context adopted throughout this paper, the Universe fine-tuned for life begins lifeless. At some later stage it gives rise to observership, assuming thus a subjective dimension and becoming thereby self-comprehended.

To discover that our Universe is, in fact, fine-tuned cosmologists had to *transcend* actual physical experience and to invoke *imaginary* physics with different laws, different spatial dimensions etc. They needed to look at our world and its physical basis as if „from outside". Such a perspective appears to be peculiar for the natural science which certainly prefers approaching reality „from inside", from the „immanent side of experience". Nevertheless, this wider perspective has nothing mysterious about it. All our cognitive enterprise is in fact pre-embedded in it. This was always evident for philosophers, especially for those whose primary interests lay in the theory of knowledge.

3. TRANSCENDENTAL VS. ANTHROPIC PHILOSOPHY

All philosophy is in a sense „anthropic", for it has always concerned the study of subject-object structures mediating human world perception. Since the image of reality presents itself in the subject's mind in a sensually and conceptually disjunct form, distinctive of a specifically human viewpoint, one should not merely identify, as common sense usually does, the reality in itself and its subjective reflection. The result of cognitive experience — the world of phenomena, the picture of nature — must be comprehended in correlation with the conditions of knowledge. In particular, the latter may pose constraints on the very content of experience. Disregarding restrictions inherent in the cognitive process may result in making false connections, for instance, in the unconscious attribution of certain aspects of experience, which are due to the said restrictions, to the reality itself. The philosophical stance, unlike the commonsensical one, is so arranged that the subject-object relations shaping our knowledge can be clearly seen, and any experience can be *critically* examined.

The most comprehensive method of doing such an examination is provided by the transcendental philosophy, which is basically a *presuppositional* analysis of knowledge that concentrates not so much upon the world in itself, as upon the conditions of its *appearance* in the mind, in the form of knowledge. Such conditions are necessarily *selective,* in the sense that they shape the raw material of experience into cognizable forms, therefore restricting the domain of possible knowledge by those aspects only which impart synthetic character and general validity to it. In Kant, it is the productive power of imagination that activizes *a priori* forms of sensibility and understanding which reveal natural limits of knowledge, rooted in the mode of the subject's contact with „raw reality".

However, to outline the boundaries of knowledge one has, so to say, to „overstep" them, i.e. to go beyond the limits of subject-object relations and to look at them „from outside". In this respect, the similarity of the Kantian „transcendental breakthrough" to the Copernican revolution becomes visual. Copernicus in fact looked at Earth and at its motion „from outside", having transgressed the limits of the geocentric standpoint, which enabled him to explain the peculiarities in the motion of other heavenly bodies.

Such an understanding of transcendentalism suggests productive analogies. The anthropic reasoning also „oversteps" the limits of the actual view of the physical world and brings us into wider realm of possible or even real worlds, in order to obtain, within this extended framework, an acceptable explanation of the specific characteristics of our world and, consequently, of the natural constraints inherent in our physical knowledge. Again, reality turns out to be much richer than that particular aspect of it with which we, in principle, can be correlated as observers.

Admittedly, while in physics the transcendence beyond the boundaries of the present state of things can be done, say, by an imaginary variation of constants and examination of the effects consequent upon this, on the entire Universe; in the *epistemic* perspective, on the contrary, transgressing the limits of the actual world perception is impossible in any *direct* sense. Philosophically speaking, there is no „point" from which both the world and our thought image of it could be observed. The world always presents itself in terms of our thoughts and ideas about it. The critical study of the subject-object relations can be fulfilled only via intense peering, on the part of the philosophizing subject, into his own subjectivity, in the acts of reflective self-comprehension. Thereby, all that is not of a subject can be removed from the sphere of subjectivity, and the ultimate foundations of the remaining structure can be put under examination. Kant was the first to recognize the full significance of this task for philosophy. The transcendental tradition originated by him has found its most substantial continuation in the works of Edmund Husserl, the founder of phenomenology.

In the Husserlian intentional analysis one can detect a manifestation of the universal selection effect that seems to pertain to all kinds of transcendentalism. By revealing the alternative modes of mind's directedness to its object, the philosophizing subject discovers their limitations, or „horizons", as well. In the phenomenological vocabulary *horizon* means a brink of the perceptual field — a boundary or a periphery of the particular intentional framework. Because of the horizons, any experience — be it scientific or otherwise — submits itself to the appropriate constraints, whose explication is necessary in interpreting the experience. Otherwise, those features of it which have their immediate source in such constraints might be tackled inadequately, by deriving them from the supposed outer world, while their origin may, in reality, lie *between* the *Welt-Pol* and the *Ich-Pol,* in the intentional structure of consciousness, and in the correlations between the particular mode of conscious activity, *noesis,* and its corresponding immanent object, *noema* (see Fig. 2). Husserl says:

> Science is, in the first place, a unified item in anthropology: it is a unity of acts of thinking, of thought-dispositions, as well as of certain external arrangements pertinent thereto (Husserl [1900], 1970, 225).

This picture strikingly reminds one of the anthropic self-selection *modus operandi,* right up to its terminology. Remember that the AP expresses a *correlation* between the existence of the subject-observer and the properties of the observable world, while the cosmological *horizons* serve in the current models as brinks of the causally connected spacetime regions, or as physical boundaries of different universes belonging to the world ensemble. The similarity — though not a substantial but a typological one — of the Husserlian intentional analysis with the anthropic patterns of reasoning becomes apparent

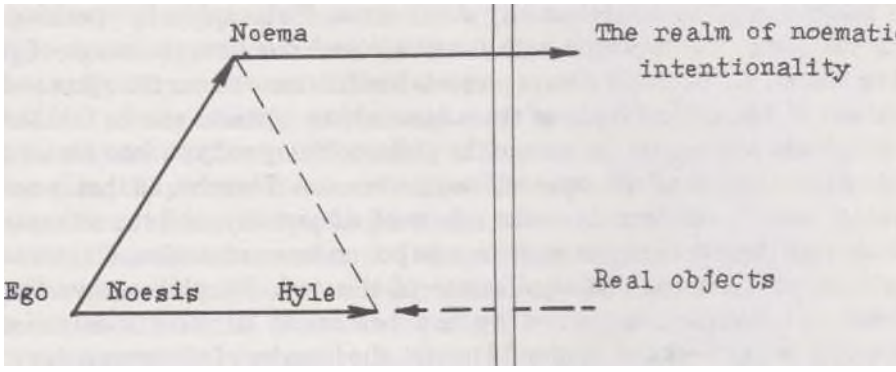

Fig. 2. Intentional structure of consciousness according to Husserl, as depicted by Babushkin (1985, 30). Husserlian phenomenology is basically a philosophical investigation of the ultimate acts of consciousness actualizing the particular kinds of correlation of the latter with its objects or, as phenomenologists usually say, the particular modes of *constituting* the objects by consciousness. These acts, taken in their totality, form consciousness as something primary and self-sufficient, and are termed *intentional.* Intentionality is a fundamental characteristic of consciousness consisting in its permanent *directedness* to the immanent object. Consciousness is always consciousness of something, though its object thus defined should not necessarily have a counterpart in „objective reality". The objectivity of the latter must yet be constituted by consciousness, and this does not always happen. We may have before us not areal, but an imaginary, or remembered, or even negated object. Meanwhile, its immanent equivalent called *noema* always has its locus in consciousness as an essential „pole" or „focus" of intentionality. Noema embodies an ideal meaning of the object, whether the latter has actual existence or not, be it a particular thing, or a universal. Noema as a passive meaning is counterposed by *noesis,* the activity of consciousness, its intentional action constituting the noema. Inseparability of the acts of consciousness and meanings thereby constituted — *noetico-noematic correlation* — is thus characteristic of the activity of consciousness. To understand phenomenology appropriately one should bear in mind that the entire intentional structure shaped by noetico-noematic correlations resides in the proper sphere of consciousness — to the left of the vertical line bordering the supposed reality „out there".

in the structural resemblance of Figs 2 and 3 as well as in some statements of the philosopher. For example, in one of the earliest works by Husserl we read:

> If there are no intelligent beings, if the natural order excludes them, or if they are in a *real* sense, impossible — or if there are no beings capable of knowing certain classes of truths — then such *ideal* possibilities remain without fulfilling actuality. The apprehension,
> knowledge, bringing to consciousness of truth (or of certain classes of truths), is nowhere ever realized (Husserl [1900], 1970, 149).

Something akin to the AP is certainly involved here. Yet, there is a substantial difference between this fragment and the AP. This difference lies in the fact that, while the AP imparts *subjective reality* to the realm of physical being, Husserl speaks of the selection of *meanings* in the „timeless kingdom of truths", i.e. in the ideal space of abstract noemata. „Noematic space" cannot be equivalent to the usual

physical space (even superspace), to which the self-selection AP applies, for the former has no physical existence and entirely belongs to the subject's territory. Indeed, Fig. 1 is a *causal* pattern of the self-comprehending Universe, while Fig. 2 is an *epistemic* pattern of the intentional structure of consciousness, having its locus in pure subjectivity.

4. CONCLUSION

As is usually believed, the development of the transcendental tradition from Kant to Husserl entailed further abstracting from the concrete cognitive situations in which the irremovable presence of the *Welt-Pol* persistently claims its rights. However, in retrospect it can be stated that, apart from its phenomenological continuation, transcendentalism has also assumed a „naturalistic" embodiment which culminated in the anthropic cosmological arguments. Transcendental philosophy may be looked upon as an „archetype" of the anthropic arguments. And the AP, in turn, appears as a variety of a „naturalized transcendentalism". Transcendentalism — because, like transcendental philosophy in general, the AP studies the conditions of the appearance of the world in the mind. Naturalized — because, unlike philosophical transcendentalism, the AP does it the other way round, by unquiring into the conditions of emergence of the mind in the world. Yet both types of inference draw their power from the selective discourse inherent in the conditions of knowledge, to the extent that the latter, broadly conceived, must be taken into account in interpreting the experience.

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