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PRE-HINDU COSMOLOGICAL PRINCIPLES VS. BIODIVERSITY

1. Cosmological principles

Cosmology deals with the Universe as a whole. It is assumed that only some finite part of the Universe is accessible to experiments; therefore, cosmology extrapolates the experiments' results to the Universe in its entirety. In order to do so it must be assumed that the remaining, invisible part of the Universe does not differ in any significant way from what is available to the researchers. Thus, it is adopted that the entire Universe consists of the elements known on the Earth; there are the same galaxies, group of galaxies and systems of higher ranks which exist on the earth's sky, there is no such direction in the space which would be mostly favored and all the matter in the space is spread equally. Such philosophical assumptions exemplify our opinions on Universe structure and are referred to as *cosmological principles.*

It must be pointed out however, that in all fields of science there are certain philosophical assumptions, which in a definite way let us interpret the results of the studies. The results alone are obtained independently from any other philosophy.

It is not the case with cosmology though. As pointed out by K. Rudnicki, philosophical assumptions – cosmological principles – are highly related to the results of cosmological estimations. It was firstly noted by A. Einstein who assumed that the

Universe is the same in every single part and direction (as it is currently formulated – homogeneous and isotropic). As a result he ended up with a model the only motion of which was a radial one: expansion or contraction where the reciprocal speed of two points is directly proportional to the distance. The conclusion appeared to emerge from the theory of relativity (Rudnicki, 2002).

The discovery of displacement towards the red in the specter of galaxies began to be interpreted as Doppler's effect. Thus it seemed as if the standardized model was confirmed via the process of moving away ("escape of the galaxies").

However, such results (proven by H. Bondi) were obtained due to an assumption of the Universe homogeneity. Application of that method in different models, lead to similar consequences: escape of the galaxies. But when applying another cosmological principle in Einstein's model it does not lead to expansion (Rudnicki, *ibidem*).

The cosmological principle of homogeneity of the Universe has been the most often applied method and thus majority of cosmological models derive from it. After decades of anthropocentrism which wanted to see the middle of the World in the middle of the Earth and then the Solar System (the Sun), such an opinion sounds reasonable and underlies the unprivileged role of the mankind in the Universe. As a consequence, application of such *a principle* implies expansion and suggests Big Bang in the past. And such a model supports anthropic principle with its further, anthropocentric consequences.

2. Biodiversity

The problem of bio-diversity has arisen quite recently (a conference in Washington IX 1986: *Forum on Biodiversity*) when animals' extinction rose to an alarming level, the reason for which being man's activity. Since then the bio-diversity became synonymous to all the Nature being in danger.

An act of dislodging some species by others in the history of the Earth is a normal phenomenon; however, species' extinction in recent millenniums is quite a significant process. The species which are mostly threatened with extinction are large and gregarious herbivores together with predators and scavengers which are together in an alimentary chain. In quaternary, before a man came into being, such a phenomena was not observed. Man's activity – industry, agriculture, demographic expansion, environmental pollution – are the basis for hecatombs of animals and plants together with all their species. Their diversity decreases and what is more significant, all the fragile coexistence chains (not only alimentary ones) between particular species and ecosystems (which we managed to know only partially) are breaking . The unknown species are disappearing as well.

Authors did not reach an agreement as to the species living on the Earth right now: the figures range from 5 to 50 million. They are also not unanimous when it comes to the rate of extinction. It is estimated though, that the rank of it is very significant and reaches around 50 species per day.

When man's activity leads to species' extinction, the natural evolution process is shaken as well. Having seen the problem helped to believe that there is a necessity to

take responsibility for life's evolution and see the problem as the basis for environmental ethics (Kośmicki, 2001).

Those facts help to treat bio–diversity not as an unimportant abundance of Nature, but rather as an *immanent* Nature's feature and its *vital value* (Wawrzyniak, 2000).

3. Pre-Hindu cosmological principle

Since antiquity different cultures, scholars and branches of science have developed philosophical assumptions of their ideas about the Universe. It was systematized for the first time (as cosmological principles) by Conrad Rudnicki (The Cosmological Principles, 1995).

Cosmological principles of the general structure of the world diversified the characteristic features of the Earth and Heaven, attributing unusual features to Heaven whilst the unknown, supernatural ones to the Earth. Such a tendency could be observed with ancient Greeks who treated the basic substance of Heaven as totally different from earth's material atoms of 4 elements: water, fire, earth and air. The unchangeable and immortal *quinta essential* (ether) came into being thanks to Aristotle.

Cosmological principles often applied in the distant Universe structure are impossible to be applied on the Earth: it is not alike in any place – it is infinite, homogenous and isotropic .

However, there is one principle defined as being unusual. In 1972 the author of *Principles* together with M. Heller pointed out the oldest philosophical assumptions referring to the Universe structure and named them pre-Hindu cosmological principle. It was finally formulated by C. Rudnicki in 1982 in his work *Die Sekunde der Kosmologen* – Vittorio Klostermann, Frankfurt a/M (in English: *The Cosmologist's Second:* Lindisfarne Press, Hudson NY 1991).

Hindu ideas about the Universe structure which are discussed in my paper, came into being in the times of Hindu spiritual prime – the times of the Great Rishi (IX-VI b.c.). Many of those views are presented in the texts of Wed (XIII b.c.) and Upanishad (VIII b.c.) (Szyszko-Bohusz, 1990). We may find there some information about the World being materially homogenous and the Universe – immortal, though constantly changing: „All the matter world is an entity in its deepest essence. The reason for this being [...] primitive matter. [...] (primitive matter) is the only thing [...] immortal and ubiquotous[1]. [...] Primitive matter is subtle [...]. The visible world is fleeting and what we see as an act of rising and going by is only a manifestation and disappearance of the matter" (Frauwallner, 1990, pp. 328- 329, v. I).

Yet, both the texts of Wed and Upanishad belonged to very difficult ones to be commonly read. Therefore, another work (VI-II b.c.) *Bhagavad Gita* (Bhagavad-Gita) - „song of the blessed", „song of the Lord" (*bhagavat – blessed, gita – a song)* fulfilled that role. In 18 chapters of the song, Ardżuna – the hero – obtains some lessons from his friend Sri Krishna (his Divine Teacher), the incarnation of Vishnu (The Hindu Trinity – Brahma, Vishnu and Shiva).

In chapter XI of Bhagavad Gita *the Cosmic Form* of Krishna demonstrates its essence / creature as Cosmos:

Text 5: „The Supreme God said: My dear Arjuno, son of Prthy, look then at my wealth, hundreds and thousands of different divine and colorful forms".

Text 10-11: „Then Ardżma saw an icredible numer of lips and eyes, magnificient views In that Cosmic Being [...]. It was all wonderful, brightful, infinite and filled the endless space".

Text 16: „Our Lord of the Universe, Cosmic Form, I see in your body so many arms, abdomens, lips and eyes spread everywhere. And I see in you neither the end, the middle nor the beginning" (Bhagawad Gita as it is, 1986).

According to the newest reconstruction the principle should be interpreted as follows: *the Universe is infinite in time and space and endlessly diverse* (Rudnicki, 2002, p. 21). At the same time the pre–Hindu cosmological principle is not only the oldest one but also the oldest to assume the spacious and temporal (I would also add – material) infinity of the Universe. What is more that is the only principle which refers to the immanent feature of Nature – its diversity (endless diversity) which has been mentioned earlier. Quite on the contrary, the Universe seemed to be relatively little diverse in comparison to earth's structures, both the animate and inanimate ones (materials' diversity in comparison to quite primitive building material of stars).

The pre-Hindu cosmological principle came into being a few centuries before Christ and was discovered and formulated by the language of science by Polish authors in 1972. That is 14 years before bio-diversity was appreciated by ecologists (1986). It is quite significant how mostly debates on the farthest spaces of the Universe tell us much about man's closest environment!

It is difficult to foresee how influential the pre-Hindu principle will be to an application of cosmological models. It seems obvious that the earth's and universe's environment ought to be dealt as an inseparable entity governed by its own laws and sharing common features. I tried to prove it in a slightly different way when formulating *Gai-Uranos's hypothesis* (Korpikiewicz, 2002). The pre-Hindu principle then supports my considerations.

Apart from an ontological problem there is another – a cognitive one – notified by the *principle*'s discoverer: „[...] it is not possible to form a mathematical model of the Universe based on the pre-Hindu cosmological principle, as mathematics has never worked out the instruments to use the idea of infinitive diversity [...]. A Hindu Sage from before the millenniums would say to a contemporary cosmologist: the Universe is too complex to be described with equations from our primitive mathematics" (Rudnicki, 2002, p. 22).

4. Summary

The pre-Hindu cosmological principle, formulated by C. Rudnicki on the basis of Bagavadgita: „The Universe is infinite in time and space, and endlessly diverse" points to the basic characterisitic of the World: its spacious and temporal infinity, but also to a

new feature which has not been notified before. It demonstrates the endless diversity both in Cosmos and on the Earth. Such representation of immanent features of the Universe implies not only ontological and cognitive conclusions (Cosmos's diversity requires new mathematics which uses new concepts of infinite diversity) but also ethical ones, raising bio-diversity and the necessity to preserve it for the natural laws.

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