

Paper Title: The Religion Principle of our Cosmos – The Theory of Evolution and the Divine Action

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Abstract:

When physicists use the anthropic principle, it is usually the weak version they accept. The strong version, formulated in 1973 by Brandon Carter states “..that an intelligent observer in the cosmic evolution has to arise” and is mostly regarded as too speculative. Certainly, the strong version would be more credible, if a second independently formed type of life or intelligence in our cosmic neighborhood could be proved.

For an evolutionary based belief in creation, we propose the strong version of a religious principle for our universe is sufficient. It assumes that religious potentials are involved in the natural laws and cosmic parameters from the beginning and therefore, it demands the occurrence of religious creatures after a sufficient time of evolution, although the development is based on chaotic and random processes.

Teilhard de Chardin, who died 50 years ago, shortly before the anthropic principle was been proposed, already prophesied that intelligent and religious creatures are populating other galaxies. He based his prophecy on a radial energy in the evolution process, analogous to physicists of his time, who needed radial energy to explain the contradiction of the increasing order in evolution and the increasing disorder elsewhere, following the law of entropy. Nowadays, this can be explained from the excess of energy from the sun. A much better explanation for the evolutionary power Teilhard looked for is our current understanding of the anthropic principle and the detected fine-tuning in the laws of nature.

Evolutionary progress can be shown at least as the transfer between earlier stages of the evolutionary process, when parts of the material passes through a kind of bottle-neck and follow afterwards new characteristic laws (e.g. nuclear chemical, geochemical, biochemical, genetic and cultural laws). The stages represent higher types of information processing up to our present potential, on which the principles of the cosmic development and its origin can be investigated.

One can realize even structural limitations of the available information. Faith in god motivates us to learn more about the divine creator, but would end, if god were to become totally known. Also hope would end if the future were exactly known, and love would loose its typical excitement, when partners could look into the other's brain and determine their true feelings. With faith, hope and love as highest values of the Christian religion, their structural limitations are also essential for the realization of a religion principle.

With the installation of this principle, the creator also gave the impulse to an automatic cosmic system. At a minimum, when religious creatures appear in evolution, the creator

gets a potential and free partner, who can help to fulfill divine wishes, without directly violating natural laws and without god sacrificing his transcendence. The prophets of the Old Testament and Jesus Christ have shown us how to get connected to god and how this connection through prayer and religious belief can change the world.

Biography:

Dr. Gerd C. Weckwerth received diploma and PhD in Physics from the University of Mainz with feasibility studies of β - and β - γ -coincidence neutron activation analysis at the Cosmochemistry Division of the Max-Planck-Institute of Chemistry.

From 1990-93 he was co-author of the biggest German technology assessment study in manned space travel at the German Aerospace Establishment in Köln-Porz.

Since 1995 he has been a scientific co-worker and, since 2000, university lecturer at the institute of mineralogy and geochemistry (University of Cologne) with research projects in cosmo-, geo-, and environmental chemistry.

Since 1985 he has been a leader of a working group on 'Natural Science and Religious Belief' in an academic catholic society (KMF-ND) and since 2000 leader of the new society of public utility "Natural Science and Religious Believe e.V." In this function he gives lectures mainly at Catholic institutions of education throughout Germany.

Paper Text:

Today the theories of evolution and of an initial big bang are not any longer a direct attack on our Christian belief in creation. In turn recent findings of natural sciences yields even a better understanding of human religiosity. What are the cosmic conditions of the homo religiosus?

A recent result of the NASA in 2003 from measurements of the satellite WMAP is a calculated age of our cosmos of 13.7 ± 0.2 billion years. Most interesting is the new way and the reduced uncertainty, on which this has been calculated and the additional confirmation of our modern cosmological world-view based on the laws of nature, the theories of big bang and evolution. This new way was enabled by the discovery of the cosmic background radiation, which was found in 1965 during the examination of disturbing interferences of radio-wave transmissions, which soon afterwards were identified as the predicted afterglow of the big bang.

When first precise measurement of the background radiation with the satellite COBE in the early nineties found in the beginning no spatial variations, from which the distribution of cosmic matter in our present universe could have been developed, once again doubts about the interpretation came up. When now the recent measurements with 40 times more sensitivity enables an additional dating method of our cosmos and the result is fitting with the Hubble constant, which is measured from the cosmic dynamical development at the other end, the confirmation of the big bang model received from the background radiation is even strengthened.

The anthropic principle of the modern physics

Especially, the long time scales, on which the present cosmos has been developed based only on the laws of nature, puts the belief in creation on a severe test. Although, the modern exegesis has been smoothed away former contradictions, many believers keep an emotionally distance to the present world models of natural sciences and keep sceptical against their used methods.

Correct is that natural sciences are hardly suitable to examine the content of a faith. But, they are successful to examine corporeal organs, which are used to perceive this kind of content. The potential of human beings to believe religiously and to make their faith to the starting point of their actions is based mainly on their brains. Therefore, an important question of creation thinking is, how and under what conditions the necessary capacity of religious reflection and action could develop.

The classical creation doctrine assumes brains, which are not evolutionary developed, but directly given tools from the creator. The idea of creation got experienced to the people mainly because the surrounding world enables them to stay alive. The possibility to find food and all fulfilments of the necessities of life in the terrestrial (light, heat, air) and social (parents, friend) environment was explainable only with a creator in love to human beings. All tales about the creation have been pictures how god eliminates deficiencies and they describe his power, love and order establishing potentials. Symbol and visible sign of the divine order have been the daily spectacle at the sky with day and night, as well as the seasons, which was also believed to be made exclusively for the mankind (Lovell, 1983). To prevent themselves from any danger, it is necessary that all human beings strictly adjust their life to the divine order. The man orientated creation (classical anthropic principle) was the crucial basis of religious experience in all cultures. Often this was pressured to the background by man's own works like buildings, towns and social orders. But, from natural catastrophes, illnesses and death the people saw themselves always fixed to the divine power.

A chance to turn away from this concept of god arose first, when natural sciences presented with the evolution theory a new explanation, which before no one could think of: "not the surrounding world was constructed to fulfil the necessities of man, but human beings are adjusted in the frame work of evolution to the environmental conditions". Independent from the correctness this model of thinking gave reason to see the idea of creation as a historical error of a being, which has the tendency, to set himself into the centre and everything to be made for his sake. But, have been all types of religion only products of an anthropogenic wishful thinking? Is man in the model of evolution the product of a nature without will and aim?

To have a chance not to accept such a scenario, creationists believe in errors in parts of the evolution theory, which have been in science for long time outside of any doubt and discussion. How does a believe in creation look like, which on one hand takes the scientific observations into account and on the other hand sees nature not as competitive explanation, but for instance as a significant part of a creation plan?

Starting point of a general model on cosmic evolution is the theory of an initial big bang. This theory was based on a discovery of Edwin Hubble in the year 1929, that galaxies have linearly with their distance a growing red shift in their spectra. This is interpreted as a growing escape velocity, from which an initial compression of the total cosmic material can be calculated.

Beside the mentioned background radiation there was a second confirming discovery, that in contrast to heavy elements, the main part of helium has not been produced in stars. Therefore, this observed primary proportion of around 24% helium, would have been fused necessarily in the early 3-minute-phase of a big bang. The reason, why heavy elements like carbon and oxygen can not be produced during that early phase, is the high stability of the helium nucleus (=alpha particle). The connection of 2 helium nuclei is unstable and disintegrates into alpha particles in 10^{-17} seconds. First the con-

nection of three helium nuclei leads to carbon the crucial element of life. (Chown, 2004)

The British astrophysicist, Fred Hoyle, noticed in 1954, that the probability of a connection of three helium nuclei (triple-alpha-process) is also at the high density in the centre of red giant stars by far too small to explain the high proportion of heavy elements in the interstellar medium. Therefore, Hoyle predicted that the triple-alpha-process leads exactly into an excited level of carbon-12. In such cases a strong resonance of the cross section occurs, with up to one million times higher reaction probabilities. Later measurements at accelerators show, that this unlikely case is really fulfilled in the triple-alpha-process. The successful prediction gives evidence, that a sufficient amount of solid materials in our cosmos is dependent on this special physical coincidence.

The unusual way of deduction Hoyle took for his prediction is based on a strong believe in a cosmic evolution without any gaps in the general validity of the laws of nature. For such a fore cast it is crucial, that the relevant factors are all known and that nothing happens outside the laws of nature. Animated by the success of Hoyle's prediction the American physicist Robert H. Dicke formulated the so called anthropic principle as follows: "Since there are observers in this universe, it must have qualities, which admits the observer's existence". To make clear, that this principle can be calculate back not only from human beings, it was related to observers and their ability to reflect, what is in any case needed, to find and to use such a principle. Its idea is to use the products of the cosmic evolution to deduce retrospectively, specific events and requirements in the development (Breuer, 1981).

The feasibility of such kind of deductions is most likely at special points of compression in the evolution. The causal nexus of these points are partly not understood, but they are necessary steps for the further development, which can occur only at places with specific conditions. The big bang belongs to these points, but also supernova explosions, because without the ejection of the produced heavy elements, they would not have been available to form planetary systems. Further significant steps have been the accretion of a suitable terrestrial planet and some 100 million years later the first DNA-molecules from which the biological evolution could start. These steps are also called "bottle holes" of the evolution and they allow new kinds of development under so far not relevant rules, like those of biology after the first occurrence of life.

Evolution is not a chance

The anthropic principle gave rise to look for specifically necessary conditions of the cosmic evolution, namely on the local level of the terrestrial surrounding as well as on the global level of the universe, what means mainly the fine tuning of the universally valid laws of nature. For example, from Hoyle's prediction of the triple-alpha-process you can deduce a precisely necessary ratio of electromagnetic and strong interaction. Furthermore, the gravitational constant must be a factor $10^{40\pm 1}$ smaller than the constant of the strong interaction. With a 10^{41} smaller gravitational power supernova explosions would become very rare, so that the amount of heavy elements available in the free space is not sufficient to form new planetary systems. With a 10^{39} smaller gravitational power the lifespan of stars would be reduced by a factor of 100 and would be not sufficient for the evolution of intelligent brains. A third example is the cognition that human observers could not have occurred in a much younger or in a much older universe.

For many of the relevant local conditions you can give limits, in which the development of life is possible (e.g. distance to the sun, size of planet, kind of atmosphere).

Since our knowledge about frequency and structure of other solar systems is still very low and several requirements are still unknown, we cannot say how often a development of life in our cosmos really occurs. But, the astonishment that there is a suitable planet like the earth is kept in limits in view of the high number of stars ($\sim 10^{22}$) and potential planetary systems in our universe.

In total the relevance of up to 100 global and local conditions has been determined. It was found that in many cases these conditions are needed to be precisely close to that, how they are realized in the universe or how the planet earth has made them available. Although, we still do not know, why the laws of nature have specific forms, the high coincidence with the very restrictive necessities of evolution must have a reason. A chance as explanation would have been much too high, to be scientifically acceptable. Therefore only two other explanations remain:

1. Similar to the local level, where the high number of star systems gave evidence, why a suitable planet like the earth exists, a multi world theory has been outlined to explain the fine-tuning on the global level. This theory assumes the existence of a high number of universes with different laws of nature and cosmic parameters and our fine-tuned universe is selected because of our existence. Quantum mechanics and the theory of relativity gave at least an additional idea, that such parallel universes may be possible.
2. The “intelligent” design of our universe with the incredible possibilities of development could be explained today without the earlier assumption of external interventions, but with the fine-tuning of the laws of nature and cosmic parameters. Even more this extraordinary design needs an external intelligence. This could be identified with the primary intelligence religions ascribe to a creator.

Both assumptions could be correct commonly and both are not suitable as last explanations, because you can ask also, what are the causes of multi worlds or of a primary intelligence.

Compatible with the Christian believe in a creator?

Although, the model of a big bang is based only of very few indications, its basics are not very controversial among natural scientists. Also many Christian theologians agreed surprisingly fast with this model. Main reason should be, that our cosmos based on that model has a beginning and an end. At these points natural sciences reach borders of cognition, whose transcendence theologian want to reserve alone to faith.

On the other hand with the big bang and the following cosmic evolution arise a series of difficulties to the creation faith. Among these problems are especially, that the cosmos behaves according to this model like a fully automatic evolution machine, based on the laws of nature, which are assumed to be constant. Once initialized and started this machine runs on without help and corrections of its creator most probably without aim and sense. This idea corresponds more to the philosophic model of deism, which differs crucially from the belief in god, not only of Christianity, where a helping and accompanying god is assumed. What chance could such a view of god in a framework of cosmic evolution still have, in which nothing runs outside the laws of nature?

To answer such a question, it is necessary to get a clear idea about the role of the laws of nature in a modern way of believing in creation. This role cannot be in rivalry to divine action. On the contrary, since these laws are the most original property of the cosmos they might represent closest the divine action of creation. But, this action is outside of history and has no reference to any historical situation, in which human be-

ings come in. They can on one side rely on, that the laws of nature do not suddenly change and that firstly enables self-controlled human actions with responsibility. On the other side with the unrestricted validity of the laws of nature, the misery (e.g. of ill persons) is mercilessly continued.

Emergency situations in the animal world are managed always instinctively, that means in the framework of behavioural programs, which have been developed during the biological evolution. With the special sensibility on personal emergencies human beings are able to make use of a more creative form of mastering. On one side they are able to develop new ways out of emergencies and on the other side they can experience, how to receive help. Religious intercession and thanksgiving prayers express these potentials only given to human beings, to give and to get help. In the framework of most religions this talent of human beings obtains a divine dimension. That gets clear not only with statements like, "Help yourself, than god helps you", but especially with the personal experience, to be oneself a tool of god. In the Christianity this was taught among others in the theory of Thomas of Aquin about a god determined secondary initialized human action. Without rejecting actual cognitions of natural sciences, one can assume, that together with the brains of the creatures the potential to develop religions enables these creatures, to realize divine spirit in this cosmos. Divine work is possible with his in time active creatures namely, because it happens in their free personal decision.

The phenomenon of a "Homo religiosus" appears in the biological evolution firstly with the development of human beings and can be analyzed in relation to the necessary conditions with natural sciences. An important contribution to a modern belief in creation would be to find out, how strongly the laws of nature are fine-tuned especially in respect to the occurrence of religion. Indications in this direction would strengthen at least the believe, that the talent of religion has been intended with the evolution from the start. If this indicates the potential of divine action with human's help, it would be also a crucial step beyond deism. Such a view of god would be not any longer that of an inactive initiator. With the occurrence of human beings or a similar creature with religious talents god is enabled to act personal in history, how it is assumed in the framework of religions. The anthropic principle with its belief in a continuous evolution without gaps would be firstly compatible to a Christian belief in creation with this additional assumption on intended human talents.

The analysis of cosmic preconditions especially the laws of nature in relation to such a religion principle could be seen as a subdivision of the anthropic principle, but of a part, which has been in the previous research of almost no attention.

Finally, some first reflections to the cosmic preconditions of religion are given, drawing some lines in which a suitable scientifically research in future could go. It stays uncertain, whether this comes ever to testable forecasts in the developing process, e.g. during the research of the specific details in the hominization. Important is to notice, that the support of the belief in creation is not to look for gaps in the evolution, but in the closing of supposed gaps with the confirmation of subsequently predicted details.

Cosmic preconditions of religion

Among the different religions on earth there are beside many similarities in many respects divergent opinions in saying, what is specific of the phenomenon "religion". Even controversial is, whether religion is a useful characteristic talent at all. Some people have classified religion more as an illness or even as "opium of the

crowd”(Lenin). Independent from those classifications conditions can be specified, without those the phenomenon religion could not have been occurred at all.

As mentioned in the beginning, religious behaving is based on human brains. For the development of such an extensive collection and processing of information and at last the attaining of a sufficient intelligence an undisturbed evolution time of some billion years is needed. Since religion is a phenomenon of a highly developed organic life, all preconditions needed for such an organic life are also necessary for the evolution of religion. The focus in the following is lying on additional preconditions, which are additionally necessary for the ability of religion.

Today we believe that religion can be practised only with the freedom of action of intelligent individuals. This can be thought only in an open system, in which all actions are not completely determined from material interactions. In discussion is e.g., whether the offer of overlapping possibilities in the area of Heisenberg’s uncertainty firstly enables the influence of spiritual processes relative to a pure materially determined world. Besides this, a freedom of action needs probably the individual differentiation, like it is caused from random parts in the evolutionary developed genetic reproduction. It cannot be ruled out, that a creation, in which intelligent responsible creatures should come into existence, needs a cosmos of similar size and complexity as well as the duration and randomization of the evolution process, that formed our cosmos.

Religion is a phenomenon on earth, which is adjusted on individual persons. The basis of this personal human structure is an evolutionary developed internal cosmos of memorized pictures and independently running patterns of thoughts. Since intelligent observers could be imagined without individual person, sexual reproduction and social ways of life, it should analyzed, why they developed in the case of human beings with those especially for the ability of religion important qualities.

At last we look for possibly preconditions of three in the Christianity and several other religions highly significant values of religious action: hope, love and faith. All three aspects exist on one side, because a lot of information gives reason and motivation to establish them, but on the other side some crucial information is generally not available.

This is easily reasonable with the aspect **hope**. To get hope, you first need basic information, from extrapolations, that special wishes for the future have at least a minimum of probability to reach. But, if the future is already known, the specific feeling of hope cannot arise. To prevent that the capability of this aspect in religion would be doubtful or a temporary phenomenon, all methods of a direct inspection in a much later realized future should be impossible, generally.

In a similar way this is true for the phenomenon **love**. You need individual persons and mutually information, to motivate partners for love. Although, the wish for even more information about the partner arises from loving him, human beings and their surrounding cosmos are structured so, that a full knowledge of the partner, even with continuous effort is never possible. To keep alive that transcendental excitement, it would be necessary that last secrets remain always hidden to psychology and neurology and that the well-known ideas from the science-fiction literature on total telepathy and brain fusion never could be completely realized.

A special cosmic dimension is included in the structurally deficit of information, which is necessary to enable the **faith** in god. If the creator would has been known in all his features, nothing would remain to belief. In this case the transcendental excitement lies probably in the fact, that the creator’s existence is not provable at all.

A typical question in the framework of the religion principle would be: How a cosmos has to look like, that the existence of the creator for developing creatures remains not provable? Although such a question is rather speculative, some consequences seem to be reasonable: The beginning of the cosmos may not show any traces or features, which can be subsequently led back on a creator and there might not be any direct interventions of the creator in the cosmic evolution process, which can be proved later on. Everything that develops has to establish in consistence with the laws of nature and all provable cognitions of natural sciences should be explainable also on a non-religious way, e.g. the multi-worlds theory as explanation of the cosmic fine-tuning.

Even the faith, as an indirect with creature's derived method of divine intervention in the world's history might not provide any proofs for existence of a creator. This can be shown from the projection hypothesis of Feuerbach, which explains faith as the sum of human wishes and dreams without any real background. Such alternatives to faith, are crucial for its existence.

Effects on the Christian belief in creation

A specific belief in creation, which shows no reaction on the strong changes of our world-view since the time of the bible (mainly caused from natural sciences), becomes more and more unworldly and gets in danger with every contact to the real world outside. An antiquated, not any longer credibly explainable belief in creation can become a main reason for a decreasing faith and a problem of acceptance also for the entrance to the Christian message.

Therefore, it helps to reflect on the basic assumptions of the Christian belief in creation and to try to make them understandable as credible as possible in the actual world-view. Shortened to the urgent necessities it can be formulated: *A creator has wanted me and takes care of me.* In the framework of the presented religion principle this can be put in a more concrete form like: *A creator has wanted me as religiously qualified creature and has given me with this ability nearness to his spirit, what enables me, to be a tool of his protection and to receive it as well.*

The development of the phenomenon religion cannot be explained on the way of classical determinism, but, if at all, in the framework of an evolution that included coincidences and liberties. Such a strongly reduced assumption of creation, which defines only potentials, defuses the problem of theodicy. It enables with the design of evolution before all time a potential way of divine salvation and incarnation, like the Christian message proclaims it for Jesus Christ.

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