Concept of God in Natural Sciences

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Introduction

While checking the list of paper presenters it could not escape my attention that I might be the only representative of the Old Continent (i.e. Europe). More over - the only presenter who was brought up and educated in the former *socialistic country* where it was believed that every aspect of *Nature* and *Civilization* could eventually be explained based on *scientific approach*. In this respect *God* as well as *religion* was put aside and regarded as an unnecessary relict of the past - to become only a chapter in the history books.

As a matter of short introduction let me say that several decades ago, as a student of perhaps the most difficult *Faculty of Nuclear Sciences and Physical Engineering* of the Czech Technical University in Prague, I adopted a particular way how to interact with the opposite sex while looking for someone who could be close to mine line of reasoning by asking the girl if she would be able to convince me about her *real existence*, i.e. that she was not just a mere product of my *vivid imagination*. This simple approach worked as a very efficient filter indeed. Majority of those I asked labeled me as crazy. Only very few of them were ready to cooperate for various reasons. None of those, however, could actually grasp the potential depth of the subject. Their minds kept inevitably drifting to more practical activities. Thus, having been left alone in the dark, I had enough time to thing about number of interesting topics. And I feel honored to be given the chance to share some outputs of that reasoning with you today, during my very first visit to Japan.

As all of you know there are two approaches in offering answer to the most intriguing question of all: how we, people, as well as the planet we are living on, came to its existence. One answer is provided by the *theory of evolution*, the other comes from the *theory of intelligent design*. These two lines of thinking are on the first sight *contradictory* and as such they make their passionate supporters to dislike each other. My life experience made me to realize that people defending two *antagonistic standpoints* are usually much better approachable if some *workable compromise* can be offered to agree upon by both sides. As we are all gathered here under the umbrella of *unificationism* I shall try to use the opportunity to make a *daring attempt* in building a possible bridge between both of these camps while taking as scientific approach as I am able to apply.

First of all let us put forward some basic facts. For those educated in physics deeply enough there was (and still is) one *fundamental problem* to deal with - the *energy conservation law* which applies to *closed systems*. According to this law *energy cannot be created* – only *transformed* to another form. And when we shall regard the whole Universe as such closed system we are facing the ultimate challenge – how to explain *where the whole energy of the Universe initially came from*. Once having the energy available we can play

with it the infinite number of ways. It is exactly that kind of energy Rev. Moon is calling the *primary universal energy* in his *Devine Principle*. And it is *directly at this topic* where concepts of *Nature (science, evolution)* and *God (religion, intelligent design)* are closely connected.

As a scientist I am fully aware of the fact that the satisfactory answer about the *origin* of the energy of the Universe may never be found by us, mere mortals. Therefore, if its origin will be declared as a *product* of some *intelligent design*, I have no convincing arguments to prove such an idea wrong. I may express some doubts about such explanation by raising questions impossible to answer by scientifically acceptable way but that is about all science can do in this matter. Indeed, it would be a total waste of time to aim for anything beyond that. Much more interesting from the scientific point of view would be to look upon *possible consequences* of the very existence of such energy. In particular, it would be thrilling to study the potential forms such energy could gradually acquire based upon fundamental qualities it was created with.

I am fully convinced that these *fundamental qualities* are just the area where the *intelligent design* could play its decisive role. The rest would be left for the *evolution* to take care of. It seems to be very difficult to imagine how every movement of every individual elementary particle in the known Universe would be looked after by some higher intelligence like a shepherd caring about his herd. Therefore, the task left for *natural sciences* and *physics* in particular would be to provide some clues to our understanding *why* phenomena observable in our Universe *are as they are* even without any additional direct involvement of the *Designer*. In this respect I would like to share with you one such possible model of the Universe which I created already 30 years ago – just after my graduation – and which I am occasionally working upon ever since. This model is extremely *simple* (actually I could not come up with anything simpler than that) but surprisingly capable of explaining all major phenomena existing in our Universe (gravitational forces, inertial forces, curvature of space time, quantum mechanics, annihilation etc.).

1. Can the Universe be understood?

1.1 A short historic overview

The most fundamental question of all is the simplest one - WHY? In the history of mankind this question was raised countless times by many bright and inquisitive minds in their attempts to understand the surrounding reality - both *natural* as well as *social*. In *religious teaching* many answers are often provided as a result of acquired wisdom passed from the *founders* to their followers with a very limited chance to find the *real reasons* for any particular details of the teaching itself. There is simply no founder available to ask - with very few potential exceptions (like Rev. Moon). As a result of that one has to be satisfied with answers provided by interpreters (priests, rabbis, imams, etc.). And the teaching itself thus remains practically unchanged through the history.

The methodology adopted in *scientific approach*, on the contrary, allows for testing foundations of every theory at any particular time. And any new findings can play an important role in the body of accumulated scientific knowledge. In this respect let me provide some illustrative examples which will bring us eventually to the creation of one particular model of the Universe.

Through the history of mankind people had been fascinated by the *night sky*. Thousands of brighter or dimmer objects kept teasing minds of our ancestors. In particular, the objects which seemed to be changing their positions on the otherwise static background (planets versus stars). The real breakthrough in trying to understand these effects was started by *Nicolas Copernicus* and his *heliocentric* system. This was followed by measurements of *Tycho de Brahe* which he performed in Prague where he was later joined by *Johannes Kepler*. Based on these measurements Kepler managed to find his three famous laws governing movement of planets (known today as *Kepler's laws*). These laws were very nice examples of *experimentally obtained* (i.e. through observation) laws. Planets were behaving according to the laws and so these could be used to many *important predictions* (like determination of dates of *eclipses* etc.). However, nobody could provide the satisfying answer to the question WHY these laws assumed their particular form.

The answer to this question was eventually found by *Isaac Newtton* when he applied a newly developed mathematical apparatus (calculus) to his idea of *gravitational forces*. Suddenly it became clear that the Kepler's laws were simply a direct consequence of gravitational forces proposed by Newton. The role of experimentally obtained law thus shifted from Kepler's laws to the gravitational law (even if that remained to a certain degree a speculation confirmed rather indirectly through the derivation of Kepler's laws themselves). The question WHY thus accordingly moved towards the *gravitational law*. Why are two matters attracting each other? This became a new burning question.

Practically every physicist at certain time of his/her carrier was looking for the answer - which has not been found, yet. Many people wrongly assume that it was *Albert Einstein* who provided the answer in his *general theory of relativity.* This, however, was not the case. His theory describes the behaviour of the space-time continuum affected by the presence of matter. But tells nothing at all about the way *how* it is performed. So we have the mathematical description of gravitational forces but do not understand the *principles* of its functioning. Many models of the Universe have been proposed and studied (like e.g. the *super string theory*) but still without any conclusive results.

A very similar situation is faced by the *quantum mechanics*. There seems to be a mathematical apparatus describing reasonably well measurable reality but the foundations behind this reality are not really understood (e.g. the actual *physical origin* of *wave functions* and probabilities based on their modulus).

Therefore it seems that some *model of the Universe* which could provide an insight into the understanding of the reality might be very useful for further advancement of the research efforts. One such model will be now presented. It is quite simple but surprisingly providing.

1.2 The first attempt to explain gravitational forces

In this paragraph we shall try to explore some *straightforward* ways for explanation of the origin of *gravitational forces*. It should be noted in advance that this attempt will *fail*. However, as it is the most natural way to be followed by a newcomer, it needs to be included in our search.

Let us make a closer study of the *interaction* phenomenon between *two masses* (*A* and *B*) separated by a *certain distance*. It seems quite obvious that such interaction must be realized

by some *go-between* (or intermediary). Such go-between (whatever it is) has to have some *energy* associated with it. In the simplest model we might consider some intermediating particles being exchanged between these two masses. Like if two persons standing on a slippery surface (e.g. ice) would be exchanging reasonably heavy balls. Needless to say that it would be necessary for all these exchanging balls to find its safe way to the intended targets (otherwise the targets itself would start shrinking – regarding balls as their integral part).

Let us ignore for a moment the fact that both masses would have to posses a certain degree of *intelligence* (to be able to properly *aim*) as well as some *skills* (to be able to *throw* and *catch*). The most important output of such interaction would be the *resulting force*. According to our daily experience imbedded by science into the laws of physics we can quickly conclude that such force would be *repulsive* and *not attractive*. This finding is rather uncomfortable. However, let us presume for a while, that for some reasons (going beyond our experience) the resulting force would, after all, be the attractive one.

To further investigate this model let us introduce the third mass – *C*. If the attractive force existed between the *A* and *B*, it is only natural to assume that similar attractive force will exist also between *A* and *C* as well as *B* and *C*. Now, to make our virtual research a bit more complicated, let us bring the mass *C between* the *A* and *B* (i.e. having all three masses *on one line*). This particular arrangement needs a special attention. No problem seems to be created for the interaction between neighbouring masses (*A* and *C*, *C* and *B*). However, in the case of interaction between *A* and *B* (which have the *C* in between as an obstacle), the question arises, how the *A* and *B* will exchange their respective go-betweens.

One option might be that these go-betweens would find its way *outside* the *C*. This communication, however, could be made rather unlikely simply by extending the *C* in a perpendicular direction to the connecting line between *A* and *B*. To overcome such an obstacle and finding some way from *A* to *B* and vice versa well outside of the connecting direct line would require a great deal of sophistication which renders this option highly unlikely.

The only other option for the *A*-*B* interaction would assume that the respective go-betweens would have to *pass through* the *C*. This, however, requires the *C* to be able to *distinguish* what go-betweens are meant for *C* itself and what for the *A* or *B* (from the point of *C* just passing through). To be able to do so these go-betweens would have to be somehow *specific* for *every interacting pair* of masses. Taking into account the number of elementary particles in the Universe with specific communicators for every single pair it is becoming clear that neither this option can work.

As there is no other viable scenario to work with we have to accept the *failure of this approach* towards the explanation of gravitational forces. A completely new model is necessary to be proposed.

1.2 From the model of the vacuum to the model of gravitational forces

Having failed in our previous attempt to find an explanation for gravitational forces we have to start, so to say, from the scratch. And as there is nothing less fundamental than the *vacuum* we have to try to search for a meaningful model of the vacuum itself.

It is well known that when solution of Maxwell equations was found in the form of electromagnetic waves scientists felt the need for a suitable substance filling the vacuum which would allow for propagation of these newly found electromagnetic waves. They started to call the substance *ether* and regarded it as *static* in the *absolute space*. Later on, in connection with the famous experiment of Michelson, they were forced to give up the idea of ether. The vacuum thus regained its emptiness only to be gradually filled by all sorts of new ideas…

When I started my postgraduate studies (1977) and was looking for some suitable model which could explain gravitational forces, after having performed the analysis presented in the previous paragraph, it became clear to me that everything is closely connected with the model of the *vacuum* itself. The only alternative to the abandoned *static ether* was, quite naturally, the *dynamic* one. The fact that the static ether was not immediately replaced by the dynamic one at the beginning of the twentieth century was most likely due to the *pre-quantum* era. And even when this era came Einstein remained rather skeptical to the idea of energy quanta for the rest of his life.

Let us now briefly present the idea of the *dynamic ether*. As I used in my original work the term *universal energy*, I shall keep this terminology from now on. This might be also the right time to mention that when I became acquainted with the *Devine Principle* of Rev. *Sun Myung Moon* over 20 years later (1998) it was to my great satisfaction to find that he was actually using a very similar concept of the energy out of which the whole Universe was built and which he called the *primary universal energy*. At that very moment it became clear to me that he was a man of even deeper thinking than I initially was aware of. And ever since I could appreciate his work even more than before.

Let us now assume that in some system of reference (e.g. the room we are sitting in right now) the universal energy is coming *evenly from all directions*. This will be our model of *inertial system of reference*. We do not know anything about the *character* of this universal energy. It is the working secret of the Designer who brought it into existence. However, to be able to work with it, we can try to *speculate* about some of its attributes.

First of all we shall assume that this energy can be *structured* and represented by some *energy quanta*. I shall call them (in accordance with my original model) *gravitina* (plural). Gravitina are traveling through our inertial system *statistically randomly* – but *evenly* (when averaged over a certain period of time).

The first question we can consider would be the way *how they are traveling*.
There are two possible scenarios:
(i) their propagation is not influenced by the presence of any other gravitina,
(ii) while propagating they *feel* the other gravitina passing by through the same space.

Even if there is no direct proof supporting either the case *(i)* or *(ii)* the latter option seems to be more providing. The option *(i)* would actually mean that such gravitina could happily travel alone through a *completely empty space* (thus running lose). However, as these gravitina are creating a *backbone of the space itself*, they must be somehow connected to it. And the only way for them would be by their *mutual interaction*. As an immediate consequence the average gravitino path in the *inertial system* would be a *straight line* (receiving, due to the assumed symmetry, the same amount of interactions from every perpendicular direction).

Under the *vacuum* we shall understand such region of space in which these gravitina can propagate *freely* without any internal modifications or changes. If there would be nothing but vacuum in the whole Universe such situation would be rather unfortunate. There would be certainly *no intelligent life* in it to be able to ask some inquisitive questions in order to understand the Universe it has been living in. Therefore the next natural step in building our model of the Universe would be to introduce some *disturbance* of the vacuum.

What could be the most *general model* of such *disturbance*? Well, the gravitina propagating through it must *feel it somehow differently* in comparison with the pure vacuum. Something simply *must happen* to these gravitina. But what could happen and how? Let us start by mentioning an obvious fact that whatever would happen to these gravitina *some time* would be needed for such a change to materialize. In this respect we could look at such disturbance as a place in space in which some *transformation* of original gravitina would occur. It could be looked upon as a process of *absorption* and a subsequent *emission*.

If the process of interaction of the gravitino with the disturbance would result in the same gravitino there would be *no way* how to feel a presence of such disturbance from any part of the Universe. Therefore, a *change* of some gravitino characteristics must take place. What characteristics could be considered? *(i)* energy, *(ii)* impulse, *(iii)* spiraling.

If there would be any *net change of gravitino energy* the disturbance would have to gradually either accumulate the energy or keep losing it. This would be detrimental from the point of *stability* of the disturbance. Taking into consideration that such disturbance with the amount of simultaneously converting gravitina would in fact represent an *elementary particle* some stability could certainly be desirable. If there would be no net change of gravitino energy the absolute value of the *impulse* would also remain the same. Therefore the first possible real candidate for any change might be the *spiraling*. If the gravitina would have one type of spiraling (e.g. clockwise with respect to the direction of propagation) the *angular momentum* brought into the disturbance from two counter-propagating gravitina would be zero. For the same reason two gravitina with the counter-clockwise spiraling emitted in opposite direction would leave the zero net angular momentum to the disturbance. For the sake of simplicity let us call the gravitina absorbed by the disturbance as *alpha* and those emitted as *beta*.

We are now coming very close to the explanation of *gravitational forces*. Let us suppose that the disturbance can react with the *alpha* gravitina only. In principle, it would be enough if there would be only some *small difference* in sensitivity between reaction with alpha and beta. However, for the sake of simplicity we shall assume that it reacts only with the *alphas*. So the process of interaction is the following one: the *alpha* is *absorbed, converted* into *beta* and subsequently *emitted*. The question remains about the relation between *directions* of the absorption and emission. If the direction of the emission would be the *exact continuation* of the path from which the absorbed gravitino arrived there would be zero net impulse passed to the disturbance. Under such conditions there would be no way how to realize the resulting non-zero impulse and thus to generate some *force* on the disturbance. Fortunately it seems to be quite likely that the disturbance will during the process of transformation “forget” about the original direction from which the absorbed gravitino arrived. Therefore, the angles of the emitted gravitina will follow some *statistics* and thus the *non-zero resulting force* is, in principle, possible.

If the disturbance would be the only one in our inertial system there would be a complete symmetry in directions from which the absorbed gravitina would arrive. Therefore, the zero net force would be created. The disturbance itself would also look like a *point source of beta*. However, if there would be *another disturbance* present in our inertial system, this disturbance would feel from the direction of the first disturbance a *smaller intensity of alphas* (as some portion of alphas was transformed into beta). As a result of this asymmetry the *net non-zero impulse* would be felt by the second disturbance *in the direction of the first one*. The same would be true for the first disturbance. This way the *mechanism of gravitational attraction* comes up quite *naturally* without relying on any intelligence of the disturbances under consideration.

1.3 Further consequences of the model of the vacuum

In the previous subsection we were able to demonstrate beyond any doubts that the simplest possible model of the vacuum will result in gravitational forces. This certainly was a very encouraging discovery which holds without any need for some additional support of the Designer. Moreover, based on the model above, it is possible to derive the *exact mathematical form of the Newton gravitational law*. The gravitational forces thus *ceased to be a mystery*. On the contrary, we have shown that it simply *cannot be any other way*.

As a byproduct of our model of the vacuum we were also able to realize what actually needs to be understood under the term of an *elementary particle* (or the matter as such). It simply is the disturbance on the vacuum in which the *permanent transformations* of the alpha gravitina into the beta ones are taking place.

Looking closer to the acts of absorption and emission for a given disturbance of the vacuum (which are certainly governed by a statistical approach) it is becoming clear that the center of gravity is *permanently fluctuating* around its equilibrium position. And due to the statistical character of the interaction it is *not possible* to predict its *instantaneous position exactly* - only with some *probability*. This uncertainty is much larger for disturbances with lower number of simultaneously transforming gravitina as for lighter particles any individual act of absorption or emission has much bigger influence. This is in a complete correspondence with predictions of the *quantum mechanics* - a lighter particle will have its wave function spread over much large area. Once again our model of the vacuum provided results which are not only in the *complete accordance* with the *official science*, but unlike the official science they are capable of providing a very *simple* and *convincing explanation* of the underlying *mechanisms* as well.

And this is not all. Using the same and easy way it can be shown that the *curvature of space* in the vicinity of large masses is nothing mysterious, either. On the contrary, it is very natural and *cannot be otherwise*. This conclusion comes directly from the way how gravitina are propagating through the background of the universal energy. In the vicinity of large masses they experience more interactions with gravitina coming towards the matter than coming out of the matter. As a result of that their path must be *curved towards the matter*.

Using the model of the vacuum it is also very easy to demonstrate the origin of *inertial forces*. When is the disturbance (particle) experiencing some *acceleration*, the statistics between the angles of absorbed and emitted gravitina is getting changed accordingly (the acts of absorption and subsequent emission are taking place in different inertial systems – due to

the change of velocity of the particle acquired during the time needed for the conversion from alpha to beta).

Another result coming from the model of the vacuum: it is possible to show that the amount of gravitina which are undergoing the conversion while propagation through the disturbance region is a *very tiny fraction* of all. If it would not be so only the *cross-section* of any matter would be important and not its *volume*. This effect is typical e.g. for the neutrina which can easily penetrate the matter. And which differ by the clockwise and anti-clockwise spiraling.

Also, the effect of *annihilation* can be explained quite easily based on the studied model of the Universe. In this case the *particle* (disturbance converting alpha to beta) and *antiparticle* (disturbance converting beta to alpha) would come to a *direct contact* and due to their *mutual symmetry* they would *negate their disturbing effects*. The energy of simultaneously converting gravitina (alpha and beta) would then be released in the form of pure energy. This provides some insight into how the electromagnetic energy could be looked upon - as some combination of *alphas* and *betas* which would be necessary in providing both *attractive* as well as *repulsive* forces among *electric charges* (more detailed studies of this aspect are still needed).

Conclusions

In my presentation I offered one particular explanation how two seemingly contradicting theories – *evolution* and *intelligent design* – could happily live side by side covering different historical era of our Universe. The *intelligent design* would be responsible for bringing into existence the *primary energy of the Universe* with its *particular properties*. The rest would be left for the *evolution* to take care of. With our very simple model of the Universe we were able to demonstrate how the *basic features of our reality* can be *easily explained* as a *direct result* of the *primary universal energy natural behaviour*. My initial intention was to go in my talk beyond this level into the arena of *living matter* and *Civilization* to provide some insight into the understanding of the *Civilization development*. However, due to the limited presentation time this part will have to be left for some other occasion. Thank you very much for your kind patience.