Downfall of Dialog
Between Theologians and Scientists?

Eugene Kindler

Abstract

The paper concerns a certain view on God, which declares to be based on the modern science and which is very different from what the classical philosophy and Christian religion tell on God. Nevertheless, the pieces of knowledge that are taken as premises contradict to what the modern science – namely physics – knows and states. An astonishing fact is that the contradicting pieces of knowledge are stated by a renowned astronomer and priest. The paper is completed by an outline of the discussion that followed and that – together with the mentioned paper – illustrates the deep downfall of the present dialog between the scientists and the theologians and the exigency of knowing traditional philosophical concepts.

Keywords: theory of relativity, uncertainty principle, God, natural sciences, philosophy

1. Introduction

1.1. What a Catholic Scientist Said

In Czech Republic exists an organization called “Czech Christian Academy”, which declares its mission as contributing to the development of science, art and education. This organization proclaims itself as being opened to the Christians of all churches and to all who feel being responsible for application of Christian culture and moral values in the society. It publishes a journal “Universum”, adding a mention that the authors are responsible for their contributions and their view needs not express the standpoint of the Czech Christian Academy.
In the winter 2001 issue of the journal, an article was published under the title that can be translated into English as “What did God know?” [1]; the author George V. Coyne was presented as the director of Vatican observatory. In the journal, no mention existed on the origin of the paper, but later there were references about this topic in two other articles [2], which gave an impression that the article might be translated from its German version published in the magazine “Der Spiegel” [3].

The longest part of the article was a description of the evolution of the Earth and the biological life and then certain conclusions were presented. Let us express them in English (using American term billion for a thousand of millions) in the next paragraphs numerated by 1.1.2 – 1.1.4:

1.1.1. If we take the results of modern science seriously into account, it is difficult to think that God is almighty and omniscient in the sense of the scholastic philosophers. The science tells us about God who must be very different from God how the medieval philosophers and theologians saw him.

1.1.2. For example, would God have been able to forecast after one billion of years of the existence of the universe (which is nowadays 15 billions years old) that the human life would come into being? Let us base on that God would have known the “universal theory”, all laws of physics and all elementary forces. Even then: would the God have been able to know for a certain that human would come into being?

1.1.3. If we accept the really scientific point of view, that beside the deterministic processes there exist also random ones, to which the Universe affords immense occasions, then it looks like even the God would not have been able to know the result. God isn’t able to know what is impossible to be known.

1.1.4. But it is no limitation of God. On the contrary. God appears to us, who created Universe in that a certain dynamics takes effect and which by this means takes part at the divine creative act. As far as the believers respect the results of the modern sciences, they have to keep a distance from the notion on “a dictatorial God”, i.e. Newton’s God, who created Universe as a clock-work that does not cease regularly to go.
We can see that the author of the mentioned article presented his notions on God as a rooting in the pieces of knowledge given by (natural) science. Therefore, discussing with the ideas expressed in 1.1.1 – 1.1.4, let us set the philosophical questions on the God’s existence by and – similarly – let us neglect the theological questions that could be asked by those who would accept both the God’s existence and the properties assigned him in [1] (e.g. how could we accept God as a righteous judge who sends any person in the eternal bliss or eternal suffering, since he was not able to predict whether anybody will exist?). Let us only concentrate on a certain idea of God, which could be even comprehended independently of whether God exists or not; let us namely concentrate on the idea of God who is independent of space and gravitation, and whose cognition ability is infinite.

1.2. Some Principles of Science Reasoning

Nevertheless, it is necessary to remind some aspects of the scientific thinking, namely those very important in the modern scientific domains.

1.2.1. Certain modern scientific results appear very strange, often seemingly contradictory to common sense. That is well known e.g. from the theory of relativity or from the mathematics of infinite numbers, but many people could accept some discoveries of genetics, ecology, technology, computer science or astronomy with similar distrust. Therefore the statements like “It is evident that…”, “It may seem that…”, “It looks like…”, “It is difficult to accept (to think…) that…” etc. cannot be used as scientific argumentation (note that the scholastic philosophy and the Thomistic theology applied similar restrictions when they discussed with other philosophical streams and when they had exactly to study such themes like essence/existence, particular/general and certain Trinitarian, Christological and Ecclesiastical relations).

1.2.2. Although the results of a science might be difficult to be understood by ordinary persons (not professionally oriented
on the given scientific branch), they must be taken into account in the applications.

So neither the patients who accept a medicine nor the physicians who prescribe it need to know the chemical processes existing during the production of it; and neither the car drivers nor the car servicemen need to know (or even to solve) the partial differential equations describing the processes existing inside the motor cylinders. Similarly, a person who uses a tape recorder or a CD player does not need to know how the acoustic signal can be recorded (and then reproduced) by the help of magnetic or laser tools. It is common that the non-professionally oriented persons accept the products and the service with a certain believe (tested by methods that are outside the related scientific field), and the reason of that believe is that some good specialists designed certain aspects that are incomprehensible for the user. It would be stupid to replace the specialized explication by snake stories (e.g. those on ghosts dwelling inside car engines, tape recorders, CD-players or medical pills). The stimuli rooting in the nature and leading one to think about God are also applications of a science that studies the nature and should satisfy similar criteria.

1.2.3. The scientific branches had to develop their terminology. They have only limited possibilities to form new words and thus they must often use common words and give them specialized contents, which could be strange for those who are outside.

As examples, terms of topology may serve, like compact set, open set, closed set, closure, neighborhood, map, interior or covering. Or – in computer science – storage, memory, accumulator, network and register. Even the elementary and high school education has to apprise a lot of people with some of such words, like square, prefix, real number, force or fluid, cell or rodent. A specialist must know a lot of such words. On the other hand, a person who would like to establish a new scientific branch by a mere change of the contents of certain fixed terms of an existing branch would present himself as a dabbler (as an example, let us imagine someone who would like to cultivate the
computer science by interpret the word register as its is done by an organist or a ships insurance clerk).

2. Real Time and Idea of God

In the next consideration, let us omit such primitive ideas of God like an idea of an old man sitting on a cloud. In general, independently of supposing whether God exists or not, one can accept an idea on God, telling that if he exists he is a spiritual being. Let it be called $I_1$. In the present section, let us assume only a certain consequence of $I_1$, namely that if he exists he is not bound to a certain place in the space; let this idea be called $I_2$. Before analyzing the consequences of this idea, it would be suitable to remind some results obtained by physics since the end of the 19th century.

2.1. Time, Movement and Gravitation

The famous Michelson’s and Morley’s experiment (see e.g. [4] or [5]) revealed that the speed of the light is always constant with regard to any measurement: when an observer is moving in relation to another one and when both of them are measuring the same ray of light they get the same value of the light speed. However, this statement seems to be in a contradiction with the general law of composing of rates, but it appears real. Years later, certain possible logical consequences were derived. They seemed to be in a contradiction with some other traditional physical law. 1905 Albert Einstein brought them together into a logical system and concluded with the following statement: neither the mentioned experiment nor the logical consequences it implied are in contradiction: they describe a real physical world $R$, which is in a certain manner different from the conventional world $W$ supposed by the scientists until that time. $W$ is a good approximation of $R$ for rather small speeds of movements but it substantially differs in case such speeds are near that of light. It is known that some
elementary particles may reach such speeds and that such speeds exist in areas of the Universe, which are rather distant from us (galaxies, quasars,…). The specialists in the sciences which concern the macro-processes on Earth manage with \( W \) and these scientists do not need to turn to the properties of \( R \); but for the astronomers \( R \) should be as familiar as the multiplication table.

One of the important properties of \( R \) is that there is no absolute time in it: if two observers move one in regard to the other, each of them detects other flow of time. The greater is the speed of an observer regarding to the other the bigger is the difference of their time flows. In case the speed difference is near the speed of light the difference of the time flows is enormous.

The conclusions of Einstein on the reality of \( R \) are known under the name Special theory of relativity. The analysis of the uniform movement under the Michelson’s and Morley’s experiment is sufficient to derive them. In the next ten years that followed 1905, Einstein studied what could cause the analogous reasoning about the movement that is no uniform. His results are known under the title General theory of relativity. One of them says that gravitation is narrowly bound with the movement acceleration and with the time flow, too.

One can simply state that – according to the results of the modern physics – time, movement and gravitation are strictly mutually bound, a change of one of them causes a change of the other two and the absence of one of them presents the other two as nonsense. One can expect that even in case new results will modify the theories of relativity, the mutual contexture of these three factors will remain.

2.2. God, Space, Time and Gravitation

As we mentioned at the beginning of this section, let us now respect the only one idea on God, namely \( I2 \): he is not bound to any place of universe. In other words, it is meaningless to thing over God's position in the physical universe. It implies that it is meaningless to thing over God's physical movement in the universe (e.g. over his stand-still or speed relating to the Earth,
Sun, Galaxy, to a certain place at the Earth or at the Solar system etc.). But – independently of what tells theology, Bible, Christian tradition or faith – we do not need but the special theory of relativity to derive, that since it is meaningless to fix God to some physical movement it is also meaningless to bind God to some physical time.

Naturally, something similar can be derived on God by the help of the general theory of relativity, especially if we follow another God's property that is commonly accepted: his independence of the gravitation. The general theory of relativity tells the gravitation to be reasonably applicable only together with moving. Suppose a person would like to state that God was continually being bound to the whole period of about 15 billions of years during the development of the universe and of the biological processes at the Earth; then the same person would be obliged to accept that the same God has been bound to a certain place, e.g. to the place where the Earth or its neighborhood was (to be) placed. That is in contradiction with the God's independence of positioning. Moreover, the astrophysics offers factual examples how an immaterial observer could be released from the dependence of the Earth “tedious” time of billions of years: to be near the horizon of a black hole (see e.g. [5]); if one were there he could in several seconds watch what happened (and/or what will happen) e.g. at the Solar System during billions of years. Of course, a material observer, namely a human, who would dwell near a black hole could not convey his observations further, as gravitation would attract his body into the black hole and kill him. But an immaterial being is not so limited.

Thus the modern physics detects what the traditional philosophy and theology told and what is also expressed by saint Peter in his second letter (chapter 3, verse 8): “with the Lord one day is like a thousand years and a thousand years like one day” ([6], p.372, in Latin: Unus dies apud Dominum sicut mille anni, et mille anni sicut dies unus), or – in Psalm 90 according to Hebrew original – “A thousand years in your sight are as yeasterday, now that it is paste, or as a watch of the night” ([6], p. 662, verse 4, in Latin version – Psalm 89 according to Vulgata, verse 4 and 5 –
Mille anni ante oculos tuos tamquam dies hesterna que praetexerit, et custodia in nocte quae pro nihilo habentur eorum anni erunt). Such words needn’t express that one “divine” day would be like a thousand “human” years, but that all times are equivalent for God.

Anyone who accepts an idea of God as a reality supposes that God did not need to visit the neighbourhood of a black hole in order to learn on long future of the Earth; nevertheless, in line with the Coyne’s aim (what science tells us on God), it is physics that tells us that after one billion of years of the existence of the universe, God was not bound inside a time an wait during the next billions. Hence the statements expressed under 1.1.2 are against the statements of science. Even those who do not accept the God’s real existence can formulate a similar statement in conditional: if an immaterial God existed he would not have been limited so as in 1.1.2 was mentioned.

The opposite way of applying the results of physics can be applied, too. The idea of God bound to a flow of time implies that the same God is bound to a place in the space, i.e. it leads to paganism, to a god dwelling in a sacral grove, inside a volcano, at a mountain, etc.

3. Infinity and Idea of God

3.1. Notion of Infinity in Logic and Physics

In this section, let us neglect that God is not fixed at place/time and let us take another idea on God into account, namely that God is infinite. Although the notion of infinity was studied by the old philosophers it was very clearly elaborated by the mathematicians during the XIX and XX century. It was elaborated so clearly that even the pupils of high schools are supposed to understand it and to distinguish it from the notions like “very much” or “very great” (for example, they should consider that an abscissa of length 1 cm contains infinitely many points and not “very many” points). And during the initial courses,
the university students of exact sciences (mathematics, physics, astronomy etc.) receive serious knowledge not only on the notion of infinity but also on a certain classification of infinite sets. Let us quote what can be read at the University of Cambridge web sites [7]:

Georg Cantor (1845-1918): A German mathematician who, near the end of the 19th century, gave the first clear and consistent definition of an infinite set. He was the first to distinguish between denumerable and non-denumerable sets, showing that not all infinite sets are the same size.

Although a current astronomer’s opinion may be that the Universe, which could be experimentally studied, is finite, he understands the notion of infinity, because he was well instructed to understand the meaning of mathematical statements like “the set of natural (or real) numbers is infinite”. And, naturally, he needs to know about the notion of infinity when he considers the difference between the ideas that the Universe is infinite and that the Universe is finite.

3.2. God and Infinity

The students of high schools are supposed to know that there is an infinite number of real numbers between zero and any positive number, independently of the value of that number (one or one millionth, ...). It is possible to interpret that knowledge so that there can be an infinite number of steps performed during a certain non-zero time interval, e.g. during the time interval existing sometimes soon after the big bang.

During such an interval, a person with infinite capacity of thinking could perform infinite number of deductions; hence, after a small time such a person could deduce what will happen in any time after. Therefore – even if God were bound to some time flow – his infinite ability of deducing would be able to derive all about what will happen in the Universe during the next billions years (one must add: of the time to that he is bound). The scientific results on the infinite sets support the ideas that God is omniscient in the sense how the medieval philosophers and theologians saw
him. The same scientific results bear evidence that the statement 1.1.2 is not true.

3.2. The First Conclusion

We came to two ways how to recognize that for God there was “no problem” to know all what happens “after billions of years”. Both the ways are based on the scientific pieces of knowledge and not on the knowledge coming from Bible, from theology or from communications expressed by mystics. And each of them is based on its own piece of knowledge, independent from that of the other. Hence the statements of 1.1.2 are falsified by two different ways.

4. God and Uncertainty

4.1. Heisenberg’s Uncertainty Principle and its Consequences

Every measuring is a physical process. Therefore the measuring penetrates into what is to be measured, and changes it. W. Heisenberg elaborated that phenomenon exactly, receiving a so called uncertainty principle, which allows events that can be unpredictable by the science. The principle itself (e.g. [8]), formulated in 1927, concerned the impossibility to determine exactly the movement of particles; thus it is applicable for processes concerning very small objects, while its influence for material systems we habitually meet in our normal life are often negligible.

Nevertheless, studying the nonlinear systems (during approximately the last 50 years) discovered that rather small phenomena can provoke terribly large processes. The science oriented to those aspects is called theory of chaos [9], [10]. A popular term in this branch is “butterfly effect”, which characterizes a possibility that “a movement of a butterfly’s wings in Japan may cause a tornado in Texas”. Really, science shows
that a small event – may be that caused by an unpredictable movement of an elementary particle – can cause something that affects nations’ lives.

4.2. Uncertainty Principle and Immaterial Beings

Now let us return to the hypothesis I1. Theory of chaos together with the uncertainty principle tells that many events are unpredictable. The unpredictability figures as a notion of science on nature. The Heisenberg’s principle of uncertainty was derived from the fact that the material beings (humans) “spoil” the state of the measured system when being measure it. The same principle does not speak about the influences of – may be hypothetic or not – immaterial observers. If such an observer could predict the particle movements in the absolutely exact way and then derive the consequences of those movements he could exactly predict anything which can be caused by the nature. Clearly, such an observer would apply other than physical tools for his observing and measuring.

The material beings cannot do it and therefore they always measure and observe under the uncertainty principle. The beings able observing particles in exact way would have been immaterial (and – of course – intelligent). God is an example of such a being. Although his “monitoring” the Universe is far above such a practice, a conclusion does come, that according to the results of modern sciences the idea of God is not in contradiction against exact mastering of fluctuations existing in the nature. Statement 1.1.3 could appear true only for who apprehends God as something material, i.e. for persons who interpret God in a pagan manner (see the end of section 2.2).

Moreover, the same immaterial God can direct a particle in a certain manner so that it does not violate the statistical laws among the other particles but it causes the butterfly effect. This possibility witnesses that God can influence the world but does not need violating natural laws; in other words, it witnesses that the statements formulated by the medieval philosophers and theologians and speaking on God as on an almighty being, agree
with modern science. Thus the same results witness against the statement 1.1.1.

5. Newton and Dictatorial God

Text 1.1.4 concerns Isaac Newton and describes him as a representative of deistic philosophers and other scientists confessing a false idea of a God who at the beginning created Universe as an excellent clock-work which then operated without his interventions. Let us compare 1.1.4 with another text, occurring also in [1] (near the beginning of the paper):

For example Isaac Newton. He formulated the gravitational law and knew that any substance distributed in finite space necessarily in the end collapses by mutual attraction. And he also knew that the Universe does not collapse. He saw the reason in God hindering such a break down. And so he has got a proof of the God’s existence.

Evidently this text is in contradiction with 1.1.4. When considered from the view point of history, Newton is a rather complex phenomenon; during his life, his opinion corresponded to the statement presented just above while about 50 years after his death it was P. S. Laplace who elaborated theory of perturbations and discovered its consequence for Solar system stability. 1.1.4 would better correspond to Laplace than to Newton.

But let us return to 1.1.4. This texts is based upon a supposition that the negation of the sentence on the dictatorial God is a sentence presenting God as a “farmer” who makes something and then must wait a certain time to know the results. Classical logic tells us that there are many other sentences, which follow from the negation of the sentence presented in 1.1.4, i.e. which follow from the sentence “God is not dictatorial”. Among them, there are sentences derived by the old theologians and commonly confessed by the Christians: God is the Lord of Universe, who – though leaving freedom to the humans – reacts so that all what he wants is achieved.
6. Some Observations on the Discussion Following the Paper

Immediately in the same issue where [1] was published, three Czech specialists expressed their opinions. Their respect to the director of Vatican observatory – i.e. to an important scientific and catholic person – could be perceptible and thus only one of them, a specialist in meteorology and related branches expressed remarks that “reasoning about predictability is rightfully meaningful only in relation to a certain time scale” and “if one loses time consecution then the question of predictability loses any solid buttress”. Nevertheless, he expressed no mention that it is just the modern physics that makes such buttresses illusory. He wrote the paradigm of Universe is rather a flow of a mountain stream splinting in rapids, than a clockwork, and added that it would be absurd to endeavor after a mathematical describing the route of every chosen drop of water: the tendency of the stream is clear – to go low. One could say that such mode of thinking is true and inspiring but only as poetry, because all targets that both philosophy and science respect are neglected in it, especially if one takes into account what was achieved by the help of the power of computers e.g. in fractal models (or if one realizes that for many clock users living centuries ago the behavior of the gear system of clockwork could be similarly puzzling as for the present-day mountain tourist the behavior of stream water particles).

Another participant of the discussion, a specialist in nuclear fusion, did not discuss to the scientific aspects of [1] and his contribution was oriented to general questions of the relation between science and faith. He presented Coyne as “an astronomer with sufficient international reputation and with sufficient influence in the church” and did not forget to note that Coyne was one of the persons who had put through the Galilei’s rehabilitation. And then the same discussant presented a rather long comparison of Coyne and Polkinghorn [11]. One could watch aspects similar to those in many contemporary discussions
in the last years, which could be shortly expressed by phrases like “the Aristotelian attempt does not correspond to the today’s mode of thinking”, “the steep development of science demands to change our evaluation of the medieval philosophy”, or “beware not to repeat the Galileo’s process”. No mention can be read on Coyne’s errors against physics and mathematics. Nevertheless, independently of the scientific aspects, the discussant remarks that the God presented us by Coyne would be a sad God.

The third participant of the discussion was a philosopher strongly oriented to the relations between science and philosophy/theology. He formulated some questions that he called scrutinizing ones. Naturally, it is not possible to expect a philosopher to be familiar with sophisticated results of modern physics and therefore it is no wonder that those “scrutinizing” questions were purely philosophical, like “Why there is rather something than nothing?” or “What is truth?”. His tendency to turn the readers’ attention to more serious aspects can be appreciated, but in relation to the scientific errors used as foundations of the argumentation in [1], such a situation can be compared to a state of a philosopher discussing with a biologist who argues in favor of the evolution theory by stating that human is a descendant of a cow, because he has four stomachs: nowadays the philosophers do know that human has not four stomachs, but let us suppose the situation of a philosopher who does not know that (he could represent a present-day philosopher whose knowledge is far from the difficult statements of modern physics); such a situation would be much more difficult, than if the same philosopher would simply counterargument using a simple piece of knowledge that human has not four stomachs.

The finale of the discussion came one and half year after in [12]. The author of that contribution presented the process philosophy as a possible way out from the difficulties existing in relations between science and faith. Nothing that could witness on the advantage of the process philosophy was legible in [12], but the same paper offers an excellent illustration of monstrous errors existing in the “battle for surmounting the incompetence of the tight thinking that roots in the Aristotle’s philosophy and over
scholastics is applied by the theologians until the present days”; let us describe it.

The author of [12] agrees with the statements on the limitation of our understanding the God’s almightiness, expressed in [1] (see 1.1.1). He based his arguments on the facts like that God cannot make a rounded square. In the first lessons of the course of catholic religion the sentence “God is almighty” is explained as “God can do anything he wants” (therefore not “God can do anything” – the complement “he wants” is essential). That is a definition of a “professional” term used by people who speak on God (even who would speak against God), a definition comprehensible even for the children, which reflects the consequence of the “Aristotelian” fact (comprehensible for the philosophers) that God is not composed of parts. The argumentation in [12] illustrates the poor level of the “modern” philosophy that presents a chaos in terminology as freedom or new results. The argumentation in [12] belongs to a person completely ignoring the common rules of science mentioned in 1.2.3.

7. Conclusions

The reader of [1] does not need to be a high level specialist in astronomy, in order to be shocked by the author’s gaps in mathematics and physics, gaps concerning mathematical knowledge supposed for finishing first year university students of exacts sciences or technology or economics, and concerning physical knowledge supposed for any person graduated in physics and for many persons graduated in mathematics or in a branch of technology.

And the reader of [1] does not need to be a high level specialist in astronomy, in order to be shocked by the author's argumentation and application of the results of natural sciences to the questions that concern everyone. There is a lot of specialists in technology who can imagine a similar errors in applying results of physics e.g. for production, transport, medicine, modern
agriculture etc. The products would not function or would function with faults and the people would be injured and killed. The question arises, why such papers could appear.

When I met a collaborator of the author of [1] at a certain conference, I openly expressed wonder concerning the paper; the mentioned man explained me that the author of [1] professed a “certain different theology”. I asked him, whether the author did not profess also a “certain different physics”, but he did not understand my irony.

The only conclusion is that many Christian theologians and philosophers have forgotten (or even thrown out) many principles of rationality that were achieved during the long development of ancient and medieval development of Christian theology and philosophy and that were even more or less respected in the post-medieval philosophy. For the last fifty years, the hard situation of philosophy and theology consisted in great difficulties in deriving new serious results and it stimulated the Christian theologians and philosophers to reject the rational principles. Although that rejecting is often presented as new way of development and a step to freedom of thinking, it deprived philosophy and theology of rational argumentation (and communication as well) and turned them into branches of journalism. In parallel, natural sciences saved these principles, namely those applying mathematics; and the good rational principles overpass the frontiers of natural sciences, entering to new sciences like system science or computer science. Surprisingly, the science of computer models is slowly and stepwise coming to analogies (computer models) of the categories to that the philosophers won clear during old centuries (materia/forma, nominalism/realism, classification of causes, … [13], [14]).

Nowadays, the emergent influences of the science onto Christian theology and philosophy could be characterized as familiarizing them with the tools of rational principles, starting from the elementary ones. So the Christian theologians and philosophers should get lessons from the scientists that

7.1. one must clearly distinguish between mere whims on the future studies and the results well-founded by detailed
experiments and profound analysis, especially in case of the results that change some statements that have been considered true during a rather long time;

7.2. the concepts of infinity were studied (and even classified) by mathematicians using completely rational methods, and so they were applied in sciences on the physical world;

7.3. the humanities together with the natural sciences endeavor after modern interdisciplinary synthesis based on mathematics and computer modeling (including knowledge representation and system theories);

7.4. the terminology has to be defined as exactly as possible, not neglecting that sometimes two differently formulated definitions of the same concept can differ in their contents, contrary to that they may seem equivalent at first sight;

7.5. the historical development of a science is often different from the view of the present-day historians to the development of the same science and the trend of the historical development cannot be extrapolated for the future;

7.6. in the serious scientific journals and proceedings, certain principles of referencing the sources are respected.

The Christian theologians and philosophers should listen the scientists on what are the actual and fresh problems and results of their branches. The theologians and philosophers often adapt such information from their own colleagues and the result is that they try to contribute to something which is overcome or which appears in a substantially different context because of quite new discoveries.

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