

Explaining the universe

Wieslawa Lewandowska talks to Rev. Prof. Michal Heller, a theologian, physicist, mathematician and cosmologist, the 2008 Templeton Prize winner



Wieslawa Lewandowska: - When you were passionately involved in the studies of natural sciences just after you had completed the seminary, did you mean investigating the traces of God?

Rev. Prof. Michal Heller: - I have always thought that two things are important to me and to mankind: knowledge, which science gives, and a feeling of sense, which religion gives. I do not know which was first: to be a priest or my scientific passion. I suppose it must have been science as my first interest. I was keen on natural sciences and I owe my interest in sciences and passion for reading to my father. I think that these two vocations developed in a parallel way and not as separate vocations but as two fibres of the same material. As far as the ups and downs of my life are concerned I studied at the seminary first but during that time I got interested in natural sciences; I devoured books, especially on holiday, whatever I could find in the fields I was interested in. And then when I had new opportunities I began studying natural sciences since they have always been my passion.

- During your studies at the Catholic University of Lublin you dealt with a special theory of relativity and cosmology. What did this mysterious science have that it enchanted the young priest and scientist?

- I wrote my Master's thesis about the issues of interpreting the special theory of relativity. I have always been interested in astronomy, especially large-scale astronomy, i.e. the universe. It had a taste of metaphysical thrill and many scholars still feel it...

- ... not only young priests. When you studied at the Catholic University of Lublin cosmology was rather a new field of science.

- Indeed, when I began my studies cosmology was not a fully consolidated science. Even my professor of physics advised me not to pursue cosmology since it was not mature enough and it was based on feeble foundations and in his opinion these were rather discussions between different hypothetical models (then there were two main models), that it was a waste of time and it would be better to conduct research in other fields of physics. I did not obey him and it was a good move.

- Soon it occurred that cosmology was not that thrill of emotions but a serious scientific work. Your doctoral dissertation about 'concepts of consecutive models of universe', written in 1966, contained germs of the inflational model of universe, which was put forward almost 20 years later!

- When I began writing my doctoral thesis I chose a completely different subject. I do not remember exactly what it was... But one evening I had a revelation; I saw a certain idea for my doctor's thesis, which I called 'consecutive

models'. I wrote my dissertation very quickly, within 3-4 months. The work was well received. And when I look at it today I think that the idea was good but its realization was primitive...

- However, others saw innovative thoughts in it!

- I forgot my work myself but after years someone turned my attention to the fact that my doctoral dissertation included elements of the widely spread inflational model. And it actually did.

- What is the inflational model?

- It is a cosmological model created in the 1980s by Alan Guth, explaining some problems of the standard model of the universe, which had been unsolved. Just after the Big Bang, i.e. after fractions of a second, the expansion of the universe, because of certain physical processes, was rapidly accelerated and soon afterwards it slowed down to the normal tempo. This extraordinary acceleration, this moment of sudden expansion of the universe, is called inflation. And actually, my model of the 1960s presumed something similar. However, I would not like to be regarded as the precursor of the inflational model.

- Well, we have it in black and white, on pages written almost half a century ago!

- There is some little pattern from which one can read it but I did not pay much attention to it then. I have found out this relationship with the popular theory as if ex post.

- What is the connection between the contemporary cosmological models of the universe and the idea of God the Creator?

- There is no connection. The models usually describe some details of the cosmological evolution of the universe and that's all.

- And what about the biblical cosmology? Should we change the interpretation of the Scriptures if science denies the Scriptures?

- St Augustine said so. Speaking exactly: if we have some conflict between the biblical statement and the well-established knowledge we should change the interpretation of the Bible since it is never obvious. Each epoch has its own picture of the world. The picture of the world was different 2,000 years before Christ and different 200 years before Christ, a different one in the Middle Ages and a different one today. The Bible used the picture that was obligatory at the time of its creation. One should remember that.

- Some cosmologists say that we do not need God to explain the universe. Is there any room for God in the cosmological evolution?

- There is room for God but brutally theologically speaking, Lord God does not bother with the questions whether to create a stable world or an expanding one, whether to create it with an initial curiosity, whether to create one world or infinite number of worlds...it is all the same for Lord God but not for science since it must examine what it is.

- And for example it must pose the question: what was before the Big Bang? Did God exist or did God not exist?

- Such solutions still persist in scientific books but I oppose them from the theological point of view. Firstly, according to the most traditional Christian doctrine the creation of the world is not only the beginning of existence but it is a continuous process. According to the doctrine of the catechism creation is continuous. Making it simpler, it is a continuous giving life by Lord God to all universe, all creatures. If Lord God stopped giving life he would fall into nothingness himself. The world is also being created at the moment. St. Thomas found out, he even wrote a special little work about it entitled 'On the Eternity of the World', that one could imagine the universe that had no beginning and was being created by Lord God. Creation is a constant dependence and it does not matter whether it lasts a finite or infinite number of years. Therefore, identifying creation with the moment of the Explosion is unjustifiable. In the 17th century philosophy and theology had a concept that if science did not know something it placed Lord God there.

- Today we also speak about 'God who mends holes and fills the gaps' when we cannot explain some

issues.

- Today this biggest cosmological gap is our lack of knowledge about the beginning of our universe. The universe might have existed before the Big Bang or might not...Just in case we place Lord God in this gap. And this is a wrong doctrine.

- Wrong for Lord God and theologians?

- Exactly. Since there can be time for scientifically 'mending holes' and Lord God will be removed again, just one more time, to the margin. This has never been good.

- And yet, not only scientists like repeating the old question of Origen: what had God been doing before he created the world?

- St Augustine was the first to answer it but not the way he is often quoted: 'he was creating hell for those who ask silly questions.' He said the opposite, namely that some say maliciously that Lord God was creating hell but this is only an excuse since it is a deeply philosophical question. How to answer this question? Augustine says: time is something that is connected with the universe and Lord God exists outside of time; eternity is not existence in infinite time but existence outside of time. And if Lord God exists outside of time there are no breaks and the question 'what had he done before he created the world?' is senseless.

- **The dialogue between religion and science, faith and reason, has continued since the appearance of science. In the times of the Enlightenment and Positivism solid barriers were placed between faith and reason. The barriers were pulled down by post-modernism that dominates in the contemporary culture but the contradiction has remained.**

- I would not use the word 'contradiction', rather a conflict, tension. It is worth noticing that this conflict has existed since the very beginnings of religion and Christianity but as someone noticed rightly this conflict did not disturb religion and science and even after fierce clashes both parties were enriched. After the fall of Positivism in the 1970s one could undoubtedly see an increase in mutual interest of both parties. Furthermore, the interesting thing is that it is scientists that are more interested in theology than theologians that are interested in science. Naturally, there are also scientists whose attitudes are very aggressive.

- What is the reason for this surge of interest?

- Probably because Neo-positivism, like a big cap, covered all questions of possible discussion. Therefore, it was not polite to ask about certain things. And now you can ask. Moreover, contemporary physicists, especially theoreticians, are more open to mystery. Physicists see the world as big rationality and more as a thought than a machine and actually they cannot see the world as a machine at all...This provokes ultimate questions. The interesting thing is that one can see great interest in religious thought and theology in the post-communist countries. It is a way of abreacting.

- Why do theologians remain more silent in his dialogue? You propose to create a new theology. Does its mean that theology loses its ability to conduct a dialogue with science?

- In the 20th century theology was transformed to a considerable extent. The pre-counciliar theology was quite different than the post-counciliar one. The former was dominated by Thomism and Neo-Thomism. It was many a time accused of being scientific, that it wanted to prove religious truths the same way scientific truths were proven. The opposition began before Vatican Council II and after the Council theology was changed. And today it is not neo-thomistic; the discipline of Neo-Thomism was given up and theology has become a deepened reflection; it has come closer to the humanities but not to sciences...And even, I dare to say, theologians are not interested in hard sciences to the extent that they do not want to speak in the dialogue with these sciences.

- They do not feel competent enough?

- That's right. They feel they lack competence. The reason might have been that philosophy was removed too quickly. Thomism was removed or reduced to maximum without introducing something else. In the meantime, in the 20th century philosophy made a big progress, especially in working out certain analytical methods, philosophy of language, which would be very much needed in theology since theological language is an essential tool of dialogue. Based on my own experiences I can say that it is hard to find theologians who would not fear

participating in symposia organized within the framework of dialogue between theology and sciences, who would not fear discussing. And one sometimes speaks about the need of a new theology. We do not mean any revolution!

- Since it would be easy for a theologian to discuss with a mathematician if he were not Michal Heller! Mathematics has been your greatest passion for some time, hasn't it?

- Mathematics is not my new interest since I could not deal with cosmology and physics without it. Today these fields cannot exist without mathematics. If you want to learn physics or cosmology you should begin learning mathematics and never stop learning it. Mathematics develops very fast and requires constant exercise of the mind. And what has changed in my life is that with time I have been more and more fascinated with mathematics. I sometimes compare it to unreciprocated love: I love it but it gives me only poor scraps of what it is.

- Since it is great!

- Because it is great, because it is infinite.

- Lord God is said to be the biggest mathematician!

- If he is a mathematician he is surely the greatest one.

- Does it mean that mathematical structures exist in a more powerful way than matter?

- Long time ago Plato stated that the world of ideas was more real than the material reality. Modern physics in the 17th century was born from Platonism. Newton and Galileo were Platonists as many other modern physicists. Naturally, it is slightly different Platonism than the original one. But what does it mean that mathematical structures are stronger than matter? I will give an example. If two elementary particles collide with each other, producing a whole cascade of other particles we can describe it by some mathematical pattern, structure, and we are glad that some mathematical structure describes it well. We think so but in fact it is completely different. The mathematical structure is in a way presupposed and contains codified information and the particles do exactly what the structure contains. This mathematical structure is as if a programme according to which the universe acts. In this sense the universe is mathematical.

- 'Ostateczne wyjaśnienia wszechświata' [[The Ultimate Explanations of the Universe](#)] is the title of one of your books. Is contemporary science close to give the ultimate explanation of the universe?

- Please pay attention to the plural form 'explanations', which means that there are many explanations and not a single ultimate explanation. I think we will always be far from ultimate explanations in science. For instance, we can state that we will have the ultimate explanation of the universe based on the known laws of physics but then we will pose the question where the laws of physics came from... However, I think that the very fact there is a whole hierarchy of these ultimate explanations, more and more ultimate, tells us a lot about the reality.

- Are we discovering a bigger and bigger complication of reality?

- Maybe not a complication since in our language the word is associated with something wrong. Reality reveals itself as richer and richer, and not necessarily complicated since sometimes simplicity can be very rich.

- If the discovered reality seems incomprehensible man becomes smaller in it...

- Not necessarily. Man is perhaps even bigger, but bigger in a different way. After Copernicus' revolution it was assumed to speak that man is a meaningless detail in the universe and man was removed from his central position but today in many ways we ascribe to him some distinguished position again although in a completely different way. Today we have a special field of science, very mathematicised one, which says about structures being created. Structures undergo constant enrichment and enlargement. We already know that human brain is the richest and most complicated structure, richer than the whole universe. A single human brain is more complicated than the whole universe that will not contain the brain. And in this sense man occupies such an important position in the universe.

- Who are you most of all - a cosmologist, a physicist, a mathematician?

- An ordinary man.

See also

- [Hypothesis of ether, Automatically translated with http://translate.google.com](#)
 - [History of ether, Automatically translated with Google Translate](#)
-

Author: Wieslawa Lewandowska

Copied from: http://sunday.niedziela.pl/artukul.php?lg=gb&nr=200409&dz=spoleczenstwo&id_art=00089

Article downloaded from page [eioba.com](#)