

Lecture 1: The Limits of Natural Science and Theology

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S2. In this lecture I would like to focus on the question of the mutual relation between science and theology. Is science unlimited? Is theology unlimited? How much knowledge can they provide? My lecture consists of three parts: First, I will try to explain what human knowledge is and how it divides into three domains or levels. Secondly, I will recount a few tensions, or apparent conflicts between science and faith that occurred over the last two millennia of the Christian era. In the third part I will explain how the theory of biological macroevolution challenged the traditional Christian belief and trespassed the limits of science.

S3. Slide 3 represents the basic model of the human natural cognition. This model was adopted by many thinkers from Aristotle on. We see that it is based on the fundamental assumption that there is an external reality, which exists outside of and independently from our mind. This reality does not change according to the change of our mood or imagination or what we would like to be in reality. The outer reality is objective in this sense that our mind does not CREATE it but RECOGNIZES it. To know reality means to pair our mind with it. When our mind equals with reality (or when it reflects reality) we say that we possess truth, our knowledge about the universe is true. Hence classical thinkers used to say that truth is some adequation of mind and thing (*adaequatio rei et intellectus*). This adequation between mind and reality happens by mediation of the senses (vision, audition, smell, taste, touch). Our senses are capable of perceiving the outer reality and bringing the perception into our mind. Our mind, on its part, uses the perceptions to form general ideas (which are also called concepts or notions). This is symbolized by the arrows in the picture. Human knowledge resides in the intellect, it consists of universal concepts/ideas. Human knowledge is true when it matches the outer, objective reality.

S4. So far I mentioned only the visible reality and the natural knowledge about the universe. And what about the knowledge of God, the angels, the souls, demons and the entire INVISIBLE REALITY? We cannot perceive them through senses, because they are immaterial. We cannot see them, hear, touch or smell (although sometimes people have the grace of hearing God, seeing angels, or even smelling Satan, like when some saints smelled sulphur upon an encounter with the Devil). But these are not the usual ways of knowing spirits, these are rare exceptional events that cannot be repeated at our will. There is no experiment or repeated observation that could teach us about the invisible reality. Does it mean that God and spirits are completely unknown to us? No. We learn about them from the supernatural revelation. I mentioned the special graces, like the private revelations or experiences of the invisible realm. However, there are also objective sources of knowledge about the invisible. The first and most important is the Bible which is a form of special revelation, but a public one, that is directed to the entire Church. Then there are teachings of the Church, which, as we believe, are infallible thanks to the special assistance of the Holy Spirit. Thus, our knowledge can be objective and true regarding not just the visible realm (the material universe) but also the invisible realm (the Trinity, the angels, heaven and hell etc).

S5. Here I wanted to briefly present just three basic positions regarding the scope of the natural type of knowledge. NATURALISM claims that science (and by „science I mean „natural science”) can know everything. According to naturalism, the scientific method is unlimited. One consequence of naturalism is that there is no true knowledge outside of science. Whatever we know otherwise than by the scientific method is either completely subjective (is known

only to me, cannot be verified, everybody may have a different opinion on it) or irrelevant, or is just a matter of feelings (emotions) rather than reason.

MATERIALISM – All phenomena can be explained by reference to material causes, that is, whatever we observe in nature or culture, or in human behavior, all of it must be explainable by some physical (biological, chemical) process; there must be a material mechanism behind any phenomenon.

CHRISTIANITY is at odds with both naturalism and materialism. According to the Christian approach, some part of human knowledge comes from science which studies the material universe, but there is also some knowledge which is a true knowledge that is objective and certain, but it does not come from studying nature, but from the supernatural revelation. This knowledge is not based on the scientific evidence (like the natural knowledge) but on faith.

S6. Now I will talk a little bit about the nature of the three domains of knowledge – science (in the sense of natural science), philosophy and theology. What is science? It is some kind of a search for truth. Although it may sound strange to us today but it is true that science is a search for truth. If we knew that none of the scientific claims were true nobody would care about science. Instead we see that science entertains a great deal of authority not just in academia, but even in people's ordinary life. The reason is that science provides practical answers. In our times we are all a little bit too practical. We want knowledge that makes our life easier, that gives us solutions to practical questions or at least satisfies our curiosity. Science looks for particular causes of particular things. Surely, scientific theories are somewhat general, but they are not nearly as general or universal as the theological or philosophical claims. Moreover, science is focused on the material universe alone. It operates as if nothing but matter and energy existed (sometimes information is included too, as a factor building the universe, but this is another topic, which will be discussed by other speakers). Since science busy itself with nature it looks for – what we call in philosophy – material and efficient causes. This means that it is not so much concerned with the NATURE of the things (i.e., what they are, in the deepest sense), but with the OPERATION of the things (how they work together, what is caused by what in a material sense). The method of the natural sciences is observation and experiment. These methods (in contrast to the methods in philosophy and theology) are repetitive and well defined. In a sense, science takes a piece of nature to the laboratory in order to dissect it and draw more general conclusions about the particulars.

S7. What is philosophy? Philosophy means „the love of wisdom“. Wisdom is the knowledge of the deepest causes. This is why philosophy is a search of wisdom, because in philosophy we try to reach beyond and behind what is easily seen through senses. I said that science looks for particular causes of particular things. In contrast philosophy looks for one principle of everything. Ancient Greeks called it ARCHE (the arch) that is the Absolute, the first and the ultimate cause of everything. So philosophy reaches further and deeper than natural science. It speaks about all being, everything that exists, including the invisible universe. Unlike science, philosophy is not limited to nature. On the contrary it searches for those things that are supernatural. The method of philosophy is the use of natural reason that operates on basic truths and the principles of reasoning to draw more general conclusions about the entire reality.

An example of a philosophical reasoning may be the cosmological argument for the existence of God. It may be presented in the following shortened form: Whatever begins to exist has a cause; the universe began to exist; therefore: The universe has a cause. Then based on further reasoning we can conclude that the being that caused the universe to exist is one omnipotent and immaterial being who we call God. I am not presenting this reasoning as a complete philosophical argument. I am just showing how beginning with natural (pre-scientific)

observation of nature and the application of the first principles of reasoning and logic philosophy can make arguments and gain new knowledge.

S8. Finally we have theology. Theology is the „science of God” (this is what the word means). Unlike science and similarly to philosophy it reaches the ultimate reality, who is God. It also speaks about the origin and ultimate destination of man, the material universe and the angels. It differs from both science and philosophy in that the source of its knowledge is the supernatural revelation. So, the principles of theology are based on faith. We take the revelation as the principle, because we trust that what God tells us is true. Theology accepts the authority of God and gains new knowledge by building its conclusions on what God revealed. Of course, theology uses also natural reason; it is not just the faith. Fideism – an exclusion of reason from faith is not a Christian attitude. Does the fact that theology is based on faith mean that it is a weaker form of knowledge? No. It just requires a different cognitive attitude. Once you believe in God you understand that what He reveals is more certain than what you can learn on your own.

S9. A little summary of what has been said.

Theology – supernatural knowledge about God or the universe

Philosophy – natural knowledge about God or the universe

Science – natural knowledge about the universe

S10. We can transform it into a graph which shows the mutual relations between the three levels of human knowledge. On the left we have God and the invisible reality, on the right there is the visible reality. In the middle there is the human mind which contains knowledge from the three levels. The arrows marked with “t” signify truth that equals the mind with reality. We see that each level of knowledge produces its own truth about the invisible and the visible reality. An example of “t1” is the classic theological statement “God is a Trinity”. An example of a typical scientific statement about the material universe “t4” is saying something like: “gravity pulls all bodies towards the center of the earth”.

We could multiply examples of the true statements from each level. But I would like to focus here just on “t2” and “t5” because these are more controversial. Can theology speak (or discover truth) about the natural world? Can science speak about God?

Let’s take on “t2”. Are there any theological statements about the natural world that are true? YES. In fact there are many such statements. For example, how do we explain the miracles? They happen in the material universe, but they do not have a material (i.e., scientific) explanation. For example, we explain the multiplication of bread by recourse to divine causality, we say that omnipotent God multiplied matter of bread and by doing so He fed the crowd. Another examples are statements such as: the universe will end with the return of Christ. The universe will be recreated into a New Jerusalem. The human soul is called to salvation. In the Eucharist bread becomes substantially the body of Christ and wine becomes his blood. Also all statements about the origin of the universe: God created the universe out of nothing. God created plants and animals. God molded man from the slime of the earth and woman from the rib of Adam. These are all theological statements about the material universe, which are true. According to naturalism there is no supernatural (or non-scientific) knowledge about the universe. Therefore an exclusion of “t2” is called naturalism.

What about “t5”. Can science speak about God? NO. In principle science cannot speak about God or the invisible. The immaterial soul, spirits, God and miracles are outside of the scope of science. Science cannot explain how they happen or operate. Science can only make some negative statements. For example, when a miracle happens, scientists say “according to the current knowledge, we don’t know how bread was multiplied, or how cancer disappeared

from the infected body”. Scientists cannot say it was a miracle, because miracle is not a material explanation. Similarly, they cannot say anything about God because God is invisible, they cannot measure him, put under a test, take to the laboratory, perform any experiments. The invisible reality evades any method of science. The same applies to the origin of the universe and the origin of species. For example, scientists can say we know there were no dinosaurs then they appear in the fossil record. So they started to exist, but we don’t know how. This event is inexplicable in scientific terms. An attempt to make scientific statement about the invisible events is another form of naturalism.

S11. What is the relation between the different levels of knowledge? They are not entirely separated (as is clear from what has been said) but they also should not be confused. The Christian approach is that natural and supernatural knowledge are like two books that are neither mixed nor isolated. They must be completely compatible. We gain a full knowledge about God and the universe by studying both books. One should not therefore dismiss science in favor of theology, nor theology in favor of science. The Fifth Lateran Council teaches: “Since truth cannot contradict truth, we define that every statement contrary to the enlightened truth of the faith is totally false and we strictly forbid teaching otherwise to be permitted”. This is called the theory of ONE TRUTH. It means that one cannot say that there is some true knowledge in philosophy and science that contradicts some theological truth. In case of an apparent conflict between a scientific claim and the religious claim either science or theology has been misunderstood and needs to be reexamined.

S12. By now I have presented different levels of knowledge and how they relate to each other. I also showed the need of compatibility between the three types of knowledge: the scientific, the philosophical and the theological. In this second part I will show how science and religion worked together in the Christian era. I will begin with presenting several scientific claims that apparently challenged Christianity.

S13. First is the shape of the earth. It is believed that primitive people thought that the earth was flat. (Whether all of them actually believed it or not is a question for another discussion). Here I would like to debunk a common myth that only modern discoveries made us think of the earth as a globe. In fact already in Antiquity people discovered that the earth must be spherical. So at least from the ancient times, at least the educated people were aware of the spherical shape of the earth. [Possibly add here the examples of a ship disappearing behind the horizon, the shape of the shadow of the earth on the moon during an eclipse]. As early as the 2nd century a Greek mathematician, Erathostenes calculated the circumference of the Earth at 44,100 km (currently it is established at 40,075 km), so he was just about 10% off. (Very accurate estimation given the primitive technique he used). Obviously, had he believed in flat earth he wouldn’t calculate the circumference of the earth.

S14. Does the Bible teach a flat earth? Or does it teach a spherical earth? In the picture we see the Biblical cosmos. This is the vision of the universe according to the most natural reading of the text. This is how the ancient Jews probably imagined the world. We see a flat earth that sits on the columns. There is also the firmament with the fixed stars. There is the Sheol down below and Heaven above the sky. Some creationists (those who approach the Bible as if it was a natural science textbook) claim that in fact the Bible teaches the opposite, namely that the earth is spherical not flat. There are several instances in the Old Testament when the Bible speaks about the earth in terms of a circle. One notable quote is found in Isaiah 40:22: “It is he who sits above the circle of the earth, and its inhabitants are like grasshoppers”. Mind, however, that a circle is not the same as a globe or a sphere. This fragment does not clearly states that

the earth is spherical. There is no such clear statement in the Scripture. The Bible is compatible with both the flat and the spherical earth simply because it is not in the interest of the Holy Writ to explain the shape, the size, or the position of the earth in the universe.

S15. The next case of an apparent conflict between the Bible and science is the 16th and 17th century dispute over geocentrism. Ancient and medieval people imagined that the earth is immobile and sits still in the center of the planetary system. All planets and the Sun rotate around the earth. But Copernicus and later Galileo proposed the new model according to which the Sun is in the center whereas the earth circulates around the Sun. This new model is called heliocentric. When the heliocentric model was proposed some churchmen believed it was contrary to the Bible. (They quoted specifically two fragments: Psalm 104:5: “The Lord set the earth on its foundations; it can never be moved” and Ecclesiastes: “And the sun rises and sets and returns to its place”). This even led to the condemnation of Galileo for teaching the heliocentric model as a fact. But today I don’t think that any serious Christian has any problem with the Bible in the context of the heliocentric model of the Solar System. It’s widely accepted that the Bible does not teach either geocentrism or heliocentrism. It’s just not the purpose of the Sacred Text to convey the message about nature.

S16. Ancient and medieval people thought that only planets in the Solar System are in motion whereas stars beyond our Sun are permanently fixed in the sky. This idea matches many philosophical systems (like the ones of Aristotle and Plato), but it also seems to be confirmed in some places in the Bible (Proverbs 8:27-29: When he *established the heavens*, I was there, when he drew a circle on the face of the deep, when he *made firm the skies* above, when he established the fountains of the deep, when he assigned to the sea its limit, so that the waters might not transgress his command, when he marked out the foundations of the earth,). However Edmond Halley observed (in 1718) that stars have their proper motions and thus there is nothing like the sphere of the fixed stars.

S17. Until the 20th c. people believed that the universe was static. But in 1927 a Belgian priest, fr. Georges Lemaître, gave a theoretical account (confirmed two years later by experiments of Edwin Hubble) of the expansion of the universe. Based on these observations the modern Big Bang cosmology was built. Again, it seems like the Bible prefers a static universe, but it turned out to be in a permanent motion of expansion.

S18. Another big challenge for the ancient Christian worldview came from the idea of “deep” time. Based on the Bible alone one may try to calculate the age of the universe by simply counting the generations of people recorded in the Biblical genealogies. This kind of calculations establish the age of the earth at about 4000 thousand years before Christ which today gives us about six thousand years. Many scholars tried to calculate the age of the universe based on the Bible alone over the centuries. For example, an Anglican bishop James Ussher in the 17th c. proclaimed that “The Earth was created around 6 pm on October 22, 4004 BC”. However, in the late 18th c. a new science of geology was born. James Hutton first showed that based on the arrangement of geological strata one has to allow millions rather than thousands of years of the natural history. By the time of Darwin the age of the universe was calculated at a 100 million years, and in the 20th c. the age of the universe was estimated at billions rather than millions of years. We see that the scientific evidence dramatically changed our idea of the age of the universe. This change was so dramatic that even until now many Christians deny “deep time” in the name of the Biblical record. I don’t have time now to respond to the claims of young earth creationists, but I can address this problem later in the Q&A part. For now it is enough to say that the science of geology made us realize that the Bible does not teach history

in the way modern history textbooks do. We also realize that the genealogies may be incomplete and that the word “day” from the Biblical account of creation may signify some other period of time than the natural day.

S19. The last challenge of modern science to religion I want to present is the modern theory of biological macroevolution proposed by Charles Darwin. In fact Darwin was not the first to propose it. His grandfather, Erasmus Darwin, came with the same idea, but he didn't propose a biological mechanism of evolution. However he already claimed that the vision of God using evolution as the way of creation of species is “more noble” and gives us a “better idea of God”. We see the same approach in the works of Robert Chambers who greatly contributed to the change of the paradigm in Western Culture from the Biblical or creationist to Naturalist or evolutionist. In his super popular book, Chambers asked: “How can we suppose that the august Being who brought all these countless worlds into form by the simple establishment of a natural principle flowing from his mind, was to interfere personally and specially on every occasion when a new shell-fish or reptile was to be ushered into existence on one of these worlds? Surely this idea is too ridiculous to be for a moment entertained”. Darwin developed the macroevolutionary ideas by proposing a biological mechanism (of random variation and natural selection) that supposedly leads to the emergence of entirely new species.

S20. The first modern evolutionists, such as Erasmus and Charles Darwin, Robert Chambers, Ernst Haeckel, Thomas Huxley and others did not openly fight religion, or the Bible. Their goal was to modify the previously entertained Christian idea of the separate creation of species. They proposed that God created just the universe, or the first living being and then used the natural powers of nature to bring about all species. They say that God used evolution as a way of creating. This concept is called theistic evolution. It is widely accepted today in all Christian denominations (Protestant, Catholic, Orthodox).

S21. To realize what kind of problem theistic evolution presents for Christianity I prepared this little table.

Creation:	Theistic Evolution:
- Direct act of God	- God's act mediated through „laws given to matter”
- Ended once and for all with the creation of man	- Keep on going continuously (<i>creatio continua</i>)
- Not a process, but a „simple emanation of being”	- Is a process in which God participates as the main cause

We see therefore that in theistic evolution there are several substantial modifications of the Christian doctrine of creation. It is legitimate to ask, if science is capable of modifying Christian belief. Is biological macroevolution even scientific? Given its influence on religion, perhaps it appropriates some competence of religion in explaining the origins.

S22. Here we see a summary of the theories that have been recognized by science and slightly modified our worldview and understanding of the Bible. I placed the theory of biological

macroevolution under the line together with the theory of multiverse. I will not talk about the multiverse here, I will focus entirely on evolution. As we can tell, NONE of the previous scientific discoveries challenged religion to the degree which is seen in biological macroevolution. They modified our understanding of the universe, but not our understanding of any of the substantial doctrines of faith. Therefore we need to ask, Is biological macroevolution one of the scientific theories that should modify our understanding of the Biblical account of creation? Is it the same type of theory as all the previous ones? Should we blindly follow the pattern and admit that Darwin changed our understanding of the origin of species in the same way as Copernicus modified our understanding of the Solar System?

In fact many church scholars build the analogy between Copernicus and Darwin. In my opinion there is a great difference between the theories of nature proposed by the astronomers and the theory of the origin of species proposed by Darwin. There is no analogy between Copernicus and Darwin.

S23. I will now move on to the third part in which I will explain the difference.

S24. To understand the difference we need to ask what kind of problem these two men addressed? The difference is clear even in the titles of their main works. Copernicus wrote *On the Revolutions of the Heavenly Bodies* whereas Darwin wrote *On the Origin of Species*. So Copernicus writes about the movements of the planets, that is, how the universe operates. Darwin, in contrast, writes about the origin of species, that is, where the universe comes from. The Greek word “genesis” used as a title of the first book of the Bible is translated into English as “origins”. Darwin used the word origin in the title of his book because his goal was to explain the origin of the essential elements of the universe. Therefore, Darwin created an alternative “genesis”. He appropriated something that by its very nature does not belong to science. No scientific discipline explains the origin of its own subject matter. Physics does not explain the origin of physics, chemistry does not explain the origin of chemistry and biology cannot explain the origin of biology.

S25. I would like you to remember this crucial distinction between the two types of question. The first is: How the universe works? An answer to this question belongs to science. The second is : Where the universe (and its essential elements) came from? The answer to this one belongs to religion. We have therefore a criterion allowing us to distinguish which theories of nature can legitimately modify our religious beliefs and which cannot do it. If a given theory addresses the question of origins it has to account for the theological knowledge. But if it addresses the question of how the universe operates, then science is competent to explain it and theology should not exclude the scientific explanation.

S26. Bible is not a science textbook, it does not explain how the universe operates (it does not establish the laws of nature), how the universe is built or how old it is. Theology explains the origins and the ultimate destination of nature, but not how it operates.

Science is not the „Book of Genesis”: It does not explain where the universe comes from, how different species and the human being began to exist. Science explains the operations of nature, but not the origin of nature.

This is why the theory of biological macroevolution, (regardless of what kind of mechanism is proposed to account for biological changes) should not be accepted as a theory modifying the traditional views on creation of the universe, its supernatural formation by divine power and the creation of man.

