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## GOD, TIME, THE "FIRST CAUSE", AND NATURAL CAUSES

The culture wars in the United States are driven by profound disagreements about the nature of society, of morality, of the human person, of the family, of sexuality, and of many other aspects of human life. These disagreements have more than one cause, but to some extent they reflect a divergence of outlook on the most basic metaphysical and religious questions, even though atheists and religious people can be found on both sides of the various battles of the culture wars. The recent debates over the origin of the human race and the origin of the universe can therefore be seen as part of those wars. This is obviously the case in the long-running disputes over the teaching of evolution in public schools and the "Intelligent Design" movement. But it is also true of the increasing media attention given to critiques of religion based on scientific theories of the origin of the universe. Striking examples of this are the publicity surrounding Hawking and Mlodinow's recent book *The Grand Design*, and the appearance on popular TV shows of scientists making similar arguments.

Unfortunately, most of the discussion surrounding questions of "origins" in the media and in popular books reflects a lack of understanding of traditional Christian ideas, not only on the part of atheists, but also on the part of many religious people. This has led to great confusion, with many atheists wrongly believing that science has shown traditional ideas of "creation" to be superfluous, and many religious believers wrongly thinking that certain scientific ideas are in conflict with Christian faith. In this article I will attempt to clear up some of this confusion and show that neither the triumphalism of those atheists nor the fears of those religious people are at all warranted.

The perception that religion and science are at odds comes from a variety of misconceptions. One of the most basic of these, and one that does enormous damage, is the notion that God as an explanation is in competition with the kinds of explanations given by science. That mistake, in turn, can be traced to a faulty understanding of what it means to say that God is the “First Cause” of everything that exists. Many people think of God as the first in a temporal chain of causes. Just as one billiard ball sets another in motion, which in turn sets another in motion, and so on, some people think of God as being like the first ball in that chain, which starts the process going. They have, perhaps, heard that God was called the “First Mover” by Aristotle and St. Thomas Aquinas, and they imagine that this is what St. Thomas meant.

Actually, St. Thomas did not mean a temporal sequence of causes at all. He was talking, rather, about what he called “simultaneously acting causes,” i.e. causes that all act at the same time; and he was not talking about a temporal chain, but an explanatory chain. What he was really saying is that explanations have to start somewhere. They cannot go around in circles (so-called “circular reasoning”), nor can they go in an “infinite regress,” with each thing explained by something else, but with no ultimate explanation. (Think of a mathematical proof, where each conclusion followed from some previous conclusion, but where the whole chain of reasoning didn’t start anywhere. In such a proof, nothing would really be proven.) Better than the term “First Mover,” which confuses modern readers unfamiliar with the jargon of Aristotelian philosophy, it would be closer to St. Thomas’s meaning to speak of “ultimate explanation” or “first cause,” as long as we understand that he didn’t mean “first” in a sequence in time.

In order to grasp what Christian tradition really means by God being the “first” cause, it is helpful to start with the nature of time and how God relates to it. In the early centuries of the Church, pagans would sometimes mock the Christian belief that the universe had a beginning, by asking, “What was your God doing for that infinite time before he got around to creating the world?” To this, the great Church father St. Augustine gave a profound answer. He started with the insight that time is a feature of the created world, which means that time too is something created. The beginning of created things, therefore, was also the beginning of time. In other words, time does not stretch in an unbroken line back into an infinite past, as the pagan philosophers of antiquity assumed; rather, it stretches back only to the Beginning of the created world. Therefore, it makes no sense to speak about a time “before” that Beginning. This is the answer St. Augustine gave to the pagans’ taunt: “There was no time before heaven and earth, [so] why do they ask what [God] did ‘then’? There was no ‘then,’ where there was no time.” The brilliance of this insight is staggering. It was sixteen centuries ahead of its time. Not until Einstein’s theory of General Relativity, which was proposed in 1916, did science catch up with it.

St. Augustine started with the fact that time is something created; modern physics starts with the fact that time is something physical. This fact was not apparent before General Relativity. Up to that point, space and time tended to be thought of

by scientists as a kind of mathematical backdrop to physical events. Physical events and processes unfolded in space and time, but space and time themselves took no part in events and underwent no processes. With General Relativity, however, it became clear that space-time is a fabric that bends, flexes, stretches, and ripples in response to the energy and momentum of the matter that fills it. Indeed, these movements of the space-time manifold themselves carry energy and momentum. Space-time, in short, is no less physical than atoms, or magnetic fields, or rocks, or trees. It necessarily follows that *if there was a beginning to the physical universe*, it would also have been the beginning of space and time. That is why modern physics says that it would make no sense to speak of time or space existing "before" the universe began. St. Augustine's great insight has triumphed.

This insight has far-reaching implications. For Jews and Christians, there is a radical distinction between Creator and created, between God and the world. God is not part of the created world, and in particular is not part of the physical universe; and this basic truth necessarily implies that God is outside of time itself. As the Scriptures teach us, in God "there is no shadow of change." He exists eternally, not in the sense of persisting for an infinite stretch of time, but in the sense of existing timelessly. Here's an analogy: In mathematics, we don't say "2 times 2 *was* equal to 4," or "2 times 2 *will* be equal to 4"; we say simply "2 times 2 *is* equal to 4." This is, as the saying goes, a "timeless truth." God is timeless in a similar sense. God, who is Truth itself, just is. Being timeless, tenses don't apply to him. God instructed Moses, "Say unto the people of Israel, 'I AM' hath sent me unto you"; and Jesus in John's gospel declares, "before Abraham was, I AM."

A helpful, and very traditional analogy, compares God as creator of the universe to the author of a play. Many early Christian documents call God the "Author" of the universe. The plot of a play has its own internal ordering or time. The playwright cannot be located in that plot-time, because he is completely outside the play. It makes no sense, for example, to ask whether Shakespeare had his dinner before the character Hamlet had his. Shakespeare is not within the time of his play.

The analogy also allows us to see that there are two kinds of causality. Within a play, one plot event is the cause of another and happens before it in plot-time, as, for example, the character Hamlet stabbing Polonius is the cause of Polonius's death. Call this "horizontal" causality. But in a quite different sense, the playwright is the cause of the play, as Shakespeare is the cause of the play *Hamlet*. Call this vertical causality. These two kinds of causality are not in competition. It would be ridiculous to ask, "Did Polonius die because Hamlet stabbed him, or because Shakespeare wrote the play that way?" Obviously, the answer to that question would be *both!* Vertical and horizontal causes or explanations are not *alternatives* to each other. The playwright causes the entire play: every character, plot event, scene, and word. And he causes the characters and events within the play to have whatever relationships to each other within the play that they do have. The stabbing of Polonius caused his death, only *because* Shakespeare wrote the play that way. Vertical causality does not

compete with but is the cause of horizontal causality. Note, by the way, that the horizontal causes within the play do have a sequence in the plot-time of the play, but the author of the play does not. So the vertical cause of the play is not “prior” to events in the play or “first” in the plot-time of the play.

The vertical causality whereby God is the author of the created world is traditionally called “primary causality,” while the horizontal causality within the world is called “secondary causality.” The term primary causality comes from the Latin term *Prima Causa* or First Cause, and refers not to God being first in the plot time of this physical universe, but first in the sense of the ultimate reason for things.

One immediately sees from this perspective how inane it really is to ask a question such as “does this insect exist because it evolved, or because God created it?” *Both!* The process of biological evolution – and for that matter the processes of biological reproduction – are causes *within* nature. God is the cause *of* nature.

In the traditional Christian understanding, God creates in a radically different sense than we humans can be said to create. God creates by giving the world reality. The world is not a fictitious, or hypothetical, or merely possible world, but an actual world that exists in reality. And every part of the world, every event in it, every being, every moment of its history from beginning to end, *is equally real*, and thus equally *made real* – created – by God; just as the playwright is equally and directly the author of every word of his play. Creation is not just something that happened a long time ago. This present moment of your life is just as much created as the first moment of the universe or the last moment.

According to traditional theology, God can have things happen in two ways. Some things he has happen as the result of natural secondary causes, such as water flowing downhill. Other things he has happen without any natural secondary causes being involved, such as water turning into wine at the wedding feast in Cana. But whether they happen naturally or miraculously, God is the primary cause, the author of the script. While God can will things to happen in a natural way, as a result of secondary causes, or will them to happen miraculously, the traditional view is that God *ordinarily* acts in and through nature. In the words of the eminent Scholastic theologian Francisco Suarez who lived from 1548 to 1617, “God does not interfere directly with the natural order where secondary causes suffice to produce the intended effect.” His was also the teaching of St. Thomas Aquinas and other medieval theologians. This principle was important for the birth of science. It meant that when confronted by some puzzling event or new phenomenon, we should look first for natural explanations. Of course, it is not uncommon for superstitious people to see the supernatural in every unusual or strange event. But this tendency was rightly criticized by the great 14<sup>th</sup> century scientist, theologian and bishop, Nicole Oresme. In explaining marvels of nature, he said, “there is no reason to take recourse to the heavens . . . , or to demons, or to our glorious God, as if he would produce these effects directly, any more than [he directly produces] those effects whose [natural] causes we believe are well known to us.” Another great scientist-theologian, Jean Buridan,

who was in fact Oresme's teacher, said that when confronted by new phenomena we should seek "appropriate natural causes."

Unfortunately, many people, both believers in God and atheists, have difficulty conceiving of God as above time and nature. Time-bound creatures that we are, it is impossible for us to imagine God's eternity, and very difficult to think clearly about it. Almost inevitably we tend to imagine God as a temporal being. But in thinking of him this way, we unwittingly drag him down to the level of a creature, and not just a creature but a physical creature. He becomes in our thought just one thing among things in our universe, one physical cause among other physical causes.

One symptom of this is the tendency of people to think of God's role in Creation as that of some physical force that acted 13.7 billion years ago (or for some people a few thousand years ago). Many times I have been asked by religious people, "What caused the universe to start expanding in the first place?" I think that in many cases they expect to hear, or hope to hear, that it is beyond the possibility of scientific explanation, because they think this would create a job opening for God to act as the "force" that started things off, as though he were the explosive that produced the Big Bang or the match that lit it. Atheists too think this way, including Stephen Hawking, who has recently suggested that certain speculative ideas in cosmology show that "[I]t is not necessary to invoke God to light the blue touch paper and set the universe going."

Once we drag God down to the level of a creature dwelling in time, then God is forced into an absurd competition with his own creatures. Some people imagine that the more that can be explained by natural causes, the less there is for God to do. Several years ago, in a magazine article, I asked why the evolution of species should be a disturbing thought to Christians, since, "If one is happy with natural explanations of the formation of stars and planetary systems, why not of plants and animals?" This provoked an indignant letter from a well-known person who asked,

"Is it possible that a man of Barr's education really wonders *why* some of us would not accept a natural explanation for the formation of stars and planets...? A Big Bang presupposes a *force* that brought all this into being (that is, God). People who believe there is a natural explanation for the formation of stars, the planetary system, plants, and animals are, by any definition, naturalists. Neo-Darwinists have made it clear that they presuppose a natural beginning of the universe (that is, no God)."

This eminent Christian, just like the eminent atheist Hawking, thinks that God is supposed to be a "force" setting off the Big Bang. Notice also that he says that "natural explanations" imply "no God." It may seem strange that someone who sees in natural explanations a threat to God's role in the world would use such naturalistic language of God ("a force"), but actually the two ideas are logically linked. It is precisely to the extent that God is seen as being like a natural force himself that he is seen as competing with other, ordinary natural forces – they have been put on the same playing field.

For Christians, God is indeed a cause, but not on the same level as natural causes. If we look for him on the same level, as though he were just another part of

nature, we will fail to find him. It is this that leads atheists to think that Christians believe “without evidence.” For them evidence means either directly observing something with our five senses or deducing that something exists as a natural cause of what we observe (the way we observe smoke and deduce that there must be a fire). But God cannot be seen in these ways, for he is neither a part of the universe that could be directly sensed, nor a natural cause within the universe. Nevertheless, God is a cause: as I said before, God is not a cause *within* nature, but the cause *of* nature. As with any cause, his existence can be inferred from the effects that he produces. The very fact that there is a universe at all – that there is *anything at all* rather than blank non-existence – calls for an explanation. And so do the magnificent harmony, order, and lawfulness that we see in the natural world, which testify to the mind of a rational Lawgiver.

God is not to be found in nature as a part of nature any more than Shakespeare is found in his plays as part of the scenery. But nature gives “evidence” of its Creator in the same way a play gives evidence of its author. As the Book of Wisdom put it, “from the greatness and beauty of created things comes a corresponding perception of their Creator.” St. Paul echoes this in his Epistle to the Romans, where he says about those who do not believe in God, “what can be known about God is plain to them, because God has shown it to them. Ever since the creation of the world his invisible nature, namely, his eternal power and deity, has been clearly perceived in the things that have been made.”

Let me return now to a question raised by the indignant letter I quoted a moment ago. Is it atheistic to say that the Big Bang might have a natural explanation? In the first place it should be noted that the Big Bang that occurred 13.7 billion years ago may not have been the absolute beginning of the universe, but only the beginning of one phase of its history. Nevertheless, there are strong theoretical reasons (having to do with the Second Law of Thermodynamics, and the Borde-Guth-Vilenkin theorem in General Relativity) for thinking that the universe probably did have an absolute temporal beginning at some point, which might indeed have been the Big Bang or might have been some earlier event. So let us rephrase the question. Could the beginning of the universe, *whenever* it was, have been a “natural event”? For a Christian there is no theological reason to say that it could not have been, if we mean by a “natural event” an event that happens in accordance with the laws of nature.

The point is that there is a difference between the temporal *beginning* of the universe and the *origin* of the universe in the sense of the ultimate cause of its existence. If someone were to ask why the novel *A Tale of Two Cities* exists as a work of art, would one point to the opening words of the novel: “It was the best of times; it was the worst of times”? No, that would be absurd. That is just the beginning of the novel. The cause of the novel is Charles Dickens. To confuse the temporal beginning with the ultimate cause is again to confuse horizontal relationships for vertical ones.

The *beginning* of the universe was simply the physical situation that existed in its first moments; the *origin* of the universe is the power of God, who conceived of –



and gave being to – the whole history of the universe, not just its first moments. There is no reason why the circumstances and events that existed in the first moments of the universe should not have obeyed the laws of physics, any more than the opening words of *A Tale of Two Cities* should not have obeyed the rules of English grammar. Indeed, one could go further. It is quite possible that the laws of physics might explain why the universe had a beginning. That is, the laws of physics may be such that any universe described by them must have a temporal beginning rather than stretching infinitely into the past. That does not answer the question of why those laws describe an actually existing universe, rather than a merely possible or hypothetical one. The answer to *that*, of course, is God’s act of creation, his act of conferring reality.

God, the Creator of the universe, timeless in himself, brought forth by one timeless act the whole universe with all its times and events. What he supplied to it was not some “blue touch paper” or spark, not some energy or force, but *reality* – *reality* – *reality*. Creation is not an event that happened within the history of the universe, at its temporal beginning; rather, it is the vertical cause, outside of time, that sustains and makes real the whole of that history.

I have distinguished the beginning of the universe from its creation. This may sound a little unscriptural, because the Book of Genesis itself says that God created the world “in the beginning.” But early Jewish and Christian writers had a profound way of interpreting the word “beginning” in the first verse of Genesis. Of course, it does refer to a temporal beginning. But it also meant something deeper. It also meant the origin of the world, which the Jews understood to be the divine Wisdom, and which they identified with the *Torah* or Law, which they conceived of as existing eternally in the mind of God. So the rabbis in commenting on the first verse of Genesis said, “And the word for ‘beginning’ refers only to the *Torah*, as scripture says, ‘The Lord made me [Wisdom] as the *beginning* of his way.’” The scriptural quote is from Proverbs 8:22.

The divine Wisdom was often personified in the Hebrew Bible, as in the passage just quoted from Proverbs. In the later Jewish books that form the link between the Hebrew Bible and the New Testament, which Catholics and Orthodox regard as part of the canon of Scripture, but which Protestants regard as non-canonical, though of theological value, the divine Wisdom is portrayed as being “spoken” by God and being “with God” at the Creation.

In the Book of Wisdom 9:9-11, one reads, “With you [O Lord] is Wisdom, she who knows all your works, she who was present when you made the world ... she knows and understands everything.” In Sirach 24:3, one reads: “I [Wisdom] came forth from the mouth of the Most High.”

The early Church saw this Wisdom from the mouth of God who was present at the creation, and indeed through whom the world was made, as being truly, not just metaphorically, a divine Person, namely the Word (or in Greek *Logos*) of God, whose “speaking” brought the universe into being. And so we have the famous opening of John’s Gospel: “In the beginning was the Word, and the Word was with God, and the

Word was God. The same was with God in the beginning. By him all things were made.” Logos also means Reason. And so this creation account can be read also as, “In the beginning was Reason, and Reason was with God, and Reason was God. The same was with God in the beginning. By him all things were made.”

And so we find St. Augustine writing in his Confessions, “In the beginning, O God, you made heaven and earth in your Word, in your Son, in your Power, in your Wisdom, in your Truth... ‘How great are your works, O Lord; you have made all things in wisdom!’ (Ps 104:24) That Wisdom *is* the beginning, and in that beginning you have made heaven and earth.”

What Augustine is saying here is that the “beginning” of which both Genesis and St. John’s Gospel speak refers not simply to an event that happened in time, but also to the timeless *origin* of things, the ultimate *reason* for the world’s having existence, and he identifies that origin with the eternal Wisdom, or Word, or Reason of God, which is God himself. In Latin, the words “In the Beginning” are “*In principio*”. *Principium* can mean either beginning in a temporal sense, or in the sense of an originating principle, just as the word ‘origin’ can in English.

The first words of Genesis teach us two things, therefore. They teach us that God is the ultimate source of the world’s being, its origin or principle; and they teach us that the world actually had a beginning in time.

I now turn to another issue where a proper understanding of God’s relation to time can avoid false conflicts between science and religion. Christians are often bothered by the claim that random mutations drove the evolutionary process that led up to our existence. How can we be both the product of chance and yet be intended by God from all eternity, as each of us surely is? I am a physicist, so I prefer to talk about physics rather than biology. But the very same question arises in physics. If you ask why our galaxy exists, it is because of random events in the early universe. It is known from direct observation, that around 300,000 years after the Big Bang, matter was distributed very uniformly throughout the known universe, but not perfectly so. There were very slight non-uniformities – regions that were slightly denser than average; and these served as the seeds from which galaxies grew. These density perturbations, as they are called, were random as far as statistical analysis can tell, and the leading theory is that they came from quantum fluctuations that occurred soon after the Big Bang. (Quantum fluctuations, all physicists agree, are random.) In other words, whether one is willing to admit that this or that species arose as a result of random processes, almost certainly our very galaxy did, our sun did, and our planet did.

But leave aside physics as well as biology. You know that many chance events played a role in your coming to exist. Many people’s parents first met by chance. Not only their parents, but their grandparents, great grandparents, and so on. Every particular person exists because of a countless series of highly improbable events. Does that contradict God’s intending you from all eternity? That would only be so if God were a temporal being, one cause among many causes acting within the universe. We who are temporal creatures do not know the future. We can only use what



we have observed in the past and present as an indicator of what may come to be. Chance events take us by surprise and upset our calculations. The more that chance and accident play a role, the more uncertain the future is to us and the more difficult it is to plan, the more things come out other than as we intended.

But if God is outside of time, then nothing takes him by surprise or eludes his control. The eminent geneticist Francis S. Collins expressed it well in his book *The Language of God*:

But how could God take such chances? If evolution is random, how could He really be in charge, and how could He be certain of an outcome that included intelligent beings at all? The solution is actually readily at hand, once one ceases to apply human limitations to God. If God is outside of nature, then He is outside of space and time. In that context, God could in the moment of the creation of the universe also know every detail of the future. That could include the formation of the stars, planets, and galaxies, all of the chemistry, physics, geology, and biology that led to the formation of life on earth, and the evolution of humans, right to the moment of your reading this book – and beyond. In that context, evolution could appear to us to be driven by chance, but from God's perspective the outcome would be entirely specified.

Many of the supposed conflicts between science and religion are based on crude misconceptions. Many of them could be avoided if we return to the profound insight of St. Augustine that God is outside of time, and think through its full implications.

### **Bóg, czas, „pierwsza przyczyna” i przyczyny naturalne**

W artykule poruszono problem ideologizacji doktryny ewolucjonizmu. Pokazuje słabość neodarwinizmu i jego pułapki intelektualne, wyraża sprzeciw wobec czynienia z doktryny ewolucji narzędzia dowodowego, mającego uzasadnić materialistyczną koncepcję świata.