



Readings II in Faith & Science

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Christianity and Modern Science

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Christianity and Modern Science

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Thesis and Abstract

Thesis: Creation reflects the trinitarian existence of god.

Abstract: God is Trinitarian existence, unity in the diversity of Father, Son, and Holy Spirit. The eternal Word of God creates creation that is not God. Modern science discovered that novelty emerges from the unification of elements that were previously unified. The ontological structure of created existence is united diversity. It is the reflection of the Trinitarian existence of God in the “otherness” of creation.

Incarnation, The Fundamental Mystery of Christianity

The gospel of John opens with the introduction to the central mystery of Christianity: “In the beginning was the Word, and the Word was with God, and the Word was God. All things came to be through him, and without him nothing came to be” (Jan. 1,1-3). John’s gospel opens with the paradox that Christ is simultaneously the creator and creation. (1) Through incarnation the originator of all that is, the infinite God, becomes coexistent with the created finite world. (2)

Christ does not pretend to be creation but is creation. “For in him were created all things, in heaven and earth,[....] All things were created for him and through him” (Col, 1, 15-16). In Christ created reality, the finite, is taken up into the infinite, into the eternity of the creator. Christianity therefore understands Christ to be the person in which the infinite, the finite, eternity and time, intersect. (3) This is the reason why in Christ creation is open to the creator.

The mystery of incarnation therefore illuminates the mystery of creation. It allows a glimpse into how God almighty, who *is* existence, can create from what does not exist. God brings forth creation from nothingness; from what is essentially not God. The Word of God *that is* God creates creation *that is not* God.

Incarnation, the paradox of how God can be God in the absolute otherness of a human being, is at the center of Christian faith. How this is possible we cannot understand. We may understand, however, that the paradox is rooted in the almightiness of God. From incarnation a light shines that illuminates why the presence of God in the world does not destroy the world but affirms it. Faith can understand the message that the almighty Word of God does not hold on to its divinity; it departs from God to create the world.

The Deep Structure of Creation

Incarnation therefore is God’s divine gift of itself to creation. Because God is eternal his gift of the Word is given to creation from all eternity. It is only for us who are in time that incarnation is an event in history. The gift of the Word of God to the otherness of creation is, however, the center of all creation. It is the pivotal event in which the eternal act of God to create and save becomes concrete in time. Therefore it is in Christ that creation finds its goal, meaning and purpose for all time, past, present and future.

Christianity reveals that the nature of Nature is the Word of God given away to the absolute otherness of God. (4) Creation is a loving gift, a gift really given -- no strings attached. The gift is his creative Word, the Son of God who is God. This is why created existence cannot find the principle of its being. We can only wonder why it is

that synthesis is the existence giving principle. “It is in virtue of unity that beings are beings.” (5) The universe emerges through sequential synthesis. The creative process brings forth novelty by integrating elements that are integrated unities themselves. It is integration of diversity into unity that brings forth new existence. This is why all created reality exists as united diversity. It is the watermark imprinted on all that is, the mark of the Triune Word of God in the otherness of creation.

It is through this gift of the Word of God to *what-it-is-not* God that creation is creative. Holy Scripture, therefore, is not the only Word of God, creation is too! Because there is the Bible and the Book of Nature there is biblical and natural theology. As Galileo already argued, both are revelations of God and therefore cannot contradict each other. (6)

The View From Science

Ever since Darwin, however, Christianity and science seem to do just that -- be in conflict with one another. Christianity understands the world to be God’s handiwork. Darwin showed instead that all forms of life, including human beings, are the result of natural history, of evolution, not of supernatural intervention(s). Robert Chambers (and others before him) had already suggested that organisms were brought forth by nature. For Chambers, the Creator had created the world in such away that natural law was capable of bringing forth not only the physical inorganic world, but also plants and animals. He argued that this was a much grander view of the power of the creator than supernatural interventions by special creations. (7)

Darwin not only made a convincing case for evolution but also suggested the mechanism by which nature could bring forth new forms of life. He discovered that chance variations between individuals of a species provided the substrate for natural selection. Only the best adapted individuals to the ever changing environments would survive. Survival of the fittest was nature’s way to bring forth new forms of life. Darwin’s argument that plants and animals evolved by natural selection, working on events that happened by chance, deeply upset Christianity. How could creation fulfill God’s plan if nature worked by happenstance? How could human beings be created in the image of God if they had come higgledy-piggledy into the world? For most pious people Darwin had thrown out the creator from creation. They understood that Darwin had replaced God’s guiding hand in the world with blind chance events. Human beings were not special creations anymore but produced by accidental variations, natural, (and sexual) selection. (8)

There were, however, some Christian theologians that welcomed Darwin’s view. Among them was the Russian philosopher and theologian Vladimir Solovyev. In his lectures on “Godmanhood” he writes: “Why are the labours and efforts necessary in the life of the world, why must nature experience the pains of birth, and why, before it can generate the perfect and eternal organism, must it produce so many ugly, monstrous broods which are unable to endure the struggle of existence and perish without a trace? Why does God leave nature to reach her goals so slowly and by such ill means? Why in general, is the realization of divine idea in the world a gradual and complex process, and not a single, simple act? The full answer to this question is contained in one word, which expresses something without which neither God nor nature can be conceived; the word is *freedom*.” (9)

Neither Solovyev nor Darwin could have known that matter as well as life, had also evolved. Fred Hoyle, the British mathematician and astronomer, suggested in the mid twentieth century that atoms evolve in stars. Today we know that the nuclear furnaces in the center of stars synthesize increasingly complex, heavier and heavier atoms. (10) The “raw materials” to do that, hydrogen, helium and some lithium, originated in the original explosion of the big bang.

It was Albert Einstein who correctly suggested that matter emerges from frozen energy. The fundamental particles that constitute all matter formed after the universe had cooled sufficiently. This allowed the primordial plasma of energy and matter to form. (11) Some of these particles emerged within fractions of a second. The first might have been the carriers of a unified primordial force. It was perhaps “a quantum-gravity” that then split into two forces: gravity and an “electro-nuclear” force. The “electro-nuclear” force (carried by X-particles) split into the electro-

weak force (carried by Z-particles) and the strong force (carried by gluons). About one million years after the original explosion the universe had sufficiently cooled to allow light to emerge (carried by photons). The electro-weak force had split into the weak force (involved in radioactive decay) and the electro-magnetic force.

Why these “details?” Because the forces that organize the universe are a result of the natural evolutionary process not of supernatural intervention. The Cartesian view that the world works like a machine, thanks to God-given natural laws, is out of date. God is not the supreme watchmaker who designed creation to work like a wound-up watch. Deism, even in a Christian disguise, is dead. Rather, Christianity knows that creation has its roots in a far deeper ground in the Triune God himself. Creation is the Word of God that departs from God into the “otherness” of creation.

Can modern science shed a light into this foundation of creation? I think the answer is “yes.” Already Teilhard de Chardin saw that the world emerges through sequential syntheses from the integration of elements that were synthesized before. (12) Today we know this more precisely. For example, the atoms listed in the Periodic Chart really are the result of sequential integrative events. We also know that from the increasingly heavier atoms to the appearance of complex molecules and to the first forms of life, it is always synthesis (of what was previously synthesized) that brings forth novelty.

This can perhaps best be demonstrated by dissecting complex entities into their constitutive parts. By sequential disassembling of complex unities into their elements, one actually is traveling back in time. Take any animal or plant and analyze its parts. The further down into the details one chooses to go, the further back one goes into past events. For example, cells are older than any tissues, parts of cells, (organelles) are older than cells, molecules are older than the organelles they form, the DNA molecules are older than the chromosomes, and the carbon atoms in the DNA are older than the DNA they (help) to form. And what is the source of the carbon atoms? They originated in the stars that formed from matter that froze even earlier from the energy released in the original explosion.

Teleology?

Traveling back in time by sequential dissection of complexity into its elements might generate the illusion that the forward moving process was directed toward a predetermined end. Similar to a “simple” fertilized egg that reaches the complexity of the adult, so the universe might have started from simple beginnings to a predetermined complex end. The fallacy here is to project the way organisms develop to the way the universe came into existence. In organisms there is a (genetic) program that guides plant and animal development to a predetermined end. There is no such program that guides the universe from its beginning to a predetermined goal. Rather, cosmogenesis is a probabilistic process. Each event in cosmic history happens within a space of other possible events. The process is essentially open-ended and therefore undetermined (stochastic). In short, cosmogenesis is the result of a genuine historical process. This is because those events that really happen out of the panoply of those that could also have happen bring forth new reality, new existence statistically. This is why the future is undetermined and open, not an extrapolation of the determined closed past. Thanks to the presence of the energy released in the original explosion, nature is capable of bringing elements together that it has synthesized before. This is why all complexity is constructed from elements that are complex unities themselves. Cosmogenesis is not is not teleological (predetermined) but teleomorphic (probabilistic complexification).

Cosmogenesis is the result of a self-similar, non-linear process. Self-similar because it is always the unification of parts that brings forth the new. The process is non-linear because the new has qualities that its elements (in isolation) do not have. For example, hydrogen and oxygen are gases but water (H₂O) is liquid. Furthermore, the integration of atoms into molecules brings forth entities essentially different from the atoms they integrate.

We have not yet generated life from molecules. It is, however, just a matter of time before we will be able to do what nature did on earth around four billion years ago.

Modern insights into molecular genetics quite strongly suggest that synthesis was also the engine that brought forth new forms of life. Genes became integrated into genetic programs. These control the development of the fertilized eggs into adults. New plants and animals seem to have emerged thanks to the duplication, variation, and integration of primordial genomes into new genetic programs. (13)

We do not yet know how the genetic program evolved that brought forth humans. We do know, however, that we are an outcome of the universal creative process of nature. We also know that roughly forty to seventy thousand years ago *Homo sapiens* (modern humans) brought forth representational art: bison, horses, mammoths and deer, skillfully painted on the walls of caves. Self-consciousness had emerged and with it the discovery of the difference between the “I” and the “not I.” It is thanks to this space between the subjective “me” and the objective “not-me,” nature that allows me to recognizing the world as other. Self-consciousness creates the space for the understanding that I am a part of something that I am not.

Humans discover nature, but in this discovery nature also finds itself. Through self-consciousness humans and nature come to themselves. The discovery of nature within the human mind has deep consequences. Because the root of human subjectivity reaches into the objectivity of nature, we can find out how nature works. This is why we can write equations that describe the laws of nature. This is also the reason why there is art. It is the continuation of the creativity of nature at the level of the human mind.

We are that part of nature in which nature reaches the capacity to recognize itself. In this recognition nature comes to the understanding that it is not the source of itself. It is the understanding that its own existence is anchored in transcendent otherness. It is the wonder about the nature of being; the fundamental mystery of why there is anything rather than nothing.

In the depth of all human beings therefore dwells the wonder of this existence-giving “otherness.” It is the root of deep-truth all human beings share, the source of beauty in nature and art, the source of humble, pious, and moral existence and the foundation of true religion.

Christianity reveals that this transcendent source of all existence is the Word of God in the otherness of creation.

Conclusion

Christian revelation opens an insight into this mysterious nature of nature. “For in him were created all things in heaven and on Earth.... all things were created through him and for him” (Col. 1, 16). This is why Christians know that Christ, the Word of God, is the foundation of creation.

The fundamental dogma of Christianity is that God the creator is love. Out of this love God sent his Word into what-is-not God. Because of this gift of God’s Word to creation, nature becomes creative. Through the creative principle of the Word of God in the “otherness” of nature, creation reaches the point in which it discovers itself. Nature discovers itself through the emergence of human self-consciousness. Here the universe, the macrocosm, comes to itself in the microcosm of the human mind. This is why human beings represent nature, not just as empty icons but concretely. Through the human mind, nature is open unto itself. In this openness nature becomes aware of its transcendent origin.

Because human beings represent nature, their relationship with the Creator is critical for all creation. Critical, because we may accept or reject the loving relationship offered by God to creation through us. This why Saint Paul writes: “For creation awaits with eager expectation the revelation of the children of God” (Rm. 8: 19).

There is no reason for Christianity to shunt science. To the contrary, the discoveries modern science has made about creation make it even more reasonable to believe.

Endnotes

1. Nicholas of Cusa, *On Learned Ignorance*. A Translation by Jasper Hopkins, The Arthur J. Banning Press 1985, Book III, chapter 2, pp. 128-130.
2. Maurice Blondel, *Lettres Philosophiques: Lettre a Abbé J. Wehrle* 11 juillet 1904, pp. 227-235. Aubier. Edition Montaigne, Paris 1961 229
3. Xavier Tilliette: “Le Christ des Philosophes, Du Maître de sagesse au divin Témoin.” *Culture et vérité*, Paris 1993, p. 39.
4. Hegel, *Philosophy of Nature*; Edited and translated by M. J. Petry, London, George Allen and Unwin London, New York 1970, 246, 247, 248.
5. Plotinus: *The Enneads; Nine Tractate*. Faber and Faber, London, 1956, p. 614.
6. Pope John Paul II: “To the Reverend John V. Coyne, S.J.” In: *John Paul II on Science and Religion*. R. J. Russel et al. The University of Notre Dame Press, 1990.
7. From the book: *The Growth of Biological Thought, Diversity, Evolution, and Inheritance* by Ernst Mayr, The Belknap Press, Harvard University Press 1982, p.382.
8. Charles Darwin: *The Descent of Man*. Murray, London, 1871.
9. Vladimir Solovyev, *Lectures on Godmanhood*. London: Dobson, 1948, p. 178-179.
10. For an overview and mechanism of synthesis see: William Fowler: “The Quest for the Origin of the Elements.” *Science*, vol. 226 23 November 1984.
11. See for example: William J. Broad: “In a Lab on Long Island, a Visit to the Big Bang.” *New York Times*, January 14, 2003.
12. Teilhard de Chardin: *The Human Phenomenon*. Brighton [UK]; Portland, Or. Sussex, Academic Press, 1999.
13. Scott Gilbert: *Developmental Biology 7th edition*. Sinauer, Sunderland, MA 2003.

Questions

How does the author know that “in organisms there is a (genetic) program that guides plant and animal development to a predetermined end. There is no such program that guides the universe from its beginning to a predetermined goal. Rather, cosmogenesis is a probabilistic process. Each event in cosmic history happens within a space of other possible events.” Is this statement factual or is it an assertion?

“We have not yet generated life from molecules. It is, however, just a matter of time before we will be able to do what nature did on earth around four billion years ago.” Is the author contending that we shall be able to create life from non-life? If we can do so what does this say about the ‘spontaneous generation of life’?

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