

SCIENCE AND RELIGION IN THE CONTEMPORARY REALITY: DIALOGUE, CONVERGENCE AND MULTIDISCIPLINARY RESULTS

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Abstract. *This paper is the result of a dialogue converging towards multidisciplinary, whose starting points are science and religion, scientific and religious inquiry. The first section of the paper analyzes the existence of a deep conflict between modern science and religion in the 21st century, while the second section emphasizes the historical complementarity holding between the two forms of knowledge, the scientific and the religious one. An interesting example of science-religion complementarity, or a manifestation of interference of religion with economics, ecology and sociology in the newly appeared human ecology, is the content of the fourth section. A final remark describes the coexistence of science and religion in the contemporary world, appealing to an approach at once scientific and religious.*

Keywords: *science, religion, multidisciplinary, knowledge, scientific and religious truth, complementarity.*

1. INTRODUCTION

There are dialogues hard to unimagine in other time periods or interrogative interstices of spirituality, very much as there can exist questions and queries generating dialogue, which are related to the development of scientific research, as well as the volution of the apparently divergent relations between certain forms of knowledge of reality.

Two such questions were felicitously stated as: "Does sin reach to the core of the atom? Are black holes and antimatter [in themselves] demonic?" (Dulgheru, 2012).

These questions were launched during the symposium hosted by a physical engineering university in Moscow, before the Russian Patriarch Kiril, and were followed by similar ones, as natural and challenging as the former, describing a rapprochement between science and religion, which has lately become increasingly stringent; placing under the microscope lens the spiritual significance of the material world, including the laws of physics and interconnection between the two worlds, represents the content, sublimated through dialogue, of the present paper. It all started with the religious foundation of scientific ethics, which rediscovers "the beauty of science", which is more and more acutely referred to in various papers, like the scientists inspired by Biblical thinking, and religious thinking in general.

Yet, to reach a relatively stable harmony, and especially a harmony of great historical perspective, a conflicting start was necessary, a debut that was temporarily pointless. The state of general harmony of the gradual emergence of the world was offset by an initial imbalance in knowledge, but the two together will lead to a generalized harmony of knowledge, which will accompany a process of extinction of

the world, in the end, according to the physical mechanism of resurrection of the universe. (Tipler, 2008).

2. RELIGION VS. SCIENCE OR SCIENCE VS. RELIGION

Constantly, science and religion have been virtually seen as the two great, lasting examples of man's desire to know *the* truth; however, there is a significant difference between the manner of investigating scientific truth and religious truth. If the truths provided by science can be demonstrated and explained, with an almost universally accepted relativity, afforded by the development of human knowledge, religious truths are accessible only through revelation or spiritualisation. Over the millennia, the two have been in conflict, mainly due to the different nature of the assumptions of knowledge that they promoted. We can state without the shadow of a doubt that there was a conflict between the truths provided by science and those provided by religion, an obvious conflict, which unfortunately amounted to sacrifices, whose historical impact seemed to lead to a cleavage with no hope for convergence in knowledge, a *sine die* conflict. A number of early prejudices of scientific knowledge specific to remote, seemingly forgotten ages, based on various religious theories, generated a kind of "intellectual barrier", or else represented limitations, evn significant restrictions on the scientific approach.

Two well-known examples, which were extensively discussed, have constantly been invoked in this respect: the first is the case of Galileo Galilei, whom the leaders of the Catholic Church forced to retract all his ideas concerning the scientific theory regarding the position of planet Earth in the Universe, and the second is the far more dramatic case of Giordano Bruno, who was burned at the stake by the Inquisition because his ideas were deemed incompatible with the doctrine-ruled manner of knowing the outside world, and not the interior world, specific to religion itself.

In essence, however, things are much simpler today. In-depth analysis of the laws of physics shows that they actually obey the laws of the spirit. They are a projection, on the material plane, of the spiritual laws, in other words the order of scientific knowledge is subordinated to a higher spiritual order, just like the shaping presence of the observer's thinking in quantum physics.

The flimsiness of Inquisition-like approaches does not represent the subject of the present paper, nor does it need even to be demonstrated to highlight the nonexistence of a deep conflict between scientific knowledge and religious belief, though the sacrifices caused by the excesses of religious or scientific pride must not be forgotten.

Another example of cleavage is provided by a certain element of conflict between science and religion, none other than miracles, which "by definition, violate the principles of science" (Dawkins, 2006). However, miracles do coexist in the researcher's own tenacity, in the team spirit of modern scientific inquiry, which does not make it less true, while the existence of matter is still considered a miracle by a majority of scientists. Miracles do not jeopardize the survival of science, on the contrary, they demand more and more scientific research to know the simultaneously religious and scientific truth. The first object of knowledge in science was especially human outside world, while in theology it was, and still is, God and the inside of the human world. The feverishness of scientific search seems to be counterpoised by religious prayer and meditation, the scientific investigation outer to human being seems to be paralleled by the introspective approach specific to religious man, etc. The scientific method allows the articulation of an intellectual construction meant to represent and understand the world through intense intellectual involvement, apparently solely based on brain activity, on reason, considered scientific.

Following a scientific, rational path, man tries to understand phenomena that can be observed in nature, and their understanding allows him to gradually build conceptual or material tools, made by entirely copying things or in a creative manner, thus exercising, in his turn, an influence, which is not always beneficial, on nature. To do that, science makes use especially of scientific experiment, of modelling and simulation of reality.

Scientific methodology seems to be unique and invariant in relation to the time factor. Since Galileo's astronomy works or the outline of Descartes' method, as well as the multitude of founders of particular sciences in modern times, scientific methodology does not seem to have changed, although nothing excludes the hypothesis of its transformation, perhaps under the influence of religion... But this change can only occur under the pressure of an absolute necessity from experimental facts, rather than by the subjective and irrelevant will of any particular scientist or philosopher. Nevertheless, both the methodological interrogative cycle, however elaborate it may be, and the methodical investigative cycle lack an essential element, without which there could be no scientific discovery, that is revelation, intuition or a specific attitude, defined *a priori* by a certain faith in a particular aspect of the experiment, a certain objective and a certain impact it will have in improving human life through knowledge.

Is there a real conflict, or major, consistent adversity between scientific knowledge and religious knowledge or belief, or rather an overlapping of the two, aiming at a higher purpose?

Science and religion do not assume the same questions, the same methods, the same human impact areas, they do not dispute their fields of knowledge, and so they have been and

remain essentially distinct experiences of the universe, elements that cannot enter into a state of conflict or adversity (Gould,2002).

3. CONTRARIA SUNT COMPLEMENTA

It can be noted that, today, there is an approach to integrating scientific knowledge with religious knowledge, based on the principle "contraria sunt complementa", which stands a fair chance of being the future relation between science and religion, an approach that seems difficult to understand completely within the span of a single generation.

The original intention of this paper was to provide a relatively objective statistic survey, or one as close to the truth as possible, of the number of scientists who had major contributions in the history of religion, or declared with admiration their faith in God, and also another survey, at once opposite and complementary to the former, concerning the servants of faith in God whose scientific work represented an epoch-making step in the formation and development of science in general.

Such an idea, which is itself quite generous, was due to statistical thinking, which is hard to conceive without the contribution of the English minister Thomas Bayes (1702-1761), who became famous posthumously through his memoirs, two of which are sources of scientific knowledge even today, generating Bayesian inference and the analysis of the Stirling or de Moivre series. The minister's contribution to the probability theory was considered remarkable by George Boole, John Maynard Keynes, Ronald Aylmer Fisher, etc.

Similar in point of impact and retrospective, in the same statistical thinking which shaped the early scientific methodology (which gradually generated statistical physics, alongside of physics), the interpreter or statistical price index, which today helps us to assess inflation, was authored by an Anglican minister, demography and economy cannot be conceived without Rev. Thomas Robert Malthus, and without Adolphe Quetelet and his statistics there would be no social physics. But the examples that start here are really lacking some finiteness for the restricted space of a mere article...

There is also a complementary, and as natural a form of this trend, namely that scientists of past centuries who, due to the fact that they believed in God and carefully read the Bible at an early age, found in its pages, at the moment of the full maturity of their creative development, an inexhaustible resource to generate new areas of scientific interest, new scientific disciplines, new ways of observation and research of outer reality, of the world in general (McGarr, and Rose, 2006)...

A synopsis illustrating the contribution of scientists who, starting from the faith and religious content of the bible, founded new scientific disciplines

Table 1

SCIENTIFIC DISCIPLINES	SCIENTISTS
Dimensional analysis and model analysis	Lord Rayleigh (1842-1919)
Comparative anatomy and paleontology of vertebrates	Georges Cuvier (1769-1832)
Physical astronomy and celestial mechanics	Johann Kepler (1571-1630)

Galactic astronomy	William Herschel (1738-1822)
Bacteriology	Louis Pasteur (1822-1895)
Systematic biology	Carolus Linnaeus (1707-1778)
Infinitesimal calculation and dynamics	Sir Isaac Newton (1642-1727)
Chemistry and gas dynamics	Robert Boyle (1627-1691)
Isotopic chemistry	William Ramsay (1852-1916)
Antiseptic surgery	Joseph Lister (1827-1912)
Electrodynamics and statistical thermodynamics	James Clerk Maxwell (1831- 1879)
Electromagnetic	Michael Faraday (1791-1867)
Electronics	Ambrose Fleming (1849-1945)
Energy studies and thermodynamics	Lord Kelvin (1824 -1907)
Entomology	Henri Fabre (1823-1915)
Genetics	Gregor Mendel (1822-1884)
Non-Euclidian geometry	Bernhard Riemann (1826-18 66)
Gynecology	James Simpson (1811-1870)
Hydraulics	Leonardo da Vinci (1452-1519)
Hydrography	Matthew Maury (1806-1873)
Hydrostatics	Blaise Pascal (1623- 1662)
Ichthyology	Louis Agassiz (1807-1873)
Fluid mechanics	George Slokes (1819-1903)
Optical mineralogy	David Brewster (1781-1868)
Oceanography	Matthew Maury (1806-1873)
Paleontology	John Woodward (1665-1728)
Pathology	Rudolph Virchow (1821-1902)
Stratigraphy	Nicholas Sumo (1631-1686)
Computer science	Charles Babbage (1792-1871)
Field theory	Michael Faraday (1791-1867)
Reversible thermodynamics	James Joule (1818 – 1889)
Thermokinetics	Humphrey Davy (1778-1829)

Source: Morris, H. M. (1993). *The biblical basis for modern science*. New York: Baker book House, Grand Rapida, pp.56 – 80.

A large number of inventions were created by other scientists who also professed faith in God and found the Bible an inexhaustible source of inspiration for all their famous inventions and discoveries (e.g., throughout the twentieth century American scientists who confessed their faith in God consistently represented 4/10 out of the total number of scientists).

A synopsis illustrating the contribution of scientists who, starting from the faith and religious content of the bible, generated new devices and technologies

Table 2

INVENTIONS	SCIENTISTS
Autoinduction, galvanometer and electric motor	Joseph Henry (1797-1878)
Barometer and absolute temperature scale	Blaise Pascal (1623 -1662)
Transatlantic cable	Lord Kelvin (1824 -1907)
Kaleidoscope	David Brewster (1781-1868)
Global catalogue of stars	John Herschel (1792-1871)
Chloroform	James Simpson (1811-1870)
Fermentation control, law of biogenesis, pasteurization, vaccination and immunization	Louis Pasteur (1822-1895)
Inert gases	William Ramsay (1852-1916)
Electric generator	Michael Faraday (1791-1867)
Safety miner's lamp	Humphrey Davy (1778-1829)
Law of gravity and reflection telescope	Sir Isaac Newton (1642-1727)
Calculating machines and actuarial tables	Charles Babbage (1792-1871)
The scientific method	Francis Bacon (1561-1626)
Classification system	Carolus Linnaeus (1707-1778)
Double stars	William Herschel (1738-1822)
Tables of ephemerides	Johann Kepler (1571-1630)
Telegraph	Samuel Morse (1791-1872)
Thermionic valve	Ambrose Fleming (1849-1945)

Source: Morris, H. M. (1993). *The biblical basis for modern science*. New York: Baker book House, Grand Rapida, pp. 81 – 98.

A note relating to the duality and complementarity of the spirit of the relationship between religion and physics is in order to go back to the present. The analysis of the phenomena of statistical, religious, social, economic, etc. physics (in general, of complex physics) requires consideration of both the corpuscular and the wave aspects. These are obviously contrary, yet they can be said to be also complementary, in that they complement each other in describing quantum phenomena.

This is actually Niels Bohr's complementarity principle... Another interesting facet of complementarity between science and religion is that of judging the relationships between science and faith through the reductionist lens of the ideologies that are commonly known by the name of creationism and evolutionism. A purely scientific approach to these issues is generally considered foreign to the phenomenological essence of both creationism and evolutionism, and substantially departs from the spirit of patristic tradition. Although, according to some opinions, there are a lot of facts that testify to creation, many other approaches accept evolution. The theories that accept evolutionary theories coexist and share the opinion, or the impression that it is now a scientific fact; on the other hand, creationism is as much an accepted reality. There are so many creationist–evolutionary complementarities.

Today's scientists realize the limits of reason and the current instrumental means of investigation, knowledge and insight into the secrets of the real world, and felt acutely the need for complementarity with theology and the instruments of transfigured mind. Their existence and appearance does not mean giving up reason, but rather an opening to other states of reason than those usual in positivist culture and science.

The new horizon of knowledge, currently manifested in the scientific community, is moving towards theology and spirituality, which together represent a prompt and efficient step, as well as an aspect of multidimensionality of the approaches, solutions, experiments and interpretations. The new type of theology has initiated a specific identity approach in this century of internet communication, in order to more clearly approach the new sciences as well as the new technologies.

Another interesting complementarity links the Eucharistic studies and approaches and sciences (Magnin, 1993).

The Eucharist is not simply a gesture of worship, according to a devoted servant of faith as a form of knowledge, it grows to be much more than that, i.e. a new way of being human in the light of the Resurrection of Christ. (Nesteruk, 2003). Through this novel cognitive approach, Eucharistic approaches acquire (and lend) competence and divine inspiration. The Eucharist teaches the scientist to receive and give, as a gesture yielding fruits in the coordinates of grace of the scientific knowledge common to human civilization as a whole. Science can be perceived as a method of religious experience: "Scientific activity can be treated as a Eucharist work of cosmic dimensions (a cosmic liturgy). Thus, science can be seen as a way of being of religious experience, a view accessible to those scientists involved in the ecclesial community, but yet unproved to those outside of this type of community" (Ionescu, 2008).

The interference relationship between scientific and religious knowledge, a relationship of the future already present in the contemporary world, was felicitously anticipated by Galileo's famous statement: "*Let us measure what can be measured and make measurable what is still not...*".

4. AN EXAMPLE OF COMPLEMENTARY BETWEEN RELIGION AND SCIENCE, OR OF THE INTERFERENCES OF RELIGION WITH ECONOMICS, ECOLOGY AND SOCIOLOGY IN THE NEW HUMAN ECOLOGY

Developed as part of the Chicago school, in the second and third decades of the last century, human ecology is one of the first rigorous systemic sociological approach that took into account the natural environment in explaining social phenomena (promotion of human ecology belongs to Robert E. Park, Roderick McKenzie and Ernest W. Burgess). Universal recognition of the new direction was fully accomplished after the 202 Summit in Johannesburg, South Africa.

Ecology and solidarity became inseparable elements thereafter, and since ecology can only be a genuine sign of *human solidarity* which "obviously includes protecting and cultivating the earth's resources" (according to the Vatican document at the World Summit for Continued Progress, in Johannesburg).

The new approach must needs be based on "strong ethical values, otherwise there is a risk of total lack of direction and foundation on which the continued progress under investigation can be built, and sustained", as the essence of development. The concept of continuous / continued progress is linked to sustainable development and life quality, and demands a process that involves meeting the needs of the present without compromising the ability of future generations to meet their own needs. Human ecology is circumscribed to a new perspective of *integral and systemic human development*.

By and large, the comprehensive concept of human ecology consists primarily in ensuring and protecting ethical conditions in human action on the environment. "*It should also be noted that the first and fundamental structure for human ecology is, and will remain the family, in which humans receive their first formative ideas about truth and kindness, and where they learn what loving and being loved mean, and thus what actually being a unique person means*"; they shape their matrix or receptacle for the future intellectual energies, a matrix that will be completed in subsequent educational and cultural processes. In this context, particular attention should be paid to the social ecology of human education, of scientific research or of human labour in general. (Săvoiu and Sulescu, 2011). To change the current perspective, according to which the world's poor are rather a problem than some potentially productive and creative actors in society, it will be crucial to create new opportunities in employment, education, health care or even adequate housing.

Human ecology is not only about economic development, be it sustainable, or only the quality of life described in terms of ecological processes, but also (and mainly) about social processes, focusing on education, research, life-long cultural training, processes which, through a conceptual transformation, have been biologized in order to explain social reality in terms borrowed from the natural sciences based on a holistic and systemic thinking. New patterns of consumption and production will have to be examined and promoted in accordance with the principles of human dignity and solidarity, from an angle specific to human ecology (Săvoiu, 2011). Global recession, just as the new crisis that is looming, are the results of the slow pace of change along the logically expected lines of human ecology. Contemporary human ecology redefines human community, humankind itself, within the concept of *anthropoecosystem*, as a spatial distribution of man's living environment, and encompasses in its subject matter and area of investigation looking into a human population interacting with the environment, drawing the repertoire of the specific, concrete issues impacting on human life such as the inclemency of the climate, natural reserves and the hydrological regime of water sources, the chemical composition of the water from these sources, the nature of the landscape, vegetation features, the social and economic standards, the customs and traditions, the degree of environmental pollution, the degree of sanitation in people's housing, providing people with homes, specificity of their activities, food, etc. Human ecology redefines the dignity of the individual in contemporary society, as the very basis of the phenomenon of uniqueness of man as against the rest of Creation, that of having been made in the image and likeness of God, without however attracting individual selfishness.

"This similarity shows that Man, the only creature on earth that God wanted for Himself, can fully discover himself only in sincere selflessness and abnegation", according to the opinion expressed by the Vatican. One can only agree with the previous sentence, as long as self-denial ultimately ensures the welfare of others and of future generations, or in other words the continuity of progress.

And to reinforce the above ideas, one may recall that the European Community governance is already focused on the principle of subsidiarity, according to which if a state is unable to meet its development needs, the other members of the Community are obliged to come to the rescue, which can be translated as an inference of human ecology in modern human communities.

The top priority of today's humanity remains therefore doing everything in their power to activate and initiate the advanced consciousness, imminent and quick to manifest in people's lives on a global scale, in order that the flourishing may be facilitated and accelerated of a civilization that embodies the *holos* or the global wisdom of mankind, so that generations living nowadays can reveal a world in which the entire human family can live in harmony with nature on this priceless planet, under the divine grace and having faith in "the very God of peace [who] will sanctify you wholly, and I pray God your whole spirit and soul and body be preserved blameless unto the coming of our Lord Jesus Christ." (*Epistola întâia a Sfântului Apostol Pavel către Tesalonicieni, cap 5. 23*).

5. A FINAL REMARK

As an expression of maximum complementarity of the theories concerning the reality of the surrounding world, physics, in its specific disciplines (from statistical physics to superstring theory, from quantum mechanics to nuclear physics, etc.), combines matter and energy through the particle-wave duality, and places within the compass of uncertainty the exclusive alternatives of spirit and matter. If econophysics and sociophysics represent modelling extensions of physics with respect to the economic and social phenomenon, human ecology is, as exemplified in the previous section, the first multidisciplinary intersection of religion and science.

There are two features that can suggest the complete outline of the relationship between science and religion: the antinomy and complementarity of the correlative approach.

The main modality of knowing the truth in the near or more distant future will be of the antinomic type, simultaneously focusing on an approach of negation and an approach of affirmation (Nicolescu and Stavinschi, 2002) yet equally and ultimately focused on the complementarity of overcoming the contradictions and questions pending between today's science and religion worldwide.

The hierarchy and association of science and religion are defined in the most rigorous manner by Petre Țuțea: "Science moves asymptotically to the absolute. Science is the seat of usefulness. Religion is the seat of transcendent and essentially unique truth, as the sole principle of all things. "

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